

Rebuilding NOLA

*Why the reconstruction of
New Orleans will be long
and difficult.*

CITIES HAVE ALWAYS been vulnerable to natural disasters: Witness the complete destruction of Pompeii in AD 79. In addition to volcanic eruptions (which are rare) and earthquakes (which are common), cities have been ravaged by hurricanes, tsunamis, and floods. The other urban scourges are manmade: fires, plagues, and war. Natural and manmade urban disasters have occurred with almost clockwork frequency. The 1960s, for example, was a typical decade. There were five major urban earthquakes (Agadir, Morocco; Concepcion, Chile; Skopje, Yugoslavia; Anchorage, Alaska; Tashkent, USSR); urban flooding caused by cyclones (Karachi); and a major hurricane

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in Belize. In addition, cities in Vietnam, Biafra, and the Middle East were severely damaged by war.

In almost all cases (abandoned Pompeii is the rare exception), destroyed cities have been rebuilt. In other words, there is a long history of urban post-disaster recovery and reconstruction. Nevertheless, the rebuilding of New Orleans (NOLA) after the flooding caused by Hurricane Katrina is a particularly daunting task and presents a peculiar, if not unique, set of challenges. Table I lists a selected set of major urban disasters, including the estimated population of the city, the number of deaths, and the number of people rendered homeless, in round numbers. The high death tolls of

pre-modern earthquakes were due mainly to primitive construction techniques that caused the heavy roofs of houses to collapse on top of their occupants. Wood construction and ineffective fire-fighting measures produced disastrous urban fires. Thanks to fireproof construction and pressurized water, except in wartime, great urban fires are a thing of the past. Poor weather forecasting, ineffective evacuation and rescue measures, and primitive medical care, also contributed to high death tolls in pre-modern natural disasters. Modern natural disasters still produce extensive physical damage and high numbers of homeless but, except in wartime, mortality rates are considerably lower, at

Table I: Natural and Manmade Urban Disasters

Date	Type	City	City population	Deaths	Homeless
1666	Fire	London	460,000	5	100,000
1755	Earthquake	Lisbon	275,000	60,000	na
1871	Fire	Chicago	330,000	250	100,000
1900	Hurricane	Galveston	38,000	8,000	na
1906	Earthquake	San Francisco	340,000	3,000	300,000
1908	Earthquake	Messina, Sicily	150,000	100,000	50,000
1923	Earthquake	Tokyo	3,000,000	140,000	na
1926	Hurricane	Miami	30,000	373	na
1931	Earthquake	Managua, Nicaragua	40,000	4,000	na
1940	War	Rotterdam	550,000	na	na
1944	War	Warsaw	1,200,000	245,000	700,000
1945	War	Hiroshima	350,000	100,000	na
1945	War	Dresden	600,000	25,000	450,000
1963	Earthquake	Skopje, Yugoslavia	200,000	1,070	150,000
1972	Earthquake	Managua, Nicaragua	430,000	8,000	240,000
1976	Earthquake	Tangshan, China	1,000,000	240,000	500,000
1989	Hurricane	Charleston, S.C.	80,000	21	55,000
1995	Earthquake	Kobe, Japan	1,500,000	5,100	300,000
2004	Tsunami	Banda Aceh, Indonesia	400,000	90,000	130,000
2005	Flood	New Orleans	485,000	796	300,000

least in industrialized countries (the most recent great urban earthquake, in terms of mortality, was in Tangshan, China in 1976).

Considering the large population of New Orleans, the Katrina death toll was low (in Banda Aceh, a comparable-sized city, 90,000 died in the tsunami-induced flooding). Despite the common impression given by the media, the evacuation and rescue efforts in New Orleans must be judged generally successful. On the other hand, thanks to the effective evacuation and low death rate, the homelessness following Katrina is extremely high, and compared to other American disasters, the scale of damage is unprecedented. New Orleans is larger than Chicago was at the time of the 1871 fire, Galveston at the time of the 1900 hurricane, or San Francisco at the time of the 1906 earthquake. It is much larger than Charleston at the time of Hurricane Hugo (1989) which, with damages of \$7 billion, was the costliest U.S. urban disaster to that date. New Orleans is the largest modern American city to have experienced a natural disaster of such a major scale, and while the cost of rebuilding New Orleans will be unlikely to rival the \$150 billion that was spent rebuilding Kobe, it will be extremely high. The cost alone of rebuilding the levees to resist a Level 5 hurricane (greater than Katrina when it struck the city) has been estimated to be as high as \$30 billion,

a remarkable cost of almost \$200,000 per New Orleans (pre-Katrina) household.

NEW ORLEANS AND LONDON

The City of New Orleans, with a population of 485,000, is approximately the same size as London at the time of the Great Fire of 1666 (Table I). A comparison of the two cases is instructive. The London fire, which raged uncontrollably for five days over 436 acres, destroyed many public buildings and more than 13,000 houses, rendering 100,000 people homeless (households were much larger then). Londoners didn't have FEMA, but they did have Charles II. The King immediately had food and tents delivered to the survivors, and set aside an area within the city limits for temporary housing. Within three days of the fire he issued a royal proclamation requiring neighboring parishes to provide shelter to the destitute

Figure 1: The Great Fire of London, 1666



and “permit them the free exercise of their mutual trades.”

A month after the London fire, the King and the City of London established a six-man rebuilding commission. The King’s appointees—all architects—included Christopher Wren. There was much discussion about the form that the new city should take. Everyone agreed that new construction should be of brick (rather than wood, as before), but there was no consensus about the street layout. Several architects, including Wren, saw the opportunity to provide London with a new and more rational plan, an early example of the “clean slate” syndrome. Only two weeks after the fire, Wren had submitted a splendid plan with squares, radiating avenues, and new commercial quays along the Thames; so did several others. The problem with these proposals, which radically reconfigured the street layout, was that they required a wholesale expropriation of private property. Parliament and the King, afraid of appearing autocratic, decided that it would be prudent to maintain the old plan and existing property lines, while widening certain streets (and compensating owners for lost land) and imposing use-zoning and height restrictions on new buildings.

The rebuilding of London after the Great Fire offers several lessons. In an emergency situation, it helps to have someone who can take decisions quickly

and unilaterally. “Nobody’s in charge” was the common complaint in New Orleans immediately after Katrina, where authority was indistinctly divided among municipal, state, and federal authorities. It also helps to have talented men like Wren on hand (even though his plan was rejected, he was responsible for rebuilding more than fifty destroyed parish churches as well as St. Paul’s Cathedral). Sadly, talent, leadership, and ability have not been hallmarks of the New Orleans reconstruction effort.

Another difference between London in 1666 and New Orleans in 2005 is infrastructure. Seventeenth-century urban households were technologically autonomous, with on-site wells and cesspools (instead of water and sewer lines), and of course no electrical and telephone networks. Municipal systems were rudimentary. There was no garbage removal—trash was disposed of by burning on site, or by throwing it into the street. There were no police (soldiers were used after the Great Fire to prevent looting), or fire departments (which is why the fire spread unchecked). Nor were there public transit, or hospitals, clinics, public schools, or social housing, although there were almshouses for the destitute.

The absence of the scores of overlapping and interlocked municipal infrastructure systems—human and

technological—that characterize a modern city greatly simplified the rebuilding of London. The same is true of many Third World cities today, where post-disaster reconstruction, while hampered by poverty, is similarly uncomplicated. “Reconstruction” in London chiefly meant rebuilding two- and three-story houses (rebuilding civic buildings took longer—45 years in the case of St. Paul’s Cathedral). In addition, London in 1666 had considerably fewer helpless “dependents”—old, infirm, and very young—than a modern city. Children were treated like adults, and were expected to work from an early age. Diseases severely limited the aged population. A year earlier, a great plague had decimated the city. The average life expectancy at birth in seventeenth-century London was 27, although it rose to 53 if one survived to age 15. The lack of a welfare state meant that people were required to be self-sufficient, depending on family and friends for aid and support.

The challenge of rebuilding New Orleans is infinitely more complex. Many interconnected sets of infrastructure must be put in place simultaneously. The destroyed levees must be rebuilt. Water supply, sewage treatment, electricity and garbage collection need to be repaired before people can safely move back into undamaged houses. But municipal service workers need somewhere to live, as do

policemen and firemen, who are also needed. Their families require schools, and hospitals. Cafeterias, grocery stores, pharmacies, and the building supply stores that serve a crucial role in any rebuilding effort—and the workers to man them—are also needed. It turns out that in a modern city the list of “essential” services is very long. Rebuilding New Orleans is not like slowly creating Sim City, turn by turn; much of it has to be done all at once.

POSTWAR RECONSTRUCTION

It has been estimated that the reconstruction of seventeenth-century London cost £20.7 million, a fabulous sum at the time. Of course, London was the national capital—it had to be rebuilt. The same political imperative accelerated the post-earthquake reconstruction of capitals such as Lisbon and Tokyo. The post-1945 reconstruction of war-damaged cities in Europe was likewise motivated by national pride. Although Dresden, Rotterdam, and Hiroshima are probably the best-known manmade urban disasters of World War II, they do not rival the scale of the destruction of Warsaw. It occurred in three stages. The first was the siege of September 1939, when German artillery pounded the city for two weeks. The second was the three-week uprising of the Warsaw ghetto,

Table II: Duration of Post-Disaster Reconstruction

Date	Type	City	Duration (years)
1871	Fire	Chicago	3
1900	Hurricane	Galveston	7
1906	Earthquake	San Francisco	5
1908	Earthquake	Messina, Sicily	20 +
1940	War	Rotterdam	20
1944	War	Warsaw	15 +
1945	War	Hiroshima	10
1945	War	Dresden	20
1963	Earthquake	Skopje, Yugoslavia	10
1976	Earthquake	Tangshan, China	10
1989	Hurricane	Charleston	3
1995	Earthquake	Kobe, Japan	10 +

which resulted in the death of 13,000 Jewish Varsovians, the deportation (to Treblinka) of 56,000 more, and the destruction of the Jewish district. The final act was the two-month Warsaw Rising of 1944, an ill-fated venture that resulted in the death of some 245,000 fighters and civilians. In retaliation, at Hitler's personal order, Warsaw was emptied (its inhabitants were sent to Germany as forced laborers, and to concentration camps) and razed. It is estimated that 93 percent of the buildings were destroyed or seriously damaged. Thus, by 1945, the pre-war population of 1.2 million was reduced to effectively zero.

Serious consideration was given to abandoning Warsaw, but the national capital was rebuilt. This was partly national pride and partly expediency. There was simply too much there to be abandoned, including the rubble that was used for construction. The rebuilding took more than fifteen years, although some historical

buildings were not fully restored until the 1980s. The post-World War II reconstruction of cities such as Warsaw, Hiroshima, Dresden, Berlin, London, Rotterdam, and Coventry was accompanied by several unusual factors. In the case of Japan and Germany, the occupying authorities had absolute power and decision-making was highly centralized. In Poland, Holland, and Britain, the economy was on an emergency footing (rationing, governmental employment programs, priority given to certain industries) which likewise facilitated reconstruction. Even so, the rebuilding generally took decades (Table II). Judging from the historical record, the rebuilding of New Orleans will take at least ten years.

The reconstruction of New Orleans is taking place in peacetime, and can draw on the resources of a large national economy. This is an advantage. On the other hand, the existence of that economy offers workers and employers many alternatives.

In postwar reconstruction, the reconstruction effort itself is often the only available economic activity. For people who have lost jobs and businesses in New Orleans, the surrounding region offers many opportunities. Moreover, since New Orleans was hardly an economic powerhouse before Katrina, for many the hurricane will be an excuse to move. Research by Joe Gyourko of the Zell-Lurie Real Estate Center at Wharton and Ed Glaeser of Harvard has shown that while cities grow quickly, when they decline they do so extremely slowly, due in large part to people's attachment to inexpensive housing (see "Why Does Anybody Still Live Here?" WRER Spring 2002). This produces a sort of inertia. The forced evacuation caused by Katrina has cruelly accelerated this process. It is likely that post-Katrina New Orleans will be significantly smaller, by as much as 50 percent.

HOW TO REBUILD

It is estimated that of New Orleans' stock of 180,000 houses, 110,000 were damaged by flooding, and 30,000 to 50,000 will have to be demolished. How will rebuilding take place? There have been suggestions that the residential density of neighborhoods at higher elevations should be increased, and that the lowest-lying districts, which are prone to flooding, should

not be rebuilt at all. Since many of the destroyed houses were privately owned, this would require expropriation, land swaps, and some kind of forced condemnation. The city administration has promised that the hard-hit Lower Ninth Ward and New Orleans East will not be abandoned, but has not given details of how they will be rebuilt. At the time of writing, these low-lying neighborhoods remain largely empty.

The historical lessons of post-disaster reconstruction with respect to replanning are mixed. On the one hand, the wholesale replanning of cities is rare. Most reconstruction tends to follow the pattern of London after the Great Fire; that is, new buildings in the same place as the old. In San Francisco in 1906, for example, even though no less than Daniel Burnham had just submitted a new plan for the city, post-fire reconstruction largely followed the pre-existing layout (only the civic center is a reminder of Burnham's City Beautiful plan). The same happened in post-1871 Chicago, where the street layout remained largely unchanged. The explanation for such inertia is simple. Existing underground infrastructure, even if it is damaged, represents an investment. Existing patterns of land-ownership make change difficult. The challenge of rebuilding within an existing plan is difficult enough without adding yet another layer of complexity by planning anew.

Moreover, since there is a need to start rebuilding as soon as possible, there is usually no time to delay reconstruction while a new plan is prepared. The two notable exceptions to this pattern were Rotterdam after World War II and Skopje after the 1963 earthquake. The center of Rotterdam, which had been almost entirely destroyed by German bombing, was radically reconfigured and incorporated one of the world's first pedestrian-only shopping districts. The rebuilding of Skopje was an international effort; the new master plan was prepared by the Japanese architect Kenzo Tange according to modernist urban design principles.

If street plans in post-disaster cities generally remain more or less unchanged, the same is not true of buildings. Technically, there is usually an effort made to ensure that new construction will be resistant to future disasters. Seventeenth-century London was rebuilt out of a fire-proof material; when the Bourbons rebuilt Calabrian towns after an eighteenth-century earthquake, they mandated continuous foundations and wall-bracing, and when Messina was rebuilt after the earthquake in 1908, new buildings were of reinforced concrete; new buildings in Galveston were raised up to prevent future flooding; new construction in post-Hugo Charleston incorporated more stringent anti-hurricane measures. Post-Katrina building codes likely will be stricter,

although since this will also increase building costs, it can be expected to be a hotly debated issue.

Reconstruction is sometimes seen as an opportunity to revamp the architecture. When St. Paul's Cathedral was rebuilt after the Great Fire, Wren did not reproduce the original Gothic structure but devised an entirely new design, with a huge dome in the fashionable Classical style. The reconstruction of Chicago after its fire produced the innovative skyscraper architecture for which the city would become famous. On the other hand, many German city centers, damaged by World War II bombing, were rebuilt along historical lines. The medieval Old Town of Warsaw, which was entirely destroyed, was likewise rebuilt as a historical facsimile. So were parts of the center of St. Petersburg, which suffered a devastating three-year siege during World War II. A replica of the destroyed Baroque Frauenkirche in Dresden was completed only this year.

The historic districts in New Orleans (the French Quarter, the Garden District) were largely unaffected by flooding, so historic reconstruction is not a major issue. But what about destroyed residential districts, whose architecture exhibited a strong regional character? One should be skeptical of architects' calls to treat New Orleans as an opportunity to experiment with new and untried ideas about architecture and urban design. There is

Figure 2: New Orleans' 9th Ward, before and after Katrina



no reason that new buildings should not incorporate the characteristics of a local style (just as home builders in Georgetown and Alexandria favor the Federal style, and those in Charleston build in Lowcountry styles), although there is no need for absolute stylistic uniformity, for urban design is always improved by inconsistency.

One particular challenge in New Orleans is how to rebuild the housing of the poor. The United States does not have a good track record in this area, nor are there many successful precedents at hand. Concentrating the poor in large housing projects (as New Orleans did) is a poor option, given the dismal experiences in the 1960s with urban renewal.

Housing vouchers are an alternative, but the supply of moderate-rent housing in New Orleans in the near future is likely to be small. Much rental housing was destroyed by Katrina, and it is unlikely that brand new, or rehabilitated housing, will have low rents. The federal government's Hope VI program, which promotes residential developments that mix market-rate housing with subsidized low-income dwellings, has had some success, although it is expensive and may not be able to deliver a sufficient number of units quickly enough (see "Hope VI: Pleasant View Gardens," *WRER* Fall 1999).

The only organizations that have sufficient experience and resources to deliv-

er large amounts of inexpensive single-family housing are national home builders. If the City of New Orleans were able to streamline its permitting procedures and bureaucracy, it might be possible for national homebuilders to produce small (1,000-square-foot) townhouses that would sell for less than \$75,000. This would not solve the shelter problems of the indigent, but it would offer a reasonable housing solution to working families. Another affordable alternative is manufactured housing; that is, mobile homes. A good-quality 1,000-square-foot home cost about \$26,000 in 2001, which is considerably lower than the cost of site-built houses. *A Pattern Book for Gulf Coast Neighborhoods*, which is part of the Congress for a New Urbanism recovery initiative in Mississippi, includes a number of examples of how manufactured housing could be adapted to regional architectural styles. The use of manufactured housing in New Orleans would probably require changes in city zoning and building regulations.

CONCLUSION

How to plan New Orleans remains a technical challenge, but it ultimately depends on the extent of the real demand for rebuilding the city. Unlike most Southern cities, New Orleans did not

grow during the boom years of the 1980s and 1990s. On the contrary, over the last forty years, the population of the city has declined steadily, dropping 31 percent from an all-time high of 702,000 in 1965. The population of the metropolitan area has increased slightly (8 percent) during the 1990s, although in the 1980s it was one of very few metro areas in the United States to actually lose population. While New Orleans is usually associated with its port, the Port of New Orleans is the smallest of the regional ports, vastly overshadowed by the Ports of South Louisiana and of Baton Rouge. New Orleans is in the Sunbelt, but in many ways it resembles a Rustbelt city, with a stagnant urban economy and high rates of unemployment and poverty.

The pre-hurricane population of New Orleans was 485,000. Six months after Katrina, it is estimated that the population is less than 200,000 (mostly middle-class residents of the areas least affected by the flooding). Before Katrina, the New Orleans public school system served 55,000 students in 117 schools. Two and a half months after the hurricane all the schools remained closed, and only 4,400 of the original students were registered (in five schools in neighboring Algiers). Political inertia and lack of leadership are commonly blamed for the slow pace of reconstruction. The contrasting example of Mississippi, which has made greater

progress, lends some credence to this argument. But the hurricane in Mississippi affected towns and small cities, not a major metropolis. The destruction of New Orleans is altogether different and represents a problem of unprecedented scale and complexity. It will require a major federal effort, on the scale of the Depression-era Tennessee Valley Authority or the programs of the Soil Conservation Service to deal with this particular urban problem.