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New York City 2106: Back to the Future

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Our firm, Architecture Research Office, was selected as the New York City winner of the History Channel's November 2006 "City of the Future" competition. The brief for this one-week design charrette was to create urban and architectural proposals for the island of Manhattan in the year 2106. We based our design on the assumption that sea levels will rise as a result of the loss of polar ice caps, the net effect of which will be a watermark increase of approximately 36 inches around New York City.¹

In our proposal, we assumed that the elevated waters would interact with the island's topography in ways that mirrored Egbert Viele's Water Map of 1865. The Water Map, still used by geotechnical engineers to evaluate subsurface conditions, provides a record of Manhattan's wetlands and natural watercourses before they were concealed by its grid of streets and blocks. We assumed it could also be used to predict which of Manhattan's low-lying neighborhoods would be most prone to flooding. Rising water would once again cause land in the area of today's Canal Street, Turtle Bay, Spanish Harlem, West Village, and Upper East Side to become tidal zones.

This scenario led to the question: how can we reconcile the intrinsic qualities of a city defined by its grid of streets and blocks with such fluctuating circumstances? How can the urban character of Manhattan—its intensity, its diversity and mixture of programs and neighborhoods—be perpetuated? How can New York City engage this new relationship with the environment?

Above: Egbert Viele's Water Map of Manhattan from 1865.

Opposite left: Manhattan would be flooded in 2106 by a 36-inch rise in sea level.

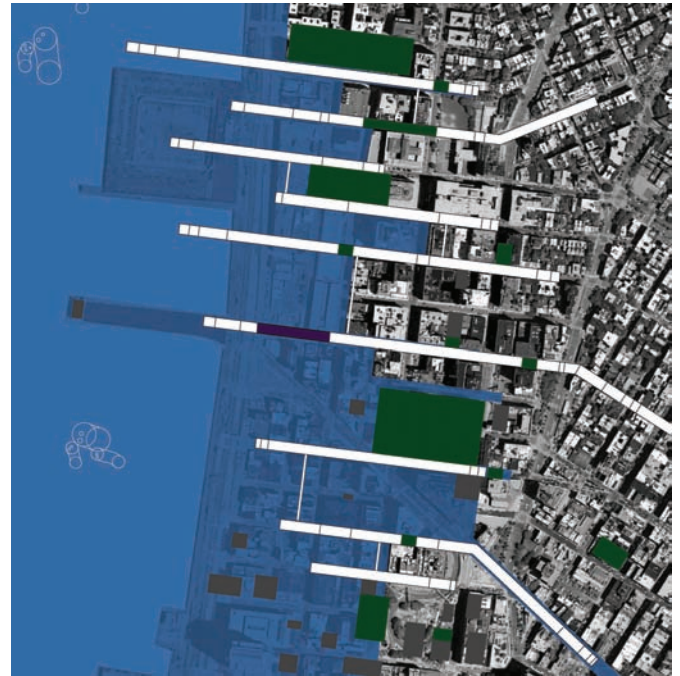
Opposite right: Vanes could be used to establish a new pattern of infrastructure in the flooded areas. Detail of Canal Street at the Hudson River.

Vanes as Form and Process

The basic building block of our proposal is a new type of mixed-use structure, which we term a "vane" after the rib-like element that is part of the structure of a feather. Pier-like and elevated on columns, each vane would serve as the vertical and horizontal extrusion of a public street in the city's flooded areas. Vanes would be analogous to the organizational matrix of streets projected in the Commissioners' Plan of Manhattan of 1811, but they would be generated from and responsive to local exigencies.

Vanes would provide habitable, public infrastructure with a mixture of public and private uses. Constructed of reinforced concrete, each would contain multiple stories of durable, generously proportioned, and flexible interior space, with a thin cross section to promote daylight and natural ventilation. They would feather outward and upward, knitting flooded, vacant blocks in low-lying neighborhoods back into the city proper. Public access to the waterfront would also be an intrinsic attribute, and each vane would include circulation space for pedestrians and vehicles on multiple floors. A typical vane would be ten to fifteen stories tall; its length would vary from one to two thousand feet; and its structure would be engineered so that both its length and height might be increased over time.

Our proposal envisions two scenarios for the construction of vanes, both of which would involve reciprocity between a permanent public structure and provisional build-outs by the private sector.² In the first, the government would construct the vane's reinforced concrete frame in a manner similar to a street or other element of public infrastructure. Included in this scope would be designated public space and circulation, as well as exterior lighting and utilities. Subsequently, the cladding and fit-out of the frame would be implemented by private developers. In



the second scenario, the entire construction and fit-out of a vane would be done by a private entity such as a developer or business; however, the basic frame would still be considered public property. In either case, the specific dimensions of spaces, provisions for services, and public rights-of-way would be set by zoning regulations enacted by city government.

Vanes would represent the city's commitment to re-inhabiting its perimeter. They would frame a process of urban development without prescribing a final outcome. The specific types and mixtures of programs in each vane would emerge in response to market forces and local conditions. Precedents for this process can be found in New York City and elsewhere in the adaptive reuse of existing structures. For example, office buildings in the financial district have been converted to residences, and warehouses have been converted to commercial spaces and living lofts. Our intent was that vanes might support a mixture of programs and densities, replicating successful neighborhoods across the city.

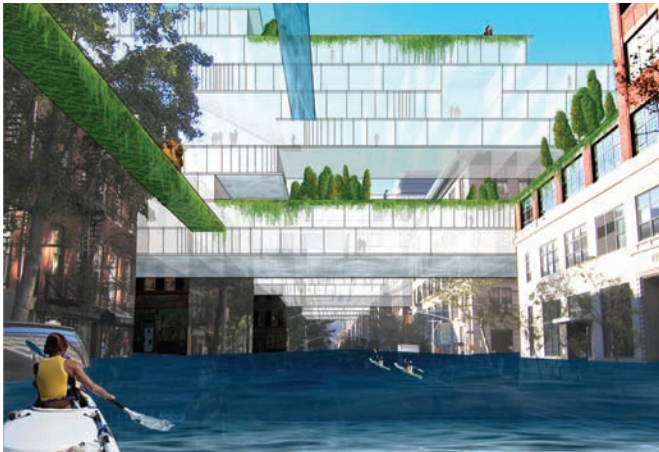
Vanes might create space for homes, offices, and shopping arcades, but also for public parks, gardens, and pedestrian and vehicular thoroughfares. A vane in Manhattan's West Village might differ from one in Red Hook, Brooklyn, in response to program needs, topography, street dimensions, and the scale of surrounding properties. Vanes

might also provide continued access to existing structurally sound buildings whose lower levels are disabled by water. For example, one level of a vane could join with a rooftop to create parkland, as shown in our rendering. The configuration of a vane might also promote light, view, air, and access to the waterfront for greater numbers of people. The result would be a density and vitality equivalent to that along many New York streets.

A Capacity for Transformation

We consider our proposal to be transformational, not fantastical. It is not feasible or desirable to completely encircle Manhattan with new or higher sea walls. Rising water levels will inevitably require public discourse to decide which urban areas will be protected and which will be allowed to flood. An entirely new and beneficial relationship will be needed between the city and water, and we hope our proposals will inspire the public to perpetuate the city in the face of cataclysmic circumstances associated with climate change.

The reality is, most existing buildings in the flood zones will be condemned because their foundations will eventually be destroyed. However, the current New York City Uniform Land Use Review Procedure (ULURP) provides a mechanism that might facilitate the planning measures called for in our proposal (such as changes to the city map



and zoning ordinances). It might also involve community boards and other elected officials. Although the specific processes would need to be determined, development criteria may be set by the public over decades.

In addition to the new system of vanes, our design for New York, 2106, proposes that tall curvilinear “water towers” would populate the Hudson and East Rivers. These diaphanous tubes, which would expand on the vanes’ renewed connection to the water, would be the most visible part of a new system to filter, cool, and pump water between the city and the harbor. Functional emblems of the city’s intersection with nature, the towers would translate New York’s tradition of tall buildings from an expression of private property to a symbol of civic identity. The vanes would seek to maintain the street, the towers to carry on the city’s characteristic verticality—familiar figures in a changed cityscape.

Collapsing Scale and Experience

The City of the Future competition was an opportunity to distinguish the ways architects—as opposed to scholars, urban planners, and politicians—understand, envision, and make places. Our connection to a particular place is grounded in its *character*. This intangible quality can be defined as the specific, interrelated aspects of form, space, and material perceived by people. To the extent that architecture simultaneously engages multiple scales of experience, architects shape the character of the physical environment. The character of an unbuilt project, however, is difficult to depict. It transcends the diagram and the plan, the model and the rendering—all of which convey data, but not experience.

If architects are to guide the public response to climate

change as it pertains to the built environment, it is vital that new forms of urbanism be evoked by a realism that combines both informational and experiential qualities. Through the spectacle of the History Channel competition—and its culmination in a public presentation in Grand Central Station’s Vanderbilt Hall with a required physical model and accompanying computer animation—we sought to make our ideas broadly accessible and engaging.

Representing the regional, urban, and local impact of climate change within the prescribed maximum volume of four by four by seven feet, our model stacked three separate levels of parallel four by four-foot sheets of one-inch clear acrylic, each mapping New York, 2106, at a different scale. A satellite photograph of the city in 2006, printed at the appropriate scale on transparent acetate, lay flat across the thick sheet of acrylic on each level. Overlaying the photo was a second acetate print of estimated 2106 sea levels shown in blue. The topmost level of the model, at one inch equals one hundred feet—the same scale as the Panorama of New York created for the 1964 World’s Fair—focused on Greenwich Village and SoHo to detail the city’s future waterline.

Bathing the model in a trembling, spectral light was a video of sunlight on the fluctuating surface of the Hudson River. This luminous moving image visually collapsed the model’s layers and rendered palpable the overlap between land and water. Echoing the model’s collage of existing and future urban conditions, our two-minute animation included a series of digitally altered images of familiar sights as well as renderings of our project. To further the impact of the model and animation, we wrote a project description from the perspective of a future inhabitant, which was issued in advance to the jury and posted on a

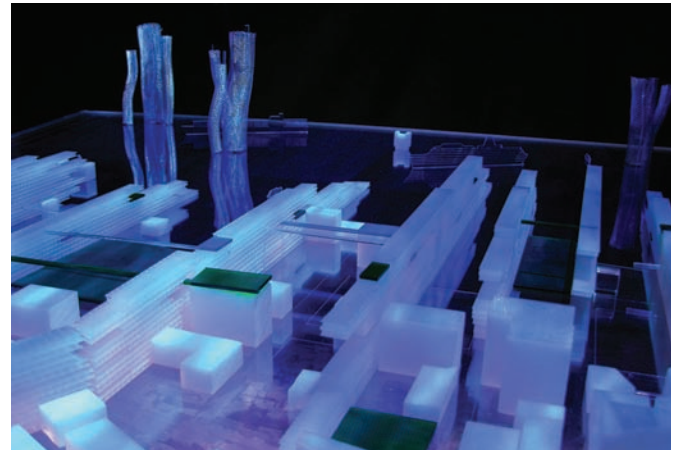


sign beside the model.³ Through these diverse means of presentation, we sought to convey the character of New York City, 2106.

Vision of a New Urbanism

One of the competition’s jurors, the architect Billie Tsien, asked: “Is your design meant to be optimistic or elegiac?” The answer is both. Even as we envision a vital urban future, the temporality of New York’s relationship to the water forces us to confront the transitory quality of our place within it. Simultaneously, we recognize that New York City has always been a feat of becoming. Flourishing in the coming century of climate change will require urban structures more responsive than those we know today. This is an unprecedented opportunity to shift our conception of urbanism from permanent, static boundaries overlaid upon nature to processes of growth attuned to natural conditions. Vanes—as form and process—might sustain New York City’s distinct urban character. As described in our competition narrative:

Catastrophes possess the unlikely power of revelation: we have



learned that an act of destruction more often than not exposes that which is most essential about a thing. In this way, the vanes built in response to the twenty-first century’s changing sea levels have revealed that which is most intrinsic to our city.

Notes

1. Vivien Gornitz, Stephen Couch, and Ellen K. Hartig, “Impacts of Sea Level Rise in the New York City Metropolitan Area,” in *Global and Planetary Changes*, 32 (2002), pp. 61–88. The following quote is from the abstract: “Projections of sea level rise based on a suite of climate change scenarios suggest that sea levels will rise by 18–60 cm by the 2050s, and 24–108 cm by the 2080s over late 20th century levels.”
2. I would like to thank one of the peer reviewers of this article for bringing to my attention N. John Habraken’s *Supports: An Alternative to Mass Housing*. Although we had not been aware of this text in developing our competition proposal, our intentions for a vane are in many ways analogous to Habraken’s concept of a support, which he describes as providing a permanent, multilevel public armature incorporating access and services for individual residential development.
3. This one-thousand-word narrative is available online at www.aro.net.

All images © Architecture Research Office (ARO). Stephen Cassell, Adam Yarinsky (Principals); Jeff Jordan, Jennifer Park (Project Managers); Matt Azen, Henrik Bisp, Scott Geiger, Keith Greenwald, and Vanessa Valladares (Project Team).

Opposite left: Vanes would provide new multilevel connections in flooded areas. View south on Hudson Street in Greenwich Village.

Opposite right: Water towers would create new symbols of civic identity. View south on the East River toward 42 Street. Vanes are in the background.

Above left: Eventually, flooding will create an underwater world of submerged foundations in the tidal zone. Still from ARO’s animation.

Above right: The City of the Future competition model, seen at 1”:100’