

**Urban Design as Problem Solving:
Design Thinking in the Rebuild by Design Resiliency Competition**

By
Kara Elliott-Ortega

B.A. English Language and Literature
University of Chicago, 2010

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Signature of Author: _____

Department of Urban Studies and Planning
May 21, 2015

Certified by: _____

Brent D. Ryan
Associate Professor of Urban Design & Public Policy
Thesis Supervisor

Accepted by: _____

Dennis Frenchman
Associate Dean of Architecture and Planning
Chair, MCP Committee

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Kara Elliott-Ortega

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ABSTRACT

Following Hurricane Sandy in 2012, federal, state, and local governments initiated a series of disaster relief and recovery programs. These efforts were criticized for their lack of coordination, and fueled the public opinion that not only were coastal cities increasingly at risk for storm events due to climate change, but also that the government is not equipped to adequately respond to or prevent future disasters. The Rebuild by Design urban design competition was the first implemented recommendation of the cabinet-level Hurricane Sandy Rebuilding Task Force, and the main goal for the competition was the procurement of innovative resiliency projects for the areas affected by Hurricane Sandy. Sponsored by the U.S. Department of Housing and Urban Development (HUD), the competition is an unprecedented use of urban design by the federal government, leading to the question of why HUD would turn to an urban design process in the midst of other recovery efforts. Through interviews with designers from the winning design teams, this thesis finds that design thinking, under-examined by the participants, management, and evaluations of the competition, is the underlying theory that explains the benefits of an urban design process in the context of responding to climate change. Design thinking theorizes design as an alternative decision making process that can address complex problems for which there is no correct solution. This leads to the use of design as a method of creative problem solving as well as a catalyst for organizational change. This thesis finds that the competition design teams practice characteristics of design thinking. The resulting design ideas synthesize across regional, social, and economic systems, and offer an improved approach to the current infrastructure practices of flood protection and water mitigation. At the same time, the ability of the design process to fulfill the organizational goals of the competition, such as capacity building for local governments, remains mixed. Finally, this thesis generates recommendations for future iterations of Rebuild by Design as well as cautionary lessons for designers in light of the politics of relying on design as a form of innovation.

Thesis supervisor: Brent D. Ryan

Title: Associate Professor of Urban Design & Public Policy

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Rebuild by Design Winning Proposals: 1) OMA 2) MIT CAU 3) OLIN 4) Interboro 5) BIG 6) SCAPE/Landscape

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Chapter 1

Introduction

As climate change becomes a phenomenon that needs to be addressed by local, state, and federal governments, urban design may be called on to participate in the visioning of new urban futures. Although urban design and government do not intersect frequently in the recent history of the United States, an argument for more “creative” approaches to urban issues is being made in many cities with the goal of innovating new solutions to pressing problems such as affordability and environmental sustainability. The 2013 Rebuild by Design urban design competition is one such effort to apply a design process to the complex problem of how to rebuild the region affected by Hurricane Sandy in 2012, and, more broadly, how cities should adapt to rising sea level and climate change. Rebuild by Design is exceptional in its federal level sponsorship by the U.S. Department of Housing and Urban Development as well as in its approach of integrating an aspirational urban design process with implementable projects in the political context of local governments.

This thesis is concerned with the question of why the federal government would turn to an urban design process to begin the conversation on rebuilding post-disaster. I argue that the competition relies on design thinking, a theory of creative problem solving, to produce three related outcomes – improved design ideas for coastal infrastructure, a way to challenge current federal procedures and standards, and increased capacity for state and local governments to respond to climate change. As the outcomes are both final design ideas in the form of the winning competition proposals as well as the secondary effects of the design process, this thesis applies design thinking theory to the competition in order to understand the role of urban design in RBD both as an alternative physical design process as well an alternative organizational process. Evaluations of the competition and its outcomes have not thoroughly modeled or theorized why urban design in RBD is successful, that is to say what it is about urban design that is a both a better method of procurement for resiliency design ideas as well as a process that is

helpful to the public entities that take part in it.

In order to investigate the competition process and added value of urban design in RBD, Chapter One focuses on the context of other governmental and civic responses to Hurricane Sandy. This chapter includes a summary of various relief and recovery efforts funded by the Disaster Relief Appropriation Act of 2013, particularly in New York State and New York City. I include criticisms of federal and local governmental response to demonstrate a disconnect between the various government responses and the on-the-ground experience of residents facing insurmountable hurdles as they tried to recover and rebuild. This situates RBD as a unique approach that emerged from a federal effort to better coordinate governmental responses to climate change.

In Chapter Two, I examine three critical lenses that can be used to interpret the competition: policy transfer from the Netherlands, design competitions as a form of alternative procurement, and design thinking theory. Although all three had a large influence on the competition, I argue that design thinking remains under examined, and provide an introductory literature review of design thinking concepts and debates that informed my analytical approach.

In Chapter Three, I describe my methods and interview data from interviews with members of the winning RBD competition teams. These interviews were conducted in order to understand how designers viewed the competition process and their role as designers in addressing climate vulnerabilities. This chapter is organized into themes from the interview data, focusing on the question of how urban design produced better design ideas, and what about the process was specific to urban design disciplines. Much of the data relates to the use of ambiguity in the competition and the resulting opportunities and challenges this ambiguity created for the designers. This chapter finds that although designers experienced frustrations throughout the competition, they overwhelmingly found that the competition itself was a productive process that gave voice to design to lead a conversation on climate change.

In Chapter Four, I return to design thinking theory and apply it to the evidence from the interviews, along with supporting evidence from supplemental interviews with U.S. Department of Housing and Urban Development (HUD) and RBD partner organizations. A comparison of the process described by the designers to design thinking literature indicates a strong overlap of characteristics of design thinking, and suggests that design thinking is a good model for the RBD design process. I go on to argue that applying design thinking to RBD clarifies what it is about the competition that is successful or still open-ended. In particular, the problem of rebuilding and adapting to climate change is framed as a “wicked problem” through design thinking, which makes it possible to generalize a larger role for urban design the production of alternative solutions. This chapter goes on to investigate how much of the benefits of design thinking in RBD are attributable to urban design as compared to the other critical lenses examined in Chapter 2. I discuss the difficulties of evaluating the impact of design on the goals of the competition, which combine process and product goals and also have mixed outcomes, particularly with respect to HUD. Finally, I argue for design as a balance between expertise and technical knowledge, generalizing an urban design process that can be implemented in other areas of problem solving. Although this raises many new challenges and political limitations for urban design’s professional agency, design thinking models, particularly as articulated through Donald Schön’s concept of reflective practice, can begin a conversation on what an elevated role for urban design looks like in the American political context. In Chapter 5, I outline recommendations for a future Rebuild by Design competition, were one to occur, as well as future research questions based on this research, concluding that design, and urban design more specifically, can and should play a role in creating alternatives as we face future crises.

This thesis investigates the design process through the case of Rebuild by Design in order to understand what would make it a useful alternative to improve disaster recovery processes and outcomes. Without a clear model for the added benefit of urban design, evaluation of the proposals and the final implemented projects is unclear, and deriving knowledge or “lessons learned” from RBD is incomplete. This thesis addresses this gap in understanding by arguing

that RBD puts design thinking into practice, from which we can learn valuable lessons about the ability of design to address complex problems.

Hurricane Sandy - Relief and Recovery Efforts

Hurricane Sandy was a record-setting weather event that hit the United States on October 29, 2012, moving up the East coast and making landfall on the coast of New Jersey. At its peak strength, Hurricane Sandy was a category 2 hurricane, but it weakened to a category 1 hurricane as it reached land, becoming a post-tropical cyclone with hurricane force winds around 80 miles per hour.¹ In New York, the peak height of the storm surge was 14 feet – in New Jersey waves reached higher than 30 feet. Around the country, people followed news and social media updates, which showed rising water submerging the boardwalk and amusement rides at the New Jersey Shore and flooded subway stations in New York City. After the storm, photographs circulated of a dark Manhattan skyline recovering from power outages, flooded streets in Red Hook, and crumpled houses along the Rockaway peninsula.²

The effects of the storm were devastating. One hundred and fifty people lost their lives in the storm, and many lost their homes or livelihoods - more than 650,000 homes were damaged, hundreds of thousands of businesses were damaged or forced to close.³ Hurricane Sandy is the second-costliest hurricane in U.S. history.⁴ There were \$65 billion total in damages and economic loss including \$2 million lost in working days, and tens of billions of dollars of damage to infrastructure in the affected states. This included natural infrastructure, in some cases the only form of protection for coastline communities - erosion, island breaching, and the formation of new inlets dramatically changed the coastline.⁵ Another large economic cost came in the form of insurance claims - an estimated “\$18.8 billion to policy holders.”⁶ The scale of the aftermath of Hurricane Sandy was striking, particularly the extent to which it halted business as usual in New

1 National Oceanic and Atmospheric Administration. “StormCentral 2012, Event: Sandy.” Dec. 1, 2012. <http://www.noaa.gov/stormcentral/>.

2 Hurricane Sandy Rebuilding Task Force. *Hurricane Sandy Rebuilding Strategy*. August, 2013. <http://portal.hud.gov/hudportal/documents/huddoc?id=HSRebuildingStrategy.pdf>, 22-23.

3 Hurricane Sandy Rebuilding Task Force. *Hurricane Sandy Rebuilding Strategy*, 29.

4 National Oceanic and Atmospheric Administration. “StormCentral 2012, Event: Sandy.”

5 Hurricane Sandy Rebuilding Task Force. *Hurricane Sandy Rebuilding Strategy*, 24.

6 *Ibid.*, 29.

York City and upended lives up and down the coast and as well as in the Caribbean. Eight years after Hurricane Katrina, Hurricane Sandy raised the question of whether one percent chance or “100 year” storms were no longer a remote possibility, but perhaps a more common threat to vulnerable coastal cities for which the U.S. and local governments remained unprepared.

Along with an increased sense of risk, the many levels of governmental disaster relief occurred in the immediate aftermath of the storm created the perception that coordination was lacking across levels of government. On October 30th, President Obama declared major disasters for New York, New Jersey, and Connecticut, authorizing many federal agencies such as FEMA and the National Guard to respond. At the same time, local volunteers and organizations were some of the first to participate in disaster relief efforts, often in their own neighborhoods, where volunteers and donations “overwhelmed” city disaster relief centers.⁷ FEMA coordinated disaster preparation and relief with the National Guard and other federal agencies, and positioned over 1,000 personnel to the area in anticipation of Hurricane Sandy, but media coverage of relief efforts in the week after the storm highlighted the generosity of individuals and volunteer groups.⁸ The *New York Times* and other media noted that while some FEMA disaster recovery centers had been “closed due to weather,” the work of organizations such as Occupy Sandy, the Sandy relief arm of the Occupy Wall Street movement, and church volunteers became important lifelines for residents needing shelter and food after the storm.⁹ Cities also responded quickly - under political pressure and in what was perceived as a vacuum of federal response efforts, mayors took up responsibility for organizing recovery efforts. In New York City, then-Mayor Michael Bloomberg sidestepped the Office of Emergency Management, and “relocated city

7 Catherine Rampell, “Volunteers Flock to Disaster Areas, Overwhelming City Relief Centers.” *New York Times*, Nov. 4, 2012. <http://www.nytimes.com/2012/11/05/nyregion/volunteers-and-donations-flock-to-areas-affected-by-hurricane-sandy.html>.

8 Federal Emergency Management Agency, “Hurricane Sandy: A Timeline.” April 25, 2013. <https://www.fema.gov/media-library/assets/documents/31987>.

9 Alan Feuer, “Occupy Sandy: A Movement Moves to Relief.” *New York Times*, Nov 9, 2012. <http://www.nytimes.com/2012/11/11/nyregion/where-fema-fell-short-occupy-sandy-was-there.html>.



Manhattan, NY



Santiago de Cuba, Cuba



8th St./Ave C, Manhattan, NY



Santo Domingo, Dominican Republic



Dumbo, Brooklyn, NY



Lindenhurst, NY



Battery Park Underpass, Manhattan, NY



Path Station, Hoboken, NJ



Harvey Cedars, Long Beach Island, NJ



Bellport, NY



Figure 2: Images of Hurricane Sandy Aftermath, NOAA

emergency funds to the mayor's office" in order to react more quickly to relief needs.¹⁰ The mayor's Rapid Repairs program began almost immediately after the storm to assist with disaster relief by offering emergency repairs such as restored heat, power, and hot water.¹¹ By December 2012, two months after the storm, Bloomberg had convened the Special Initiative for Rebuilding and Resiliency (SIRR), a planning initiative under the Mayor's Office of Long-Term Planning and Sustainability to address long-term resiliency planning for the city.¹²

Congress was not able to pass additional federal funding until three months after the hurricane, in January 2013, with the Disaster Relief Appropriation Act of 2013 (Sandy Supplemental). This act authorized \$50 billion to nineteen federal agencies and recovery efforts, including the Department of Housing and Urban Development (HUD), the Army Corps of Engineers (USACE), and the Environmental Protection Agency (EPA). Individual agencies allocated this money through their own programs, for example the Federal Emergency Management Agency (FEMA) allocated around \$15 billion to a variety of aid and recovery programs such as providing low-interest loans, individual assistance, debris removal, infrastructural repairs, and payouts to policyholders through the National Flood Insurance Program.¹³

With the passage of the Disaster Relief Appropriation Act, states and local governments began the process of acquiring and managing federal funding. New York State created the \$650 million New York Rising Community Reconstruction Program, under which the Governor's Office of Storm Recovery (GOSR) would later manage \$3.8 billion in federal funds to be spent on local planning and aid for small business hurt by the storm and a buyout program. New

10 Max Liboiron and David Wachsmuth. "The Fantasy of Disaster Response: Governance and Social Action During Hurricane Sandy." *Social Text*, Oct. 29, 2013. http://socialtextjournal.org/periscope_article/the-fantasy-of-disaster-response-governance-and-social-action-during-hurricane-sandy.

11 New York City Build it Back. "Rapid Repairs." New York City (New York). <http://www.nyc.gov/html/recovery/html/resources/rapid.shtml>.

12 New York City Mayor's Office of Recovery and Resiliency. "PlaNYC - About." New York City (New York). <http://www.nyc.gov/html/planyc/html/about/about.shtml>.

13 Federal Emergency Management Agency, "Hurricane Sandy: A Timeline."

York City used federal funds to manage and organize a set of recovery efforts geared toward businesses and infrastructure as well as a city buyout program, NYC Build it Back.

Federal Coordination and the Hurricane Sandy Task Force

Simultaneous to the Disaster Relief Act and the implementation of local relief programs, efforts were underway to coordinate federal disaster relief processes as well as reflect on long-term issues of climate change. The Hurricane Sandy Rebuilding Task Force was founded in December of 2012, only two months after Hurricane Sandy, as an inter-agency team created by the president to develop and “establish guidelines for the investment of the Federal funds made available for recovery and set the region on the path to building back smarter and stronger.” The creation of the Task Force came out of recognition that long-term planning was required quickly after the disaster, even as immediate aid was still a priority. The Cabinet-level team did more than coordinate the allocation and management of federal funds – it was also tasked with cutting through red tape and “removing obstacles to resilient rebuilding.” The Task Force was chaired by Shaun Donovan, then-HUD Secretary, and included representatives of the EPA, USACE, the White House, an advisory group of state and local government representatives, as well as a task force staff.¹⁴

Another influential member of the staff was Henk Ovink, former director of the office of the Netherlands Spatial Planning and Water Management. After the creation of the Hurricane Sandy Rebuilding Task Force, Shaun Donovan visited the Netherlands, where Ovink was his guide of Dutch water engineering projects. Ovink was interested in the American context and was brought on to the Task Force in March 2013. In a *New York Times* article about his role on the Task Force, Ovink paraphrased his experience visiting the Rockaways with a team of American engineers who were rebuilding storm walls after Hurricane Sandy:

¹⁴ Hurricane Sandy Rebuilding Task Force. *Hurricane Sandy Rebuilding Strategy*, 17.

“These are the same walls that broke before?” Ovink asked. “Yes!” came the reply. “And what if they break again?” “We’ll rebuild them again.”¹⁵

He was surprised by this approach as well as with the political climate, learning quickly that not everyone was comfortable with the term “climate change” and that flood protection often meant gray hard infrastructure. In the Netherlands, projects such as the Watersquare Benthemplein, which creates space for water storage under a park, and Rotterdam’s Floating Pavilion are examples of the region’s interest in living on water and with water where possible rather than guarding against it.¹⁶ Ovink brought his outside experience with this approach to coastal design and water management to the Task Force, and became one of its ambassadors, giving lectures and interviews about its goals and about the Rebuild by Design competition.¹⁷

The Task Force worked for eight months to produce the Hurricane Sandy Rebuilding Strategy (HSRS), which was published in August 2013. The Rebuilding Strategy contained a suite of recommendations for long-term rebuilding and resiliency in the area affected by Hurricane Sandy, broken into chapters on innovative rebuilding ideas, regional infrastructure coordination, ensuring the affordability of new housing, economic revitalization, building local government capacity, and improving data sharing between federal and local governments.

The Rebuild by Design competition is highlighted by the Rebuilding Strategy as an example of the Task Force’s commitment to promoting “resilience through innovation.”¹⁸ The stated goals for RBD include promoting “innovation by developing regionally-scalable yet locally contextual solutions,” implementing the proposals with public and private funding, and helping build the capacity of communities to prepare for the next storm.¹⁹ Capacity building is a theme in many of the Task Force recommendations, and Rebuild by Design is described as one of the only ways

15 Russell Shorto. “How to Think Like the Dutch in a Post-Sandy World.” *New York Times*. April 9 2014.

16 “Watersquare Benthemplein.” De Urbanisten. <http://www.urbanisten.nl/wp/?portfolio=waterplein-benthemplein>.

17 Henk Ovink. “Resiliency by Design, the Politics of Planning and Rebuilding.” Syracuse University. September 26, 2013. <https://www.youtube.com/watch?v=OMOsYqGW6UI>.

18 Hurricane Sandy Rebuilding Task Force. *Hurricane Sandy Rebuilding Strategy*, 44.

19 Ibid.

for local governments to create local solutions based on regional and complex issues.²⁰ This includes helping both local and federal governments learn about the vulnerabilities in the area affected by Sandy as well as their interdependencies.²¹ The Task Force references an existing federal prize-based competition program that incentivizes the private and philanthropic sectors to create innovative solutions to “tough” problems as the model for holding a design competition.²² At the same time, however, an urban design competition has never been held through that prize program. Shaun Donovan described RBD as heralding a “new era of unprecedented collaboration...attracting world-class talent to develop innovative projects that will protect and enhance our communities.”²³ RBD is the only design-related recommendation in the strategy – other recommendations from the Task Force addressed building capacity for local planning and comprehensive understanding of risk, improved climate and storm data sharing between federal and local governments, and regional and resilient infrastructure investment.

The Rebuild by Design competition began in the summer of 2013 while other federal and local planning efforts were also underway, moving from post-disaster recovery to address the complexities of climate change that were illuminated by Sandy. The White House released the President’s Climate Action Plan in June 2013, which outlines an agenda for the government – cutting carbon pollution, preparing for impacts of climate change, and working with other countries on clean energy and reducing emissions. The action plan argues that climate change is “no longer a distant threat,” drawing on evidence of increasing temperatures, droughts, heat waves, and the weather disasters of 2012, including Hurricane Sandy.²⁴ States and local governments released their own forward-looking plans. New York City’s Special Initiative for Rebuilding and Resiliency (SIRR), which had been meeting since December 2012, released a plan, titled “A Stronger, More Resilient New York,” that issued recommendations based on

20 Ibid., 46

21 Hurricane Sandy Rebuilding Task Force. *Hurricane Sandy Rebuilding Strategy*, 45.

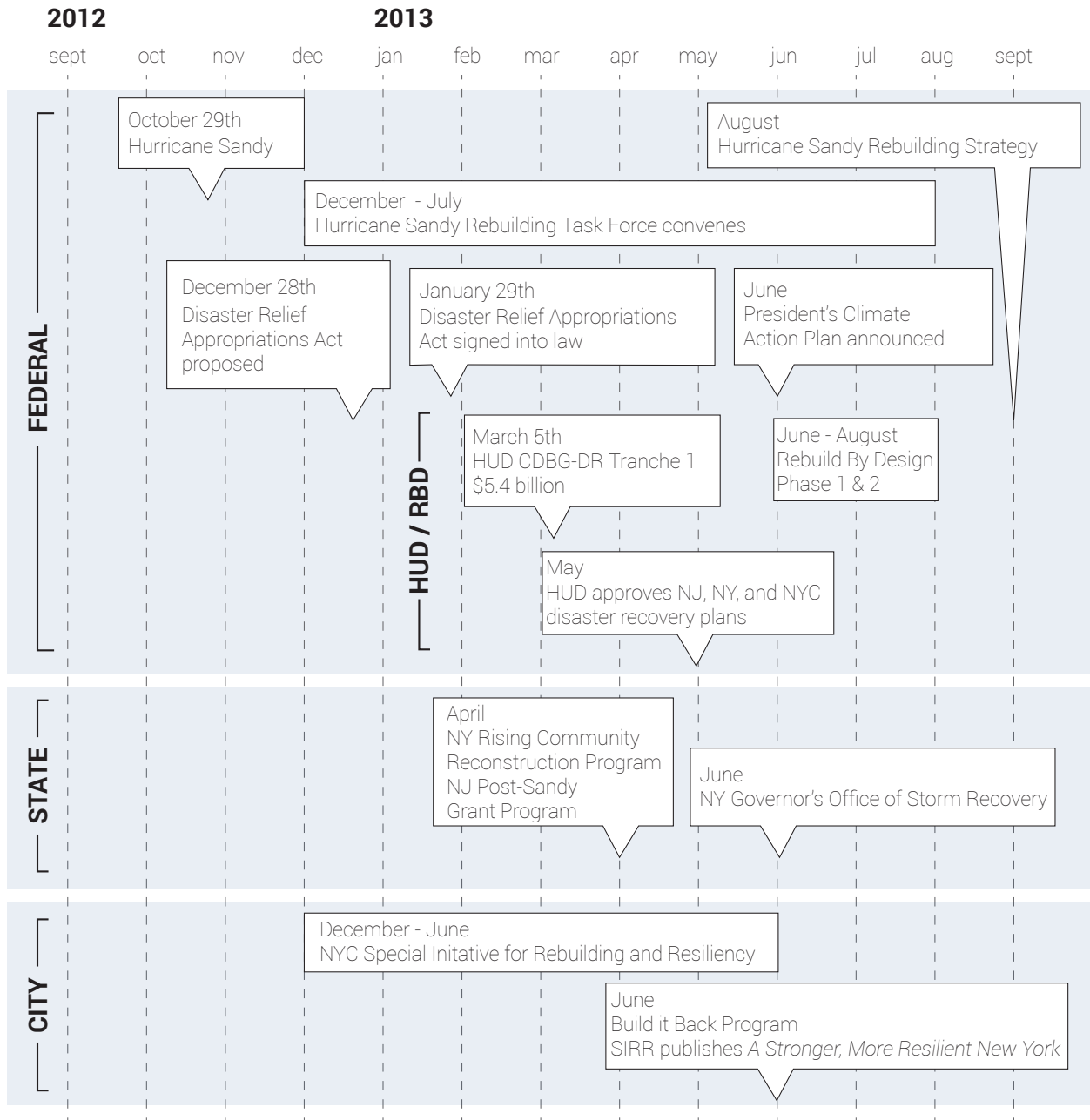
22 Ibid. For more information visit <https://www.challenge.gov/list/>.

23 Ibid., 4.

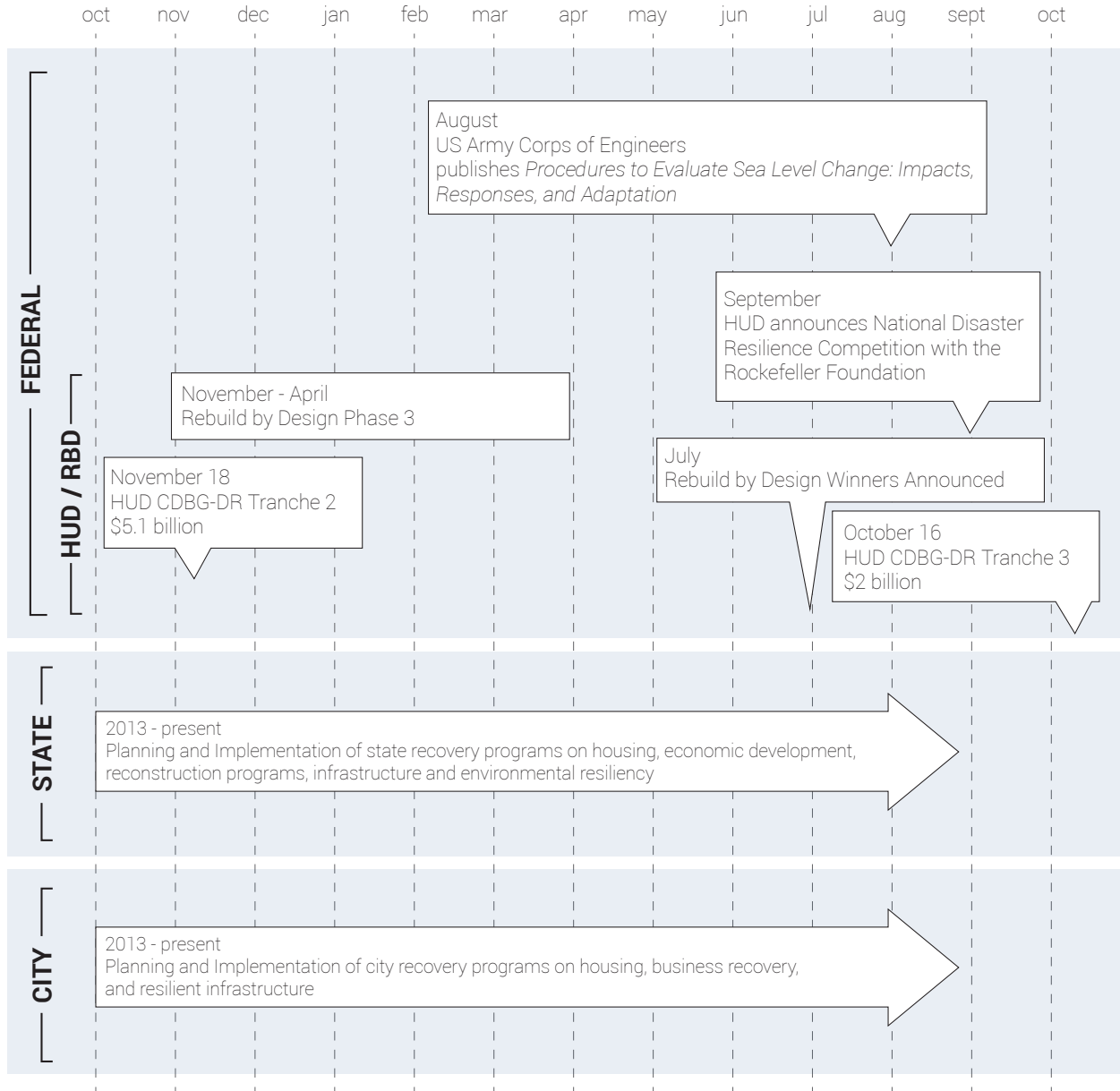
24 Executive Office of the President. “The President’s Climate Action Plan,” June 2013. <https://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf/>. 4.

**FIGURE 3:
HURRICANE SANDY DISASTER RELIEF/REBUILDING TIMELINE**

examples of governmental response



2014



the extent of the disaster and the difficulties that recovery and rebuilding faced.²⁵ The SIRR report describes, for example, how FEMA flood maps were not up to date at the time that Sandy hit, requiring interim maps to be issued three months later along with suspended zoning restrictions and modified building codes that “allowed New Yorkers to begin rebuilding after the storm to standards that better reflected actual flood risks.”²⁶ Recommendations addressed miscommunication between federal agencies and the city as well as lack of up to date regulatory standards. For their climate predictions, SIRR referenced the New York City Panel on Climate Change, which focuses on modeling climate change at a regional level. At the same time, the report recommends that flood barriers be “built, where possible, to the [FEMA] 100-year flood line with an additional allowance for sea level rise” indicating a lack of clarity as to the exact standards for the implementation of flood and storm/surge protection projects.²⁷ Certain recovery programs such as NYC’s Build it Back buyout program ended in 2013, while rebuilding programs and implementation of recommendations from post-Sandy planning efforts continued through to 2015.

Rebuild by Design Competition

Although the Hurricane Sandy Rebuilding Strategy was presented to Congress in August 2013, the Rebuild by Design competition brief was released in June 2013, beginning the yearlong design competition. Main partners throughout the competition were the Rockefeller Foundation, the Regional Plan Association (RPA), the Van Alen Institute (VAI), New York University’s Institute for Public Knowledge (IPK), and the Municipal Art Society of New York (MASNY). The Rockefeller Foundation was a major funding source, granting \$1,223,866 to

25 Urban Land Institute New York. “Mayor Bloomberg Unveils Plan to Create a Stronger, More Resilient New York.” ULI New York Blog, June 12, 2013. <http://newyork.uli.org/news/mayor-bloomberg-unveils-plan-to-create-a-stronger-more-resilient-new-york/>.

26 Special Initiative for Rebuilding and Resiliency. “A Stronger, More Resilient New York.” The City of New York, June, 2013. 23-24.

27 *Ibid.*, 46.

several competition partners, “toward the costs of engaging diverse stakeholders and producing community engagement...to inform the design teams’ development of design solutions and the selection of key projects for the rebuilding of areas affected by Hurricane Sandy.”²⁸ The foundation also made RBD-related grants to HUD, the Institute for Public Knowledge, and the Community Foundation of New Jersey Morristown to help fund the running of the competition, including the \$200,000 awarded to finalist teams.²⁹

RBD unfolded as an open design competition with three phases, mixing both an ideas competition and a project competition in one process by writing into the open-ended design brief that ideas be innovative while requiring site-specific and regionally scalable projects. The design brief lists six objectives for the competition, which include increasing knowledge of the region’s vulnerabilities, capacity building for local and federal governments, and increasing resilience. Innovation appears twice in the design objectives and many times throughout the brief, to encourage “out-of-the-box thinking” and “world-class” design.

The design brief is also a request for qualifications – teams were required to be interdisciplinary, demonstrating expertise in at least three fields relevant to the competition such as infrastructure engineering, landscape design, urban design, or planning. Teams were also encouraged to have expertise in a variety of other fields such as social science, project management, the arts, or “other disciplines as appropriate.”³⁰ The only other requirements for eligibility were “demonstrable experience in interdisciplinary research” and at least one team member with prior experience working on public projects. The brief explains the open-endedness of the qualifications by saying that it is seeking innovative thinking and new approaches.

The design brief articulates that RBD is a “policy innovation” due to the use of HUD’s CDBG-DR funds, which had never before been allocated to the implementation of projects from

28 The Rockefeller Foundation. “The 2013 Annual Report,” March 17, 2015. <http://annualreport2013.rockefellerfoundation.org/financials/grantees>.

29 The Rockefeller Foundation. “The 2013 Annual Report.”

30 Rebuild by Design. “Promoting Resilience Post-Sandy Through Innovative Planning and Design.” June 21, 2013, 8.

a design competition. Additional funds from the Rockefeller Foundation helped pay for the competition itself, including key educational sessions on regional issues for the design teams. The promise of implementation and funding for projects was a major incentive for competitors.³¹ Combined with the prestige and visibility of contributing to an important dialogue on resiliency and climate change in and around New York City, RBD was well positioned to attract design talent from around the world. In the first stage of the competition, the Task Force selected ten applicants to move forward in the competition out of the 148 applicants who responded to the design brief. Although the design brief qualifications cast a wide net, the ten teams were all recognized firms and institutions, mostly headquartered in the New York City area.

In the second stage during the month of August 2013, the top ten teams entered the research phase during which they participated in RBD-led site visits to learn first hand about areas that had been hit hard by Sandy. In this stage, teams produced regional research and mapping based on the area's vulnerabilities to help them determine sites for potential intervention. Public engagement and workshops exposed teams to a variety of stakeholders – local organizations, public officials, local politicians, and resiliency experts. The NYU Institute for Public Knowledge, an RBD partner, played a role in organizing the research component, creating a Research Advisory Group of scholars that led working groups and seminars on issues related to climate change, addressing “issues at the heart of the competition, including governance, ecology, equity, data analysis, and planning.”³² For example, one working group titled “Policy by Design - Promoting Resilience in Policy and Practice,” included speakers from HUD, the Regional Plan Association, local council members, researchers on ecology and resilience, and directors of the New Bedford Harbor Development Commission, New York State Department of Environmental Conservation, Metropolitan Waterfront Alliance, New York - New Jersey Harbor & Estuary Program. This event also included breakout sessions on topics that would help teams think about how to position their proposals for implementation by generating

31 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” June 2014, Feb. 21 2015, 10.

32 Rebuild by Design. “Research Report: A Regional Analysis.” 2015, <http://rebuildbydesign.org/research>.

conversation between regulators, political representatives, and experts on how to identify and address “the policy, regulatory, and administrative obstacles that they encountered as they developed their design proposals.”³³

Educational programs such as these offered an opportunity for reflection during the competition and were also a way for the competition to continue to develop relationships between design teams and stakeholders, such as small businesses, political leaders, and community organizations. At the end of the second stage, the design teams presented their ideas for three to five design sites to the public, the Jury, and the CDBG-DR grantees. The RBD Jury was comprised of eleven jury members, including the competition sponsor, HUD, as well as experts on resilience, architecture, engineering, and planning, who were seen as experts with the required experience to evaluate the winning projects. The Jury’s role in the second stage was advisory, “as an expert panel throughout the competition process, providing critical input during the analysis and design stages.”³⁴ With feedback from the stakeholders and the Jury, HUD selected one site per team to move forward. Although only one site would continue into the next phase, the research and reports generated from this research phase were treated by RBD as important final products in and of themselves, sharing the research proposals as resources on regional vulnerabilities and resiliency opportunities on the RBD website.

The third stage of the competition was much longer than the second, spanning November 2013 to April 2014. During this phase, design teams honed in on the specifics of their design ideas, working to make the final proposal implementable and fundable, while delving more deeply into public engagement. Teams were asked to develop coalitions of support for their projects, working with residents, local government, elected officials, local businesses, and not-for-profits. Most of the final proposals outline the number of public events and feedback that they received, documenting the extent of their outreach. The Interboro team, for example, held over forty meetings during this time period to develop their plan for the South Shore of

33 “Policy by Design: Promoting Resilience in Policy and Practice.” Rebuild by Design, June 27, 2014. 2.
34 Rebuild by Design. “Jury.” 2015, <http://www.rebuildbydesign.org/about/jury>.

TABLE 1: REBUILD BY DESIGN TEAMS

	Resist, Delay, Store, Discharge	Living Breakwaters	The Big “U”
\$ Awarded	\$230 Million	\$60 Million	\$335 Million
Site	Hoboken, NJ	South Shore Staten Island, NYC	Lower East Side, Manhattan, NYC
Design Firm	OMA	Scape/Landscape Architecture	BIG
University		Phil Orton, Stevens Institute of Technology	Parsons School of Constructed Environments
Real Estate	HR&A		James Lima Planning + Development
Engineers & Infrastructure	Royal HaskoningDHV*	Parsons Brinckerhoff Ocean & Coastal Consultants	One Architecture* Arcadis* Level Agency for Infrastructure
Environmental	Balmori Associates	SeARc Ecological Marine Consulting	Green Shield Ecology
Landscape Architecture			Starr Whitehouse
Community / Not-for-Profit		The Harbor School	
Other Design		Lot-EK	
Media		MTWTF	Project Projects
Other			AEA Consulting

* indicates a Dutch organization

Living with the Bay	New Meadowlands	Hunts Point Lifelines
\$125 Million	\$150 Million	\$20 Million
South Shore, Nassau County, Long Island, NY	Meadowlands, NJ	Bronx, NYC
Interboro Partners	ZUS* URBANISTEN	
Delft University of Technology* NJIT Infrastructure Planning Program	MIT Center for Advanced Urbanism	PennDesign
RFA Investments		HR&A
Apex Deltares*	Volker InfraDesign* Deltares*	eDesign Dynamics Level Infrastructure McLaren Engineering Group Philip Habib & Associates Buro Happold
Bosch Slabbers* H+N+S Landscape Architects		
Center for Urban Pedagogy		
Palmbout*		
	75B	
IMG Rebel* David Rusk, Innovative Housing Institute		Barretto Bay Strategies

Nassau County. In their proposal, these meetings are broken down into “community meetings,” “presentations to/meetings with government agencies,” and “presentations to/meetings with private, nonprofit, and academic institutions.” The community meetings include numerous meetings with the governmental and civic organizations that the team needed feedback from but also had to coordinate with, particularly on planning and infrastructure projects that were already under way in the site. During this stage, RBD also organized events to educate the broader public about the projects and process, such as “Scale It Up,” a series of open events held around the region that used pieces of the proposals to educate the public on resiliency and promote the competition.

Requirements for the final proposals included proof of local support and their public engagement, budgeting and phasing for the project, and a cost-benefit analysis. Each proposal walked through the logic of the proposed plan and designs, beginning with the history of the site and a mapping of vulnerabilities in the area. This led to an articulation of risk, which for all proposals included storm surge or sea level rise, as well as additional interrelated risks based on the vulnerabilities research and the design approach of individual teams.

For some teams, these additional vulnerabilities came from the analysis of social conditions. BIG, for example, mapped the lack of social services and social infrastructure, such as grocery stores, access to transit, and affordable housing. Other teams chose sites based on their position in a regional network, where the site’s flood risk was linked to a regional vulnerability – both MIT and OLIN’s proposals framed their site’s regional impact around logistical supply chains and the location of light industry. Design recommendations responding to these vulnerabilities used a combination of plans and smaller scale design ideas that could be repeated, like typologies responding to different contexts, through the entire site. For example, the SCAPE/Landscape team developed four design concepts for the coast of Staten Island, which included protective elements such as a berm, ecological “living” breakwaters, and a social or economic amenity like a marina or an education center “water hub.” Each scenario applies to a specific site

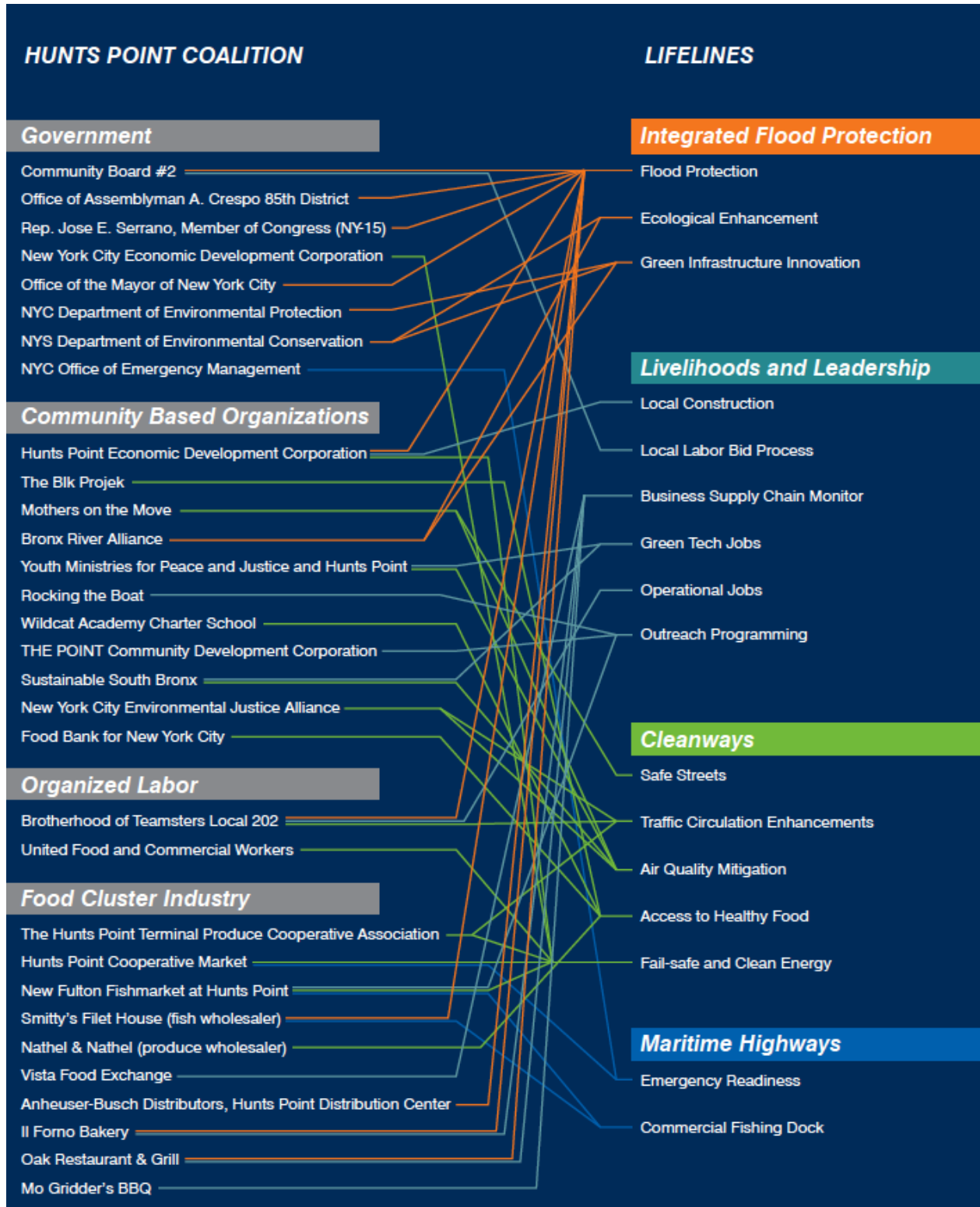


Figure 4: Example of Stakeholder Engagement and Corresponding Design Ideas (OLIN Team)

on the coast, but also shows how the design elements that the team proposes can fit into different contexts depending on the urban edge, priorities for the public, recreational opportunities, or desired habitats. Many teams took this approach in order to demonstrate how their proposed designs could be “regionally scalable” in similar areas requiring coastal protection, as requested by the design brief. At the end of the third stage, the ten design teams presented their final proposals to the public, the RBD Jury, and the HUD selection team in April 2014.

Winning Proposals and Funding

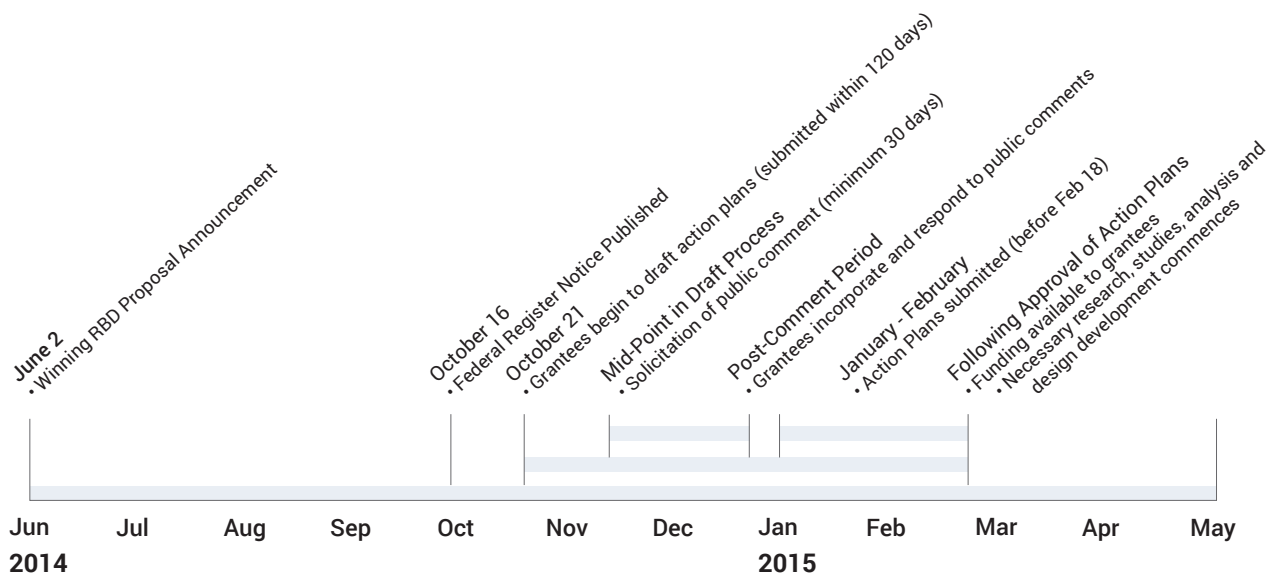
The winning proposals were announced on July 2, 2014. Six of the original ten teams won, meaning that those projects moved forward toward implementation with HUD continuing to work with the grantees to award implementation funds. As of April 2015, funding has been allocated for a first phase of development, prioritizing the construction of flood protection, which is perceived as the most immediate need. The Hunts Point proposal in the Bronx received limited funding for more planning and development in order to identify a pilot project for future implementation. One non-winning proposal, in Bridgeport, Connecticut, also received funding to identify a pilot project, bringing the total of RBD funded projects to seven. This is the only grantee awarded funding that was not a winner of the Rebuild by Design competition, and is the result of the extent of need in the area as well as the political will to continue the project.³⁵

The funding for RBD implementation originates from the Disaster Relief Appropriations Act of 2013. Of the \$15.2 billion allocated to HUD, \$930 million is going to the implementation of the winning projects through the agency’s Community Development Block Grant - Disaster Recovery Program (CDBG-DR). Community Development Block Grants began in 1974 as a flexible grant program administered through the Department of Housing and Urban Development (HUD). Funds are allocated to state and local governments for community development

³⁵ Anonymous Interview, February 18, 2015.

needs such as housing and business development, particularly for low-income or vulnerable communities. The Community Block Grant Disaster Recovery Program provides grants for the same types of grantees (cities, counties, states) but only those grantees that are recovering from presidentially declared disasters are qualified to receive funding, and all funded programs must comply with nationally-set objectives. The CDBG-DR grants are one-offs – Congress

FIGURE 5:
HUD ACTION PLAN TIMELINE
 path toward RBD implementation funding



U.S. Department of Housing and Urban Development

appropriates supplemental funding to the CDBG program in the form of Disaster Recovery grants based on the occurrence of the disasters. In the case of Hurricane Sandy, this funding was appropriated through the Disaster Relief Appropriations Act.

As of May 2015, HUD has made three allocations of CDBG-DR funds to grantees affected by Hurricane Sandy. The first tranche allocated \$5.4 billion for “unmet housing and economic revitalization needs” for the states affected by Hurricane Sandy as well as New York

City.³⁶ The second tranche allocated \$5.1 billion specifically for infrastructure needs, to “support investments in mitigation and resilience” as well as “comprehensive planning to promote regional resilience as part of the recovery effort.”³⁷ The third tranche allocated around \$1 billion for further Hurricane Sandy recovery needs as well as the \$930 million for the implementation of the seven RBD proposals.³⁸ These allocations initiated a timeline for the grantees to develop action plans and fulfill a number of requirements in order to receive the funds, including the development of Environmental Impact Statements, benefit-costs analyses, and the certification of any infrastructure construction.³⁹ Additionally, grantees are required to “implement Rebuild by Design projects consistent with the proposal to the greatest extent practicable and appropriate, considering the technical, fiscal, environmental, legal or other constraints that may be encountered.”⁴⁰ HUD awards funds to the grantees once the completed action plan has been accepted.

Tensions Over Governmental Response

There were many criticisms of federal disaster response and relief in the short and long-term response to Sandy - the number of programs and bureaucratic processes, along with the “dizzying array of government agencies” created a sense of confusion and distrust among those on the ground who had been severely affected by the storm.⁴¹ Homeowners whose property had

36 “Allocations, Common Application, Waivers, and Alternative Requirements for Grantees Receiving CDBG-DR Funds in Response to Hurricane Sandy.” 78 Federal Register 43, March.5 2013, 1.

37 “Second Allocation, CDBG-DR Funds in Response to Hurricane Sandy.” 78 Federal Register 222, Nov. 18, 2013, 2.

38 “Third Allocation, CDBG-DR Funds in Response to Hurricane Sandy.” 79 Federal Register 200, Oct. 16 2014, 2.

39 Office of Community Planning and Development. “Summary of Federal Register Notice Published October 16, 2014, Regarding Rebuild by Design Projects.” U.S. Department of Housing and Urban Development, 3.

40 Ibid., 4.

41 “Recovery Remains Spotty 3 Months after Hurricane.” *New York Times*, Jan. 21, 2013. <http://www.nytimes.com/2013/01/22/nyregion/recovery-remains-spotty-3-months-after-hurricane-sandy.html>.

been damaged in the storm faced displacement and a series of bureaucratic hoops over the course of many months in order to receive financial assistance. Those without flood insurance could receive assistance from FEMA, but that was often not enough to save the home from demolition. Of the over \$8 billion that FEMA provided in direct aid, flood insurance payouts, or business loans, almost half of the recipients in the hardest-hit areas around New York City received less than \$5,000.⁴²

Timing and red tape was also an issue, as families had to wait for months for Congress to pass the Disaster Relief Appropriation Act, for HUD to make that money available through programs like Build it Back and New York Rising, and then for these local programs to spend the federal dollars. A year after the storm, New York City, New York, and New Jersey had only paid out a fraction of the \$10.2 billion received from HUD. Residents described waiting for hundred-page applications for loans to be reviewed and the sense of having to beg for recovery money. One year after the storm, more than 30,000 residents remained displaced, often drawing on personal savings and family support while waiting to hear back from recovery programs. Following Hurricane Katrina, the government's response to Hurricane Sandy instilled in the general public not just a sense that U.S. cities in the path of storms and floods are increasingly at risk, but also that the government's ability to prevent as well as to respond in the face of disaster is severely limited by a slow-moving bureaucracy, poor interdepartmental communication leading to overlapping and conflicting programs, and political ineptitude.⁴³

These various programs and experiences of the state's relief and prevention efforts demonstrate many of the challenges of responding to Hurricane Sandy across levels of government as well as across jurisdictions, made more complex by the context of climate change. When governments turned from direct relief to planning and prevention in the summer after Sandy, standards and regulations were unclear, and recommendations for coastal

42 Patrick McGeehan and Griff Palmer. "Displaced by Hurricane Sandy and Living in Limbo." *New York Times*, Dec. 6, 2013. <http://www.nytimes.com/2013/12/07/nyregion/displaced-by-hurricane-sandy-and-living-in-limbo-instead-of-at-home.html>.

43 Ibid.

infrastructure projects brought together technical information such as levee heights, floodplains, and precedents, from a variety of sources.⁴⁴ Both federal and local government planning recommendations pointed to a lack of communication and capacity to work across agencies and levels of government.

⁴⁴ Special Initiative for Rebuilding and Resiliency. “A Stronger, More Resilient New York,” 46.

Chapter 2 - RBD Reception and Critical Lenses

Rebuild by Design was announced in the midst of these planning efforts, as the first tangible output of the Hurricane Sandy Rebuilding Task Force, and the proposals as well as the RBD process have received mainly neutral or positive press. As a suite of designs and visions for the future of these coastal cities, the RBD proposal boards have contributed to an international dialogue on design and climate change by featuring in exhibitions around the world, such as at the Danish Architecture Center, the United Nations World Conference on Disaster Risk Reduction, and the American Institute of Architects. Praise for the final proposals has highlighted their ambition as well as the comprehensive and interdisciplinary approach of the competition – factors that appeared to some to be lacking in siloed recovery efforts.^{45, 46}

In June 2014, the Urban Institute, a nonprofit policy research organization, published an in depth professional evaluation of the competition phase of Rebuild by Design drawing on interviews with design teams and partners, as well as community members and political stakeholders. The report, funded by the Rockefeller Foundation, is “highly positive” and affirmed that the design competition was an “innovative strategy for meeting resilience goals.”⁴⁷ The evaluation ultimately concludes that the RBD competition could be a replicable model, although many challenges are identified that arise from the open-endedness of the competition’s key concepts, such as resilience and vulnerability, as well as the procedural and managerial ambiguity of a new program. The evaluation, along with RBD publications, news articles, and published interviews with participants, tells the story of a fast-paced and slightly chaotic process, in which decisions about how to run the competition occurred as the competition was evolving. I argue that these materials provide evidence for the interpretation of RBD and the role of design along three analytical themes: RBD as a kind of policy transfer through the vision

45 Alan Feuer. “Building for the Next Big Storm.” *New York Times*. October 25, 2014.

46 Josh Stephens. “A Vivid Warning for Coastal Cities.” California Planning and Development Report, April 6, 2015. Accessed April 13, 2015. <https://www.cp-dr.com/node/3714>.

47 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” ix.

and involvement of Henk Ovink, RBD as new mode of procurement following the model of design competitions, and RBD as a demonstration of design thinking through the use of design to “address major social and environmental challenges.”⁴⁸ Together, these themes create a comprehensive interpretation of RBD as the result of special circumstances and personalities, the use of a model for alternative procurement, and the concept that design has a special way of assessing problems. This thesis focuses on the last of these themes because design thinking remains an under explained assumption. The term “design thinking” appears in the design brief as well as in the Urban Institute evaluation, but it is never defined. The evaluation’s theory of change, which should articulate the expectations for how RBD accomplishes its goals, describes the RBD process without generalizing what it is about design that leads to those outputs, mid-term outcomes, or long-term goals. This indicates a gap in knowledge on the role of design in the process. It is helpful to articulate what is already known about both the policy transfer and design competitions themes as they answer the question of how a design competition became a viable program option for HUD and the Hurricane Sandy Rebuilding Task Force.

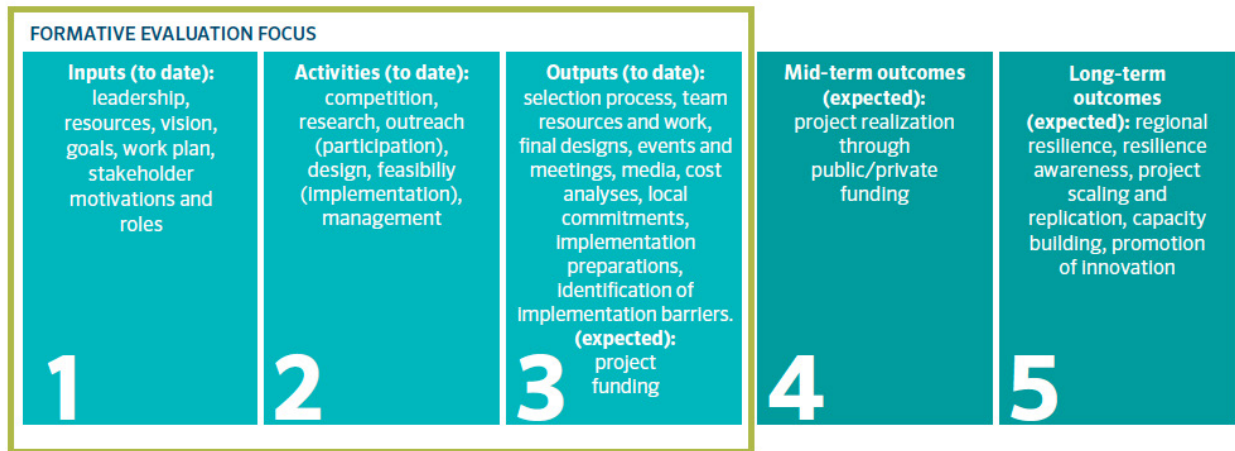


Figure 6: Urban Institute Evaluation’s “Theory of Change” for RBD

48 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” x.

Policy Transfer

Henk Ovink had an enormous influence on the competition, and is often credited with the vision behind RBD, based on his experience working on infrastructure projects in the Netherlands and his participation in international dialogues about resiliency and water management.⁴⁹ Ovink was part of an official transfer of knowledge and information between the Netherlands and the United States. As part of his appointment on the Hurricane Sandy Rebuilding Task Force in March 2013, both countries signed a Memorandum of Understanding that details a formal exchange between HUD and the Netherlands' Ministry of Infrastructure and the Environment to promote:

Discussion and strategies on integrated policies and principles for sustainable development in the two countries; exchanging experience on water management strategies and climate resilience and preparedness, and exchanging experience and best practices on integrated planning and cross-sector collaboration in the two countries.⁵⁰

The Netherlands was seen as a resource due to its long history of water management, which dates back to the Middle Ages. Fifty-five percent of the Netherlands is below sea level, and the need to plan infrastructure and development around water led to the creation of Water Boards that were formed collectively rather than by individual municipalities. For Ovink, this long regional history demonstrated that the Dutch relationship to water is historic and cultural as well as infrastructural and economic. The result is a Dutch approach to water that is more holistic and regional than that of the United States. "We combined new development, social housing, a new boulevard, the beach, parking," said Ovink, "this whole program with this protection system...the result was a comprehensive plan with all the issues combined." Ovink also described this process of living more comprehensively with water as a more flexible process of "innovation, testing, trying" that could move beyond "a more engineering approach." The Dutch approach was not only more

49 Urban Institute. "Evaluation: Rebuild by Design Phase 1," 7.

50 "Memorandum of Understanding between the United States and Kingdom of the Netherlands."

U.S. Department of Housing and Urban Development. <http://portal.hud.gov/hudportal/documents/huddoc?id=OPA3-4-13DOC.PDF>, 1.

ecological or holistic, but also tied to different regulation standards, using the standard of the one in every 10,000-year storm (.01% storm) as opposed to one in one hundred storm (1% storm) standard used in the U.S.:

“If our main protection system, which is the dunes, fails on the assessment of the 1 in 10,000, we start working on it. I asked the people from the task force to draw me a map of the flooding area of the New York region for storms every 1 in 10,000 years, they couldn’t do that.”⁵¹

Ovink connected the different approach to water management in the Netherlands with a different approach to urban design, saying that in the Netherlands, “design can play a critical role when it comes to politics.”⁵² Ovink’s vision for RBD included the application of design to the political realm, in order to change regulatory standards as well raise expectations for urban projects. Some of the design teams shared this approach and critique of the siloed and less progressive U.S. bureaucracy – the Urban Institute Evaluation found that teams co-led by Europeans “expressed a desire to share their ‘European sensibilities’ because they felt the US ‘has a tendency to be really atomized.’”⁵³

How was this Dutch and European perspective communicated to the design teams through the RBD process? The Urban Institute Evaluation found that Ovink was a “guiding hand for the design teams” and that his charisma and vision were essential to the process.⁵⁴ Although Ovink was officially Jury Co-Chair, his involvement in the task force and knowledge of design extended his role into the competition, where he “served as an ongoing mentor to and ‘generator of goodwill’ among the design teams, a driving force for RBD’s outputs, and a public face for RBD’s vision.”⁵⁵ RBD project manager Amy Chester helped create “feedback channels” between Ovink and the teams, keeping the overarching vision in contact with the RBD management

51 Henk Ovink. “Resiliency by Design, the Politics of Planning and Rebuilding.”

52 Ibid.

53 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 19.

54 Ibid., x.

55 Ibid., 7.

on-the-ground processes.⁵⁶ Design teams also had direct lines of influence to Dutch ideas by including Dutch water management and infrastructure consulting firms on their teams.

Henk Ovink emerged as the “thought leader” of the RBD competition, shaping RBD to take full advantage of what the *New York Times* described a paradigm shift; a state of “chronic uncertainty” shaped by Hurricanes Katrina and Sandy. Emerging from this crisis, and with Henk Ovink’s vision, HUD could sponsor an urban design competition for the first time. Ovink’s role as a conduit to the Dutch cultural and political perspective on the role of government and urban design shaped the competition. At the same time, his personality and ability to capture the momentum from the government’s response to a disaster shaped the competition’s level of ambition and elevated treatment of design. The outside perspective from the Netherlands illuminated some of the political and organizational challenges in the United States, making RBD an experiment in regionalism, comprehensive climate planning, and holistic resilient infrastructure.

Design Competitions

Design competitions are not new – design competitions began with the Ancient Greeks for civic buildings and public spaces and continue to be a relevant form of procurement for high visibility projects such as the Guggenheim Museum in Bilbao, Spain. Beyond the search for design talent, however, there are many reasons for hosting a design competition including challenging “conventional wisdom,” generating political support, using the competition to secure funding for a project, or creating a dialogue on a topic through an ideas-based competition.⁵⁷ One use of the design competition, which is perhaps growing in popularity, is to create an alternative problem-solving process, by opening a design problem to any design talent that would

⁵⁶ Ibid., 22.

⁵⁷ Leentje Volker. *Deciding about Design Quality: Value Judgements and Decision Making in the Selection of Architects by Public Clients under European Tendering Regulations*. Leiden: Sidestone, 2010, 79.

like to enter the competition.⁵⁸ There is a procedural element to this as well, as the fast pace of

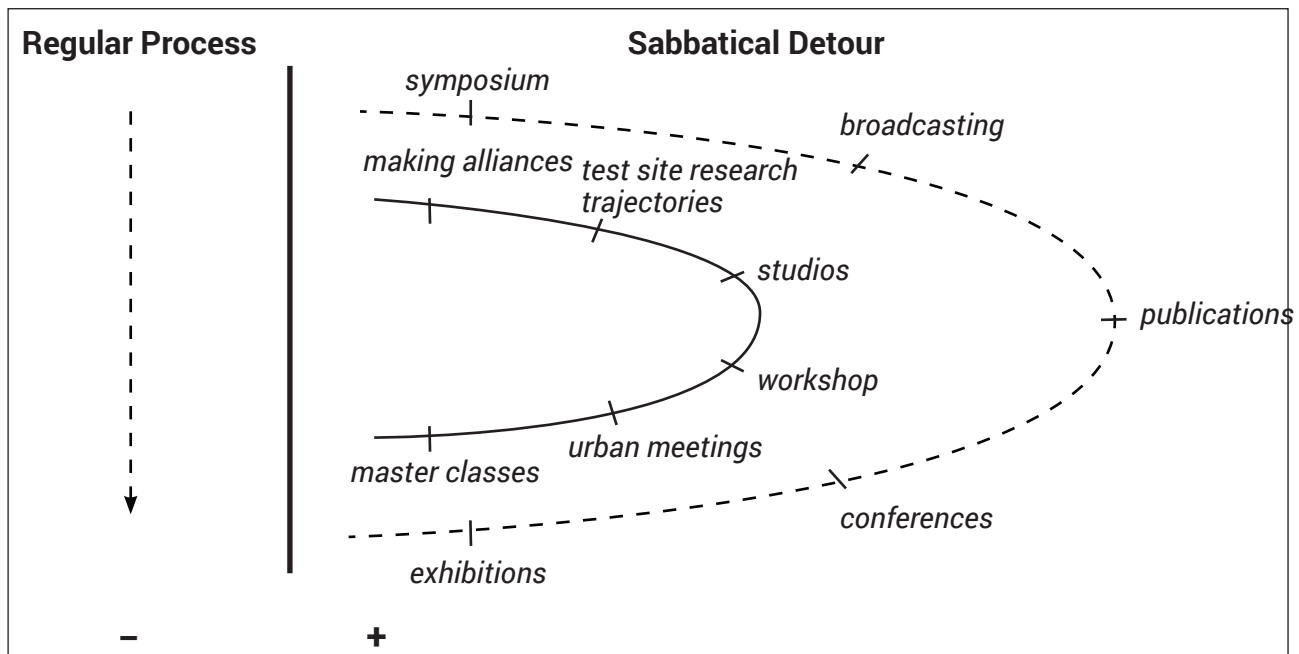


Figure 7: Henk Ovink's "Sabbatical Detour" Model

a competition and promise of implementation can create a platform for agreement on designs that otherwise would have to engage a lengthy and more public process.⁵⁹ There are many similarities between the use of a competition for generating new ideas and as alternative forms of procurement and the way HUD used the RBD competition. The federal government faced several challenges in the procurement of design ideas that could respond to climate change, and in the face of these challenges a design competition offered an alternative process.

Perhaps the most glaring and challenging obstacle to new federal policies is the political pressure of decentralized government in the United States. In an article on RBD, the *New York Times* commented, "American individualism...has yielded a system in which each municipality has a great deal of autonomy, making regional cooperation difficult." Judith Rodin, president of the Rockefeller Foundation, described this phenomenon in the context of resiliency - "The

58 Ernest R. Alexander and Lawrence P. Witzling, "Planning and Urban Design Competitions: Introduction and Overview," *Journal of Architectural and Planning Research* 7:2 (Summer, 1990): 98.
 59 Ernest R. Alexander and Lawrence P. Witzling, 100.

vulnerabilities are regional, yet we have individual community rule, and very little incentive to get out of that.”⁶⁰ At the same time, local governments struggle with capacity to respond in what may be perceived, as in the case of Hurricane Sandy, as a vacuum of political power. In this understanding of the relationship between subnational climate change policies and the role of the federal government it is important to note that “it is not all clear that leading states, when stepping as policymakers in the inviting breach of federal inaction, do so with any greater ability to balance ends and means.”⁶¹ For states and cities, fragmented municipalities, local politics, and general lack of capacity present their own challenges to those mid-level organizations that could produce regional plans and programs around resiliency. The Hurricane Sandy Rebuilding Strategy describes these challenges specifically in the recommendation for RBD, writing that RBD is meant to address issues that are “too large or too complex for individual towns to solve themselves,” to increase “understanding of regional interdependencies,” and foster “coordination and resilience at both the local and national levels.”⁶²

From the perspective of HUD, understanding that regional and local coordination face huge hurdles, the question was what to do in order to support existing local efforts while pushing the process toward comprehensive climate change in a meaningful way. There was no normative process for the procurement of design ideas that fit these criteria, and so the design competition emerged as a procedure outside of the bureaucratic restrictions that could bring stakeholders together.

Design Thinking

Materials by and about Rebuild by Design mention the concept of “design thinking,”

60 Russell Shorto. “How to Think Like the Dutch in a Post-Sandy World.”

61 Dana R Fisher. “Understanding the Relationship between Subnational and National Climate Change Politics in the United States: Toward a Theory of Boomerang Federalism.” *Environment and Planning C: Government and Policy* 31 (2013): 771.

62 Hurricane Sandy Rebuilding Task Force. *Hurricane Sandy Rebuilding Strategy*, 46.

without defining the term or explaining how it is applied in the design competition. The most detailed description comes from the Urban Institute Evaluation, which claims that the success of RBD suggests that “design thinking is an innovative strategy for resilience challenges.” The evaluation’s theory of change, however, does not take into account design thinking or how it might operate differently.

This is true for the RBD design brief as well – although design thinking appears as a descriptor, there is no explanation for why design thinking, and therefore design more broadly, would lead to better solutions. Another model or theory of design’s impact comes from Henk Ovink. Called the “sabbatical detour,” this model side steps a “regular process” by creating new alliances in which people can step out of the demands of their institutional roles to more fully address problems.⁶³ Ovink’s model, however, does not make design’s role in the sabbatical detour very clear and it was not officially integrated into or adopted by the RBD process. Therefore, although there are some theories about design and some mention of design thinking, there is a lack of integrated understanding about how design thinking functions.

Despite this, there is a field of study on design thinking that has attempted to answer the question of how designers make decisions and create meaning differently from other disciplines. In the literature, design thinking is a term applied to creative problem solving. It is defined in contrast to bounded rationality, in which problem solvers are never able to identify all of the possible solutions to a problem and “therefore settle for choices that seem to satisfy the required solution properties of a problem.”⁶⁴ The concept of bounded rationality is that people are too constrained by their own views and framing of the issue at hand to come up alternatives. This applies to organizations as well, where a normative bureaucratic process limits the possible outcomes. Although design thinking is seen as an-of-the-moment trend (see figure 8), its current popularity is just another iteration of a discourse on the topic that has been developing for over fifty years.

63 Henk Ovink. “Resiliency by Design, the Politics of Planning and Rebuilding.”

64 Peter G. Rowe. *Design Thinking*. Cambridge, MA: MIT, 1994. 39.

Design thinking as a concept was developed the 1960s and 1970s, at a time when design and planning professions were in crisis over urban renewal, increased emphasis on the end user, and a shift toward technical processes.⁶⁵ Detailing problem solving processes became a technical and scientific matter - the correct steps leading to a product that could be quantitatively evaluated and benchmarked. Architect Peter Rowe writes that “the step beyond description into a normative realm in which process became pursued as an end in itself resulted in abject failure” particularly in comparison to what was recognized as the subtlety of the design process.⁶⁶

In 1967, Herbert Simon’s *The Sciences of the Artificial* was a very influential book in design theory, and represents the technical-rational view of design theory in the discourse. Although there had been debate about the characterization of Simon’s work, the rise of a “science of design” is attributed to Simon. Donald Schön’s *The Reflective Practitioner*, published in 1983, positions itself as a response to Simon and the overly technical focus on design thinking as an optimized scientific process. Schön developed problem solving theory through the idea of

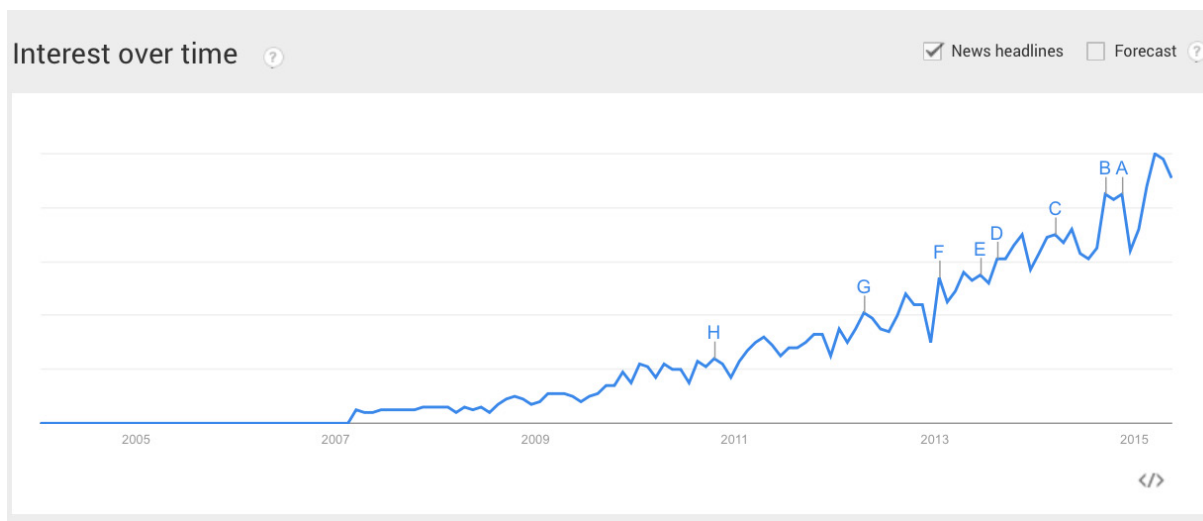


Figure 8: Google Searches for “Design Thinking” Over Time

65 Peter G. Rowe. *Design Thinking*. 40.

66 Ibid., 111.

“reflective practice” with specific attention to planners and architects.⁶⁷ Drawing on literature on the professions and their expertise, reflective practice referred to the “reflection of the moment” or “reflection-in-action” in which two kinds of knowledge are applied at once: the understanding of procedure as well as the understanding of the circumstances.⁶⁸ Schön reintroduced the idea that the designer’s intuition and experience is in and of itself an important part of the process and something that cannot be reduced to a technical-rational set of procedures. Schön goes on to explore how designers and planners can become more aware of their “reflection-in-action” in professional practice and in the context of organizations and institutions. In his conclusion, Schön writes that the broader question of problem-setting and problem-solving is one that concerns society as a whole, and argues for the role of the professional in society as someone who sits in between the technical-rational and wholly expert worlds. For Schön, this is a path that can only be successfully managed through the individual’s reflective practice, in which the practitioner reflects “on their own evaluative frames and in situations which transcend the limits of their expertise.”⁶⁹

Beginning with Simon, much of the literature on design thinking has mostly come out of the world of management and business. In recent years, the application of design thinking to understanding how organizations change has been described as a growing trend. For those interested in business and management, how an organization changes and how that process is managed has become a question of design, particularly when tied to the idea of “innovation.” How innovation occurs and its relation to design thinking has become the focus of recent literature that sees the organization as a product and design thinking as an alternative form of decision-making that creates new products.⁷⁰ The momentum of this thinking has had an impact on both design firms as well as organizations. Richard Buchanan, a professor at the Weatherhead

67 Jude Chua Soo Meng. “Donald Schön, Herbert Simon and The Sciences of the Artificial.” *Design Studies* 30.1 (2009). 60.

68 Donald Schön. *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic, 1983. 50-69.

69 Schön, 346.

70 Richard Buchanan. “Introduction: Design and Organizational Change.” *Design Issues* 24.1 (2008): 2.

School of Management at Case Western Reserve University writes that “Since the 1990s, a small but growing number of designers and design consultancies have become competitive with management and consulting firm in certain areas of work...More recently, some of the leading management consulting firms have begun to look at design as a tool that may be included within their own practices, with or without deep understanding of the nature of design.”⁷¹ The term “designers” and “design” here refer to many kinds of creative problem solvers, sometimes entirely divorced of their professional training. This makes it difficult to trace one line of theory about design thinking to the practice of urban design, already comprised of multiple disciplines - although some architects and planners write about design thinking, like Peter Rowe, more attention is given to the management literature in which management and design become blurred and design takes on a role apart from the profession in which the designer was originally trained. For example, Buchanan’s list of “design as it commonly understood in the design community,” includes architecture, industrial design, information design, and interaction design.⁷² He argues that these traditional design professions are undergoing a shift in what they actually produce:

“It is the concept of form that has grown more supple and complex, embracing the social and environmental context of design. Without the integrity of form-giving and making that lies at the core of design, what can the designer do that is not already within the sphere of other disciplines?”⁷³

Although one could take issue with how much of architecture, landscape architecture, and urban design is really part of this “trend” of addressing organizational change, design consulting firms like IDEO have drawn attention to visual professions like graphic design using design thinking as a form of business consultancy. Media attention and published books, particularly *Change by Design* by IDEO President and CEO Tim Brown contributed to IDEO’s recent popularity. IDEO claims some authority over the term “design thinking,” calling it a “deeply human” process that ties their designers and creativity to the end users. IDEO warns against the overly rational and

71 Buchanan, “Introduction: Design and Organizational Change.” 3.

72 Ibid., 4-5.

73 Ibid., 9.

analytical and claims that its three steps of “inspiration, ideation, and implementation” result in better and more innovative products, at the same time creating a model out of their process that is available at a price, including the new IDEO U video series that costs \$399 to enroll. While this represents an approach centered in the world of business consulting, projects with public clients are a significant part of IDEO’s business, including the Dubai Department of Economic Development, the Centers of Disease Control, and Singapore’s Ministry of Manpower’s Work.⁷⁴

Public sector design thinking consulting is not limited to IDEO. Sitra, an independent fund operated under the Finnish Parliament, ran the Helsinki Design Lab from 2008-2013 specifically to address public decision-making, including “redesigning both the boundaries of complex problems and the ways that institutions deliver solutions.”⁷⁵ One of HDL’s more high profile projects was a redesign of GOV.UK, the United Kingdom’s government website which was deemed difficult to use and confusing. This was a reflection of the bureaucracy’s “business as usual” method of website procurement, which choose large companies with inflexible content management systems that were not user-focused. In all of its projects, HDL’s process included articulating a “theory of change,” which in the case of GOV.UK included the idea that a website designed for users needs would “spread throughout government.” That is to say that changing the end product to reflect citizen’s needs would result in workflow changes that also reflected the priorities of the citizens, articulating an organizational ripple effect around the end user. Organizations like IDEO and HDL demonstrate that design thinking is applied to private and public organizations, in the case of IDEO capitalizing on the ability of design, broadly defined, to think outside of the box.

74 “About IDEO.” IDEO. <http://www.ideo.com/about/>. May 10 2015.

75 Bryan Boyer, Justin W. Cook, and Marco Steinberg. *Helsinki Design Lab, Six Stories about the Craft of Stewardship*. Sitra: 2013. 138.

Focusing on Design Thinking

There are three overlapping lenses through which Rebuild by Design can be understood – as the influence of the Netherlands and its ambassador Henk Ovink, as the procedural benefits of a design competition for creating alternative processes of design procurement, and as the implementation of design thinking for innovative ideas and organizational change. Assessments of Rebuild by Design are more familiar with the first two critical lenses, such as a *New York Times* article on Henk Ovink’s role in the competition or the comments of Scott Davis, Senior Advisor to HUD, at the 2014 National Planning Association Conference on the benefits of a competition structure. In particular, the Urban Institute Evaluation details more procedural challenges and opportunities of the competition, focusing on the management of the design competition structure. There is an extent to which RBD can be explained as the product of one outsider with a new perspective or the federal government’s knowledge of prize-based competitions, but the specifics of urban design remain under examined. It is assumed in many RBD materials that urban design does serve a unique function to unite disparate topics and stakeholders, but these statements need to be unpacked in order to understand what HUD and designers should learn from the process. Additionally, understanding the application of design thinking in RBD can reveal challenges and opportunities in using design thinking to address other difficult socio-spatial problems. Since RBD has a process and outcome that may use design differently, design thinking emerges as a useful theoretical model that unites the idea of design affecting organizational procedures and processes with the benefits of a design process for creating alternative design ideas.

In the next chapter, I discuss interviews with RBD participants to understand the role of design thinking in both the competition process and outcomes. Interviews with RBD designers provide data on the design process that can be compared to design thinking theory. This allows for analysis of how design thinking was used in the competition, as well as what can be learned from RBD about the use of design thinking today.

Chapter 3 - Interviews with Rebuild by Design Designers

Methods

As discussed in the previous chapter, there are many angles from which to understand Rebuild by Design. Previous theses have focused on evaluating the community engagement in RBD and the nature of the climate science used by different design teams.⁷⁶ This thesis, however, is concerned with what urban design adds of value, how to theorize it, and whether this is something that can be built on in the future.

To answer these questions, the perspective of designers on the RBD teams was critical. Interviews were conducted with representatives of each winning team, except for one in which a published interview was used as proxy. In all but one of the interviews, the subject was the project manager or team lead. The choice to speak to the team lead as opposed to the principal of the design firm was based on wanting the design perspective on the RBD process. Team leads and project managers were the most involved designer in the process, attending the most meetings internally and with stakeholders, and served as contacts between RBD staff, HUD, and the other design teams. The choice to interview winning teams was the result of wanting designers who had been through as much of the process as possible, and who were facing implementation. The assumption was that these designers would be reflective about their role and the role of design since they were at a point where the designs might be changing or facing challenges.

Each designer was asked the same series of questions in order to be able to compare across interviews. Designers were never asked directly about “design thinking” – instead, designers were all asked what they thought design contributed to the competition, and why a design competition would be a good decision for HUD given the issues of rebuilding after Hurricane Sandy. Subsequent questions were directed toward the unique aspects of the

⁷⁶ Justine Shapiro-Kline. “The Impact of the Public Process in Rebuild by Design.” Masters Thesis. Columbia University, 2014.

competition, how they described their “design approach” to the final proposal, how the designers defined “innovation,” and how replicable they thought RBD could be. As a result, in the following chapter that uses information from these interviews, there is little distinction between “design” and “urban design” unless the designer made the specification him or herself.

Interviews were also conducted with representatives of HUD and the Regional Plan Association, in order to understand how the government and an organization embedded in the traditional means of planning perceived RBD and the use of design. Conference and lecture videos provided the perspectives of other RBD partners who could reflect on the role and importance of design in the competition, in particular Judith Rodin of the Rockefeller Foundation, Henk Ovink, Scott Davis, and David van der Leer of the Van Alen Institute.

The main challenge in conducting these interviews was that, due to the ongoing implementation process and other professional pressures, most interviewees were wary of their comments and did not want to make statements that could be seen as too political. In order to address these concerns, and due to the small number of winning teams and their many possible identifiers, all the interviews have been made anonymous. Any attributed quotes are taken from a conference, published interview, or otherwise public comments.

Why Design?

The central question for this thesis is “why design?” What is it about the way design operates that would make it useful in addressing how our bureaucratic and physical systems adapt to climate change? A related question in this discussion is about the role of design expertise, for while the interviewed designers had many thoughts on what made design good at proposing solutions in the RBD context, it was less clear how unique this was to urban design. That is to say that it was easier to discuss the characteristics of a successful solution (and conversely what problems needed to be addressed) than it was to describe why designers should come up with it.

The predominant benefit resulting from urban design in RBD was characterized by designers as a kind of synthesis, in which the designer is perceived as someone who works across many fields, as the person who can synthesize across ideas and solutions. This includes responding to complexity and understanding the ways in which systems and issues overlap.

We were able to say, ‘this is really complicated situation’ there’s no one thing that’s causing the problem - storm water issues, so much water going into the rivers, polluting, flooding upriver, wastewater problems, it’s all interrelated. Looking at the problem holistically; not a silver bullet solution.⁷⁷

I don’t think we have an expertise in water protection, there are better people to talk to about [that], but you know if you talk about protection, and development, and social equality, etc, nobody does that mix.⁷⁸

I think design and designers have this really interesting role of being able to understand multiple types of systems and how they interact with one another and then effectively communicate that to people.⁷⁹

Design is design when its taking multiple things and creating a new form and structure out of it. It’s not just something pulled out original, there’s a lot of original things - that doesn’t necessarily give them value. It’s really aligning need and opportunities in a really clever weaving. And that’s what we did.⁸⁰

77 Anonymous Interview, February 20, 2015.

78 Anonymous Interview, January 21, 2015.

79 Anonymous Interview, February 20, 2015.

80 Anonymous Interview, January 14, 2015.

Knowing that there is a considerable investment, how can you make that investment go further? So what are the other benefits apart from flood risk reduction that you can get? And I think the only way to get ahead on that is to bring in design thinking that has that ability to deal with uncertainty. To take in a lot of different information and distill it.⁸¹

Thus synthesis meant having a process oriented toward working across a variety of systems - this was also related to the ability to understand issues across disciplines. Designers were not experts in every field, but they could communicate with the different members of their teams and the process: scientists, politicians, engineers, artists, etc. This was often framed as the ability to speak the same language and have a conversation, for example “between engineers, marine biologists and people who are involved with schools.”⁸² A frequently cited foil for the role of the designer was that of the engineer. Where the designer can speak the language of many disciplines and therefore create synthesis through a multi-pronged solution, engineering was characterized as a narrow approach that only produced singular solutions. Engineers were also characterized as responsible for hardening initiatives such as levees and sea walls. One designer described engineer-led solutions as detrimental, saying, “[Engineers] are focused on in the singularity of how can they, in the most efficient and clear way achieve a predefined objective. The programming portion has already been done. So it can be dangerous if we’re leading all of these efforts from an engineer led perspective.”⁸³ In many ways, this is the future that designers were wrestling against - how to have more nuanced flood protection that did not rely on one hard element but that solved multiple problems by making flood protection accessible, an education tool, a landscape, etc.

Urban design and landscape firms were often characterized as organizations in which these kinds of conversations could take place, including a critical dialogue between the technical expertise of the engineer and the urban designer who would push back against the engineering solution in order to get something more. Design firms are “one of the only places to talk across

81 Anonymous Interview, March 12, 2015.

82 Anonymous Interview, February 20, 2015.

83 Anonymous Interview, January 14, 2015.

engineering, planning, and design professions,” said one project manager, “a lot of flood protection and resiliency and hardening initiatives that cities are undertaking are engineer-led and I get a lot out of collaborating with engineer community, but I think people are typically looking to engineers not to be creative or certainly not to take on a social agenda or think about the neighborhood fabric.”⁸⁴ By comparison, the design firm was described as a place that was allowed to practice its values as well as to understand the urban implications of infrastructure topics. One designer described this ability to have an interdisciplinary conversation:

What we’re looking for is talking to our engineers and saying ‘how can the levee protection system be a modular thing so that you can construct it in a way that local labor can build it, and it’s modular, and if you grow over time with sea level rise, how can we do local material sourcing instead of just saying ‘well this is the thing on the shelf.’ I mean those are the kinds of conversations that we want with our design and engineering team is how is the design of something part of the neighborhood life and economy.⁸⁵

There was some tension about the difference between the benefits that result from the urban designer’s role at the crux of many professions, as shown through the interdisciplinary nature of the work of design firms, and the idea that there was something unique about urban design itself. This could also be described as trying to identify how much of the ability to synthesize and address complex problems was the benefit of being a generalist or an expert. Some designers turned to the idea of creating meaning, saying that the ability to connect physical place to the social and the cultural was the ability of the urban designer. This was described as more than the sum of its parts, as one designer described it, “it all speaks to urban design and how do you craft a place that’s not only safe but that provides all of the factors and amenities and services that people look for in a place that they would call home.”⁸⁶ Urban designers described their projects as removing barriers to a more holistic experience, often through green infrastructure - not just as a strategy for RBD but as an overall turn in the role of the urban designer as one who pieces urban areas back together. “I think you can already see it happening a little bit in places.

84 Anonymous Interview, January 14, 2015.

85 Anonymous Interview, January 14, 2015.

86 Anonymous Interview, March 12, 2015.

For example, Brooklyn Bridge Park is one of the first places along the waterfront in the city where you can actually get down close to the water, to the salt marsh, and its one of the most spectacular open spaces in the city right now.”⁸⁷ This quote also illustrates how the reknitting of the physical urban experience includes access to and visibility of water, as opposed to a retreat from it.

The designer, then, by working across multiple systems was also able to respond to the technical mechanisms that produce the built environment, including the separation of uses. One designer summed up this perspective, saying that the “challenge in the next generation of city-building is how do you integrate where we work with where we live with finding spaces for reemergent ecology in the same shared geography.”⁸⁸ In this example, reknitting the urban fabric includes addressing divisions in zoning and land use that may be outdated. The application of this idea to flood protection meant challenging not only the hardness of flood protection but also its ability to play a role in the larger social and cultural understanding of sea level rise and nature. “Once you’re on the other side of the berm, you can observe tidal change and the gradual rise of sea level,” said one designer of the educational role of water visibility, “for us, that really brings it home, just as a matter of recounting the story or allowing people to discover the story.”⁸⁹ Described as moving past the idea of flood protection as purely an object, one designer struggled to articulate how his expertise as a landscape architect benefited the project, saying “the investment will come into that making a better work of landscape architecture if it has...if people know what it means to them.”⁹⁰ Again, this was a kind of synthesis that being able to understand “not only the technical requirements but also what the social dynamics are...what the program dynamics are and so forth require the kind of thinking you would normally associate with an urban designer.”⁹¹

87 Abigail Carney. “LES Gets a Big U: architecture + culture = resilience.” City Atlas, New York. July 28, 2014. <http://newyork.thecityatlas.org/lifestyle/les-gets-a-u-architecture-culture-resilience>.

88 Anonymous Interview, January 14, 2015.

89 Carney.

90 Anonymous Interview, January 14, 2015.

91 Anonymous Interview, March 12, 2015.

When designers described multifunctional flood protection, they were speaking to a synthesized design idea that resulted from their process of synthesizing across various overlapping issues and systems. BIG's idea of deployable flood protection walls under the FDR in New York is a good example of the relationship between the synthesized process and resulting product:

When not flipped down, they act as a canvas for public art or local artists, and they also have lighting integrated, so that it becomes this kind of secure ribbon of public space to walk through at night. That's one example of how seemingly conflicting needs: the need to contribute to the urban environment and to provide use for people, and then the need to protect, actually come together in a kind of unexpected way when you try to solve them.⁹²

The deployable flood protection addresses public safety through additional lighting as well as what might be categorized as quality of life benefits through art and increased open space.

In the interviews with these RBD team designers, the question about the role of design was phrased specifically to address why the government, or any other organization, would turn to urban design to address issues around resilience that are otherwise managed through municipal planning, policy, federal agencies, or private development. Part of the difficulty of evaluating the benefits of an urban design process and attributing those benefits to urban designers comes from the interdisciplinary nature of urban design itself - often comprised of architects and landscape architects, some with supplemental degrees in urban or city planning, who have experience working on an urban or landscape scale. Landscape architects in particular reaffirmed their profession, connecting the regionalism of resiliency to their experience with hydrology, ecology, and natural systems. For them, RBD was a chance to bring systems thinking into the project, as part of understanding "what's best for the whole region."⁹³ Similarly, landscape architects were described as better generalists, due to their knowledge of design as well as the "hard" sciences and experience working with engineers. One designer commented that landscape architects were

92 Carney.

93 Anonymous Interview, February 20, 2015.

good “basically because of the nature of the profession being a little more generalist jack of all trades than architects tend to be,” while another said that “you need to be flexible enough and a generalist - a good generalist - to kind of tackle a lot of issues at the same time.”^{94,95} The expertise of the urban designer was this ability to be a generalist - to be able to address multiple technical and non-technical issues and alternatives through the “black box” of design.

Ever Present Ambiguity

Only one interview question directly asked the designers about the role of design in RBD. The rest of the questions focused on the unique characteristics of the competition as well as the competition process, in order to understand how the designers perceived their role in relation to the competition’s goals and unique structure. Several themes emerged from these other questions, all stemming from the open-endedness and ambiguity of the competition – how much was “up in the air” during the process and how that affected the work of the design teams. There was ambiguity in RBD both about the procedure of the design competition as well as in the “ask” of the design brief, which provided broad definitions of “resilience.” The brief attempts to describe the full complexity of issues that affect “communities, cities, waterways, and ecosystems” with their “interdependencies and dynamic interactions...that create nonlinear feedbacks across temporal and spatial scales.”⁹⁶ Briefly quoted research in the design brief demonstrates the breadth required of a project that would address the “biophysical and socioeconomic patterns and processes that influence system resilience.” The definition of “resilience” that RBD does offer, taken from the National Disaster Recovery Framework, includes a similar list of many kinds of systems and therefore many approaches: hazard mitigation, land use planning, critical infrastructure, environmental and cultural resource protection, sustainability, and the revitalization of the economic, social and natural environments.⁹⁷

94 Anonymous Interview, February 20, 2015.

95 Anonymous Interview, January 21, 2015.

96 Rebuild by Design. “Promoting Resilience Post-Sandy Through Innovative Planning and Design,” 11.

97 Ibid.

This meant that design teams were responsible for defining the goals of their work during the research phase: what vulnerabilities were most important to address and what methods to use. This was seen as different from other competitions, which “lead to work but are very specific and ask for very particular things – like a museum design” and meant that teams had to “do some local scoping to determine the problem.”^{98,99} From this ambiguity flowed myriad opportunities and challenges for designers, allowing them to explore many interrelated topics under the umbrella of “resiliency” but also creating confusion, particularly in the research phase.

Community and Stakeholder Engagement

One unique aspect of the RBD competition was the extent of required community and stakeholder engagement. For many designers, this engagement was seen a necessary part of the methodology of the research phase, particularly since that the process of defining vulnerabilities and resiliency was so open-ended. Designers tried to make sense of their role between the many layers of stakeholders, and had a mix of levels of satisfaction with engagement, although all the interviewed designers agreed that it was an improvement over a normal competition process.

For some, the approach of creating prototypical design solutions that could be replicated regionally meant that they were not as grounded as they could have been on a specific site. As one designer commented, “the solutions we came up with we targeted certain areas but they’re flexible in terms of where we could do them...we hadn’t exactly landed on where we wanted to do those things, so we couldn’t do that targeted community outreach and we’re really looking forward to it.”¹⁰⁰ For others, the community engagement provided critical input that helped define the issues that the designers would synthesize through the design in the proposals:

What we found in the overlap of stakeholder interests was development of a

98 Anonymous Interview, February 20, 2015.

99 Anonymous Interview, February 20, 2015.

100 Anonymous Interview, February 20, 2015.

program plan that delivered a whole lot more opportunity than the singular notion of the one function is flood protection. We developed a plan that has multi public and private institutional support because it's doing things for health outcomes, it's doing things for open space, it's doing things for flood protection, it's doing things for air quality, it's doing things for affordable power. We weren't smart enough to come up with all those program ideas. It came from that engagement.¹⁰¹

I think where you have to negotiate those two things [storm protection and something that the public will enjoy], you find unexpected solutions that you wouldn't really imagine beforehand...It's part of a line of projects that we think of as social infrastructure: infrastructure that serves a utilitarian purpose, but that can also serve as an opportunity for people or for other activities that make it something that people can use, that people can understand, and that people can love 365 days a year.¹⁰²

In each quote, local feedback was negotiated with the constraints of flood protection and the sites, helping form the framework of possibilities for the design ideas. Design teams that prioritized community engagement as a method for sourcing local knowledge and information tended to understand their role in the terms of advocacy, focusing on job creation or affordability in their proposals.

Multiple designers reflected on the bureaucratic and political systems that they encountered, indicating that the conversations with political leaders and stakeholders had taught them some of the challenges of “really communicating between those kinds of scales of stakeholders.”¹⁰³ One European designer said that it was his first time working at a large scale in the United States, and that the “really weak spot in...politics in that area are in the county or in the regional level...it has no authority.”¹⁰⁴ At the same time, designers were aware that it was through the competition that local governments were able to access federal agencies, putting the designers in the lead role, with the help of the RBD administration, of convening resources:

So not only as the design team did we have access to FEMA people, we had conversations with Army Corps of Engineers...which HUD orchestrated, but it

101 Anonymous Interview, January 14, 2015.

102 Carney.

103 Anonymous Interview, January 21, 2015.

104 Anonymous Interview, January 21, 2015.

meant that the municipal governments were also part of these conversations. So what would otherwise take considerably longer in the normal day to day, the RBD process was able to shortcut in half and really have a larger collective conversation with all of the relevant people in the room.¹⁰⁵

The open program of the competition facilitated these conversations by providing the teams and the local governments with federal access without a specific goal on the table. Having a purposefully open agenda meant that, perhaps for the first time, a mayor could discuss how to prevent Sandy-level flooding with a FEMA representative, HUD, and a team of urban designers.

Competitive Collaboration

Open-ended terms like “resiliency” and “risk” meant that design teams were wrestling with ambiguities around the content of their designs, but there was also ambiguity in the management of the competition itself. RBD described itself as a non-competitive competition, which was outlined as early as in the design brief, which described stage two as “analysis of the region through a collaborative process,” with the addendum that:

Content from this facilitated analysis process, being collaborative in nature and involving a wide-range of stakeholders, will be public, meaning that it can be used by all teams and will be collected throughout the process and presented by NYU IPK through a variety of mediums.¹⁰⁶

Although this was disclosed early on, designers were somewhat confused about this collaboration, and were not clear on how many teams would win or how the choice would be made – some expressed surprise that the majority of the finalist teams were in fact winners. Part of the collaboration stemmed from the openness of the site selection process, where the sites were not determined from the beginning of the competition but rather through the research phase of the individual teams. This led to “selecting ten teams that weren’t in competition with each other over set targets and set sites, and so it was the most collaborative competition I’ve

105 Anonymous Interview, March 12, 2015.

106 Rebuild by Design. “Promoting Resilience Post-Sandy Through Innovative Planning and Design,” 5.

ever been a part of,” said one designer.¹⁰⁷ Sharing information and research across teams was also encouraged, and although some designers felt that this was more aspirational than put into practice, others reflected on how much sharing did occur between teams, with one team lead saying that collaboration was “almost to the point where we were like ‘how are they going to choose a winner?’ We’re all sort of working on the same goal and presenting our ideas to each other and it was very much a non competitive sort of way to look at design.”¹⁰⁸

All Encompassing Resiliency

One of the most undefined topics in the competition was that of “resiliency” – very central to the design brief and the RBD discourse and yet also very flexible and up for interpretation:

[RBD] specifically looked at performance and trying to achieve a concept rather than...target-driven specifics, so you know the big overarching theme was what does resiliency mean. In the face of future storm events and sea level rise on the East Coast, and that was as specific as it got.¹⁰⁹

Resiliency became an all-encompassing term for addressing any aspect of the region that could be deemed at risk. Interrelated vulnerabilities are exacerbated by disasters like Hurricane Sandy, and resiliency came to include the strength of local economies, culture, social infrastructure, sense of place, job security, education, etc:

Resiliency is like a two-sided coin with vulnerability, and you know, storms and disasters have a way of showing where the cracks and holes are in our communities and the state of our urban environment. They kind of exacerbate what’s already suffering.¹¹⁰

Thus any vulnerability could be addressed through a resiliency concept. The synthesis

107 Anonymous Interview, January 14, 2015.

108 Anonymous Interview, February 20, 2015.

109 Anonymous Interview, January 14, 2015.

110 Anonymous Interview, January 14, 2015.

that designers highlighted as specific to their discipline came from addressing these many systems. “A big part of resilient thinking is how do you get many things to work together in interdisciplinary ways,” said one design lead, “it’s a meta logic to making things happen.”¹¹¹ Designers were excited by the opportunity to identify overlapping issues through the research process, and to broaden the definition of resiliency beyond climate change and environmental issues to “a whole lot more... which actually urban conditions can improve.”¹¹² One designer defined resiliency as “an adjective to describe something – what is being made stronger?” For that design team, which focused on job creation and skills training, “that [question] led to focusing on what is risky in our economy and who will be hurt the most by it.”¹¹³ Once teams moved to stage three of the competition and began to develop their stakeholder coalitions, the change in scale from looking at regions to working with neighborhoods concretized the overlap of interrelated issues:

One of the great things we’ve found about dealing with resiliency is that when you deal with resiliency at the scale of a neighborhood, you end up really working on everything about that neighborhood, because everything is so interlinked and water goes everywhere. So in that sense, adaptation and mitigation are not so separate.¹¹⁴

All teams connected their ability to synthesize and the comprehensiveness of their solutions to increasing resiliency and leveraging the investment of infrastructure in neighborhoods.¹¹⁵ For most, this also represented a turning point between addressing flood risk in a community and solving a technical infrastructural problem, and being more forward-looking to the question of how to build any kind of urban environment better, in the face of any kind of layered vulnerabilities.

111 Anonymous Interview, January 14, 2015.

112 Anonymous Interview, January 21, 2015.

113 Anonymous Interview, January 14, 2015.

114 Carney.

115 Ibid.

Ambiguity and Challenges

Although different sites and increased ability for designers to define their own goals may have resulted in more teams collaborating with one another, it also meant that, when combined with different standards for flood protection, teams were working under very different flooding scenarios and assumptions that could make proposals more difficult to evaluate, compare with one another, or implement. Despite the benefits of the open-endedness and eagerness of teams to define their own projects, a lack of clarity and limited access to data made it difficult for teams to study the region as robustly as they might have liked. The difficulty of picking a methodology for the research stage was described by one designer as “such a hard thing to do because some projects are based on opportunity, some are based on hard risk. Some are political, some are really engineering. So it’s kind of, there’s no good methodology for that.”¹¹⁶ The designer went on to describe how difficult it is to map political opportunity or real estate pressure - variables that they wanted to use to help determine their site and their approach, adding that “there’s a lot of data missing or there’s not enough consensus about what’s the best data to predict flood change, flood zones.”¹¹⁷ Other designers had similar issues during the research phase, saying that missing data contributed to a lack of clarity with political stakeholders who were looking for a better mechanism for their decision-making.

A lot of regulators are saying ‘oh yeah Sandy really changed how we view some of our regulations and we’re willing to work with you to try to think of new ways to bring innovative projects forward’ which was great, but I feel like a lot of agencies did not have a very, and still do not have a very concrete idea of what that meant.¹¹⁸

The way that it was organized was very much letting the designers set the baselines for themselves. So, none of us were designing to the same storm surge height or the same flooding level or anything like that, which I felt like having that common understanding and baseline, especially now that we’re moving into a more implementation heavy phase, probably would have helped give these

116 Anonymous Interview, January 21, 2015.

117 Ibid.

118 Anonymous Interview, February 20, 2015.

projects technical understanding of what was going on.¹¹⁹

The lack of a standard of sea level rise or climate change projections for the RBD teams was seen as a disadvantage not only because it was difficult to make recommendations to local governments, but also because it undermined the authority of the design work. One designer spoke to this issue by describing a team that “got their engineer to project based on the most extreme climate change projections, so there’s a whole debate about that...then let’s say social poverty issues, I mean how do you map that, what’s the best about that.”¹²⁰ This sense that there was not a clear methodology nor an agreed upon set of standards made it difficult for some designers to benchmark their ideas, with one designer recalling the feeling that “I have no idea if this is completely crazy or just crazy enough for someone to think about it a little further.”¹²¹

Innovation: Interrelated Functions and Systems

Innovation was one of the main RBD goals. For designers, the innovation lay in design’s ability to synthesize and address multiple issues through an urban design process, as described earlier in this chapter, as well as the interaction between design and government representatives and the consideration of the regional scale. The benefits of design’s synthesis were increased flexibility and thinking beyond hard infrastructure – the idea of promoting urban life as well as the environment holistically as opposed to a zero sum game between flooding and livability. “The whole attitude of [our project] comes from the Dutch idea of ‘living with water,’” said one designer, “not just hardened or gray infrastructure – it acknowledges that there’s going to be flooding; [it’s] more adaptive.”¹²² In the same way that engineers were foils for designers, design solutions were seen as innovative because they moved beyond the singular engineering solution to something more complex and with more benefits:

119 Ibid.

120 Anonymous Interview, January 21, 2015

121 Anonymous Interview, February 20, 2015.

122 Ibid.

It's not only at ecological systems and how those are really important to natural ecosystems but also how then that influences the way that we build or the way we are affected by these larger forces such as storms or storm surge...and then we can create a project that is not just about a singular goal. A good example of that would be an army corps of engineers project, where they can only do something for coastal protection. But how can we think about these structures as being beneficial to ecology and also beneficial to people.¹²³

As shown through the comparisons to engineering, designers framed innovation around looking to the future and improving on current governmental practices and attitudes about urban resiliency. "It's about how we need to set up frameworks that are really flexible," said one team lead who thought that living with uncertainty was the largest paradigm shift explored in the competition, "it's not only that we don't know or that we don't agree about the future...we're not going to know what the future will be...so we have to know how to design in a way that will accommodate various futures."¹²⁴ Multifunctional designs were seen as more flexible because they provided benefits during a crisis but also before and after, wet or dry. One team described this as the "no risk" approach in which a design idea would always result in an improvement of urban life, even if the next storm even never came.¹²⁵

Not all designers thought that the design ideas themselves were innovative. Some described the proposals as "clever" or "layered," but acknowledged that the individual components, such as green infrastructure, were not new or innovative. Designers had difficulty explaining what about the proposals specifically was innovative, often returning to the list of issues that they were addressing and relying on the concepts of comprehensiveness and synthesis. One team lead defined innovation as "finding ways for infrastructure to be multifunctional not in a Swiss Army Knife kind of way, many functions for having many functions, but that would be tied to the granularity and scale of the neighborhood."¹²⁶ That is to say, it was not the individual solutions that were necessarily new or interesting, it was how they were elegantly pulled together

123 Ibid.

124 Anonymous Interview, January 21, 2015.

125 Anonymous Interview, February 20, 2015.

126 Anonymous Interview, January 14, 2015.

to address various vulnerabilities of the site.

Although physical design innovations were difficult to qualify, all the designers agreed that the process of the competition itself was definitively innovative compared to “what we traditionally do in terms of infrastructure and shoreline resiliency.”¹²⁷ Designers were aware that they were bringing “the caliber of design talent” and the resources to “maintain...broad-spectrum thinking.”¹²⁸ Again, although this kind of thinking may be found in graduate schools or in one’s own practice, most designers found that the idea that it would be available to local governments constituted the innovation of RBD.

Impacts and Implementation

One of the greatest uncertainties for designers was the future implementation process. The open-endedness of the competition as well as the ambition of design teams meant that designers were worried about how their designs would change in the early stages of implementation. Designers described mixed experiences with grantees or implementation agencies. As one designer mentioned, the Department of Environmental Conservation in New York State was “very much open to rethinking their process and rethinking the types of project that they permit,” although other agencies that would be involved in implementing the projects, such as the Army Corps, were seen as “so siloed that its impossible to get a map from them, let alone a permit...it’s just a crazy bureaucracy.”¹²⁹ Other teams faced tensions with the political structure around their sites. Even if a governing body had the ability to rezone and make the kinds of changes required of the proposals, politics and bureaucracy were potentially stifling. “They lost the vision,” one design said of a local commission, “they lost the kind of comprehensive understanding of what they’re supposed to do. They became kind of technical

127 Anonymous Interview, February 20, 2015.

128 Anonymous Interview, March 12, 2015.

129 Anonymous Interview, February 20, 2015.

in a sad way...that's all going to be restricted now...they are merging with another authority."¹³⁰

The ability of grantees to implement the projects with limited funding was also a concern, particularly under the assumption that states and local governments would not necessarily understand the added urban design benefits of the projects such as the synthesis of solutions or multi-use infrastructure:

What we've put forward in our projects is all three of these things – the infrastructure, the social, and the ecological – it's like a three-legged stool. Without one it just falls over. Everything is very much connected to one another and all three things need to be funded with the same amount of rigor.¹³¹

Having that sort of top down approach that basically mandated you to have a bottom up approach was I think incredibly helpful. Now, how that's playing out in terms of moving these projects forward when you actually are dealing with a lot of large-scale regulatory agencies like the Army Corps or the Department of Environmental Conservation... I think [in] the next phase will be much harder to maintain that type of community engagement just because it's now out in the real world of permitting and governmental agencies and terms of politicians.¹³²

In these quotes, the designer was not only concerned with maintaining the spirit of the design but also with how the top down regulations around implementation would limit community engagement, funding, and permitting. Another designer pointed to the language in the grantee action plans, in which the language describing the projects is taken directly from the RBD winning proposals. For this designer, this was a good sign that even if "it's...really hard to change processes" the expectation-setting and agenda-setting was based very closely on the actual proposals and had not been watered down.¹³³ Despite uncertainty about how politics and regulations would constrain the implementation phase, designers described this as a mostly positive tension:

Of course, to get this right, it will absolutely require shifts in how government agencies, municipal service providers...and regulators, play a role in today and

130 Anonymous Interview, January 21, 2015.

131 Anonymous Interview, February 20, 2015.

132 Ibid.

133 Anonymous Interview, January 14, 2015.

how they help plan for the future. We're excited to work with the city and with all of these players to imagine a range of new ways that cities can become more resilient economically, environmentally, and socially...¹³⁴

The access to agencies and stakeholders during the design phase of the competition made designers feel more likely that the outcome would be a positive one, particularly as compared to a "normal process." RBD was seen as a new process, and as something productive that designers were excited to participate in. Many described it as a significant shift, and as an opportunity for design to play a role in the larger conversation about how to respond to climate change.

A Chance for Design to Lead

There were benefits and drawbacks to the ambiguity and open-endedness of the design brief, but overall designers praised the experimentation of the competition and thought that it moved dialogue and capacity around climate change in the right direction. Having the opportunity to address multiple systems and larger scales was seen as an innovation for government as well as a chance for the design discipline to contribute to the conversation on what urbanization in an age of climate change should look like and take into account. In the end, the openness of the process and the ability to put everything on the table for discussion was perceived as giving deserved power to design:

We were given a lot of power as designers to make what might otherwise be a policy decision or a decision based by formula. So that was kind of intriguing as a designer to be able to weigh in to what has been what was arguably one of the major issues of the last few years which was Sandy and dealing with its consequences.¹³⁵

I think people were really interested and sort of taken by this idea of trying to use design as a tool to look further into the future and think of long-term ways of not just building physical things back after a storm but of creating an economic and

134 Carney.

135 Anonymous Interview, March 12, 2015.

social resiliency...¹³⁶

In a recent conference on design competitions at Harvard University, Gena Wirth of SCAPE / Landscape Architecture described why she felt that participating in the RBD competition was worth it to her as a designer. She argued that designers bring an understanding of the “elements of place” to the “big conversations on climate change and infrastructure.” She added that designers’ experience and approach is “not something that engineers and politicians think of, and is why designers can lead in these processes.” Wirth described the competition as a gift that “allowed us to be a leader in the conversations around infrastructure...allowed us to present a new format for thinking about what our shorelines should be and how it should respond.”¹³⁷ Although there were dissenting opinions among the designers about how specific synthesis was to the urban design profession, they generally agreed with Wirth’s sentiment – that RBD created an opening for the profession to lead a conversation on climate change and potentially impact governmental processes, both federal and local, for the better.

Interviews with the RBD designers provided many design process themes that can be understood as elements of design thinking, such as synthesis, taking advantage of open endedness and ambiguity to address complexity, and sourcing information locally. In the next chapter I use design thinking theory to analyze the interview data, and to explain some of the challenges that RBD faced as well as the difficulties of evaluating RBD’s process and product-related outcomes. The use of the theory in this analysis also leads to considerations of the extent to which design thinking may be used in other problem-solving processes, as well as tensions between the design thinking theory that is applicable to RBD and how design thinking is understood contemporarily.

136 Anonymous Interview, February 20, 2015.

137 Gena Wirth, “Case Study II: Rebuild by Design.” Harvard University. Design Competitions Conference, April 24, 2015.

Chapter 4

Applying Design Thinking

Through the interviews with the urban designers, the Urban Institute Evaluation, and the lectures given by Henk Ovink and others, it is clear that many participants in the RBD competition viewed design as a kind of problem solving – a way to address the complex problem of adapting to climate change in the built environment. The participants understood this more than it was expressly articulated by the Hurricane Sandy Task Force Rebuilding Strategy, which described vulnerabilities and solutions but never explicitly referred to the design process as one of problem solving. Additionally, interviewed designers focused on the characteristics of the design process as critical to the producing better solutions to the problems at hand. Therefore it is possible to apply the model of design thinking to RBD, and by doing so tease out a more nuanced and detailed understanding of design's role in the process as well as its implications for design disciplines and government actors.

As described in Chapter 2, prominent scholars on design thinking identify a techno-rational normative process and an alternative design thinking process that differ from each other in the way they define and solve problems. The literature on design thinking has developed with particular attention to organizations and organizational change – how bureaucracies or companies that are weighed down by their own rules and structures can apply creative thinking order to adapt to be more effective. Finally, the literature reflects on repercussions of “design thinking” on the design professions and poses new avenues for inquiry. Using the literature as a roadmap, it is possible to compare RBD to the theory on design thinking along these three factors: what kind of problem is being addressed, what characteristics of design thinking are practiced, and how the process impacts the role of the design professional.

Wicked Problems In Bureaucratic Contexts

RBD addresses a specific kind of problem – one that is unclear and difficult to define. In design thinking, this kind of problem creates the need for a different process, as the lack of a clear problem stumps rational technical processes that require a set of goals in order to proceed. This is referred to a “wicked problem,” a term popularized by Webber and Rittel – a professor of city planning and a professor of the science of design from the University of California, Berkeley. Writing in 1973, Webber and Rittel describe an era of public distrust against professionals and professional solutions to social problems:

A growing sensitivity to the waves of repercussions that ripple through such systemic networks and to the value consequences of those repercussions has generated the recent reexamination of received values and the recent search for national goals. There seems to be a growing realization that a weak strut in the professional’s support systems lies at the junction where goal-formulation, problem-definition and equity issues meet.¹³⁸

They identify a major problem with the professional social services like planning, which is the difficulty of defining the goals and problems of complex systemic issues, such as poverty or education. Webber and Rittel argue that the inability of planning to address these problems stems from planning’s roots in “the classical paradigm of science and engineering” which is “not applicable to the problems of open society systems.”¹³⁹ They go on to connect this limitation, much like other problem solving scholars, to rational and technical processes. Incorrectly defining and approaching problems as technical issues, they argue, led to the ineffectiveness of infrastructure and urban renewal projects of the 1960s, and the perception that planners were ineffective.¹⁴⁰

It is not difficult to place RBD in a similar context, in which the difficult problem, full of uncertainty and indefinable goals, is climate change. The public perception of federal

138 Horst W. J. Rittel and Melvin M. Webber. “Dilemmas in a General Theory of Planning.” *Policy Sciences* 4.2 (1973): 156.

139 Rittel and Webber, 160.

140 Rittel and Webber, 161.

government's response to Hurricane Sandy and the descriptions of siloed technical federal agencies parallels Webber and Rittel's critique of professionals as technocrats who fail to see the larger systems at play in their policies. Where Webber and Rittel understand that there is a political and managerial dimension to planning's limitations, authors like Buchanan directly link the bureaucracy and structure of organizations to narrowly defined problem solving. It is not necessarily the individual social service professional who errs, it is the system of meaning-making and its reinforcement and codification by the organization that stands unmoving, unable to adapt or change. This is demonstrated in the Hurricane Sandy Task Force Rebuilding Strategy's description of RBD as an innovative tool. Wanting to have a larger conversation on interrelated risks at a regional scale, the strategy uses a design competition as the vehicle to have an open conversation on climate change. That is to say that the question is so open-ended that there is perhaps no method to answer it within the structure of the government, and so a new method of problem solving must be adopted. Scott Davis, Senior Advisor to HUD and former Director of HUD's Office of Recovery, confirmed that, from the government's perspective, the problem of rebuilding post-Sandy and responding to climate change was so open ended that it was unclear how to proceed. Responding to a question about the choice of using a design competition as opposed to other methods, he said:

We didn't know who the actual clients would be, the places where they'd be working. Teams were tasked with finding their client who would steward the project through to completion. We didn't know the solution to procure. We couldn't have written a statement of work to say "this is what we want."¹⁴¹

The political limitations of the bureaucratic processes were also addressed by RBD, through the capacity building goals of the process. If federal government felt that it needed an alternative process for such a difficult problem, it also acknowledged that local governments and states would also be ill equipped to think through how they are impacted by regional environmental risks as well as what their options are. In this sense, RBD took on the role of one large open

141 Scott Davis. "Case Study II: Rebuild by Design." Harvard University. Design Competitions Conference, April 24, 2015.

conversation that incentivized, through the timeframe of the competition and the promise of implementation, many politically and managerially constrained processes to discuss adaptation. This is a somewhat hidden purpose of RBD, which, though framed broadly, is directly tied to post-disaster mitigation. Yet the hope was that by providing a platform for interdisciplinary conversations and by bringing agencies and talent directly to political stakeholders, people could begin to think differently about what it means to build better in any scenario – proactively, not reactively.

This underlying goal for RBD was that the open-endedness of resiliency, addressing a multitude of sociopolitical and environmental systems, would “move the needle forward” on a new paradigm for adaptive urbanization.¹⁴² There is a sense that this aspect of the competition’s mission was understood informally, communicated more amongst the participants than through the competition materials which focused on the proposals and specific design ideas. Post-competition, the RBD organization’s mission does include that it will “promote resiliency in existing policies that will help us prepare for an uncertain future, with or without a next big disaster,” reflecting the pivot of the organization from the RBD competition into a potentially replicable model.¹⁴³ The Urban Institute Evaluation touches on the larger RBD competition goal, writing that “the problem...is not one of simple Sandy rebuilding and recover...rather, it involved preparing for future Sandies.”¹⁴⁴

Perhaps the clearest articulation of RBD as a mechanism for improving the efficacy of government to respond to climate change came from Ovink. In lectures at universities and settings outside of the RBD process, Ovink described Rebuild by Design as the “Trojan horse for the federal government” that allowed “an escape out of the organized, positioned, and negotiation-driven construct of the defined actors.” Ovink saw RBD as an “alliance that breaks

142 Anonymous Interview, April 24, 2015.

143 “Rebuild by Design - “Rebuild Competition.” Rebuild by Design. <http://www.rebuildbydesign.org/what-is-rebuild-by-design/#challenge>.

144 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 8.

out of the institutional fixed construct to make room for flexibility, adaptability and change.”¹⁴⁵

What Ovink described is very similar to the theory of design thinking as a way to change organizations that are bound by their bureaucracies. Ovink theorized a model of an alternative design-led process that would allow government to think about the full complexity of climate change in hopes that once the individual actors returned to their organizations, they would do so with more capacity to affect change.

The Design in Design Thinking

What was missing from Ovink’s model was clarity about the role of the designer. Climate change may be a “wicked problem” and an alternative process could be an effective way for initiating new modes of thinking in governments and constrained bureaucracies, but why does that have to be a *design* thinking model? One section of the Urban Institute Evaluation explicitly discusses the role of design, leaning heavily on material from Ovink’s lectures:

Beyond the attractive and functional design of the actual physical intervention, good design can help drive the cohesion, sustainability and earning capacity of the community at large. With this in mind, the “power of design” became an integral and indispensable component of the vision.¹⁴⁶

This description of design is vague, but the idea of “cohesion” does recall how the designers talked about the contribution of their own work as a kind of “synthesis”. Comparing the description of the design process from the interviews with the theorized process of design thinking reveals many overlapping characteristics of design. Synthesis through pattern recognition appears in most of the literature as an expertise of those who have enough experience in their discipline that they are able to make intuitive leaps - “we all have strengths in life, and one of mine is the ability to take a lump of organized information, see patterns, and extract order

145 Henk Ovink. “Resiliency by Design, the Politics of Planning and Rebuilding.”

146 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 9.

from the mess - to go from chaos to concept.”¹⁴⁷ For designers, the concept is related to the art of making. Schön describes this through the example of an architect who makes decisions within the confines of the site:

“They are likely to find themselves...in a situation of complexity and uncertainty which demands the imposition of an order. From whatever sources they draw such an initial discipline, they will treat its imposition on the site as a global experiment whose results will be only dimly apparent in the early stages of the process...”¹⁴⁸

Here, Schön argues that the decision making process of design faces seemingly infinite possibilities from which designers much choose a frame or approach. The situation defies the technical logic of a straightforward decision-making apparatus such as a decision tree, or other process in which the goal and outcome are already defined. The goal, in his example, is the design of a school. Within those parameters, which may include a certain number of rooms of a particular size, there are innumerable spatial decisions that need to be made. For Schön, the designer is trained to have this intuitive process, writing, “we cannot say what it is that we know...our knowing is ordinarily tacit, implicit in our patterns of action in our feel for the stuff with which we are dealing.”¹⁴⁹

This physical design process, which confronts extreme complexity, mirrors the “wicked problems” described by Webber and Rittel. There is no “right” answer, there is no “stopping rule” in the sense that the designer could always continue to work on the design, and there is no quantitative evaluation of the success of the design. Attempts to place performance metrics on a physical design are often reductive, or only describe one technical element of the final product, such as energy performance. If this is an accurate depiction of the design process, it could explain why urban designers in particular can contribute to an open-ended problem like responding to climate change, and also why Ovink intuitively would argue for a more ambiguous

147 Mark Considine. “Thinking Outside the Box? Applying Design Theory to Public Policy.” *Politics and Policy* 40.4 (2012): 708.

148 Schön, 103.

149 Schön, 338.

design brief for the competition.

In the interviews, designers described that the openness of the design brief and the multitude of topics on the table were liberating and allowed them to consider the full complexity of the topic. It also meant that the design teams were responsible for creating their own goals. This is an important part of differentiating design thinking from normative processes. In the designers' frequent comparisons to engineers, engineers were described as technical, rigid, and producing monofunctional infrastructure. By contrast, designers were able to synthesize multiple benefits and uses out of their designs, and incorporate the flexibility of living with water and ecology into their proposals. Design thinking characterizes these differences very clearly around the idea of goal-setting. Technical problems have pre-defined goals with analytical solutions that try to achieve the desired result. Complex, or wicked, problems are quite different in that the nature of the problem and by extent the answer is unclear. In this second scenario, the technical solution is not only insufficient; it has no basis for its analytical process. This reflects Scott Davis' comments on not knowing how HUD would go about procuring a statement of work because the goal and extent of the work is unknown. In these scenarios, a design process can create its own goals, much like the physical design process, through a cycle of framing and dialoging with the problem.

When asked if he would change anything about the RBD competition, Scott Davis mentioned that perhaps the competition could have been less ambiguous for designers so that they would have had a better sense of what was possible and what was reasonable.¹⁵⁰ The designers had mixed opinions about the "fuzziness" of the research stage in particular, and an understanding of design thinking and Schön's model of framing helps to explain the differences of opinion. Each of the design teams had an overall approach to the competition, and within that each individual had their own reasoning and process. This meant that different frames were applied to the problem throughout the competition, and some of those frames required more

¹⁵⁰ Scott Davis. "Case Study II: Rebuild by Design." Harvard University. Design Competitions Conference, April 24, 2015.

data and methodology than others. For example, one of the design leads on a winning RBD team had a background in landscape architecture as well as community planning. For him, the problem that RBD addressed was how to build resiliently with an emphasis on social resiliency. The team's sites were communities defined by large places of work. The data represented in the final report emphasizes the economic and social risks of the area, and prioritizes job creation in its flood protection and other design ideas. Even the importance of landscape, for this designer, was heavily social – he articulated the importance of his landscape architecture perspective as understanding how place mattered culturally and socially.¹⁵¹ One designer described the process of testing concepts in a similar manner:

And then we started to dig in just as designers. We started to say, 'okay, what's the range of possibilities here, from anything like a simple engineered flood wall, to something that incorporates elements of urban furniture, to something that's more like a building, to something at the scale of a landscape, or even, what happens if we bury the DR and a protective park on top of that? We said [to the community] 'These represent the conditions, we don't know what makes sense where yet, we have some ideas that we can talk about with you.'¹⁵²

In this quote, it is possible to see the design process going through iterations of possibilities, making rounds of decisions about what range of design options would be presented to the public, at which point the public input would help rule out certain approaches or promote others.

This social and economic frame differs greatly from other teams that prioritized ecologies and natural sciences. Another designer characterized his team as being shaped more by an academic atmosphere that was interested in a site and issues relevant work being done in a research university setting. That designer also found fewer or less vocal community organizations involved with the final site. In that case, the combination of a more university-driven approach and less input from local stakeholders shaped a framework for the design team that relied heavily on data and methodology to shape its program and design ideas.¹⁵³

151 Anonymous Interview, January 14, 2015.

152 Carney.

153 Anonymous Interview, January 21, 2015.

It was these many frames and a back-and-forth process with the opportunities and limitations of the sites that shaped team's process and final proposals. The role of ambiguity, then, has to be understood in relation to a spectrum of approaches that are based on the experience and values of individual designers within the cultural and social context of their firms and team. Perhaps it is this complexity of understanding when and why one would provide more constraints on the design process that explains why Ovink, when asked the same question that was posed to Scott Davis about making the process clearer for designers, responded that he would not change a thing.¹⁵⁴

Evaluating the Impact of Design

Applying design thinking to Rebuild by Design reveals that the RBD vision and structure rely on aspects of problem solving associated with a design process, with the understanding that design could produce better physical design ideas for adapting to climate change while also changing expectations within the governmental context in which the design process was operating. How does this underlying theory of change help evaluate the success of RBD? The problem of evaluating the success of design in accomplishing RBD's goals is a parallel one to the drawbacks and benefits of ambiguity in the competition.

Looking back at the characteristics of design thinking (table 2), design's ability to navigate questions that have no clear goal also means that there are no clear metrics for the solutions. The design characteristics are intuitive, the expertise based on experience and personal preferences and values that are difficult to explain. Schön argues that design knowledge is actually a different kind of understanding called tacit knowledge. The idea of tacit knowledge was developed by Michael Polanyi in the 1950s and 1960s to categorize a knowledge that cannot be communicated linguistically, where "the aim of a skillful performance is achieved by the

¹⁵⁴ Scott Davis. "Case Study II: Rebuild by Design." Harvard University. Design Competitions Conference, April 24, 2015.

Table 2: Sample Characteristics of Modes of Thinking		
	Characteristics of normative thinking	Characteristics of design thinking
Design Literature (Schön, Rowe)		Acknowledging complexity
		Conflicting values and purposes
	Bureaucracy	
	Uniform procedures	Flexible procedures
	Objective measures of performance	Qualitative evaluation
	Center/periphery systems of control	Decentralized responsibility
	Predefined goals	Goals as outcomes
Policy/Public Management Literature (Considine, Buchanan)	Technical expertise	Implicit Heuristics/rules of thumb, high level of discretion
	Rule-bound	Thinking outside the box, playful, surprise
	Analytic	Open process of inquiry, open-ended, mix of rational and non-rational, emotion
	Goals as determinants	Prototyping, goals as outcomes
		Synthesis

observance of a set of rules which are not known as such to the person following them.”¹⁵⁵ Thus an observer cannot necessarily understand how decisions are being made just by observing one of the design teams, and even the designers themselves may not be aware of the many decisions and positions that they take throughout the process. Design’s opaque process is often referred to as the “black box” of design; the hidden space in which design decisions are made. The problem of evaluating RBD goes beyond the difficulty of categorizing solutions and measuring them. Introducing the concept of design thinking places RBD in a larger context, begging the question of what RBD reveals about the efficacy of on design as a method of problem solving.

As illustrated in Chapter 2, there are multiple inputs in RBD that shape its process and can be credited with its outcome: policy transfer, the design competition format, and design thinking. Table 3 provides an overview of the ways in which these different components shaped three of the main products of the competition. “Changing content” refers specifically to the new (in the U.S. context) design ideas suggested in the proposals – ecological infrastructure, building

155 Michael Polanyi. *Personal Knowledge: Towards a Post-critical Philosophy*. Chicago: University of Chicago, 1962, 42.

flood protection that also functions as public space underneath a highway, creating a new intersect that incorporates marshland and light industrial supply chains. “Changing procedures” refers to the bureaucratic or organizational impact of “getting everyone around the same table” and reflecting on current standards and practices of the federal, state, and local governments. “Capacity building” describes the specific goal of the competition to increase the capacity of local and state governments to respond to climate change by providing resources in the forms of funding, access to federal agencies, and design talent. These inputs overlap, and there are evaluation issues around each input and goal.¹⁵⁶

Table 3: Potential Impacts of RBD Competition			
	1. Changing design ideas	2. Changing procedures	3. Capacity building
Design thinking	<ul style="list-style-type: none"> • More comprehensive physical designs 	<ul style="list-style-type: none"> • Questioning current standards / making the case for different regulations and standards 	<ul style="list-style-type: none"> • Educating government and stakeholders on alternatives
Design competition		<ul style="list-style-type: none"> • Room for reflection and alternatives • Exploring new procurement strategies 	<ul style="list-style-type: none"> • Incentivizing political participation and collaboration
Policy transfer	<ul style="list-style-type: none"> • Sharing technical knowledge from the Netherlands on water management 	<ul style="list-style-type: none"> • Ovink’s theory of the “sabbatical detour” which greatly influenced the vision of the competition 	

Changing Design Ideas

In the Urban Institute’s evaluation, lectures by Ovink and others, and the interviews with designers, it appears that all of the competition participants felt that the process produced

¹⁵⁶ Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 19. Explains the overlap between process goals and product goals as the as “intentionally blurred lines between process and product innovation.”

new and interesting design ideas that did something different from the normal post-disaster rebuilding efforts. As seen in the interviews, some designers did not think that the specific design solutions in the proposals were “innovative” by broader standards, but compared to the context of the U.S. Army Corps of Engineers and the CDBG-DR funding stream, there was agreement that, as the Urban Institute wrote, “design teams’ innovations...have resulted in many proposed advances for resilient infrastructure design.” The evaluation concluded that RBD fostered “radical thinking about the real environmental, social and economic challenges faced by Sandy-affected communities.”¹⁵⁷ The Urban Institute’s conclusions are mostly geared toward better management practices and do not get into the details of how to define “radical thinking.” One of the difficulties of evaluating the design ideas is that their synthesis is not captured traditional or metric-based evaluation methods. This can be observed in the application of the Benefit-Cost Analyses (BCA). The BCAs were introduced as a proposal requirement in stage 3 of the competition (around November 2013) as a way to bridge the gap between the design ideas and future implementation. BCAs are required of many federal building projects are used by FEMA to quantify the “future benefits of a mitigation project are estimated and compared to its cost.”¹⁵⁸ The BCAs, then, are an interesting analysis of RBD – if designers produced new benefits through tacit design thinking, then the proposals should resist being quantified through the logic of a BCA. From the Urban Institute Evaluation, we find that this was the case:

RBD leadership held a BCA workshop in New York, inviting representatives from FEMA and several firms with BCA experience to present an overview and demonstration of BCAs. At the workshop, several tools were presented, something that might have proven confusing to design teams with little BCA experience...Dutch firms Rebel and Deltares were asked to provide a more uniform framework that was more appropriate to the proposed design opportunities. Teams and jury members noted that this guidance provided some consistency in terms, but many core parameters were still unclear. Ultimately, this meant that teams developed many of their own assumptions, which contributed to comparability challenges in BCA ratios at the final presentation.¹⁵⁹

157 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 49.

158 Federal Emergency Management Agency. “Benefit-Cost Analysis.” May 6, 2015. <https://www.fema.gov/benefit-cost-analysis>.

159 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 45.

The Evaluation paints this problem as simply one of not providing the right kind of information to the design teams, but the methods that the teams used for their BCAs show that there are, in fact, incalculable costs and benefits. In their BCA of the “green corridor” idea, Interboro described a future scenario in which the lack of new affordable housing would be detrimental to Long Island, which included a stagnating economy, increased difficulty of selling homes, parents and their children living farther apart, and the missed opportunity to improve communities.¹⁶⁰ Proposed diversity of housing was an important piece of their proposal, and so when considering “costs” the Interboro team listed counterfactuals, answering the question of “what would we lose if we did not intervene?” These kinds of costs and benefits are difficult if not impossible to calculate monetarily. Other teams did a more traditional BCA. The OLIN team quantified many aspects of their proposal estimating damages avoided by category: damages to property and inventory, loss of business activity, and indirect economic impacts, resulting in a benefit to cost ratio of 1.6. When interviewed, however, one of the biggest costs the designer mentioned was that of infrastructure that does not respond to the fabric of the neighborhood, citing the lost economic output of communities torn apart by highway projects. He also described one of the main benefits of landscape architecture as making open space legible to its community.¹⁶¹ Both of these are unquantifiable concepts that are important to the proposal’s framework, values, and benefits that are missed by the 1.6 BCA ratio. Other teams gestured to the limitations of the BCA as well - BIG’s proposal lists financial costs and benefits along with a “key social and environmental benefits” section that explains qualities such as open space and increased connectivity.¹⁶²

This presents one of the main challenges of adapting the policies of agencies responsible for infrastructure or coastal development that do rely on BCAs and other regulatory standards. As the proposals proceed through implementation, regulatory processes have already begun to

160 Interboro Team, “Living with the Bay: A Comprehensive Regional Resiliency Plan for Nassau County’s South Shore.” Rebuild by Design, March 25, 2014, 270.

161 Anonymous Interview, January 14, 2015.

162 BIG Team, “The Big ‘U.’” Rebuild by Design, n.d., 222.

eliminate some of the innovative aspects of the designs.¹⁶³ To frame this in terms of the BCAs, if the specified costs and benefits do not capture the “holistic” nature of the proposal, then an implementation based on the BCAs could reduce the innovative qualities of the design ideas by focusing on what the regulatory process is already familiar with - building flood protection. Several of the interviewed designers were worried that their contribution of synthesizing flood protection and infrastructure with ecology, social equity, and quality of life would be restricted by the implementation process and limited funding, stripping the projects down to something that might have been built by the Army Corps of Engineers.

Changing Organizations and Building Capacity

In the theory of design thinking, the alternative problem solving process is set in juxtaposition to the normative process, thereby providing room for the normative process to learn and change. This is seen in two of the RBD goals – the more explicit goal that the process builds capacity for states, local governments, and communities, and the broader goal of changing the way that the same stakeholders as well as federal agencies approach climate change. Beginning with HUD, the competition sponsor, it is not clear what the organization has learned about design from the RBD process. HUD has not released an official evaluation of Rebuild by Design. Interviews with HUD staff, however, showed a similar difficulty of defining the benefits of design in the competition. One HUD staff person summarized this issue by saying that it is difficult to quantify resilience and innovation:

It’s hard to also monitor the process of making choices between funding available and your innovative and resilient options. How do you make each individual decision that amounts to an overall...a project that’s in the spirit of the concept as it was designed and fulfilling those goals. So it’s hard, and it’s a little bit uncharted territory for HUD, I would say.¹⁶⁴

163 Urban Institute, “Evaluation: Rebuild by Design Phase 1,” 53.

164 Anonymous Interview, February 18, 2015.

She went on to describe the resilient and innovative contributions as the “softer aspiration aspects of the projects,” saying that “there’s less question about whether or not [they’re] feasible flood protection projects...what’s hard are these other softer components.”¹⁶⁵ This adds a layer to the concern that regulations and procedures may de-innovate some of the proposals. The problem here is not just that the regulations may be based on previous models that need to be updated, but that the CDBG-DR grantees and HUD do not qualitatively understand enough of the design process to advocate for the proposals or to understand the benefits of the “softer aspirations.”

Although individuals at HUD may not have understood how to qualify all of the aspects of the design proposals, the agency did make two significant efforts to change their process and procurement strategies to support these “soft” benefits of the RBD proposals. The first change came through the Community Block Grant Disaster Recovery Program (CDBG-DR) funding for the proposals. As mentioned in Chapter 1, the CDBG-DR grants are one-offs, with the amount of funding determined by a congressional appropriation based on the occurrence of disasters. The Disaster Relief Appropriations Act was the funding source for the CDBG-DR money that ultimately became the implementation funds for the RBD competition. Taking a step back to look at the overall process, the CDBG-DR funds are a resource for states and municipalities (the grantees) to run programs that fall within the CDBG-DR requirements. Eligible grantees then draft action plans for the funding, which outline how the grantee will fulfill the grant requirements. This action plan goes through iterations between the grantee and HUD as the project develops, until it is approved and funds are allocated to the grantee.

Figure 9 illustrates this process, in which the grantee is ultimately responsible for implementing the program or project and can shape the program how they see fit within the federal requirements. This differs significantly from RBD, in which the jury recommended winning proposals that grantees then had to implement. Recalling that HUD selected the finalist and winning teams and that Shaun Donovan and Henk Ovink were chair and co-chair of the Jury,

¹⁶⁵ Anonymous Interview, February 18, 2015.

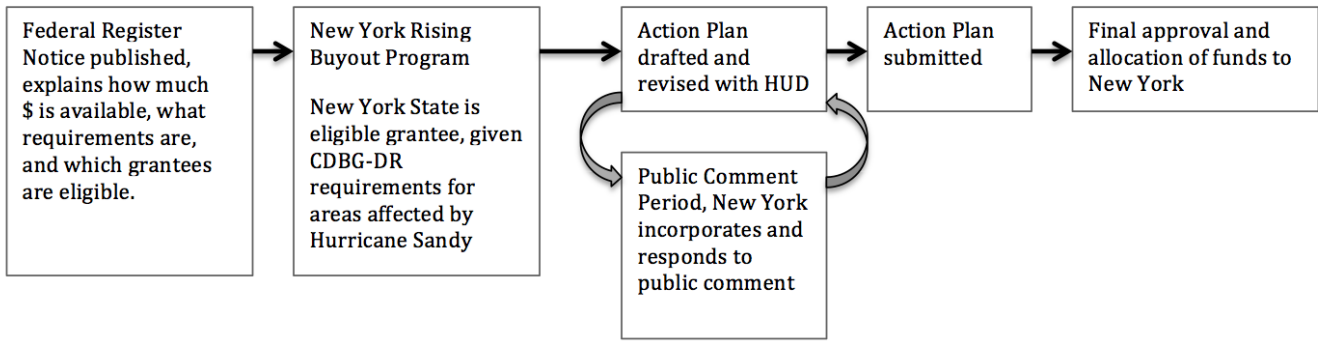


Figure 9: Example of a CDBG-DR Process

the final designs appear to be dictated more by the federal government than by the states and cities who have to build and manage them. One HUD staff member familiar with RBD could not think of another instance in which the CDBG-DR process had been arranged this way.¹⁶⁶ This is a significant change in the management of the CDBG-DR funds, and reflects a desire on the part of HUD for RBD to produce designs that are innovative and may be beyond the abilities or desires of state and cities. Although this may create some tension over the implementation of RBD projects that the states and cities are less enthusiastic about, this use of CDBG-DR shows how HUD changed a process in order to make room for more innovative design that might not have resulted from the normal procurement and planning processes.¹⁶⁷

The second change that HUD implemented was regulatory. Although the finalist design teams were compensated \$200,000, they estimated that the amount of work they contributed to the project was valued at three to six times that amount.¹⁶⁸ Teams worried during the competition that despite the commitment of their resources they may not have the chance to actually work on the projects due to federal procurement laws that require an open bid process for procurement on projects build with federal funds. HUD attempted to address this issue as well as the concern of how to maintain the “spirit” of the design proposals by changing its procurement laws for the RBD projects. The federal notice that allocated funds to the RBD implementation (tranche

¹⁶⁶ Anonymous Interview, February 18, 2015.

¹⁶⁷ Anonymous Interview, February 18, 2015.

¹⁶⁸ Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 7.

3) writes that “grantees are specifically authorized by HUD to engage in non-competitive, sole-source procurement of the design teams or members of the design teams” and also encourages grantees to consider how they might continue to work with the designers, “given the unique knowledge and understanding that each Rebuild by Design design team possesses regarding their respective proposal.”¹⁶⁹ Procurement law for the proposals now falls to the states, which means that projects in New York are able to directly hire their design teams while projects in the state of New Jersey must still engage an open bidding process. Still, this one time change in federal procurement demonstrates an effort on the part of HUD to consider how the transfer of design knowledge passes from the competition phase to the implementation phase and indicates that there are direct effects of design on the process and thinking of the federal agency.

Beyond these procedural responses to RBD, HUD staff members who were interviewed articulated three main lessons learned from the RBD competition. The first is the idea of using a design competition as a way of sourcing more local knowledge. HUD perceived the stakeholder coalitions and community development as an important step in defining the problem and generating solutions beginning at a more local level that could build more support for the project and generate better solutions than policies generated at the federal level. This is the idea of the CDBG-DR program, which is framed by HUD as a way to provide a resource to states and cities. One HUD employee, however, felt that more collaboration and capacity was created through the framework of the competition.¹⁷⁰

It is difficult to say whether or not this is true, the difference between a federal grant program and a competition for federal funds seems at first glance to be semantic. Regardless, HUD has proceeded with this takeaway into the formation of a new program, the National Disaster Resilience Competition. This program was announced on June 14, 2014, and expands the competition format of RBD to any community that experienced a natural disaster (from

169 Office of Community Planning and Development. “Summary of Federal Register Notice Published October 16, 2014, Regarding Rebuild by Design Projects,” 5.

170 Anonymous Interview, February 18, 2015.

2011 – 2013). These communities may submit proposals for “innovative resilience projects” that address the disaster from which they are recovering. The HUD website states that this program “builds on the successful model set forth by HUD’s Rebuild by Design competition,” and yet urban design is not a part of the initial proposal stage. Although HUD describes a process in which communities engage with stakeholders, non-profits, and philanthropic organizations, there is no connection to the role that design played in RBD. Although design may become involved later in the process, omitting an urban design partner or even a commitment to incorporating urban design in the beginning stages of this competition raises a question about whether for HUD design was an important element of the innovative process of RBD.¹⁷¹

The second lesson for HUD from the RBD competition is that third party funding and programming support can bolster federal programs and build the capacity of local governments. The example of this in the National Disaster Resilience Competition is the Rockefeller Foundation, which will be hosting a “capacity building initiative” comprised of workshops around the country. These workshops, similar to those of RBD, will help educate local communities on resiliency issues, how to identify vulnerabilities and risks, and what kinds of tools are available to address those risks.¹⁷²

The third lesson from RBD is that it may be possible for the government to do more preventative planning as opposed to only funding resilience retroactively, post-disaster. “Changing the conversation” or sense of what was possible was identified as one of the goals of RBD. It appears from speaking with HUD staff members that RBD is perceived as a step in the right direction. Again, the National Disaster Resilience Competition was referenced as a process that could increase the capacity of local governments to think proactively about resilience, even though the structure of the CDBG-DR funding still limits eligibility to municipalities that have already experienced a disaster. As one HUD staff member said:

171 “National Disaster Resilience Competition - HUD Exchange.” U.S. Department of Housing and Urban Development. June 6, 2014.

172 “Resilience - The Rockefeller Foundation.” The Rockefeller Foundation. <http://www.rockefellerfoundation.org/our-work/topics/resilience/>.

The other [connection to RBD] is that we can focus on resilience and thinking about the future rather than just repairing following a disaster. I think the spirit is a lot the same, I think the difference is that these will be grantee driven projects, so that's very different, and they won't have these creative teams driving them from the beginning.¹⁷³

This quote demonstrates that the “spirit” of RBD is understood by the speaker to be present in the National Disaster Resilience Competition even though design is not leading the process. There may be good arguments for design not taking the lead, but still serving an important role, which will be discussed in the following section on the politics of design thinking. What these three lessons indicate, however, is that HUD does not seem to have carried over the idea of design as an important process into its future policies. The successful aspects of RBD that serve as a model for the national competition are non-design factors: a competition structure, the role of outside partners in government, and pivoting to prevention from recovery.

Although individuals from HUD expressed that RBD had an effect on how they think about options for responding to climate change as well as the role of design, this opinion is not unanimous. Returning to the theory that a design process can be used to improve the workings of an organization, it is possible to conclude that RBD has affected HUD. The National Disaster Resilience Competition is an attempt to rebuild better, not just in a coastal climate change context but also in response to many types of natural disasters. The format prioritizes local sourcing and attempts to continue to use CDBG-DR and outside expertise in experimental ways. These elements, however, draw more from the competition structure of RBD than it does from the benefits of urban design or the design process.

HUD was not the only organization that was affected by the competition process or by urban design. State and local governments, along with community organizations, were the main targets of capacity building. Some community organizations felt that RBD helped them develop a new frame for work that they were already doing on community development or social

¹⁷³ Anonymous Interview, February 18, 2015.

justice, “compelling them to ‘rethink’ their work through resilience lenses.”¹⁷⁴ Although local governments reported mixed experiences for the Urban Institute Evaluation, the majority felt that they gained knowledge from the teams:

In some cases...engagement was seamless and the design teams were met by supportive mayors and county executives, council members and city offices, and, when existing, regional governmental organization. These groups have noted two critical actions: i) that the design teams were “well prepared” and “had done their homework” towards presenting concepts that were compelling, and ii) that the RBD process had informed or would inform master planning or special planning efforts in those jurisdictions.¹⁷⁵

This quote illustrates that part of what successfully impacted local governments can be credited to the role of urban design on the teams. The ability to present information in a compelling way is a design skill, and this successful communication likely contributed to the education of the local political stakeholders. An interviewee from an RBD partner organization also highlighted the importance of urban design’s ability to present information:

But I also think that urban design was a big part of it because after something terrible like a disaster happens, you have to give people something to hope for. And a beautiful rendering or picture of what could be in my neighborhood is a lot more graphic than some policy memo, and more hopeful. You know, I think that’s a reality, too.¹⁷⁶

In this quote, the staff member was trying to describe what it is about design that contributed to the organizations and made an impact. “Hope” may be intangible, but what these descriptions of the process indicate is that there was a method of communication from the design teams that helped local governments understand new aspects of a complex issue and gave them ideas that they could apply. Overall, it is difficult to say what exactly HUD or other political stakeholders have learned, as organizations, about the role of urban design or how to utilize design thinking from the RBD competition. What can be observed is that institutional change is slow and

174 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 37.

175 Urban Institute. “Evaluation: Rebuild by Design Phase 1,” 43.

176 Anonymous Interview, February 17, 2015.

very difficult to trace. One federal staff person mentioned that he felt that the participants had become more fluent with design concepts and that their idea of what was possible had been greatly expanded. He added that it would be very difficult if not impossible to draw a straight line from RBD to future institutional changes, such as the Army Corps deciding to build green infrastructure, even if he felt that that conclusion would be justified.

Politics of Design Thinking

From the evaluation materials and interviews, RBD was qualitatively a success, even though it is difficult to definitively say how RBD performed on its goals and exactly what of that success could be attributed to design. This is not surprising, however, because the RBD competition was recent and unprecedented without a clear method for tracking and evaluating the process. It was also an experimental process for the sponsor, for the levels of government that participated and for the design teams. Federal level experimentation in the U.S. context is not seen as common, and there is an extent to which RBD is a success simply for trying something new and introducing some flexibility into the federal process.¹⁷⁷ If RBD was a step in the right direction for thinking about how to improve resiliency, does that mean that design thinking should be applied to other complex problems? It is important to revisit the idea of wicked problems and design's role in addressing them.

In April 2015, the Van Alen Institute released the results of its first ever Competition Survey that was created to collect data and opinions from designers about design competitions. The survey received around 1,414 responses from 65 countries. In response to the question “What do you think have been the most interesting or influential design competition of the last decade and why?” the fourth most frequently cited response was Rebuild by Design.¹⁷⁸ Some

¹⁷⁷ Urban Institute. “Evaluation: Rebuild by Design Phase 1,” x.

¹⁷⁸ “Architectural Record / Van Alen Institute Design Competition Survey.” Van Alen Institute. <https://vanalen.org/projects/architectural-record-van-alen-institute-competition-survey/#propositions>.

of the responses mirrored concepts of design thinking and what the designers interviewed for this thesis liked about RBD. The top two reasons for entering a design competition were that the topic was an interesting one and that it was opportunity to “experiment and work more creatively than in typical projects.” The top three strategic goals for design competition mirrored RBD’s goals exactly: to produce good design solutions, serve as provocations to challenge conventional thinking, and advance public discussion of pressing issues. The survey revealed a population sample of designers eager to tackle complex topics – although the respondents were overwhelmingly white/Caucasian, male, and under the age of 44, suggested topics for future design competitions included racial segregation and suburban growth.¹⁷⁹

The benefits of design thinking have been discussed at length, but should the result be designers tackling racial segregation through design competitions? Is there a limit to the kinds of question design should ask – a limit to its expertise? The popularity of design thinking as a form of consulting has not gone without criticism. IDEO, in particular, has been criticized for selling “design thinking” as another fad in a long list of approaches to streamlining bureaucracies. A more nuanced critique, however, places criticisms of design expertise in the context of a debate on problem solving that has been ongoing since the 1960s.

A 2015 article titled “Edutopia” begins with the headline that “education is not a design problem with a technical solution. It’s a social and political project neoliberals want to innovate away.” Author Megan Erickson is responding to the latest book by IDEO’s Tim Brown, called *Design Thinking for Educators*. In the article, Erickson critiques design thinking as “the look and feel of progress” that reduces structural and institutional problems to a technical process that then misses the larger political and social questions. Her example is of a Peruvian school system designed by IDEO that performs better on test scores than public schools, but also requires tuition. “If test scores are higher than those of public schools, it is not because of the soul-searching of teachers/designers,” she writes, “It’s because tuition is about a quarter of the

179 “New Summary Report - 03 March 2015” Van Alen Institute. https://vanalen.org/content/uploads/2015/04/15.03.03_Comp-Survey_Report-on-Frequencies.pdf.

national median income.”¹⁸⁰ In this critique there are reflections of Schön’s perspective from thirty years ago - that the discourse on creative problem solving has become too technical.¹⁸¹ In the popularity of design thinking, attempts to codify or capitalize the design process have produced their own bounded outcomes that may rely more on specific brainstorming steps, performance metrics, and other rational-technical systems of thinking rather than on the expertise and experience of designers.

In all of the discussion about vague terms describing the benefits of design in RBD, it is easy to forget that the proposals include very concrete design ideas, for the most part thoroughly presented with histories, systems analysis, and ecological knowledge, covering a variety of material in depth including modeling hurricane patterns and wave heights, etc. Design may excel at synthesizing these concepts, but it is important to understand that the problem and process being addressed is both technical and non-technical. This is a clarification to the theory of design thinking, which places “art” and “technical” as opposite processes. Rather, the complex problems that design thinking can contribute to, such as climate change, include social, political, and cultural dynamics as well as mitigation. A good solution will therefore not simply be technical, as in the example of the hard infrastructure of the flood wall, but it will include technical solutions for flood protection as all of the RBD proposals do.

It could be argued that with its interdisciplinary teams and process RBD achieves a balance between the technical and the expertise of the designer, but the managerial language in the Urban Institute evaluation as well as the general lack of reflection on design thinking feeds the political tension between technical and expert knowledge. In 1983 Schön bluntly describes this dichotomy by saying that design professionals “are neither the heroic avant-garde of the Technological Program nor a villainous elite who prevent the people from taking control of their

180 Megan Erickson. “Edutopia.” *Jacobin* 17 (2015). <https://www.jacobinmag.com/2015/03/education-technology-gates-erickson/>.

181 Erickson.

lives.”¹⁸² How designers actually navigate between these extremes is not as clear, particularly in relation to larger societal questions in which there is rarely a client or in which the outcome is hampered by politics or problems of implementation.¹⁸³

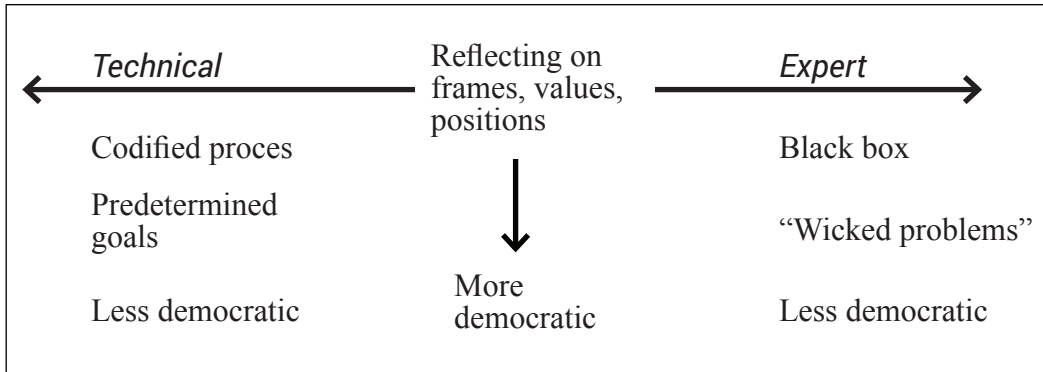


Figure 10: Diagram of Schön's "Reflective Practice"

How to integrate design thinking, and urban design specifically, into other complex spatial debates in a way that would benefit the public is a difficult question in light of these political complexities. On one hand, a more technical process can be transparent in that all of the steps and reasoning are clear. On the other hand, an extremely technical process in a complex context can ask the wrong question and pose a solution that does not make sense to the general public. The same is true for the extremes of expertise. The “black box” of design expertise is usually met with distrust from the public because it is unknowable, and often maintained as unknowable as a form of professional protection. At the same time, design expertise may be able to address more fully the complex problem that is missed by the technical solution. Herein lies the need for balance and reflection. In the middle of the two extremes, Schön argues for reflective practice in which design professionals can be aware of the extent of their expertise, the kinds of frames and values that they bring to their process, and how they communicate with their clients (see figure 10). Through this awareness, a more transparent expertise is achieved, in which the design professional is attentive to his or her own biases and limitations.

182 Schön, 346.

183 Considine, 711.

Reflecting on the political context of RBD might help designers understand the limits of their own expertise and design thinking. As shown by the designers' different frames, values, and approaches to RBD's research and site selection stages, there is no neutral position for the designer, who is already bringing a perspective to his or her work. Similarly, the design opportunities themselves are not neutral and may in fact restrict the kinds of options available to design. Managed retreat was not an option exercised within the winning proposals and was not a premise of the competition - the impetus to rebuild was assumed. Design proposals kept with this assumption, which could certainly be bound with political pressures and capital interests at stake in rebuilding coastal urbanization as much as it was in the interest of helping residents live in their communities and get back to work. Designers committed to creating better design solutions and innovative thinking for the public benefit need to understand the ways in which the politics or social constructs of their design opportunities are shaped. Similarly, if designers want to contribute to innovative processes in organizations like HUD or local governments in RBD, it would be necessary to reflect on the effect of a third party funded federal effort – does it build the capacity of government to supplement its programming and sponsorship to an outside entity, and what is the role of designer in that condition?

These are questions that are difficult to answer, but if design would like to have a voice in future problem solving, they are important ones for the designer to consider. Returning to the context of Hurricane Sandy's relief and rebuilding efforts, RBD appears a potential route for government and stakeholders to move forward from a politically disconnected process: federal agencies not communicating effectively with state and local governments, the federal government unsure of how to coordinate relief funds as well as update its regulations and policies to new standards, and a disconnect between the efforts of government and the experience of the disaster on the ground. One interpretation of RBD is that the rise of an urban design process is a way of moving past these tensions that does not fully address the problem of contested experiences of the disaster that resulted from a lack of governmental capacity. It follows that the continued outsourcing of planning and designing visions of urbanization does

not address the original contestation of space and process that occurs in the months and years after a crisis like Hurricane Sandy, or as referenced in this quote, Hurricane Katrina:

The process that has unfolded in New Orleans confirms the finding that urban design has increased in structural significance due to political economic changes in cities and that this new context for professional practice has changed the division of labour among public and private-sector planners and designers while the design of the city and its use value remains deeply contested.¹⁸⁴

Whether or not this a trend, RBD qualifies as a “new context for professional practice” and the impact for HUD does include shifts in the relationship between government and the civic/private sectors as well an increased reliance on “stakeholders” as opposed to the public. Urban design may not be equipped or responsible for changing these political dynamics, but I argue that without reflecting on the larger political contexts that shape its role and shape the use of design thinking, designers risk working against their own purposes or values.

Throughout the interviews with designers and others, the RBD design proposals have been described as “better” or “good” in the absence of a quantitative descriptor. Design thinking theory demonstrated that this was a result of asking a question that has no “correct” answer in the first place. What this leaves us with as a qualitative measure are the very frames and values that are inseparable from the process. For each team, the success of the design ideas stems from their own goals – to integrate community needs with flood protection, to fix the problem of how to mix residential and light industrial uses, or to reintegrate the shoreline with ecological functions. Additionally, interviewees remarked time and again that there was something obvious about these goals – that the innovation was not necessarily generating the ideas but actually creating a governmental and regulatory system that could put them into practice. Returning to the evaluation of the designs, then, perhaps the best follow up question to “did a design process lead to better solutions,” is “for whom are these solutions better?” In a city of contested space, can designers engage more directly with their own values and think critically about where to position

184 Jacob A. Wagner and Michael Frisch. “Introduction: New Orleans and the Design Moment.” *New Orleans and the Design Moment*. London, NY: Routledge, 2013. 1-20.

their efforts? These are difficult questions for climate change adaptation, in which there remains a tension between the desire to support the self-governance and capacity of communities to define their own resiliency locally and the needs of a governmental structure that is also arguably lacking in capacity to execute infrastructural improvements on the scale required for water mitigation.^{185, 186}

RBD and Contemporary Design Thinking

A final challenge for design thinking lies in its current use in the hands of consulting companies and business schools that broker in “design thinking” as a form of product innovation - a popular approach that differs from the understanding of the design thinking cultivated in this thesis. As companies attempt to expand their consultancy beyond the generation of new products to consulting on processes, they are met with mixed success. The resistance to this use of design thinking is characterized by the *Edutopia* article, which contains both a dismissal of “design thinking” as simply the latest business jargon, as well as a criticism of the technical solutions that it offers.

This contemporary approach to design thinking, typified by IDEO and the Institute of Design at Stanford, has a base in the literature addressed in this paper, relying on the concept that a creative approach produces better results and “new forms of value.”¹⁸⁷ This approach has its origins in product design, and it differs in many ways from the way design thinking is characterized in this thesis and used in Rebuild by Design. Take, for example, descriptions of IDEO’s process. There are many diagrams and versions of what IDEO considers the steps of the design process. In one, there are five stages: discovery, interpretation, ideation, experimentation,

185 Lawrence Vale, Shomon Shamsuddin, and Kian Goh. “Tsunami + 10: Housing Banda Aceh After Disaster.” *Places Journal*, Dec. 2014. <https://placesjournal.org/article/tsunami-housing-banda-aceh-after-disaster>.

186 Max Liboiron and David Wachsmuth.

187 Tim Brown. “Design Thinking.” *Harvard Business Review*, June 2008. http://www.ideo.com/images/uploads/thoughts/IDEO_HBR_Design_Thinking.pdf.

and evolution. Another diagram describes the process as a cycle between brainstorming and prototyping, and a Venn diagram shows IDEO's "innovation" as the overlap of "viability (business), desirability (human), and feasibility (technical)." Still another definition of design thinking defines it as a series of sayings: "show don't tell," "focus on human values," "craft clarity," embrace experimentation," "radical collaboration," meanwhile understanding that these tropes may sound "corporate and even simplistic."¹⁸⁸

Therein lies the difficulty of comparing RBD's use of design thinking to the concept as it is contemporarily understood. Although both forms of design thinking rely on interdisciplinary work, iterative processes, and creativity, the market-oriented description of the design process abstracts and generalizes steps to the point that they could apply to almost any process that requires generating ideas. There is a sense that anything could be design thinking, and therefore that the use of this term by companies is an attempt to create their niche in the market more than it is an expression of a new and useful process.

Examining one of the central tenets to market-based design thinking illuminates how it differs from RBD as it is interpreted in this thesis. The concept of "human-centered design" appears consistently in popular descriptions of design thinking, primarily circulated by IDEO. It instructs designers to pay attention to what people prefer or the user's behavior, "what they like or dislike about the way particular products are made, packaged, marketed, sold, and supported."¹⁸⁹ Although it is "human-centered," this version of design thinking focuses on understanding people as a way of delivering a more desirable and profitable product. Even the role of empathy according to IDEO's founder Tim Brown, is about meeting the needs of individuals through product delivery – understanding their desires and behaviors in order to create a tool that they did not even realize they needed. He writes in his book *Change by Design*

¹⁸⁸ Peter N Miller. "Is Design Thinking the New Liberal Arts?" *Chronicle of Higher Education*. May 26, 2015. <http://chronicle.com/article/Is-Design-Thinking-the-New/228779>.

¹⁸⁹ Tim Brown. "Design Thinking," 87.

that “what we need are new choices – new products.”¹⁹⁰

This approach of design thinking as product innovation is significantly different from RBD’s use of design thinking as problem solving through synthesis. For the RBD designers, RBD was less about solving a design problem with a design solution, and more about addressing a societal and environmental problem with a design process that contained design solutions. It was due to the openness of the process that RBD designers’ “products” were more comprehensive, and synthesized benefits in other areas – ecology, public space, education, regional planning, conservation, transportation, etc. Furthermore, these design ideas were not the only outcomes of RBD. This is an important contribution of the case study of RBD to the design thinking literature. The design process did not simply produce products – in fact the products were not considered entirely innovative. Rather, the innovations came from the potential changes to the organizations and ways of thinking of stakeholders and regulators that occurred in the process of achieving a multifaceted urban design ideas. In this sense, RBD deviates from the contemporary market-based use of design thinking.

The problem-solving and design theory used in this thesis is not new. It is this literature from the 1960s-80s, however, which so closely matches the design thinking process the way it was described by RBD designers. Perhaps a lesson here, for the future of design thinking, is to bring creative problem solving back to the conversation; to emphasize what it is about design that results not just in better products, but also in the alternative processes that can recognize complexity and thus impact structural change.

190 Tim Brown and Barry Kätz. *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. New York: Harper Business, 2009, 3.

Chapter 5

Conclusion

Although the concept of design thinking was rarely mentioned in official materials during the Rebuild by Design competition process and not directly referenced by the interviewed designers, the content of the interviews and how designers described their process reveals that many of the characteristics of design thinking were at play. Not only were the designers approaching the problem and making decisions in a way that replicated design thinking's model for how designers solve problems, but also the nature of the problem itself and the role of ambiguity throughout the competition closely resemble the kind of wicked problems that design thinking is theorized to address.

The original research question of this thesis was why an urban design process would be a useful approach for federal government in addressing climate change. Design thinking, then, emerges as an answer and the main finding of this thesis – that in response to a difficult question that has no correct solution and in which a highly bureaucratic governmental system needs to adapt, design thinking can generate a suite of alternative design ideas and educate and bring stakeholders together during the process. The related secondary finding of this thesis, which marks a return to design thinking theory before the rise of design as a form of private-sector consulting, is that design does not just produce a product outcome. In the case of Rebuild by Design, the final products were considered an improvement over current approaches to flood protection and water mitigation, but they were not necessarily the innovation. The design thinking characteristics, such as the ability to synthesize across larger urban scales and systems, are expected to affect the organizations and regulations that they encountered throughout the process – whether by increasing the design literacy of individuals in those organizations, providing a process for federal agencies and local governments to come together in a faster and more nimble environment to procure design projects, or by demonstrating that it is possible to blend local knowledge sourcing into federal infrastructure projects. Although it has proven

difficult to evaluate the overall success of these organizational impacts of RBD, the competition has been successful as a moment of experimentation.

Applying design thinking to RBD has provided some explanation for the complexities that arose during the process, most notably the difficulty of evaluating the impacts and products of a qualitative process as well as the ambiguity of the urban design discipline's role in design thinking. RBD was the product of a moment of crisis in the wake of Hurricane Sandy as well the individual personalities and perspectives of Shaun Donovan and most notably, Henk Ovink. It is therefore difficult to say if it will be replicated, and were it to be replicated, it seems likely that it would take on another form without Ovink's vision. The following are recommendations for such a future Rebuild by Design as well as other efforts to put design thinking into practice:

1. *Embrace ambiguity, but think carefully about which standards and regulations should be addressed*

There are benefits to giving design teams full flexibility to address any of the interrelated systems issues made more vulnerable due to climate change. At the same time, there are technical standards that need to be addressed. The most pressing is that of which percent storm to design to and what sea level rise projections to take into consideration. Deciding on a standard ahead of time may make it more likely that projects will be implemented, will help design teams understand what is actually feasible, and can add credibility to the designs.

This is a generalizable principle of design thinking. The expertise of the professional, as discussed by Schön and as evidenced by the interviews with RBD designers, is a combination of both technical and non-technical knowledge, reflecting the complexity of trying to address a problem that is shaped by both environmental and socioeconomic issues but also requires the production of specific solutions. In the case of design, these specific solutions are design ideas or physical interventions. There

is no formula for finding the right balance between framing the problem in a way that achieves implementable and useful design ideas, and allowing enough open endedness that those design ideas represent a real synthesis of complex issues. It is likely that this balance needs to be discussed on a case-by-case basis, with attention to defining the goals of the process. For RBD, accepting certain climate change projections would add minimal restrictions on the technical elements of the proposal, while still allowing teams to address whichever systems they see fit. This would still encourage design thinking and synthesis, while making the product outcomes more implementable and comparable to each other.

2. Allow more time and support for research

For the design process to be successful, it needs the time and support to delve into the topics and expertise that the design teams want to pursue, without cutting corners. Although a fast time span was considered instrumental in bringing political stakeholders to the table, it also contributed confusion during the research phase when teams felt they did not have enough support or time to understand the systemic vulnerabilities they wanted to address. Additionally, a fast time span meant that while communities could see the results of their involvement quickly in the form of the proposals, the community engagement period was truncated, prioritizing established local organizations over those with less capacity.

Sourcing local knowledge was an important step for many of the teams, and strategic engagement should be combined with a longer research phase by adopting a participatory research approach. Participatory research actively takes into account what communities need and what kind of information would be beneficial to them in the future. This is similar to some of the strategies adopted by teams, but could be more intentionally implemented to leverage funding and expertise provided to the design teams in a way that feeds back into community engagement to increase community capacity.

3. *Question the competition format*

RBD was not a convincing competition – there were multiple winners, the sponsor or “client” was responsible for selecting the finalists, and research and site selection were collaborative processes. The changes that HUD and the Task Force made to the process are improvements on the typical competition format in that they required public engagement as part of the competition process. These changes, however, were likely due to the political nature of CDBG-DR funding - part of a strategy to engage the grantees in order to build their support for the projects. HUD and the Task Force would not have been served by a more traditional, or more competitive, design competition. Instead, RBD takes on the role of an alternative procurement method rather than a design competition, raising the question of why calling RBD a competition is even necessary.

If there is something lost in calling new programs “competitions,” it is an element of institutional knowledge and understanding. If all alternative processes become “competitions” then we may be missing an opportunity to address what it is about federal agencies or regulations that does not allow the normal or standard procurement process to improve and adapt to new contexts and challenges, such as climate change. In light of this, RBD could think of its future iterations as the actions of an independent organization rather than as a competition organizer. An interesting format for bringing design thinking into government is a Design Task Force, similar to the Helsinki Design Lab, in which the government funds an independent organization tasked with working across agencies to improve processes and help adapt policies. This is already occurring in some states and cities within planning departments, where urban design studios or offices are encouraged to “innovate” across siloed departments. Moving RBD away from the competition format and language would allow it to create more permanent relationships with each region in which it operates and build institutional knowledge, which would in turn enable reflective practice.

4. *Create an effective feedback loop between the government or public processes and design thinking*

In RBD, the biggest gains for local governments came from the fact that HUD was involved, brought authority and resources in the form of other agencies and experts, and had a federal grant process tied to the competition. Without this mechanism, i.e. in a normal design competition scenario, the interaction between the design process and the government is minimal. If one of the goals of RBD is to create viable alternatives for the way the government responds to climate change, then it needs to create a process that forces interaction with public systems in order to affect them. If funding from HUD is not secured in future iterations, RBD will have to consider carefully how it plans to be impactful and avoid the route of being just another out of touch design competition.

There are other partnerships that could connect RBD to public processes. Civic organizations, such as the university system, could lend their influence, credibility, and resources to RBD, serving some of the same functions as HUD in terms of bringing local governments, experts, and policy makers to the table. At the same time, the requirements around RBD's funding are the most direct way to ensure interactions with agencies and regulations, and perhaps the best route is to continue to engage federal or state funding streams. With or without a HUD-sponsored competition, RBD or other design thinking institutions could partner with grantees on CDBG-DR or other governmental grants. This would help increase the capacity of states and local governments, and could improve grantee's program and project ideas. As evidenced by interviews with HUD staff, the agency's grant programs are seen as resources for activity that is already happening locally. If the expectations for these programs are raised at the grantee level, it could impact the requirements and goals of federal funding programs more broadly.

Placing RBD in the context of design thinking also raises questions about the role of urban design as a form of creative problem solving more generally. There is a potential agenda for urban design to address challenges that have a strong spatial expression and that impact the urban environment. How to identify the correct kinds of problems that urban design can address, the partnerships and stakeholders who could benefit from an urban design process, and the organizational mechanism for guiding the process are all remaining questions. This shift from exclusively focusing on the end result of the design process to also considering the outcomes achieved along the way means that these organizational considerations are critical to the ability of the design process to be effective and impactful. Future research questions that would help clarify the role of urban design as an approach to problem solving include:

1. How does the use of design thinking build urban design as a discipline – what is design research in this context?

To consider urban design as a discipline assumes a kind of expertise specific to urban design, beyond the independent professional training that urban designers might receive as planners, architects, and landscape architects. Design thinking may contribute to building a more unified theory of urban design, as a type of interdisciplinary process practices across the above mentioned disciplines. In the literature, several examples of problem-solving specific to architecture and urban design focus on the role of spatial knowledge. Future research on urban design and design thinking could focus on the ability to synthesize the spatial manifestation of systems (including the public systems of politics and public realm) as a way of developing a more coherent theory of urban design.

2. What kinds of organizations and civic space can create more opportunities for design to address complex problems?

RBD is unique in its use of design, sitting at the intersection of government, civic organizations, and design firms. What other cases of governmental experimentation

with urban design exist, and how can the federal or local governments learn from them? The fourth recommendation in this thesis references existing attempts to bring design thinking into government processes. Researching these new studios and departments could help show their impact on improving government services or working across siloed departments and may help make a case for design thinking. Understanding the benefits and challenges of these new departments could also help generate strategies or best practices for integrating urban design and design thinking into other agencies or levels of government. This research would also be helpful for generating alternatives to the competition format - for finding institutions that allow design to practice design thinking and generate real impact.

3. How can designers build their capacity for reflective practice?

Although the designers interviewed for this thesis exhibited many levels of reflection of their practice and the RBD process, opportunities for this kind of discussion are few and far between. What venues exist for designers to strengthen their communicative and reflective practice, and how can those be integrated into settings such as the design competition or urban design studios?

Design is often described as having optimism bias – there is a certain amount of faith that designers have in the process to produce better outcomes and tackle any problem. Although Rebuild by Design illustrates many of the managerial and political challenges that result from using design thinking, it also indicates that is possible to attempt something new and experimental, even at the federal level, in a time of crisis. There is a case to be made, then, for design’s optimism. Rebuild by Design’s implementation phase and its future iterations will hopefully allow the results of this creativity to be put into practice. This thesis also finds that Rebuild by Design’s use of urban design and design thinking are not only successful elements of the competition, but also critical to achieving innovative process and product outcomes that have the potential to push regulatory and bureaucratic systems toward recognizing climate change.

Moreover, the use of design thinking theory revealed a renewed relevance for understanding the benefits of the design process, beyond its ability to produce new design ideas. These lessons from Rebuild by Design can inform future uses of design thinking to better our public institutions as well as increase our capacity to address and effect systemic change.

Appendix

Descriptions of Winning Rebuild by Design Proposals

The BIG “U” / East Side Coastal Resiliency



Figure 11: Rendering of the BIG “U”

Design Summary

The BIG U is the most recognizable proposal from RBD, due to its high profile site in Manhattan, its quick implementation turn around, and the subsequent media attention. This proposal focuses on social infrastructure, resulting from its analysis of future flooding risk and the socioeconomic vulnerabilities specific to the area.

The plan calls for a series of berms and open space creating the “U” around lower Manhattan. Moving forward with implementation, only the Lower East Side “compartment” will be constructed as a preliminary phase. The proposal maps land uses, transportation, public housing, income, and social infrastructure (drugstores, supermarkets, community resources,

medical resources, public buildings) in order to demonstrate that the Lower East Side population is underserved. The proposal is very direct in this analysis, using words not often read in a design proposal - “structural poverty.”

The BIG U described their community engagement as a participatory design process, emphasizing the use of models that allowed the public to build their own versions of flood protection and then discuss which options to reject.

The documentation of these community engagement processes is particularly thorough in the proposal, and describes how these workshops also involved partnerships with local organizations that took leadership positions during the process. Beginning on the East Side, the final plan includes a meandering berm that makes its way through the East River Park to water amenities like an “in-river Harbor Pool.” A bike lane follows the berm, and ramps, benches and bridges add connectivity and programming. Moving South, the plan works with the existing elevated Franklin D. Roosevelt East River Drive (FDR), proposing flip down walls that can come down under the FDR to create a flood wall during storm events, but that also serves as a community or market space when dry. The berm extends through battery park, creating more green open space and culminating in the “reverse aquarium” - a museum and educational site that sits below water level so that visitors can view wildlife as well as understand the changing height of the water.

Finally, the proposal moves away from masterplan

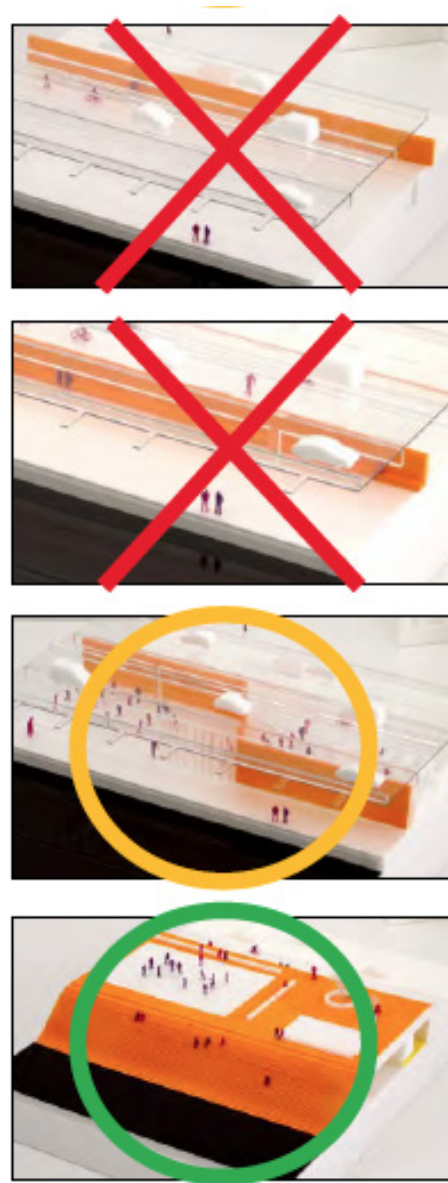


Figure 12: Accepting and Rejecting Design Ideas Through Participatory Process

into a “tool kit” that addresses some of the more socioeconomic issues that were uncovered in the vulnerabilities analysis. These tools are not very site-specific, maybe speaking to the difficulty of producing this kind of product in within the competition scope and timeline. The tool kit contains “formulas” around the idea of “resilient community planning” such as: resiliency + creation of job programs for the new amenities and resiliency + preservation of public and affordable housing.

Design Approach

BIG has offices in New York City and Denmark and brings some of its experience working in the European context and with Dutch firms to RBD. This proposal focused on “social



Figure 13: Deployable Flood Barriers Serve Various Functions Beyond Flood Protection

resiliency” - the idea that flood protection should be tied to community benefits. This is a fairly common goal for the proposals, and one that is explored in Chapter 3 where designers discuss the role of urban design in synthesizing different kinds of benefits through resiliency. The BIG U and Hunts Point Lifelines share a similar approach in that both proposals try to push that synthesis beyond the integration of sociocultural amenities with flood protection. Both teams also share an awareness of the historic significance of “community-tailored” infrastructure, as illustrated by BIG U’s much celebrated graphic marrying the approach of Robert Moss with Jane Jacobs. This manifests itself in BIG U’s arguments for leveraging government funding in infrastructure to support other concrete socioeconomic needs such as public housing.

Living with the Bay

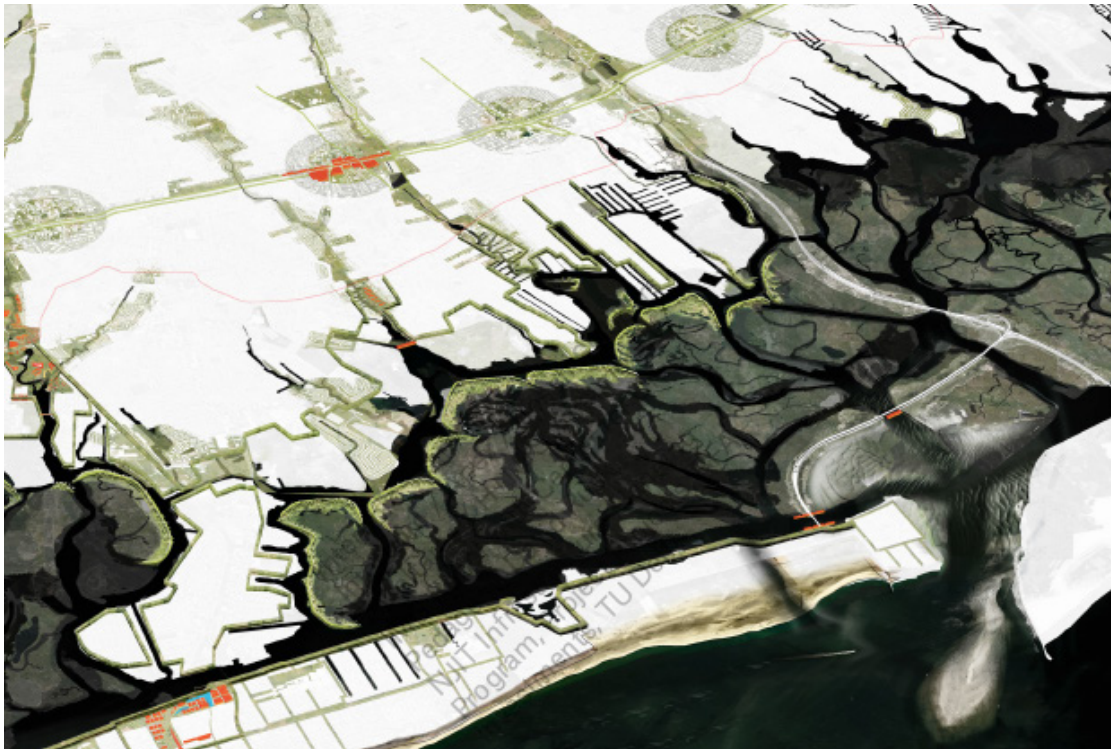


Figure 14: Illustrative Plan of Interboro's Five Interventions

Design Summary

This proposal addresses the South Shore of Nassau County, Long Island. It is a predominantly suburban area of single family homes and is very urbanized, particularly around the coastline where there is strong culture of living on the water and having private docks and water access. Although many of these homes were severely damaged during Hurricane Sandy, the population is aging, conservative, segregated, and resistant to change. One way that the design team showed support for the Living with the Bay proposal was to set up a petition on causes.com, which closed in April 2014 with 294 signatures.

The proposal's analysis includes three test scenarios in a hydrological model: no change, marshes, closable inlets, and closable cross dams. From the results of that modeling, a "buffered bay" approach is proposed. The proposal then compares the effects of the different elements of

the buffered bay: marsh ridges, cross dams, inlet barriers, and levees against sea level rise, storm surge, wave impact, and habitat. Finding that there is no “silver bullet,” this analysis leads to strategies that are demonstrated in plans for five specific sites:

- “The Ocean Shore: Sediment Flow” uses the existing flow of sediment along the barrier islands to strengthen the dunes. Creating a new inlet and adding additional sediment to the system allows for the “area to grow along with the rising sea level.”
- “Lowlands: Slow Streams” moves inland and proposes a combined boulevard and levee that creates opportunities for new residential and recreational development.
- “March: Eco-Edge” addresses the marshland between the coast and the barrier islands by proposing “marsh ridges” that offer another layer of protection for the urban coast while creating new marshland habitats. Cross dams in the marsh add protection against storm surge.
- “Uplands: Green Corridor” builds on the hydrologic function of the creeks and rivers that run out to the bay, using ponds, sluices, and pumps to control the flow of the rivers. This also serves both to retain, filter, and drain storm water outflows.
- “Barrier Island: The Smart Barrier” proposes a “recreational dike landscape” that contributes the current touristic use of the barrier island while consolidating critical infrastructure .

These plans are examples of how larger regional principles from the proposal can be implemented, leading the team to think beyond the ability of a specific municipality to implement one of final designs above. The proposal includes the idea of creating a coalition called the Bay Alliance, which would coordinate and develop the strategies across the three scales: regional Long Island, sub-regional Southern Nassau County, and the phase one Living with the Bay projects.



Figure 15: Perspective Facing South Oyster Bay

Design Approach

Interboro's proposal is methodological and creates a series of interventions based on a regional approach that can be applied on five prototypical sites. These strategies could work in different combinations for the area as a whole, and also are able to be combined to be effective. This is a different approach from some of the other RBD teams, and reflects the nature of designing for Long Island, which faces similar conditions all along the South Shore. Another Long Island condition affecting the proposal is its political and cultural context. The proposal includes quotes from the community engagement phase that represent some of these opinions, including statements such as "I don't support anything that will prevent my water-front home from seeing the water, raising it is ok, but not blocking the view" and "Do we have to leave our home and move to a strange community to avoid another 'Sandy' that many will not occur in our lifetimes?" As attested by the complex dialog around buy back programs on Long Island and Staten Island, these communities are difficult to plan and design for. The structure of the proposal handles this well by proceeding very diligently through its five design strategies, with each strategy followed by an explanation of how the design responds to RBD's core requirements - research/analysis, demonstration of participatory design process, innovation, design quality, impact, and implementation. This builds a coherent argument for the interventions, which in turn are described as "no risk, no regrets" scenarios - not overly designed and more geared toward solving the direct ecological and flooding issues than dramatically reshaping the area.

New Meadowlands



Figure 16: Illustrative Section of Meadowband and Meadowpark

Design Summary

The New Meadowlands proposal was submitted by the Massachusetts Institute of Technology Center for Advanced Urbanism along with two design firms - ZUS and URBANISTEN. The site for the final proposal is the New Jersey Meadowlands, an area chosen based on overlaying maps of sea level rise, pollution, social vulnerability, infrastructural/logistics networks (sewage plants, power substations, airports, truck transportation routes), and economic vulnerability. The Meadowlands emerged from this regional analysis as an area at high risk. At the same time, it is a main site for warehouses and logistics functions that are critical to the region. This proposal thus

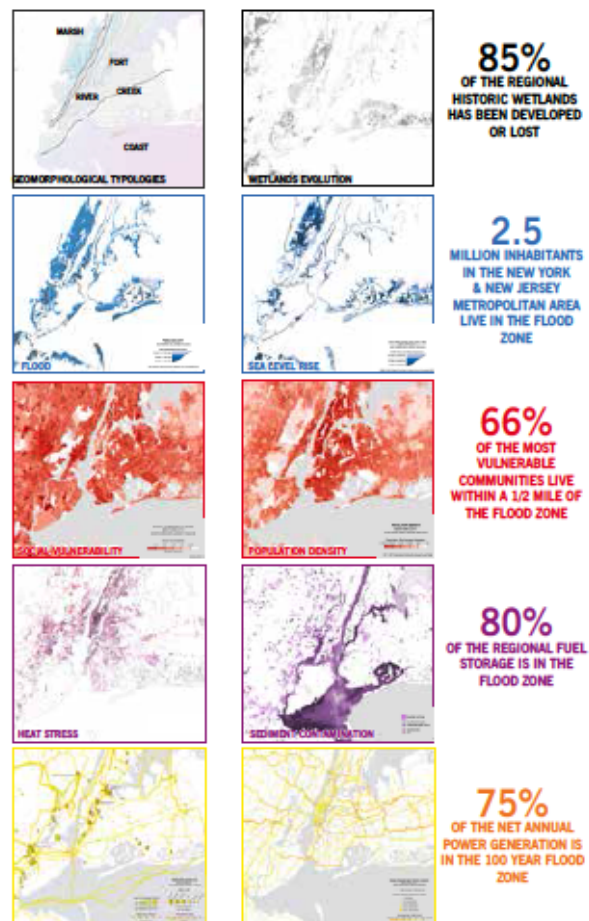


Figure 17: Regional Mapping Analysis

looks at the intersection between ecological, residential, and supply chain needs that will be under pressure from increasing development and population growth as well as flood risk.

Based on this analysis, the design proposal offers two concepts in its master plan: the Meadowpark and the Meadowband. The Meadowband is a berm at the edge of the urban development designed also as a bus rapid transit corridor with residential and retail development. Beyond the Meadowband is the Meadowpark, which includes another level of berms that protect against sea level rise but also works with the wetlands for wave attenuation. Beyond flood protection, the Meadowpark's change in grade creates opportunities to rehabilitate different habitats as well as play a role in storm water management. The Meadowpark is also a recreational space, with plans for bike paths, sports, and engagement with nature. With these two elements, the basin that goes through the site is restored as a natural area, with the berm and new catalyst for development running along either side of the basin to protect the urban areas.

The Meadowlands is the largest site in the competition, and is comprised of 14

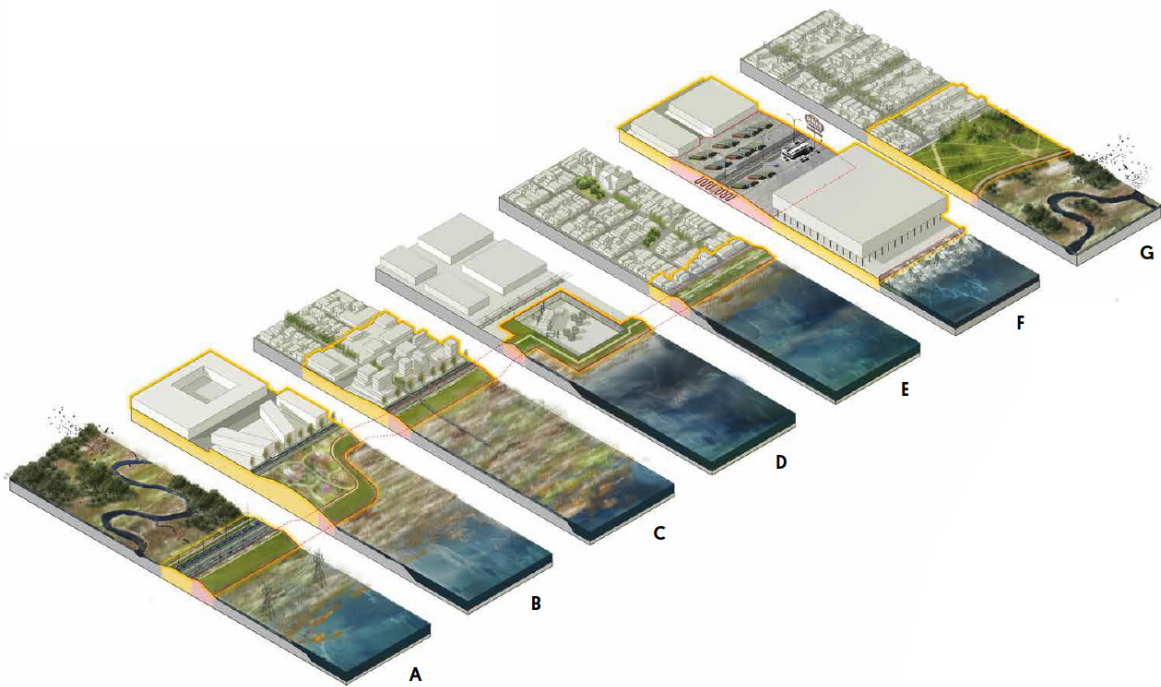


Figure 18 Segments of the Meadowband

municipalities across two counties. This is a much more governmentally complex site than those contained in one city. There is, however, the Meadowlands Commission that oversees planning and development in the area. This makes the Meadowlands a politically strategic site for implementing a larger scale plan could assuming that the commission has the capacity and political will to make plans in line with the design proposal.

Design Approach

The design approach of this proposal is one that thinks about how to integrate the logistics and supply chain urbanism that is often placed outside of urban centers with transit-oriented development. This is a more academic approach than some of the other proposals, and it addresses resiliency as well as a landscape of segregated and displaced light industrial uses that affects the rest of the country. This design proposal shows that both of these aspects of the site share vulnerabilities. The individual designs themselves are comprehensive if not wholly new concepts, but the systemic linkages between resiliency and large scale patterns of development remain an important intellectual contribution of this proposal.

Hunts Point Lifelines



Figure 19: Rendering of Hunts Point Design Interventions

Design Summary

Hunts Point, in the Bronx, was not as damaged by Hurricane Sandy as some of the other RBD sites, but OLIN’s mapping shows that it is more vulnerable at high tide and that significant areas are within FEMA’s 100 and 500 year flood zones. This proposal highlights Hunts Point’s regional importance as the location of the Hunts Point waste water treatment plant and center for large distribution companies in the area. This makes it economically vulnerable, and the proposal’s analysis demonstrates the tension between the needs of the food industry with other local vulnerabilities. The South Bronx is the poorest congressional district in the U.S., is linguistically isolated, and high in number of families with children.

The proposal organizes itself around four “lifelines” to address these vulnerabilities - integrated flood protection, livelihoods and community resilience, cleanways, and maritime

highways:

- “Integrated Flood Protection” proposes different forms of sea walls and levees, integrating the industrial edge with flood protection. It also builds on an existing plan for a greenway, incorporating programs promoting the local industry and organizations such as the idea of the “levee lab” - a place for research with experimental ecologies and materials.
- “Livelihoods and Community Resilience” is a job-focused proposal for taking a “labor intensive” approach to resiliency. This includes sourcing labor locally for climate adaptation needs, and highlights the need for community-based planning hand in hand with local maintenance contracting.
- “Cleanways” attempts to improve different kinds of circulation through Hunts Point to better connect the waterfront, existing community, and industry. “Cleanways” addresses air quality, truck routes that affect pedestrian/bike safety, local food security, storm water management, and the energy demands of the food industry that requires refrigeration.
- “Maritime Highways” proposes Hunts Point as part of an emergency response system accessed by waterway. Citing that up to 60% of NYC’s food supply already moves through Hunts Point, it suggests building toward a robust water-based supply chain system. The design recommendation is a pier that can also operate as a temporary emergency operations center.

The proposed plans for Hunts Point are replicable on other Significant Maritime Industrial Areas that have similar industrial contexts and could potentially form a network with one another.

Due to the industry-focus on this proposal, the community engagement was tailored to the food industries and its workers. Using food as an outreach tool, one of the community engagement events was a “Slambake” cooking competition that used products from local wholesalers.

Design Approach

This proposal has many elements of a workforce development plan, with its emphasis on job creation and industry. It also incorporated local youth organizations very directly, proposing physical spaces that matched local programs one to one, such as a boathouse that could be run by Rock the Boat, a youth engagement not-for-profit. The emphasis on job and industry growth is less connected to physical design in the proposal. The \$20 million that was awarded is for a pilot project and continued development, with different reporting requirements than the other proposals - essentially a requirement for more proof of concept. A unique aspect to this proposal is its advocacy of a more labor-intensive resiliency plan. This recalls the use of public projects as employment opportunities, and is an interesting example of a design team going beyond the scope of the design brief, perhaps due to the experience with community planning from OLIN.



Figure 20: Section Illustrating Relationship Between Public Edge and Industry

Resist, Delay, Store, Discharge

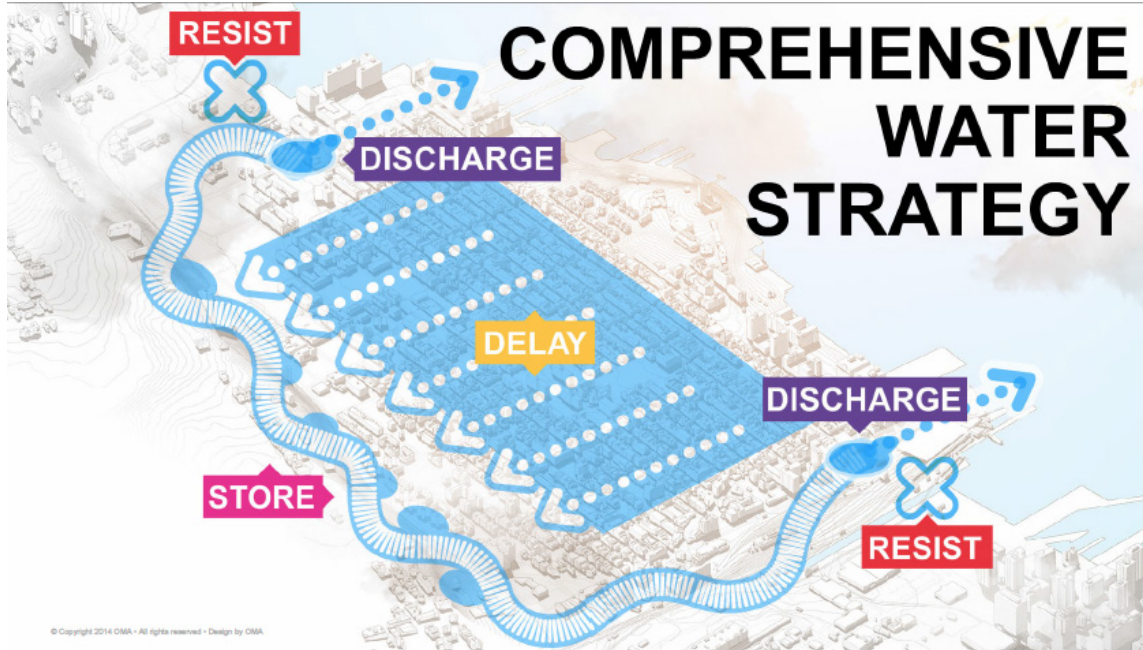


Figure 21: Diagram of OMA's Water Strategy for Hoboken

Design Summary

This proposal for Hoboken demonstrates that the city is at extreme flooding risk and proposes hard and soft infrastructure for water management specifically to address storm surge and flash flooding. The “resist, delay, store, discharge” refers to coastal infrastructure, slowing rainwater runoff, green infrastructure to absorb and filter rainwater, and a system of water pumps to help drain water. The individual solutions for these categories are straightforward: bulkheads and deployable flood walls, bioswales and green roofs, constructed wetlands, water cisterns, and stormwater pumps. In addition, the investment value is extended with amenities: transit, public space improvements, and open space. New development is also encouraged by flood protection in this proposal, which has been quantified to include 5.2 to 6.2m square footage of new residential, commercial, and retail space. The proposal also aims to alleviate the economic burden of flood insurance. Through its flood protection and water management suggestions, the entire city could be exempt from the new requirements of higher priced flood insurance.

This proposal as a document is truncated compared to the others. Only the first 27 pages describe the concept in detail, and only with text. Following the text is an appendix PDF of OMA's final presentation, which includes some of the graphic renderings of the proposal. This is a different kind of document than the others, and is more opaque to interpretation.

Design Approach

OMA's proposal is very reliant on an economic concept of risk - quantifying investments and costs as the basis for the proposal. While economic analysis is present in all of the proposals the OMA document adheres strictly to its economic language:

“Safety level for flood protection is ultimately a political choice. It is the question how much safety a society desires at which costs. By monetizing the investments in flood protection and determining the corresponding present value of risk reduction, an economic optimum level of protection can be determined.”

Hoboken is described as being worth the investment because of its transit hub and density, quantified as \$11 billion in value. The amenities that the proposal integrates into its water



Figure 22: Rendering of Proposed Open Space

management are also valued as is the new opportunity for development. This strict understanding of cost and value are not necessarily incorrect, but are certainly a departure from the other proposals that attempt to communicate the “soft” benefits of their proposals into the narratives about their design if not also in their cost-benefit analysis. Although many described the OMA design process as very “bottom-up,” the proposal is not very community-friendly if only because it is not easy to understand. This is demonstrated by an educational poster on flood risk that OMA produced as part of their community engagement. The poster uses economic graphs and opaque language to describe something that most people experience on a more human scale.

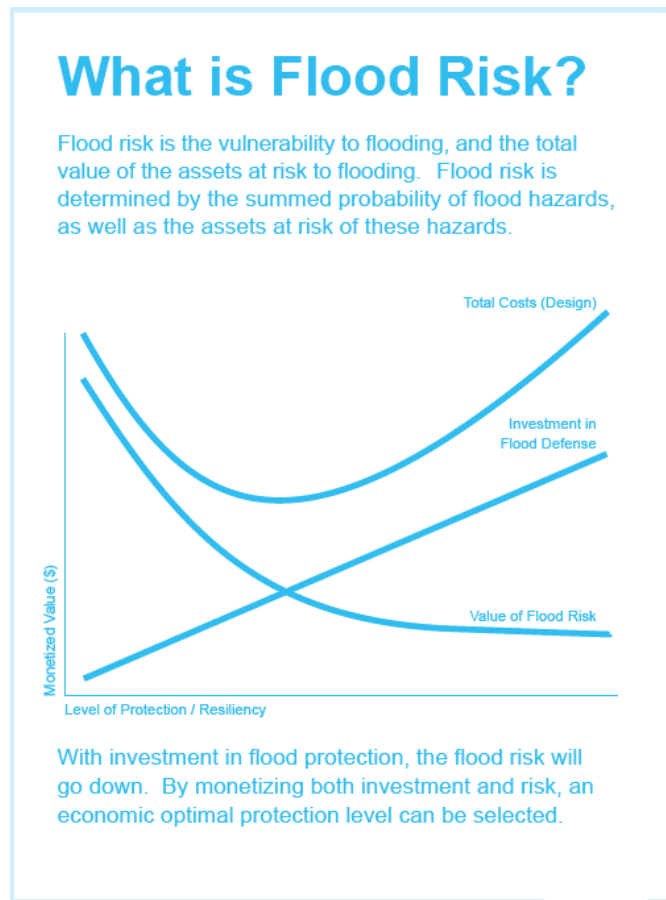


Figure 23: OMA's Understanding of Flood Risk

Living Breakwaters



Figure 24: SCAPE's Vision for Staten Island

Design Summary

Living Breakwaters risk reduction with “eco-infrastructure” and social and educational amenities through submerged or partially submerged breakwaters that incorporate new ecological habitats. This proposal sees the social benefits and ecological benefits going hand in hand, and focuses on wave attenuation or the slowing of waves from storms and storm surge. This does not necessarily keep water from flooding the coast, but when incorporated with other protection measures can lower the heights of barriers like sea walls or levees. Breakwaters can also be used to control the sedimentation of the dunes and shoreline.

Changing a handful of characteristics results in many breakwater typologies that are replicable in different contexts. An exposed breakwater with a dune system creates the “revive reaction economies” option, which incorporates a “water hub” - and educational and recreational building on the beach. Other options include subtidal breakwaters, marinas, and navigational channels. These different types of breakwaters encourage a range of habitats, and the proposal details how the breakwater construction materials and placement are designed for ecological

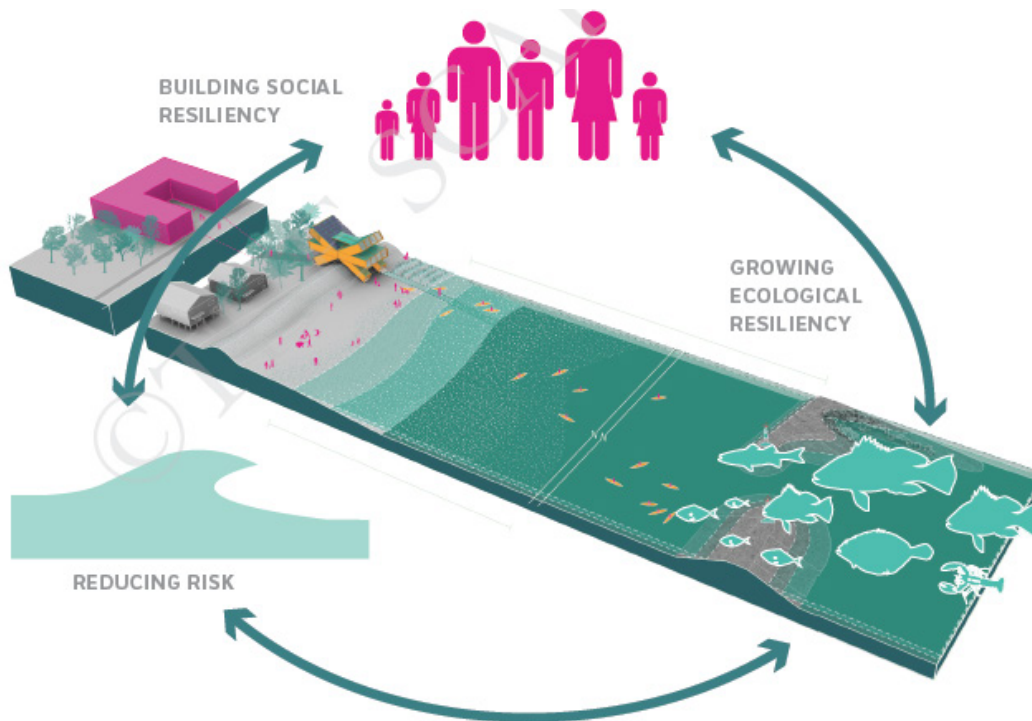


Figure 25: SCAPE's Three Related Systems

complexity and diversity. This includes a focus on reviving historic oyster habitats that strengthen the breakwaters. As this kind of restoration is somewhat experimental, the proposal demonstrates that the shellfish harvest has diminished over time and that an experimental ecology can be a rallying point for educational resources about the environment more broadly. This connects to an idea of the “harbor as classroom” and includes a set of youth programming around the oyster habitats and monitoring the ecology.

Design Approach

Living Breakwaters is one of the more landscaped-focused proposals, reflecting the design practice of the firm. The focus on habitats is a strength of the proposal. The overall strategy of using “eco-tecture” is the result of a SCAPE/Landscape contribution to the Museum of Modern Art’s 2010 Rising Currents exhibition which featured design responses to rising sea levels. Titled “Oyster-tecture” the exhibit proposed creating an oyster reef to contribute to wave

attenuation and cleaning water. In terms of design approaches, this is perhaps similar to the MIT proposal in that both are an application of fairly developed ideas already existing in the firms/ universities. In this case, the application is a direct implementation of the oyster-texture concept. SCAPE/Landscape has also proposed an oyster-based “eco-texture” solution for New York Rising, the state’s post-storm community reconstruction program.

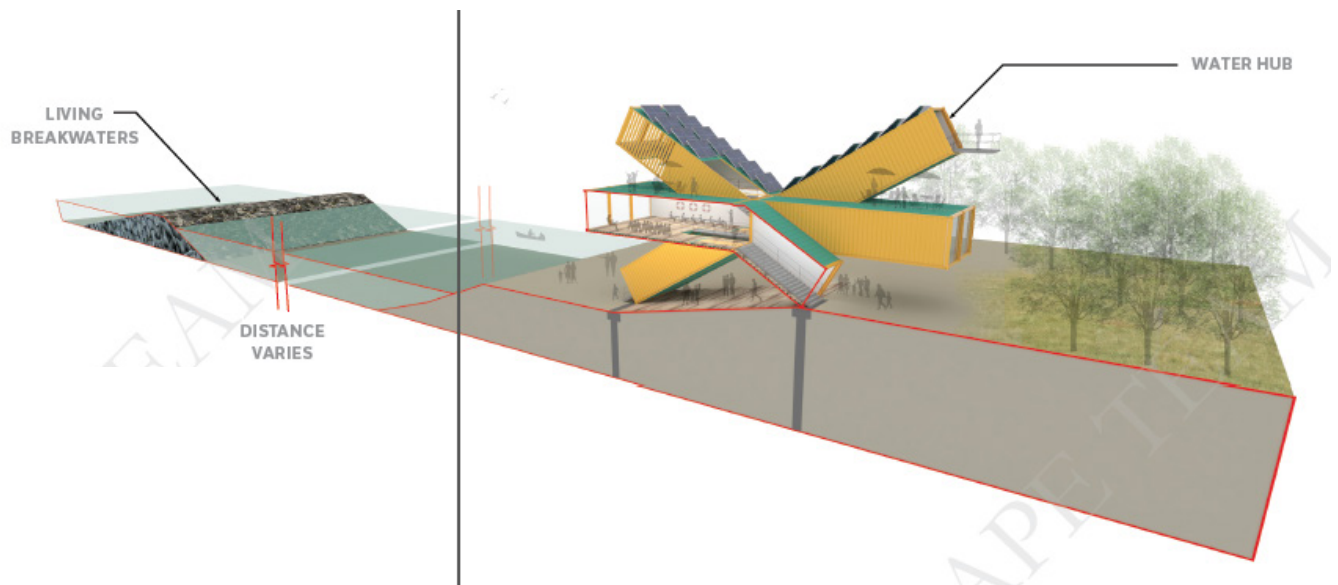


Figure 26: Axonometric Showing SCAPE’s Main Design Ideas: the Water Hub and Breakwaters

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