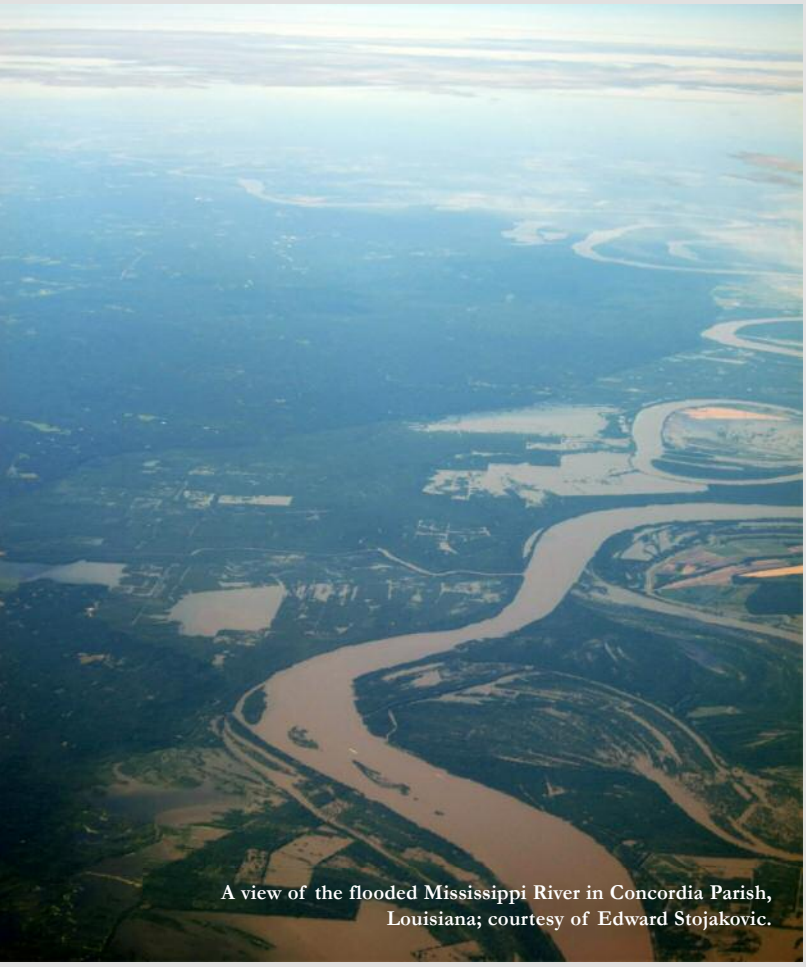
Thinking Strategically About Flood Mitigation

Stephen Deal



A view of the flooded Mississippi River in Concordia Parish, Louisiana; courtesy of Edward Stojakovic.

Flooding is the costliest type of disaster in the United States and America has suffered more than $260 billion in damage between 1980 and 2013.[1] Given the scale and scope of flooding across the nation, all potential lines of defense should be considered and deployed as appropriate to help flood-prone communities adapt. Elevation and fortified construction aren't the only flood mitigation options in the community planning toolbox. There are numerous other techniques and strategies that, when applied appropriately, expand the range of responses available for managing flood risk.

Good city planning is as much programmatic as it is based on building standards and setback rules. Incorporating a novel urban tactic or assessing how the urban form may be modified or expanded upon can have a catalytic impact. Through constant revision and refinement a city may, in effect, reprogram itself as new resilience techniques and practices get embedded in the cultural fabric of the city. There is considerable value in a city assessing workaround solutions, such as temporary infrastructure and well-managed site planning, as part of its overall resilient flood planning process because it allows for new avenues and pathways for recovery to open up in the face of sudden calamity or change.

The Lasting Value of Temporary Buildings

One aspect shared by both natural and urban systems is that they have emergent properties. At the beginning, small variables are introduced. Over time, these changes lead to rich, complex communities supported by an intricate web of feedback loops and mutual support networks. Jane Jacobs realized this when she wrote:

> Cities, again like the life sciences, do not exhibit *one* problem in organized complexity, which if understood explains all. They can be analyzed into many such problems or segments which, as in the case of life sciences, are also related with one another…. they are not helter-skelter; they are "interrelated into an organic whole."[2]

This paradigm shift has profound implications for how one goes about solving urban problems. The type of solutions required within such a framework is not simple templates or formulas, but rather "catalytic changes to a network of dynamic relationships."[3] When a city is perceived as one dynamic, interrelated system it becomes

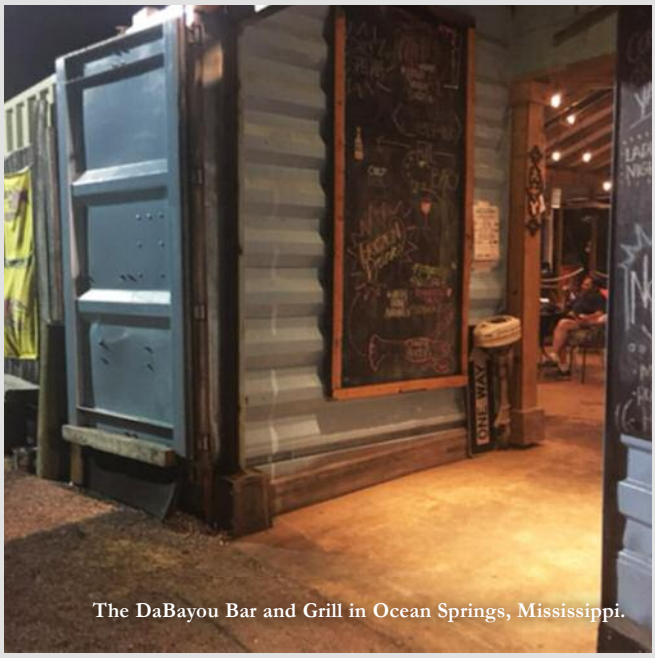
Re:START City Mall made of shipping containers in Christchurch, New Zealand.

possible to see how a simple urban installation or temporary development can have lasting value. Their value is derived from the way in which they directly engage the informal array of creative and institutional relationships that give rise to an urban system.

To break this down even further, a temporary structure, in the right situation, can be an experiment in determining how resources can be allocated more efficiently over a dynamic urban network. Some planners have labeled these types of changes as incremental or tactical urbanism and they may be pivotal in addressing the challenge of organized complexity within a city. Tactical urbanism aims to improve the urban fabric through quick, temporary projects, which may be deployed strategically across the entire city. Two techniques employed within tactical urbanism that may have catalytic potential for flood-prone cities are shipping containers and food trucks.

Shipping Containers

Aside from their general connection to working waterfronts, shipping containers retain a number of key advantages that make them highly suited to providing urban amenities in flood-prone cities and towns. For one thing, shipping containers are, in some respects, fortified modular boxes. They can be stacked on top of each other or arranged in rows to create a small retail plaza. Shipping containers range between ten and forty feet long and because they start their life as industrial storage they are generally tested for strength and durability. A 40-foot shipping container, for example, can generally hold about 40,000 pounds.[4] They are also fairly mobile, because they are designed and fitted with devices that allow for quick and easy transport. Their strength and mobility are strong selling points for today's urban professional, which is why shipping containers have blossomed into a commonly used urban redevelopment technique over the past few years.[5]



The DaBayou Bar and Grill in Ocean Springs, Mississippi.

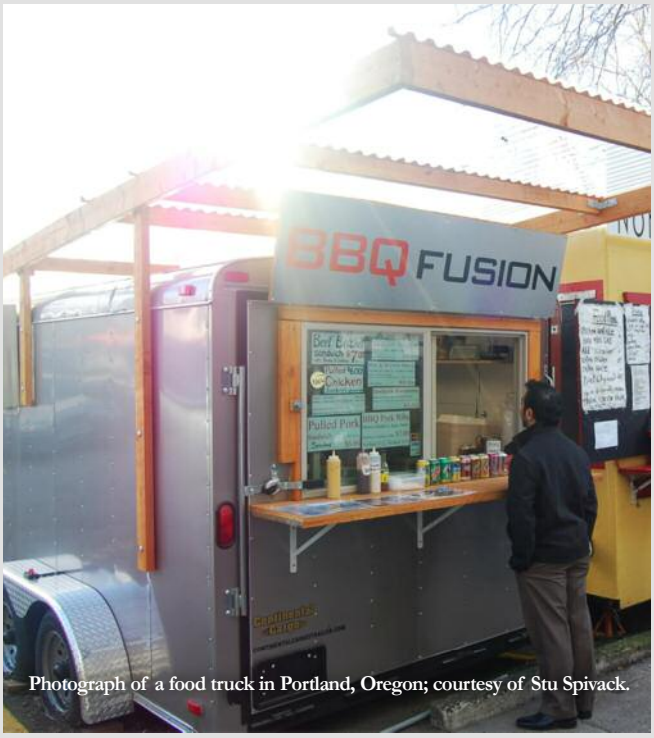
Shipping containers have been used in innovative ways in two Gulf Coast communities to maintain a strong connection to the water while still addressing flooding concerns. The DaBayou Bar and Grill, in Ocean Springs, Mississippi, utilized retrofitted shipping containers when it was constructing a new restaurant in the Gulf Park neighborhood.[6] The containers are retrofitted with hurricane straps, bolts, and reinforcements as required by MEMA and FEMA. Bolts and other reinforcements help keep the structures anchored on the ground, so they can resist flotation or lateral movement.[7] Also, if a hurricane were to threaten the region, the restaurant can disconnect all its electrical and plumbing devices, pack the restaurant into one container and have it moved off on a flatbed.

The DaBayou restaurant was inspired by a similar concept in Orange Beach, Alabama. The Gulf Restaurant in Orange Beach consists of four shipping containers, averaging 40 feet high and 8 feet wide.[8] One of the containers houses the kitchen, while another container is being used as a second-level observation deck. The shipping containers, according to project developer Johnny Fisher, had been purchased for around a few thousand dollars a piece from Southern Truck in Theodore, Alabama.[9] The Gulf Restaurant is not intended to be a permanent fixture of Orange Beach, but is rather a workaround solution until a nearby bulkhead can be repaired.

Food Trucks

Another solution, which provides catalytic urban change while still being readily mobile, is food trucks. Food trucks and other forms of mobile vending are an important fixture of a resilient, urban ecosystem. Acclaimed urban theorist Jane Jacobs theorized that newer urban areas that lacked a dynamic street life could benefit greatly from the presence of street vending carts because they provide low cost, low overhead space – space that in a more established community would be provided by old buildings.

Some cities are home to food truck pods, locations where multiple trucks convene on one site. The pod idea has recently taken off in the city of Portland, which has no rules against redeveloping vacant or private lots for mobile vending purposes.[10] In 2012, Portland had more than 20 food truck pods scattered in different sections of the city. Even if food trucks are not fully embraced by a city, their seasonal use in local events or for temporary placemaking projects can provide a lot of insight into an area's potential capacity for further redevelopment. With minimal investment, a coastal community could develop a food truck pod, or similar concept, as an accessory use to a waterfront park or deploy it more strategically as a way of gauging future demand for waterfront investment.



Photograph of a food truck in Portland, Oregon; courtesy of Stu Spivack.

Conceptually, food trucks offer the same basic advantages as shipping containers, but with considerably more mobility. A food truck may have a dedicated neighborhood or pod it frequents, but it is every bit as mobile as your average automobile. Even if a few food truck owners opted to have a single location, the infrastructure generally required for such an undertaking is light and simple, such as outdoor seating and restrooms, and the main components of the development, the food trucks, still retain complete mobility.[11] Its also worth noting that a wide range of regulatory options are available for regulating food trucks, so cities can be as aggressive or conservative with a food truck rollout as they wish to be. Although many coastal communities may lack experience with food trucks, they offer a practical alternative for urban experimentation in flood-prone regions. A food truck pod may be regulated in a manner similar to RV parks. Preparedness toolkits for mobile home and RV parks can provide useful models for weaving disaster preparedness and evacuation planning into the existing food truck pod model.[12]

Cluster Houses in a Creative Manner

A study by the Urban Land Institute (ULI) indicates that 54% of the multifamily market is made up of properties that have between two and forty-nine units to them.[13] These numbers attest to the idea that resilient cities contain a rich mixture of buildings, small, medium and large, that can be recombined and repurposed into many different combinations. Larger developments often result in more expensive housing. For example, according to the ULI study, a development of 40-49 units rents for about $948 on average, while rentals with two units average a rent of $750.

Considering that small, multifamily units have the potential to both increase a city's overall building mixture and deliver units more cheaply to the market, this should be an area of further focus for coastal communities. A major hurdle coastal communities face implementing small, multifamily projects is that elevation requirements generally lack adequate guidance for retrofitting attached or mixed-use structures. This was a key finding of a report compiled by the New York City Planning Department on flood mitigation in the wake of Hurricane Sandy.[14] In order to have a flood resilient community that is attainable for both seasonal workers and visitors, it becomes important to consider how multifamily dwellings and coastal elevation requirements can be merged into one single urban arrangement.

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One way to satisfy this unmet demand for small, multifamily developments is by constructing a number of small, separate units centered on an elevated porch or courtyard. One unique example of this is Mayfair Lane, in Buffalo, New York, where an elevated common area conceals parking underneath.[15] The entire property fits on just a little under two-thirds of an acre of land and, by one measure, achieves a density of over 42 units an acre. Mayfair Lane manages to create beauty within its elevated profile, but is also quite dense as well.

A scaled down version of this approach can be found in Pascagoula, Mississippi's Anchor Square development. Though intended for commercial use, Anchor Square takes a novel design approach as it features several retrofitted Katrina cottages elevated several feet above ground level. Each cottage faces an elevated boardwalk, which has the effect of disguising their high profile.[16] Such an arrangement retains the intimacy of small home living while dispersing the maintenance costs of elevating across multiple, income-producing units.

In England, one developer has proposed a particularly ingenious solution of having a home that is both modular and elevated. Architect Bill Dunster seeks to redevelop the city of Oxford's park and ride sites with eco-friendly "pod homes," which will be elevated over the parking facilities.[17] The tiny structures average around 74 square feet and, according to the homes' developer, may be installed at a price of around 55,000 and 60,000 pounds. Renderings of a fully developed complex of pod homes show a common porch running down the middle. Because they're modular, the pods may be forklifted to another location. These examples illustrate how innovative proposals to elevate

Postcard illustration of a Bungalow Court in Los Angeles, California.

multifamily housing provide for a level of interdependence and promote sustainable urbanism in a way that is difficult to come by in elevated single-family structures.

Conclusion

The challenges posed by flooding are too pervasive for a one size fits all approach. That is why it is important to call upon a plethora of solutions that, in effect, serve to reprogram the city. In order to effectively reprogram a place, communities must develop redundant systems and implement multiple approaches. Temporary structures, for example, do not need to be fortified structures to be resilient. Mobility can also help a region rebound quickly from potential shocks and stressors. Good site planning for multifamily housing can serve to make elevated infrastructure feel like a collective asset for multiple tenants. These strategies, when employed as part of a larger system of flood mitigation measures, can have real value because they expand the capacity of a city to adapt and evolve to sudden, cataclysmic change. In a complex system such as a city, where each social relationship may have hidden importance, adaptation to change can occur on multiple lines and may take on different permutations, so it stands to reason that multiple strategies are needed to craft a truly resilient and sustainable coastal community.

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Endnotes

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