

The New Orleans Principles

Celebrating the Rich History of New Orleans Through
Commitment to a Sustainable Future



U.S. Green Building Council **New Orleans Planning Charrette**

November 9-11, 2005

Celebrating the Rich History of New Orleans Through Commitment to a Sustainable Future

Charrette Overview

The New Orleans Principles are guidelines developed by participants of a charrette on Gulf Coast Reconstruction that was held on November 9-11, 2005, at the U.S. Green Building Council's annual Greenbuild conference in Atlanta, Georgia. These principles represent a consensus position of the 160 participants, approximately one-fifth of whom were invited guests from New Orleans and the immediate vicinity. The rest, from throughout North America, represented a wide range of expertise in urban planning, water management, engineering, and architecture and included some of the leading voices in sustainable design.

opportunity

Opportunity

The recent destruction in New Orleans and the surrounding areas presents the city and the region with a historic opportunity. That opportunity is to rebuild these communities in a way that brings forward their rich history while creating a new definition of a 21st century city. In the process, it also allows the city to address problems that were long-standing before Hurricane Katrina—to create a city that is stronger economically, physically, and culturally for all of its citizens.

The following *New Orleans Principles* were developed to help guide the planning and rebuilding efforts, with the intent of enhancing environmental, social, and economic outcomes. This holistic, or “triple-bottom-line,” approach promotes environmental, economic, and equitable solutions in addressing the rebuilding efforts, creating a stronger, more self-sufficient and protected city for the coming century for all of its citizens.

In this effort, it is clear that the resources of the entire nation will be required and should be forthcoming. New Orleans has given the nation much through its culture, its music, its architecture, its cuisine, its language, and its people. The physical planning characteristics of the city, including diverse and mixed-use neighborhoods, and the charm of its human-scaled environment have become models for communities across the nation. New Orleans plays a vital role in the nation’s cultural life. Our country needs now to stand behind the city in order to strengthen the nation as a whole.

The process and outcome of the rebuilding effort on which our nation is about to embark holds the potential to generate a redevelopment of New Orleans that serves as a world-class, living example of what is possible when we work together intelligently and strategically. In choosing this path of creating opportunity out of adversity, by growing vibrant, prosperous communities out of the devastation, New Orleans will find a new place for itself once again as a world-class destination that lives up to its reputation as a place to celebrate life while also embracing the wellbeing of its residents.



The New Orleans Principles

1 • Respect the rights of all citizens of New Orleans

Displaced citizens who wish to return to New Orleans should be afforded the opportunity to return to healthy, livable, safe, and secure neighborhoods of choice.

2 • Restore natural protections of the greater New Orleans region

Sustain and restore the coastal and floodplain ecosystems and urban forests that support and protect the environment, economy, communities, and culture of southern Louisiana, and that contribute greatly to the economy and well-being of the nation.

3 • Implement an inclusive planning process

Build a community-centered planning process that uses local talent and makes sure that the voices of all New Orleanians are heard. This process should be an agent of change and renewal for New Orleans.

4 • Value diversity in New Orleans

Build on the traditional strength of New Orleans neighborhoods, encourage mixed uses and diverse housing options, and foster communities of varied incomes, mixed age groups, and a racial diversity. Celebrate the unique culture of New Orleans, including its food, music, and art.

5 • Protect the city of New Orleans

Expand or build a flood protection infrastructure that serves multiple uses. Value, restore, and expand the urban forests, wetlands, and natural systems of the New Orleans region that protect the city from wind and storms.

6 • Embrace smart redevelopment

Maintain and strengthen the New Orleans tradition of compact, connected, mixed-use communities. Provide residents and visitors with multiple transportation options. Look to schools for jumpstarting neighborhood redevelopment and for rebuilding strong communities in the city.

7 • Honor the past; build for the future

In the rebuilding of New Orleans, honor the history of the city while creating 21st century buildings that are durable, affordable, inexpensive to operate, and healthy to live in. Through codes and other measures, ensure that all new buildings are built to high standards of energy, structural, environmental, and human health performance.

8 • Provide for passive survivability

Homes, schools, public buildings, and neighborhoods should be designed and built or rebuilt to serve as livable refuges in the event of crisis or breakdown of energy, water, and sewer systems.

9 • Foster locally owned, sustainable businesses

Support existing and new local businesses built on a platform of sustainability that will contribute to a stronger and more diverse local economy.

10 • Focus on the long term

All measures related to rebuilding and ecological restoration, even short-term efforts, must be undertaken with explicit attention to the long-term solutions.

respect

Principle 1. Respect the rights of all citizens of New Orleans

Displaced citizens who wish to return to New Orleans should be afforded the opportunity to return to healthy, livable, safe, and secure neighborhoods of choice.

Background and Context

There is concern among some displaced New Orleanians that the city will be rebuilt in a manner that physically or economically prevents their return. There is fear that some portions of the city will be deemed impossible or impractical to rebuild and that residents from those portions of the city will not be afforded opportunities to relocate to other, more livable, areas of the city. There is also concern that a gentrification of New Orleans will occur that economically forces its lowest-income residents from the city.

Even at this early point in the planning, it is becoming increasingly clear that to protect the city and its residents, some areas of the city should not be rebuilt. New Orleans should not shy away from these difficult decisions if they benefit the city as a whole. That some sections of the city may not be rebuilt, however, does not mean that all people should not have the opportunity to return. Planning needs to find other opportunities for good neighborhoods, and policy-makers from the city, region, and nation need to find ways to fund the creation of those neighborhoods.

Roughly 80 percent of the city's 485,000 residents fled before the storm hit. This left nearly 100,000 stranded and subject to the storm's rage.

Times Picayune



Photo: hellmuth + bicknese architects

Four Gulf Coast Reconstruction Charrettes in November, 2005 brought together more than 160 people from the New Orleans region and throughout North America to address rebuilding in the wake of Hurricane Katrina.

For New Orleans to recover its position as a center of America's culture, music, art, architecture, language, and cuisine, it is critically important that all its current and displaced citizens—and the diversity of cultures, heritage, and income levels they represent—be a central part of the *new* New Orleans. Finding other places in New Orleans to build good quality homes, apartments, and neighborhoods therefore needs to be a top priority.

Benefits

Removing the specter of uncertainty surrounding the rights of New Orleans residents to return to the city allows attention that would otherwise be focused on this issue to instead be devoted to addressing the long-term challenges that face the city and its residents. By working together with common purpose, the residents of New Orleans can achieve a livable city, a strong economy, and a sustainable future.

Policy Recommendations and Actions

1. **Communications Outreach Program** – Immediately implement a communications outreach program that will reach all New Orleanians—those who have returned and those who remain displaced—to maintain a sense of community and open access to information.
2. **Announce Policy of Return** – Convey to all New Orleans residents that it is the City’s and State’s policy to make it possible for all residents wishing to return to the city to be able to do so.
3. **Plan for New Neighborhoods** – Direct New Orleans planning efforts to explicitly address the fact that not all residents may be able return to their original neighborhoods. Redevelopment should be planned to maintain density in regions of the city that can safely support development, while shifting development from regions of the city at the highest risk of future flooding. For those portions of the city that are deemed unsuitable for rebuilding, identify other living options for the former residents of those neighborhoods. There are many areas in the city to provide additional housing and new neighborhoods for people displaced by flooding. Some of these possibilities are listed below:
 - **Central City** – Large sections of the central part of New Orleans have been abandoned over the years, are underused, were in need of replacement before Katrina, or are simply vacant. After the flooding problems in these areas are resolved, they will provide ample opportunity for new neighborhoods in close proximity to the center of the city.
 - **Higher-Density Uses Along Major Streets** – Many of the structures along commercial/arterial streets, including Claiborne, Carolton, Canal and Tulane Avenue, need to be rebuilt. Following the traditions of older parts of New Orleans, it would be relatively easy to plan for mixed-use centers with higher-density housing along these routes. Placing housing above retail follows longstanding traditions in older parts of the city, including the French Quarter, and the practice can be extended to redevelopment along major streets.
 - **Mixed-Use Centers** – Create higher-density centers in neighborhoods by combining retail and commercial space with apartments and housing for people of all ages, including the elderly. Jackson Square and its Pontalba buildings—with retail on the first floor and townhouses and apartments

above—can be a model for other neighborhoods, helping to bring more people into the city while reinforcing a sense of community.

- **Levee zones** – Many of the levees have to be rebuilt, modified, or reinforced. In many cases, the banks of the levees can and should be greatly widened to reinforce them while creating higher ground for critical-need facilities. These widened levee zones can also be locations for higher-density housing at key points. If developed in a comprehensive way, the system of levees could also become a major new system of linear urban parks linking all parts of the city.
 - **Mississippi River zone** – Numerous areas of high ground along the Mississippi River corridor, both above and below the French Quarter, are underused and suitable for redevelopment into new neighborhoods.
 - **Downtown Core** – The edges of the downtown core, including the former hospital zones and numerous vacant parcels, provide an opportunity to create higher-density housing areas adjacent to the existing business and residential areas.
4. **Publicly Owned Conservation Zones** – Flooded areas that are to remain unbuilt for the protection of the city should remain protected public lands either as parks or conservations districts. They should be used for the benefit of all of the people of New Orleans. These natural “greenway” areas should be linked with trails and bicycle paths to form connected corridors for people and wildlife.



Photo: HOK

Use restored wetlands and forest buffers around the city as public parks and amenities.

restore

Principle 2. Restore natural protections of the greater New Orleans region

Sustain and restore the coastal and floodplain ecosystems and urban forests that support and protect the environment, economy, communities, and culture of southern Louisiana, and that contribute greatly to the economy and well-being of the nation.

Background and Context

Human actions along the Mississippi River and Gulf Coast have dramatically altered the natural hydrology of the region and resulted in significant erosion of the wetlands and protective islands, marshes, swamps, and floodplain forests that have long protected New Orleans and other coastal communities. Because levees were built along the Mississippi River and the river and shipping canals were channeled, sediment is no longer deposited to a significant extent in the Mississippi Delta around New Orleans; instead, high-velocity river flows erode the remaining land base, carrying sediment further out into the Gulf of Mexico.

Marshes and wetlands are wave buffers, storage tanks, water purifiers, oxygen pumps, a food pantry to wildlife, and fish nurseries. According to the strategic plan *Coast 2050: Toward a Sustainable Coastal Louisiana* (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority, 1998), since 1930, more than 1,500 square miles of vegetation-rich wetlands have been lost along the Louisiana coast; these losses are continuing at an average rate of a football field every 30 minutes—25-30 square miles per year. This land area—lowland marsh and swamp—is being replaced by open water, which offers no protection from hurricane winds or storm surges. Compounding the problem, the land not eroded is subsiding as the organic silt soils decompose and compress. These actions make New Orleans increasingly vulnerable to hurricane damage.

The severity of storms in the Atlantic Ocean and Gulf of Mexico has increased in the past decade, which many scientists believe to be a result of global warming—which has increased water temperatures (the driver of tropical storm systems). This adds



Photo: Ralph Bicknese

One mile of cypress swamp will absorb approximately one foot of storm surge.

urgency to the need to repair the natural systems that provide the primary line of protection to coastal communities.

The Gulf Coast houses North America's largest expanse of coastal wetlands. Along with putting people at risk, the loss of these wetlands also threatens the coastal fisheries upon which a significant portion of Louisiana's economy depends. These ecosystems contribute nearly 30% by weight of all commercial fishery harvests in the lower-48 states. The same wetlands provide wintering habitat for some 70% of migratory waterfowl on the Central and Mississippi Flyways.

Healthy floodplains protect the wetlands and down-river communities, such as New Orleans. As high water forces a river out of its banks, the river is forced to slow down and thus loses its power to carry its cargo of silt. As the river spreads its blanket of silt, it not only cleans itself and provides rich nutrients for plant life, but it also protects the bays, estuaries and wetlands downstream. Without healthy, functioning floodplains, rivers tear into the estuaries and overwhelm the saltwater-adapted life there.

Benefits

Protecting and restoring the coastal floodplain and woodland ecosystems in and around New Orleans will better protect the city from future storm damage and coastal erosion. Restoring some natural flows along parts of the Mississippi River and allowing floodplains to function would allow sediment deposition in the wetlands surrounding New Orleans, in turn allowing these wetlands and the vegetation they support to protect New Orleans and other Gulf Coast communities from storm surges and other impacts of hurricanes. In rough terms, every mile of wetland buffer absorbs one foot of storm surge. The planting of cypress groves and urban forests in and around New Orleans will help to deflect winds during hurricanes; while some trees will be lost, trees provide a critically important protective buffer. Healthier wetland ecosystems along the Gulf Coast are crucial in sustaining the fisheries upon which the New Orleans region has so long depended.

Policy Recommendations and Actions

1. **Levee/Water Control** – Consolidate all boards and authorities controlling levee, water control and coastal restoration into a single organization to manage the regional ecosystem comprehensively.
2. **Coast 2050 Plan** – Update and revise accordingly the *Coast 2050* plan in light of 2005 Katrina hurricane damage. Fully fund and expedite its implementation. Promote the restoration of natural river flows and floodplains along parts of the Mississippi and other river systems to begin rebuilding sediments that support vegetation and protect inland areas. Very simply, we must use the valuable services of river systems to rebuild the protective wetland land base around New Orleans and along the Gulf Coast.
3. **River Sediment** – Pump and trap river sediments to restore eroded islands and wetlands. Sediment can also be pumped across levees to raise land elevation in parts of New Orleans. Care should be taken to use dredged sediment appropriately. Fine sediment can be used for wetlands and bottomland forest, while silty sand is used for islands and fill areas. Small woody debris can be used as “brush mattresses” to accelerate vegetative establishment. Filled areas should be promptly vegetated with native vegetation.
4. **Use Hurricane Waste to Form Crib Walls** – Crib walls made from hurricane waste can naturally trap sediments and rebuild islands and wetlands. Using large woody debris to trap sediment is a natural process and has a high likelihood of success. Very simply, the boles and branches are towed into place



Photo: Louisiana Department of Natural Resources

Building crib walls out of hurricane waste

and arranged to trap flowing water and accelerate sediment deposition.

5. **Reforest City and Region to Provide Storm Protection** – Plant wind-resistant, native trees in and around New Orleans to provide bands of protection from future storms. Use composted botanical waste and wood chips from Hurricane Katrina, if uncontaminated, to mulch trees and provide an organic soil matrix. Fill areas on islands and riverward of levees should be forested to protect them from waves and surge. A forested band landward of levees should be included to lower risk of wind damage to structures.



Photo: Ralph Bicknese

Live oaks and other native trees absorb and deflect wind energy.

6. **Eliminate man-made channels** – Channels create open water in areas that used to be wetlands, thus eliminating natural protections. When channels are open to large bodies of water, storm surges can be funneled into populated areas, risking lives and loss of property. Eliminate these artificial channels where not absolutely necessary and restore these areas as wetlands and floodplain woodlands.

implement

Principle 3. Implement an inclusive planning process

Build a community-centered planning process that uses local talent and makes sure that the voices of all New Orleanians are heard. This process should be an agent of change and renewal for New Orleans.

Background and Context

In the wake of Hurricane Katrina, New Orleans faces a planning challenge that is perhaps greater than any other in the history of the United States. Though on a smaller scale, it is analogous to Europe's needs following World War II. In the past, significant portions of the population have felt left out of discussions about the future of their city. Open and participatory planning is a key tenant of The New Orleans Principles.

Benefits

The most successful macro-scale planning efforts in recent decades have resulted from broad participation of residents. In North Charleston, South Carolina, for example, a major planning and development effort currently underway, known as Noisette, has garnered a remarkable participation of close to 40% of adults in planning meetings, focus groups, or hearings on their master plan—this in a city whose residents, most of whom fall at the lower end of the economic spectrum, had long felt disenfranchised from all planning. The Noisette Master Plan, built from the ground up through neighborhood- and community-scale discussions, demonstrates the remarkable accomplishments that can arise from an inclusive planning process. A clear and open policy of inclusion in planning will help New Orleans residents feel that they are part of the solution, and more will be likely to return.

Policy Recommendations and Actions

1. Involve Residents – Involve residents in guiding development decisions that will affect their communities. Work at all levels and scales—neighborhoods, church communities, school districts, nonprofit community development organizations, social justice groups, Chamber of Commerce and other business organizations, political leaders, and city-wide organizations and agencies—to ensure fully participatory and inclusive planning.



Illustration: HOK

Compact, mixed-use development is a high priority in maintaining New Orleans' unique character.

- 2. Virtual Planning** – Invite displaced residents to participate in the planning that will guide the rebuilding of their city. Use available technologies of the Internet, such as online forums, listservs, virtual charrettes and town meetings, Web-based polling, and other tools to reach out to displaced residents and ensure that they are included in discussions about the future of New Orleans. Mobilize “NOLA ambassadors” to regularly go out and meet with displaced residents.
- 3. Involve Outside Expertise** – Continue to reach out and seek the help of outside expertise, including the Urban Land Institute (ULI), the American Institute of Architects (AIA), the American Planning Association (APA), the American Society of Civil Engineers (ASCE), the American Public Works Association (APWA), the Congress of the New Urbanism (CNU), and the U.S. Green Building Council (USGBC) to assist local talent in developing New Orleans' highly challenging planning needs and to ensure the best thinking possible. Just as Europe benefited from the Marshall Plan following World War—a plan envisioned and largely implemented by the U.S.—so too New Orleans can benefit from creative thinking originating outside of the immediate region.

value

Principle 4. Value diversity in New Orleans

Build on the traditional strength of New Orleans neighborhoods and foster communities of varied incomes, mixed age groups, and a racial diversity. Celebrate the unique culture of New Orleans, including food, music, art and architecture.

Background and Context

In many ways, New Orleans is a cultural center for the United States. It is a melting pot of cultures and generally considered the birthplace of blues and jazz, two uniquely American forms of music. It is a city known for its cuisine, art, festivals, and culture. The physical limitations to development and the compact, tightly knit neighborhoods that evolved in the city have helped to ensure the survival of this diversity. The historic city has always been mixed-use; examples of this development pattern are found throughout the city, especially in the older sections. Large single-family homes, modest shotgun houses, apartment blocks, store-front retail with apartments above, restaurants, and offices are found in neighborhoods throughout the city. New Orleans is one of the few U.S. cities that have fully retained a diverse, mixed-use character after the Second World War—while many other cities are working actively to bring that character back after losing it.

Thousands of homes in the Lower Ninth Ward, which was built over a cypress swamp, were destroyed when a series of waves from Lake Pontchartrain and Lake Borgne overran levees.

National Geographic



Photo: Ralph Bicknese

Musicians on Royal Street

Benefits

The cultural diversity out of which New Orleans grew is crucial to the future of the city. By retaining compact, pedestrian-friendly neighborhoods that serve to bring the people of New Orleans together, and by addressing some of the underlying problems in the city that lead to poverty, drug abuse, and violence, the city can retain and reinvigorate its position as a center of American culture and as one of the foremost destinations to celebrate American culture and festivity.

New Orleans has been home to a large number of small, locally owned businesses—more than in most other metropolitan areas. The mixed-use tradition allows these businesses to thrive, multiply, and expand. This diverse, mixed-use character also offers competitive advantage to New Orleans—the American business community is increasingly moving to cities that attract and retain talented young people, who in turn are attracted to cities of character, quality, diversity, and uniqueness. Building on the mixed-use history of the city will help New Orleans prosper in the years ahead.

Policy Recommendations and Actions

- 1. Bring Cultural Leaders Home** – Bring cultural leaders back to New Orleans as soon as possible through targeted funding, temporary housing, temporary workspaces, and attractive employment opportunities. Engage musicians and artists, churches, and the leaders of other social organizations in this effort. Providing options for cultural leaders of New Orleans to return will inspire others to plan for a return to the city.
- 2. Schools as Neighborhood Anchors** – Schools should serve as the anchors of New Orleans' diverse neighborhoods and communities. Schools must be reopened as soon as possible, and long-term planning must address how schools can more effectively achieve their potential for bringing communities together. Enabling schools to serve New Orleans' diversity will depend on improving the quality of those schools so that all economic and cultural segments of New Orleans society return to those schools.
- 3. Continue Mixed-Use Tradition** – Plan for mixed uses and diverse housing options. Require inclusive planning for all new developments in the city. A healthy, diverse New Orleans depends on creating vibrant, safe, mixed-use communities with a wide range of housing options available to residents. The tragedy of Hurricane Katrina offers a one-time opportunity to address these needs in a comprehensive, coordinated manner that will serve the city for generations.



Photo: Ralph Bicknese

New Orleans has many fine examples of mixed-use buildings.

- 4. Expand Bicycle Access and Public Transit System** – Incorporate bicycle and pedestrian paths in and between the neighborhoods. Plan neighborhoods around expanded streetcar and light-rail systems. Use the construction of new transit lines and inducements for development in the areas served by those lines. Transits lines can be raised to act as internal levees and connect the city during minor flooding.



Photo: HOK

New Orleans could benefit from an expanded streetcar system.

- 5. Save Historic Structures** – Salvage as many historic structures as possible, moving them as necessary to protect them from future flooding or redevelopment pressures, or to serve as anchors in new neighborhood development.
- 6. Community Social Anchors** – Along with schools, plan around strong community social anchors, including churches, social organizations, and neighborhood groups.

Over 80% of the city of New Orleans was flooded.

Times Picayune

protect

Principle 5. Protect the City of New Orleans

Expand or build a flood protection infrastructure that serves multiple uses. Value, restore, and expand the urban forests, wetlands, and natural systems of the New Orleans region that protect the city from wind and storms.

Background and Context

Outward expansion of New Orleans from the historic French Quarter and other higher-ground parts of the city only proceeded in a coordinated fashion after levees were built to protect the city from floodwaters from the Mississippi River and Lake Pontchartrain. Additional levees and canals were built to facilitate ship traffic and to contain the elaborate system of drainage canals that provided stormwater drainage and a way to pump water from the city back into Lake Pontchartrain. These levees were designed to protect the city from a Category 3 hurricane, though initial investigations indicate that the levees failed under conditions less severe. Meanwhile, ample scientific evidence indicates that the severity of hurricanes is increasing, and most experts believe that flood control infrastructure should be built to afford protection from Category 5 storms.

The levee systems were built to depend on the substantial wetlands' buffering capability of years gone by. Now that the wetlands are gone, the old levees are still in place, leading to more flooding and more pressure on the levees.

Technology News



This plan of New Orleans shows elevations in different parts of the city. Levee failure points are indicated.

Benefits

Strengthening or rebuilding the constructed flood-control infrastructure is critical in providing New Orleans residents and businesses the confidence they need to return to the city and invest in their futures there. The reconstruction of levees and other flood-control infrastructure can achieve multiple benefits—for example the construction of buildings on more protected higher-elevation ground, the creation of recreational amenities such as perimeter parks, and the restoration of coastal wetlands and forests that can help to shield New Orleans from storm events, while providing recreational and economic opportunities.

Policy Recommendations and Actions

1. **Rebuild Levee System** – Upgrade the existing levee system to withstand a Category 5 storm with redundant systems throughout. Internal levees should be incorporated to isolate flooding in case of a breach in the primary levees.



Photo: US Army Corps of Engineers

New Orleans levees failed in 17 locations.

2. **Urban Linear Parks** – Use a redesigned, reinforced, and buttressed levee system and embankments as recreational areas, as segments of a system of linear parks with biking, walking and jogging trails. These linear parks can also be a component of a coordinated evacuation strategy.
3. **Emergency Evacuation Routes** – Look for creative opportunities to share the costs of creating a better levee system by focusing on recreational opportunities—for example, a new national park could be funded by the National Park Service, and an emergency evacuation system could be funded by the Department of Homeland Security.
4. **Critical-Needs Facilities on Higher Ground** – Locate higher-density housing and critical-needs buildings such as hospitals, schools, and emergency response services along the redesigned waterway system, building on higher, more protected ground.
5. **Use Demolition Waste Creatively** – Use suitable demolition waste (such as crushed concrete, aggregate, and bricks) to raise ground levels in especially low-lying regions of the city and along expanded levee banks.
6. **Water Resistant Construction** – Require new construction in low-lying areas to be built to withstand expected future flooding through careful material selection, elevated floor levels, and careful placement of utilities. Design structures to

resist water intrusion and mold growth.

7. **Reliable Pumping System** – Redesign pumping stations so that they can function and be operated safely during even the most severe storm events.
8. **Reduce Stormwater Loading with On-site Strategies** – Reduce the city's stormwater loads through the design of its new buildings and infrastructure. By reducing the stormwater loading, the rate at which stormwater reaches pumps is reduced, lessening flooding and allowing use of smaller pumps operating at substantially lower cost. Open, green areas that accept stormwater and have controlled discharge structures act as temporary storage and further reduce flooding risk.

- Require the use of porous pavement wherever feasible to reduce stormwater loading. Despite the city's high water table, porous pavement is helpful in reducing flooding that results from small and moderate storms.
- Require the installation of green roofs for most large structures, both to reduce stormwater loading and to reduce the urban heat island effect, thereby cooling the city as a whole and reducing energy consumption.



Photo: HOK

Green roofs can help to reduce stormwater volume as well as reducing the temperature of the surrounding area.

- Require the use of rainwater harvesting systems, including on-site cisterns, both to lessen the stormwater loading and to provide water for other uses (landscape irrigation, toilet flushing, cooling/heating systems, and maintenance).
9. **Survivable Wireless Systems** – Develop a reliable and survivable cell phone system and city-wide high-speed wireless access to the Internet.

embrace

Principle 6. Embrace smart redevelopment

Maintain and strengthen the New Orleans tradition of compact, connected, mixed-use communities. Provide residents and visitors with multiple transportation options. Look to schools for jumpstarting neighborhood redevelopment and for rebuilding strong communities in the city.

Background and Context

New Orleans has long served as one of America's best and most emulated examples of high-density, mixed-use, walkable, and diverse urban design. There is a strong and active movement, often referred to as New Urbanism or neo-traditional development, to recreate spaces with the human scale and feel of a place like New Orleans. New Orleans is fortunate, among U.S. cities, never to have lost its neighborhood character. While the buildings and urban layout have been in place in New Orleans to provide such spaces, problems of poverty, income disparity, drug use, and inadequate schools in recent decades have been making it more and more difficult for the people of New Orleans to achieve the opportunities for a quality lifestyle that this type of land-use provides.

100,000 people—nearly ¼ of the population—were without personal transportation, many had no way to escape the disaster.



Photo: PD Photo.com

New Orleans street scene, pre-Katrina

Benefits

The planning and redevelopment that will occur in the aftermath of Hurricane Katrina can serve both to preserve New Orleans' tradition of compact, connected communities and to strengthen that model of land use moving forward. In the process, planning and redevelopment can address problems such as poverty and separation of people by economic status that have plagued New Orleans for decades. In particular, an effective, integrated planning initiative can restore schools as the hubs of New Orleans neighborhoods and communities; schools can be the beacons of communities, jumpstarting progressive redevelopment and luring residents back to the city. Through these various strategies, New Orleans can not only recover from Hurricane Katrina but end up in far better condition than it was before Katrina came ashore.

Policy Recommendations and Actions

1. **Provide for Higher-Density Housing** – Identify areas suitable for higher-density housing. These should be areas on higher ground—or where the elevation can be raised—that are more protected from future flooding and wind damage. Where possible, utilize formerly undeveloped land or vacant properties.



Photo: Ralph Bicknese

New Orleans has many good examples of high-density housing.

2. **Plan for Mixed Use** – Support the New Orleans *Main Street* tradition of mixed-use, walkable neighborhoods, where people live near basic services (including working, shopping, eating, entertainment).
3. **Transit System as Development Incentive** – Expand the existing streetcar line as an incentive for redevelopment. Investigate the possibility of designing the streetcar system to serve in an evacuation capacity, possibly with funding from the Department of Homeland Security. Consider raising part of the system for use as internal levees for flood isolation. Sound barrier walls and berms can also serve as internal levees.
4. **Expand Rapid Transit to Airport and Northside of Lake** – Provide rapid transit from the airport to downtown and to the other side of the lake. This will open opportunities for new neighborhoods and strengthen the downtown core. Seek funding from the Department of Homeland Security to investigate the possibility of the rapid-transit system serving in an evacuation capacity.

5. **Good Neighborhood Schools as development incentive** – Jumpstart neighborhood redevelopment by rebuilding schools as key community institutions. Reestablish schools as *community centers for learning*, providing people of all ages and walks of life with access to art, music, adult education, and community-service programs. Redesign and rebuild schools to be high-performance buildings with passive survivability features that will enable them to be safely occupied in the event of extended power outages (see Principle 8).



Photo: Tulane Community Service

Clean-up, repairs and painting of New Orleans schools are being done through volunteer efforts.

Before Katrina more than 23% of the residents lived below the poverty level.

honor

Principle 7. Honor the past; build for the future

In the rebuilding of New Orleans, honor the history of the city, while creating 21st century buildings that are durable, affordable, inexpensive to operate, and healthy to live in. Through codes and other measures, ensure that all new buildings will be built to high standards of energy, structural, environmental, and human-health performance.

Background and Context

As many as 150,000 houses, schools, and other buildings were destroyed or extensively damaged by the flooding that occurred due to the storm surge and levee failures following Hurricane Katrina. Tens of thousands of other buildings that escaped major structural damage may cause ongoing problems for their occupants due to mold or other problems. Most of the buildings that were destroyed relied on fossil fuels, were not energy efficient, and contributed to global climate change, which—many experts believe—in turn contributed to Hurricane Katrina’s severity.

With the rebuilding that will occur in New Orleans, there is opportunity to reconsider how we design and construct those buildings. While there is, of course, urgency to begin reconstruction as quickly as possible, there is a one-time opportunity to reexamine standard practice and create a city that, even within a historical context, is a model of advanced, energy-efficient, environmentally responsible, and durable new structures that are able to withstand future storms.

Older homes made of cypress wood are structurally sound and able to be restored once they are dried out. Not so with pine construction.

Preservation Resources Board



Photo: Ralph Bicknese

Traditional New Orleans homes were protected from the sun, raised to avoid flood waters, and made of durable materials.

Benefits

The widespread destruction of buildings that occurred following Hurricane Katrina allows us to do better in the reconstruction—creating buildings that are less expensive to heat and cool, healthier to live and work in, durable despite occasional (limited) flooding, survivable in times of extended power outages or fuel supply interruptions, and far better for the environment. Out of the tragedy of Katrina is an opportunity unlike any we have seen in the United States in recent decades to effect dramatic, fundamental improvement in a large percentage of buildings in a city. If we plan the forthcoming reconstruction carefully, we will be able to look back at Katrina as a watershed event that ushered in an age of dramatically better buildings that will benefit the people of New Orleans for generations to come. In signing on to the U.S. Mayors’ Climate Protection Agreement and in aggressively addressing energy efficiency and alternative energy sources, New Orleans could become a model city in its response to global climate change, giving it yet another distinction and attraction for visitors.

Policy Recommendations and Actions

1. **Strict New Building Codes** – Adopt strict new building codes in New Orleans that mandate high levels of energy efficiency, structural stability, flood resistance, water efficiency, responsible stormwater management, and passive survivability (see more about this in Principle 8).
2. **LEED** – Adopt the LEED® Rating System for all new construction or major reconstruction in the city. Set a minimum of LEED Silver for all public buildings, or buildings that receive tax payer assistance. Create a *LEED New Orleans* as a high priority to address specifically the special issues of building in the Crescent City.
3. **Incentives** – Encourage the development of new building prototypes that respond to historical precedents while providing innovative and cost-effective modern structures through expedited approvals, waived fees, and tax incentives to offset process costs. Provide the greatest incentives for construction of carbon-neutral or zero-energy buildings.
4. **Partner** – Seek outside partners and funding to deliver housing to meet the needs of New Orleans residents. Work with federal, state, and local agencies and nonprofit organizations, such as Habitat for Humanity International, the Enterprise Foundation, and the Trust for Public land, to meet the extraordinary needs.
5. **Resource Center** – Establish a resource center for community education, job training, access to green building product information, and financial incentive resources.

53% of the US population lives within 25 miles of a coastal area.

Environmental Protection Agency

LEED Rating System

LEED (Leadership in Energy and Environmental Design) is used to rate the overall environmental performance of buildings, measuring such factors as energy efficiency, water efficiency, relationship to the site and community, and how healthy the building is for its occupants. LEED is widely used by governments at all level, universities, developers, corporations, and other building owners who want to improve the performance of their buildings.

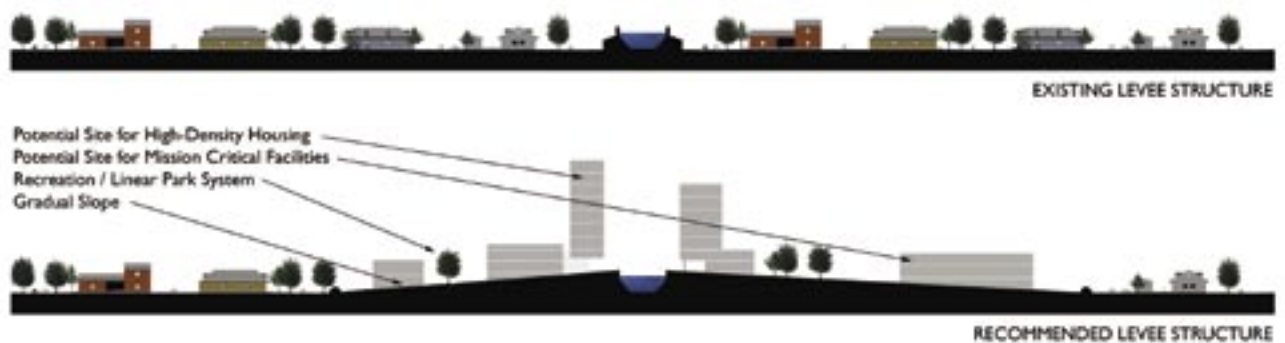


Photo: Daniel Hellmuth, hellmuth + bicknese architects

*One of the first LEED-Platinum certifications—
at the Chicago Center for Green Technology.*



Designing and building hurricane- and flood-resistant houses necessitates a multi-pronged approach. Measures, such as those shown here, not only make homes more survivable during storms but also better, healthier places to live. Low-energy homes will also significantly reduce regional energy needs and related pollution.



Higher, wider levees provide an opportunity to locate high-density housing, hospitals, and other mission-critical facilities above flood levels. The expanded levees could also be part of a system of linear parks serving as amenities for the surrounding neighborhoods as well as another way to connect the city with bike and walking trails. The levee adjacent to the Anderson Park is used in this way.

Principle 8. *Provide for passive survivability*

Homes, schools, public buildings, and neighborhoods should be designed and built or rebuilt to serve as livable refuges in the event of crisis or breakdown of energy, water, and sewer systems.

Background and Context

Hurricane Katrina will not be the last hurricane to hit New Orleans; there will be others. There may also be power outages and fuel supply interruptions caused by terrorism, resource shortages, and other circumstances. In the weeks following Katrina, many newer homes, otherwise little damaged, were not able to be occupied because they depended on electricity to function. This characteristic was also blamed for many deaths, particularly among the elderly. Many older traditional homes, however, functioned without power as they did for many years before electricity. These older homes were designed to minimize solar gain through the use of deep porches and overhangs, and they functioned adequately with daylight as the primary source of illumination. They were designed with high ceilings and cross ventilation, with raised first floors to cool the buildings. Most of these homes originally had their own cisterns for rainwater catchment.

In New Orleans—and everywhere—it makes increasing sense to design buildings so that they can maintain livable conditions in the event of extended power outages or fuel supply interruptions. This design criteria for buildings is referred to here as *passive survivability*.

The most lethal weapon in a hurricane's arsenal is not the wind, but rather the storm surge, the large dome of water, it brings ashore.

National Geographic



Photo: Ralph Bicknese

Cisterns for storing collected rainwater were common in early New Orleans homes.

Benefits

Many experts believe that natural disasters, terrorism, energy supply shortages, and other circumstances will become increasingly common through the 21st century. If that is the case, we can significantly reduce human discomfort and suffering by designing homes, schools, and other public buildings so that they can serve as livable refuges in the event of crisis or the interruption of electricity, heating fuel, water, or sewer systems. Beyond disaster preparedness, these simple strategies make sense, because they reduce operating costs and often create more attractive places to live. If implemented wisely, in an integrated fashion, these strategies should not significantly increase construction costs—some may actually *reduce* construction costs. They also encourage the use of vernacular architecture, which provides unique character to places like New Orleans.

Policy Recommendations and Actions

- 1. Passive Survivability** – Make it the policy of the City of New Orleans that all homes, schools, churches, and civic buildings that could be used as emergency shelters be designed and built to provide life-support shelter in times of crisis—a criteria referred to here as *passive survivability*. These buildings should be designed to maintain survivable thermal conditions without air conditioning or supplemental heat through the use of cooling-load-avoidance strategies, natural ventilation, highly efficient building envelopes, and passive solar design. Schools and other public buildings should be designed and built with natural daylighting so that they can be used without power during the daytime. Co-locate healthcare facilities with schools as part of the community anchor and to strengthen survivability.
- 2. Water Systems** – Provide incentives to homeowners and other building owners for installing emergency water systems, including rooftop rainwater harvesting, in their buildings. Configure rainwater harvesting systems to provide landscape irrigation during normal times (reducing potable water consumption), but with an option so that during power outages or in the event of water supply interruptions, stored water can be used for drinking (with filtration), toilet flushing, bathing, and other uses in the building.

320 miles of floodwalls and levees partition the city.

National Geographic

- 3. Back up Power for Municipal Sewage** – Provide back-up generator power at sewage treatment plants and pumping stations so that minimal sewage line operation can be maintained during extended power outages. Part of the problem is that sewer systems are not sealed. Rain or floodwater enter the system either by infiltration or through vents and manholes. If floodwater overwhelms the system, it backs up into buildings, and untreated waste is released from the treatment plant. One-way valves mitigate this problem, but increase maintenance costs.
- 4. Distributed Infrastructure** – Implement a distributed infrastructure (including power supply, water supply, and communications) to provide these critical services and ensure emergency response capability during times of crisis. Include renewable energy strategies in achieving this requirement.
- 5. Solar Electric Systems** – Seek federal funding through the Solar Roofs Program to provide rooftop photovoltaic (PV) systems on new homes and other buildings in the city. Configure these grid-connected systems so that they can provide emergency power within the building when the electricity grid is down (this will necessitate some battery back-up as well as equipment to safely disconnect the PV system from the grid during blackouts). In normal times, these systems will reduce the owner's need to purchase electrical power, reduce peak demand, and lower regional pollution levels.



Photovoltaic roofs could supply most of the electrical power needs of an average home.

Photo:HOK



Illustration: HOK

Many green building and sustainable landscaping practices allow buildings to provide liveable refuges in the event of extended power outages—a design criteria that can be called “passive survivability.” These practices will also significantly reduce stormwater loading for the city and reduce local ponding.

- 6. Solar Water Heating** – Provide incentives for homeowners, schools, and businesses to install solar water heating systems on buildings.
- 7. Bury/Protect Infrastructure** – Make it the policy of the City of New Orleans to install new electric, communications, and gas lines below ground and protected from stormwater and flood-water loadings.
- 8. Areas of Refuge** – Ensure that each neighborhood or community in New Orleans has a designated building (typically a school, but alternately a public library, church, or other civic building) that can serve the community during times of emergency or extended power outage. Construct or rebuild schools as neighborhood centers and potential refuges. Fund an outreach program to educate residents about this emergency shelter system.

- 9. Highway System** – Upgrade the existing highway system to withstand future Category 5 storms, both to provide safe egress from the city and to save the expense of having to rebuild them after a future storm.
- 10. Emergency Access** – At schools and hospitals and in recreation areas, include spaces that, during an emergency, can be used as assembly areas, helicopter landing spaces, and distribution points.

The storm surge that hit New Orleans was over 20 feet high.

National Geographic

foster

Principle 9. Foster locally owned, sustainable businesses

Support existing and new local businesses built on a platform of sustainability that will contribute to a stronger and more diverse local economy.

Background and Context

Recovery in New Orleans involves more than strengthening its levees, rebuilding homes, repairing and opening schools and hospitals, and restoring power and water throughout the city. For the city to become whole again, businesses must also be strong. With the vast majority of New Orleans businesses currently closed and many business owners unsure if they will reopen, the city is at great risk of losing its economic vitality and the business tax base that funds local services. There is great need to convince shuttered businesses to reopen and to attract new businesses to the city. This process provides an opportunity to establish a platform of sustainability for the economy of New Orleans. The tragedy of Hurricane Katrina can jumpstart the creation of such an economy if local businesses carry out much of the recovery and reconstruction work.

The Katrina storm surge was 30 feet and reached 10 miles inland. Extensive wind and water damage extended 200 miles inland.

The New York Times



Photo:HOX

Mixed-use communities in New Orleans have long supported thriving businesses.

Benefits

The highest rates of job growth in the United States today are not from large national and multinational companies, but rather from small and emerging companies. Likewise manufacturers that have failed to respond to changing needs, such as General Motors, are being forced to downsize, while fleet-of-foot companies like Toyota are experiencing burgeoning growth. Companies that look to the future for opportunities are better positioned for growth than companies that base plans only on the past—that steer using the rear-view mirror. As New Orleans seeks to advance a healthy business economy, supporting and attracting forward-looking, environmentally responsible, and socially responsible businesses will likely yield a high return. By promoting a strong local economy of such companies—with locally owned businesses that pay living wages—everyone in the city benefits.

Policy Recommendations and Actions

1. **Reconstruction Centered Businesses** – Create new, locally owned businesses that produce or provide materials, systems, or services to aid in the reconstruction of New Orleans. New Orleans could become a new center of excellence in reconstruction systems, technologies, and businesses as a new source of strength in the local economy.
2. **Waste as Resource** – Treat waste as a resource by using hurricane waste and demolition debris to advance economic development through locally owned businesses employing local labor. Whenever possible, *deconstruct* buildings that have to be taken down rather than simply demolishing them. Salvage, decontaminate, and store usable building materials for later use in reconstruction. Despite significant challenges, salvaging, decontaminating, and storing usable building materials for later use in reconstruction offers significant promise.
3. **Sustainability Industries** – Establish New Orleans as a world leader in a *New Economy* based on sustainable manufacturing and service industries. Attract clean industry that does not generate harmful emissions. Create new exportable skills and services based on environmental resilience, renewable energy, and responsible water-use technologies. For example, a New Orleans-based photovoltaic solar roofing industry could be the 21st century equivalent of the Higgses Boats of World War II fame. Just as New Orleans helped win that war with its local boat industry, so too could it help win the war for more reliable and sustainable energy sources.
4. **Center of Disaster Response and Mitigation** – Seek federal funding to establish a New Orleans-based Center of Excellence for Disaster Response and Mitigation. This Center can develop and export technologies and best practices for responding to

In the New Orleans area more than 750,000 workers lost their jobs.

natural disasters and other emergency situations. The Center can refine *passive survivability* building practices and code language. Local businesses and consulting firms built around this Center can generate economic growth for the city and region.

5. **Agriculture** – Within the conservation districts created for the protection of the city, designate agricultural areas to provide jobs and support the local food-service industry. Develop farmers markets in conjunction with community centers.
6. **Eco-Tourism** – Expand the tourism industry to include eco-tourism, making use of the restored wetlands and conservation areas to the east and south and immediately adjacent to the city. In addition, such sustainability features as passive survivability, energy efficiency, and effective water management can bring people to New Orleans for learning.
7. **Economic Growth** – Expand small business and micro-credit loan programs to help create or expand local business and create jobs.



Photo: Daniel Hellmuth, Hellmuth + Bicknese Architects

Fabricating photovoltaic panels at a factory in Chicago—such industries could expand the New Orleans economic base and become the “Higgses Boat” of the 21st century.

focus

Principle 10. Focus on the long term

All measures related to rebuilding and ecological restoration, even short-term efforts, must be undertaken with explicit attention to the long-term solutions.

Background and Context

There is a tendency in responding to any emergency to focus only on the immediate needs and problems, without addressing the long-term picture. The Marshall Plan put forth by the United States at the close of World War II dramatically strengthened Western Europe's economy, in part because it considered the long term. Key funding was provided to catalyze economic growth in 16 countries, and these economies blossomed. Simply throwing money at New Orleans will not fix the city's problems—while it may solve some immediate problems relating to hurricane damage, it will not fix the deeper, more systemic problems that have plagued the city for decades. Planning related to the recovery of New Orleans will be most successful if long-term impacts and benefits are addressed with every decision.

Benefits

With the tragedy of Hurricane Katrina and the planning and rebuilding that will emerge during the recovery, there is a once-in-a-generation opportunity to fix many of the problems that have long plagued the city. This holds true for wetlands and protecting the city from storm surges, and it holds true for promoting social justice in the city. If approached wisely, the ensuing planning and rebuilding in New Orleans can bring about dramatic improvement for the city, its residents, its environment, and its future.

It will take a year or more to restore the network of electrical transmission lines, substations, and feeder lines.

Entergy Corporation



Photo: Jocelyn Augustino/FEMA

Preventing future flooding of New Orleans will necessitate effective long-range planning.

Policy Recommendations and Actions

- 1. Visionary Master Plan** – Use the opportunity to remaster a city and regional plan that corrects past mistakes. Make decisions that will serve New Orleans well for the next several hundred years.
- 2. Temporary Basic Services** – Provide temporary solutions for basic services (including water, sewage treatment, electricity, and security) that will allow system-wide improvements to be made in the context of integrated needs assessment and planning.
- 3. Temporary Structures** – Phased solutions, such as temporary housing and classrooms, can be implemented in a manner that allows longer-term solutions to be fully planned and implemented.
- 4. Establish Priorities** – Prioritize the implementation of long term, environmentally responsible, and economically responsive improvements to the city.

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The Enterprise Foundation
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Special Thanks To

U.S. Green Building Council Chapters:
St. Louis
Arkansas
Houston
Balcones (Texas)
Alabama
South Florida
Louisiana (forming chapter)

The New Orleans Principles Report

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