The Infrastructural Complex: A Return to Big Design

by

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ABSTRACT

A new pattern of territorial settlement is proposed for the 70 mile-long strip straddling the Mississippi River between Baton Rouge and New Orleans, Louisiana (here termed the “South Louisiana-Mississippi River Corridor”). Current urban design paradigms at work in the area are ill-equipped to deal with the complex and competing systems within which the city of New Orleans—and any city sufficiently understood—is situated. It was a historical failure to engage with these big systems in the first place that resulted in the disaster of 2005. Such a truly big meshwork of competing interests as exists in the region can only be managed by a radically big re-definition of the scale and magnitude of the area in which design can intervene, harkening back to the territorial plans of the Russian avant-garde or the Tennessee Valley Authority.

In South Louisiana, territorial infrastructure has always been the interface between systems and complexes, and it is only through a rapid redeployment of new infrastructures across a sufficiently big scale that a viable, long-term vision for the region can be realized, and only by applying architectural thinking.

Along the (relatively) terra firma of the river’s natural levee, rapidly-constructed long-distance sediment-transport pipeline become the “spines” for new program in the region, re-situating the significance of earth and water-control infrastructures to the urban form and civic life in the region. These spines absorb the future growth program of the region—whatever it may be. And outside the developed areas along the spines, fields of sugarcane are transformed to fields of cypress trees—tended by the citizen-foresters of the region—ready to be transplanted when mature into the wetlands. Their roots, and the mud coming through the spines of the new human settlements, artificially rebuild the natural buffer between this territory and an even bigger one—the rising, warming ocean.

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Chapter 1
Introduction: the Case for BIG Design
This thesis proposes a radically new project of urban design and development in the 80 mile-long strip straddling the Mississippi River between Baton Rouge and New Orleans, Louisiana (here termed the “South Louisiana-Mississippi River Corridor”, or “South Louisiana”) (Figure 1). It was not originally conceived of as a “post-Katrina” project—again, the site is not even New Orleans itself—but the events of 2005 give the project a different urgency than it would have otherwise. The project is self-consciously “big”—just precisely how big will be discussed below—and to understand why that is the case its relation to two distinct discourses must be understood. The first of these discourses is the disciplinary, and the second is the “contextual” or, quite simply, the particular conditions and circumstances of the project area itself. Bridging these disciplines is a third, emerging from within both: the ecological.

Figure 1. Satellite image of the South-Louisiana-Mississippi River Corridor. Source: composite by author of Google Earth images.
Current disciplinary paradigms are ill-equipped to deal with the complexities that this territory—and, by extension, any territory sufficiently understood as such—contains. Rather than reinventing new paradigms from scratch, this thesis mines these imagined and realized projects of the past for relevant, if forgotten, approaches to tackling the problem of big design. This project calls for a return to "big" regional design not seen in the U.S. since the Tennessee Valley Authority (Figure 2), and involves a similar spatio-economic imperative as the TVA (rural electrification) and the regional plans of the Soviet avant-garde (Figure 3) ("de-urbanization"), both of pre-WWII vintage.¹


Figure 3. Project for the Green City by Nikolai Ladovsky, 1930, taken from Selim O. Chan-Magomedov and Christian Schädlich et al., Avantgarde II 1924-1937: Sowjetische Architektur (Stuttgart: Verlag Gerd Hatje, 1993).
There are numerous reasons why, in the design disciplines, big regional planning of the TVA or Soviet variety has had such little favor in recent decades (it is rarely attempted even cast in a purely projective or “visionary” genre). For starters, regional design requires more long-term, centralizing planning than we can seem to imagine succeeding in our free-market system; clearly, any new attempt would have to address this issue head-on. But there is another reason, internal to the history of architecture and urban design itself, and this is the sin of urban renewal, the of which has by now been thoroughly-documented and shall not be repeated here. The fallout of urban renewal centered around the forces which emerged to resist it: what has come to be called “advocacy planning”.

However timely such a position may have been in the 1960’s, advocacy has by now run its course. As Michael Sorkin puts it, “The redistributive logic of advocacy work looked on architecture and planning with suspicion as an instrument of destruction or privilege.” Its legacy is the “over-romanced utopia” of “the people”, and the relegation of the discipline to “design as midwifery”, a position which, according to Sorkin, has entrenched itself into academia as “Everyday Urbanism”. The hangover of advocacy planning and its establishment as the definitive “progressive” position among practitioners and educators has had the result of proscribing certain kinds of architectural projects—certain big projects—as politically undesirable.

The syllogism goes something as follows: 1) urban renewal was “big” and planned from above, 2) urban renewal was bad for “the people”, 3) therefore, anything “big and planned from above” must be “bad for the people.”

But the embargo against “bigness” and “planning from above” means that architecture and urban design cannot be expected to solve problems which persist at regional—or global, for that matter—scales (such as climate change, for one). Should we accept this position? Can we afford to accept it? To quote Sorkin again, “It is simply no longer possible to understand the city and its morphology as isolated from the life and welfare of the planet as a whole or to shirk the necessary investigation of dramatically new paradigms at every scale to secure happy and fair futures.”

No part of the South Louisiana context can be properly understood, much less designed, without seeing it as a part of complex of interdependent but often competing systems. In discussing a very different context, that of Los Angeles, Reyner Banham famously termed its systems “ecologies.” The story of human settlement in South Louisiana since the European conquest of the Americas is the story of its four ecologies: water; land; people; and the artifacts those people make and move through the territory.
A retelling of the geological, political, economic, and urban history of South Louisiana is beyond the scope of this thesis. It may be enough to simply say that the landscape is constantly shifting (Figure 4), its coastal wetlands built up by the deltaic action of the Mississippi over long stretches of geological time (Figure 5), and that these coastal wetlands on the Gulf of Mexico and the industries on the mouth of the Mississippi River are of strategic national economic importance (Figure 6) — facts which coupled together make necessary the formidable hydrological control.

Figure 4. "Historical coastlines of the present-day southeastern United States and development of the Mississippi River Valley since the Cretaceous Period, 72 million years ago." Source: Richard Campanella, *Time and Place in New Orleans* (Gretna: Pelican Publishing Company, 2002), 17.

Figure 5. "Deltas of the Mississippi River over the past 5,000 years overlaid on present-day coastline, parish/county boundaries, and major cities." Source: Ibid., 16.

Figure 6. "New Orleans' strategic geographical situation..." Source: Ibid., 16.
regimes under deployment.

It must also be noted that while, even before Katrina, the City of New Orleans was losing population, the upriver parishes were gaining population (Ascension parish, about 60 miles west of New Orleans vies for the title of official “fastest growing parish in the state”, 6) and that since Katrina the future emergence of a combined Baton Rouge-New Orleans Metropolitan Statistical Area (MSA) along the river—and encroaching on the wetlands—is highly likely.

A few statistics can provide a picture of the importance, and the vulnerability, of the coastal wetlands, and why they will weigh heavily in this thesis: 7

In addition to their rich biodiversity (they are, for instance, a significant bird habitat) Louisiana’s coastal wetlands and barrier islands, built up over centuries by the natural deltaic processes of the Mississippi River, help protect an internationally significant commercial-industrial complex from the hurricanes, waves, and tides. This complex includes the deep-draft Port of South Louisiana, which as of 2004 handled more tonnage than any other port in the nation. In 2000, Louisiana led the nation with production of 592 million barrels of oil and condensate, valued at $17 billion, and was second in the nation in natural gas production with $1.3 billion. In addition, nearly 34 percent of the nation’s natural gas supply and over 29 percent of the its crude oil supply, moves through the state and is connected to nearly 50 percent of U.S. refining capacity.

It has been calculated that since the 1930s over 1.2 million acres (485,830 ha) of these wetlands have been lost. By the 1970’s, the loss was 25,200 acres (10,202 ha) per year. In 2004, it was estimated that an additional net loss of 328,000 acres (132,794 ha) could occur by 2050, which is almost 10 percent of Louisiana’s remaining coastal wetlands. Adding to this total are the losses suffered during Hurricanes Katrina and Rita, estimated at 138,880 acres 8. The underlying causes of this loss are numerous, but can be summed up as: human activity. The hydrological control systems—most notably the levee system and the Old River Control Structure 9—and navigation canals constructed for the benefit of the industries and communities in the region have disastrous consequences in the long term. There can be no doubt that the consequences of human activities in the coastal area have resulted in the effective reversal of deltaic processes and a condition of net land gain to one of net loss. Combined with rising sea levels, the existence of the human settlements in South Louisiana becomes highly precarious (Figures 7 and 8).
Coastal Louisiana has lost on average of 54 square miles of land, primarily marsh, per year for the last 50 years. From 1933 to 2000, coastal Louisiana lost 1,900 square miles of land, roughly an area the size of the state of Delaware. If nothing more is done to stop this land loss, Louisiana could potentially lose approximately 768 additional square miles of land, or an area about equal to the size of the greater Washington D.C. - Baltimore area, in the next 50 years.
Figure 8. Projected effects of rising sea levels on coastal Louisiana. Red areas indicate extent of land loss to sea after a one-meter rise. Source: "Climate Change and Sea Level: USA: Louisiana", Environmental Studies Laboratory, Department of Geosciences, The University of Arizona, 9 June 2005, <http://www.geo.arizona.edu/dgesl/research/other/climate_change_and_sea_level/sea_level_rise/louisiana/slr_usala_1.htm> (29 May 2007).
The issue of the coastal wetlands, and their catastrophic disappearance in recent decades as a result of human activity on the river and in the built-up areas of the region, is arguably the single most important one facing the future of region. Yet "rebuilding" plans such as those provided by the architectural elite and by local authorities are happy to relegate these territories and their future to the engineers (Figures 9-12).

If we are to take Sorkin’s admonition seriously, however, any urban design project attempted in South Louisiana which undertakes “the necessary investigation of dramatically new paradigms at every scale” must surely include a look at the river corridor and the coastal wetlands, and not limit itself to the “urban” scale conventionally understood as such (for example, the official bounds of a planning district or a city). It must also include the infrastructures to maintain these territories in its toolkit.

As a result of the infrastructures which artificially maintain the ecologies of land and water at the service of people and their artifacts, the entire region must be understood as an artifact. That these infrastructures are designed and maintained by a branch of the US armed forces only underscores the very much hierarchical, “top-down” planning regime already in place that allows for the region to persist as it does. Infrastructure is the interface between the four ecologies of land, water, people, and artifacts.

Figures 10 and 11. New pumps and floodgates at the 17th Street Canal, site of a breached floodwall during Katrina.

Figure 12. The Old River Control Structure. Source: U.S. Army Corps of Engineers.
quite literally structuring the landscape and its settlement patterns. The infrastructure of South Louisiana is, to turn a well-known phrase, too important to be left up to the engineers.

The situation in South Louisiana, both pre- and post-Katrina, make clear the imperative for an urban design paradigm—which can manage the complex interplay of the territory’s four ecologies and their infrastructure/interface. The cultural and economic importance of the region are without doubt, although the latter, in the form of the top-ranked Port of South Louisiana and its adjoining petrochemical facilities, is little known even in the region itself. But due to the peculiarities of the region’s political and demographic history, South Louisiana has resisted any and all attempts at a comprehensive model for growth and development, or even to recognizing a single regional identity (much less a unified political structure). The best efforts of planners, architects, engineers, and politicians for nearly three centuries have failed to yield a settlement paradigm which is not at best precarious and—as the aftermath of Hurricanes Betsy and Katrina have demonstrated—at its worst, disastrous.

I argue that, while a daunting task to be sure, the persistence of human habitation in South Louisiana will depend on a comprehensive understanding of the region, and a regional design paradigm which works within the existing matrix of land, water, people, artifacts, and infrastructure to create a new “ecological profile” which vastly improves upon the existing one. Furthermore, I argue that architecture and urban design are the only disciplines which can create this paradigm and design the meta-project which is so absent in this territory. While the tools and expertise of the planner, the engineer, the sociologist, the ecologist, etc., are essential to this project, each of these disciplines is too narrow in its focus to offer a vision of sufficient comprehensiveness to manage the complex relationships at work here.

The “facts on the ground” in the South Louisiana corridor urge us to think otherwise: along with sugarcane farms and refineries one can spot golf communities and strip malls emerging at highway intersections. And while, sea levels rise and Gulf Coast wetlands, essential for mitigating the effects of seasonal hurricanes, continue to wash into the sea—both issues of regional or global provenance—no settlement model of comprehensive scale and scope is offered by local managers or by the architectural elite.

This thesis proposes such a model.
Notes


3. Ibid., 14-15.

4. Ibid., 18.


9. The Old River Control Structure is situated at the divergence of the Mississippi and Atchafalaya Rivers, Erected by the US Army Corps of Energy under order of Congress in 1963 in response to the increasing amounts of water flowing from the Mississippi to the Atchafalaya, the structure maintains the distribution between the two rivers at 70% and 30%, respectively. Were it not the structure, the Mississippi would have “jumped courses” to the Atchafalaya at some time in the 1970’s. The disastrous consequences foreseen for the shipping and petrochemical industries along the Mississippi River were enough for Congress to mandate the project a matter of national priority.
References


Michael Sorkin, “The End(s) of Urban Design,” *Harvard Design Magazine, Fall 2006/Winter 2007*


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Defining the Emerging Region: Mappings
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existing regional programs

- petrochemical plant
- wetland
- settlement
- flood control structure
- agricultural area

port industry
highway
freight rail
river crossing
freshwater diversion

new regional programs

- arboriculture
- world expo
- intercity rail
- freight hub
- passenger airport
- land-sustaining infrastructure
- civic institution
- settlement grid

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Chapter 4

The Infrastructural Complex: BIG Design in South Louisiana
In South Louisiana, territorial infrastructure has always been the interface between systems and complexes, and it is only through a redeployment of new infrastructures across a sufficiently big scale that a viable, long-term vision for the region can be realized, and only by applying architectural thinking.

Along the (relatively) terra firma of the river’s natural levee, long-distance sediment-transport pipeline become the “spines” for new program in the region, re-situating the significance of earth and water-control infrastructures to the urban form and civic life in the region. These spines absorb the needed growth program of the region—whatever it may be. And outside the developed areas along the spines, fields of sugarcane are transformed to fields of cypress trees—tended by the citizen-foresters of the region—ready to be transplanted when mature into the wetlands. Their roots, and the mud coming through the spines of the new human settlements, artificially rebuild the natural buffer between this territory and even bigger one—the rising, warming ocean.
1 sediment transport pipeline can deposit 2.7 million cubic yards of material per year, and convert 300 ac (1.2 km²) of open water to land.

Figure 36: Land-sustaining infrastructure: sediment transport pipeline.
a transformation of wasteful and polluting sugar-cane farming to bald cypress arboriculture will create a second infrastructure to maintain the newly made land.
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