

## Section 2 - Recovery Assessment

The first major task of the Unified New Orleans Plan process was to assess the level of damage and the status of recovery efforts across a number of sectors, including: Flood Protection; Infrastructure and Utilities; Transportation; Housing; the Economy; Healthcare; Education; Historic Preservation and Urban Design; Environmental Issues; and Community Services (Public Safety, Recreation, Libraries; and other Municipal and Cultural Facilities). The assessments were performed at the citywide-level as well as across all thirteen Planning Districts. This section provides summaries of each sector assessment.<sup>2</sup> This introduction also contains information about New Orleans before the storm and a discussion of present and future population of the City.

### 2.1 New Orleans Before the Storm

On August 28, 2005, the day before Hurricane Katrina made landfall, the City of New Orleans was home to approximately 465,000 residents.<sup>3</sup> It was world renowned for its festivals, music, food, history and architecture. The thriving tourism industry attracted over 10 million visitors annually to the City's 38,000 hotel rooms and produced over 80,000 jobs in the hospitality and leisure industries.<sup>4</sup> The City's strategic location near the mouth of the Mississippi River enabled it to become one of the world's great ports. The Port of New Orleans accommodated an average of 2,000 oceangoing vessels per year and supported over 160,000 jobs in the metropolitan region.<sup>5</sup>

Pre-Katrina, New Orleans' economy was generally growing but at a slow pace. Energy (oil and gas), has had a strong presence in New Orleans since the advent of offshore drilling in the 1940s and 1950s. Despite job loss through corporate consolidations and relocations, a critical mass of well-paying, energy-related jobs remained in the region. Likewise, the New Orleans metropolitan area was also home to a growing healthcare sector with around 80,000 individuals employed in healthcare and medical education.<sup>6</sup> The Tulane School of Medicine and the Louisiana State University (LSU) Health Sciences Center, both located in New Orleans, were major contributors to the economic strength of these sectors, which provided well-paying jobs that helped reduce the growing gap between household incomes (and other socio-economic statistics) in New Orleans and the rest of the nation.

Despite these assets, local leaders and residents faced significant challenges prior to the storm. New Orleans' steady population decline since the 1960s (see Figure 2-1) had taken a toll on the City and its tax base and many other indicators of municipal health (i.e., poverty, crime, etc.) showed a city in deep economic malaise.

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<sup>2</sup> Citywide Recovery Assessment was published as an appendix to Working Paper #2 and is available on the UNOP website

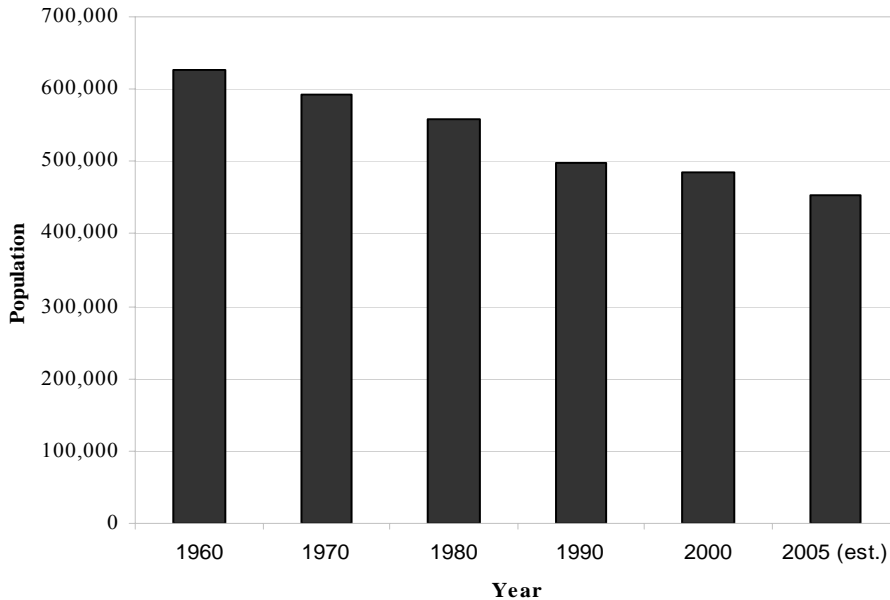
<sup>3</sup> U.S. Bureau of the Census, July 1, 2005 Population Estimate, <http://www.census.gov/popest/counties/files/CO-EST2005-ALLDATA.csv>

<sup>4</sup> New Orleans Convention and Visitors Bureau, Economic Impacts of Tourism, <http://www.neworleanscvb.com/static/index.cfm/contentID/164/sectionID/4/subsectionID/0>

<sup>5</sup> [http://www.portno.com/pno\\_pages/about\\_overview.htm](http://www.portno.com/pno_pages/about_overview.htm)

<sup>6</sup> Louisiana Department of Labor, Louisiana Workforce at a Glance, Monthly Reports, 2004, 2005 and 2006

**Figure 2-1 Population Decline in New Orleans, 1960 to 2005**



*Source: U.S. Bureau of the Census, July 1, 2005 Population Estimate.*

According to the 2000 Census, New Orleans had 26,840 vacant or abandoned housing units – 12.5% of the City’s housing stock. Census data also showed that New Orleans had more families in poverty, a lower median household income, and fewer homeowners than the national average (see Table 2-1).

**Table 2-1 New Orleans versus Nationwide Statistics**

	<b>New Orleans</b>	<b>U.S.</b>
Median Household Income (1999)	\$27,133	\$41,994
Families in Poverty	23.5%	9.2%
High School graduate or higher	74.7%	80.4%
Bachelors degree or higher	25.8%	24.4%
Homeownership rate	47.0%	66.0%

*Source: U.S. Department of Commerce, Bureau of Census, 2000*

Many of the City’s agencies did not have the capital to sustain their basic needs. Pre-Katrina, the New Orleans Sewerage and Water Board (S&WB) estimated that the water supply system needed \$2.8 billion in repairs and the wastewater system repairs would cost \$977 million. The Orleans Parish School Board

had struggled for years to maintain and provide basic operations and services, as schools received failing grades<sup>7</sup> and facilities fell into worsening conditions.

## 2.1.1 Planning Districts

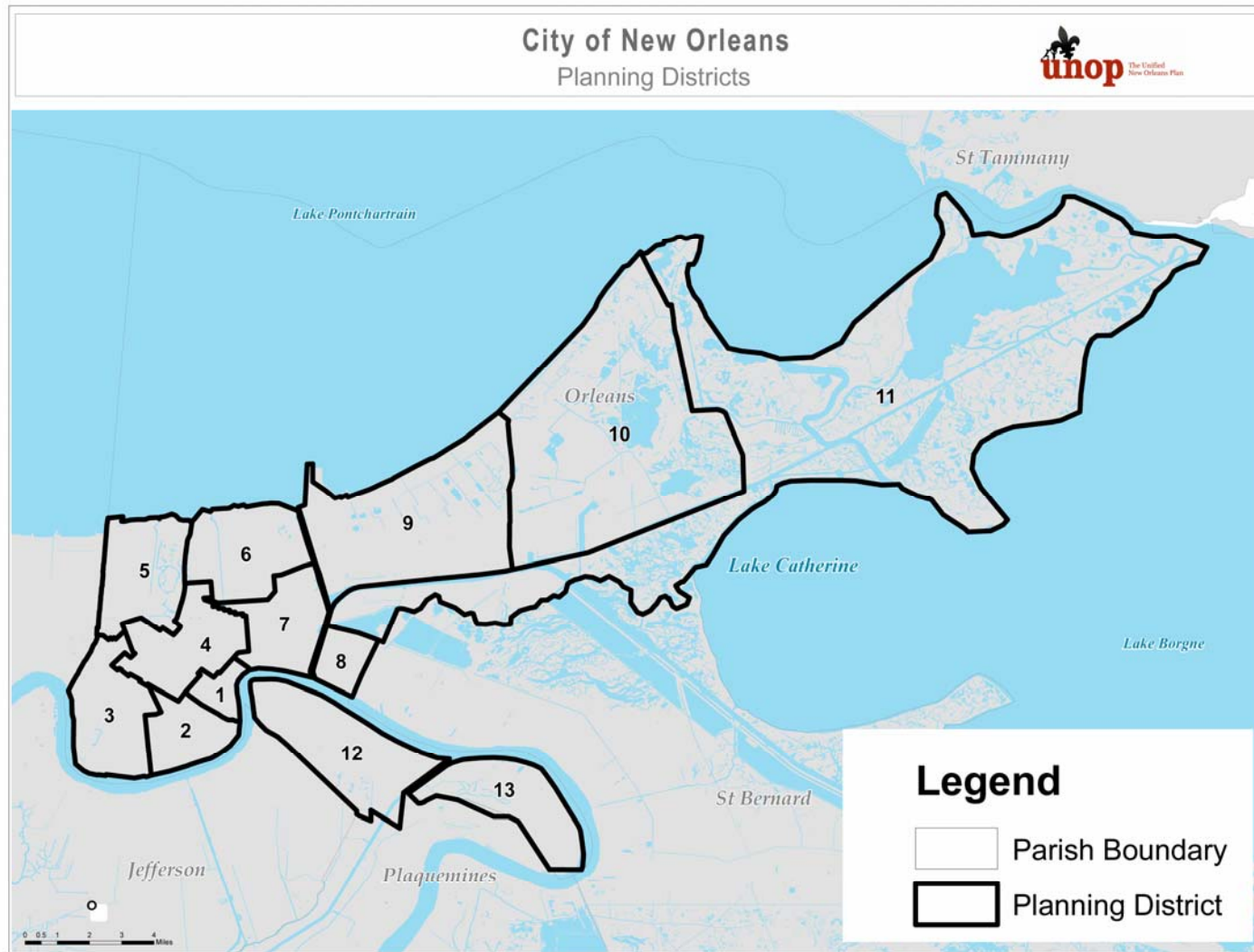
In 1980, the City Planning Commission divided the City into 13 planning districts and 73 distinct neighborhoods. The Planning Districts are shown on Figure 2-2, and the neighborhoods which they encompass are listed in Table 2.2. The Planning District boundaries have been used by the City Planning Commission and Unified New Orleans Plan in the recovery planning process.

The original neighborhood boundaries were created to coincide with census tracts, which are often used to better understand the demographics of an area and plan for its needs. However, residents of neighborhoods often define their boundaries differently, based on street networks, impediments, and major intersections. Even though the City still officially recognizes the 73 neighborhoods for planning purposes, many more neighborhood groups have emerged and been identified and involved as part of the UNOP and other recovery planning processes. (The City Planning Commission should consider updating its official list of neighborhoods and modifying its Planning District maps accordingly.)

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<sup>7</sup> Greater New Orleans Community Data Center, <http://www.gnocdc.org/orleans/education/html>, 47% of Orleans Parish Schools were rated “academically unacceptable” and 26.5% were rated as “academic warning” in the 2003-2004 school year.

**Figure 2.2: Boundaries of 13 Planning Districts in New Orleans**



Source: City of New Orleans

**Table 2.2 Planning Districts and associated neighborhoods in New Orleans**

<b>Planning District</b>	<b>Neighborhoods</b>
District 1	Central Business District and French Quarter
District 2	Central City, East Riverside, Garden District, Irish Channel, Lower Garden District, Milan, St. Thomas, and Touro
District 3	Audubon, Black Pearl, Broadmoor, Dixon, East Carrollton, Fontainebleau, Freret, Hollygrove, Leonidas, Uptown, Zion City, and West Riverside
District 4	Bayou St. John, B.W Cooper, Fairgrounds, Gert Town, Iberville, Mid-City, St. Bernard Area, Seventh Ward, Treme/Lafitte, and Tulane/Gravier
District 5	City Park, Lake Shore, Lakeview, Lake Vista, Lakewood, Navarre, and West End
District 6	Dillard, Filmore, Gentilly Terrace, Gentilly Woods, Lake Terrace, Milneburg, Pontchartrain Park, St. Anthony
District 7	Bywater, Desire, Florida Avenue, Marigny, St. Claude, and St. Roch
District 8	Holy Cross and Lower 9 <sup>th</sup> Ward
District 9	Little Woods, Pines Village, Plum Orchard, Read Boulevard East, Read Boulevard West, and West Lake Forest
District 10	Village de L'Est
District 11	Lake Catherine, Viavant/Venetian Isles
District 12	Algiers, Algiers Point, Algiers Naval Station, Aurora, Berhman, Fischer, MacDonogh/Riverview, Tall Timbers, and Whitney
District 13	English Turn and New Aurora

*Source: New Orleans City Planning Commission, 2006.*

## 2.2 Hurricane Katrina’s Impacts

Hurricane Katrina’s eye first made landfall in Buras, Louisiana around 6 a.m. on the morning of August 29, 2005, causing substantial wind and surge damage. The first storm surge was between 21 and 28 feet high and inundated much of New Orleans’ neighboring Plaquemines Parish. The eye then came ashore again about 30 miles northeast of the City, near Slidell, Louisiana, as a Category 3 hurricane. While wind-related damages were extensive, it was the storm surge and subsequent flooding which caused New Orleans’ catastrophic level of loss.

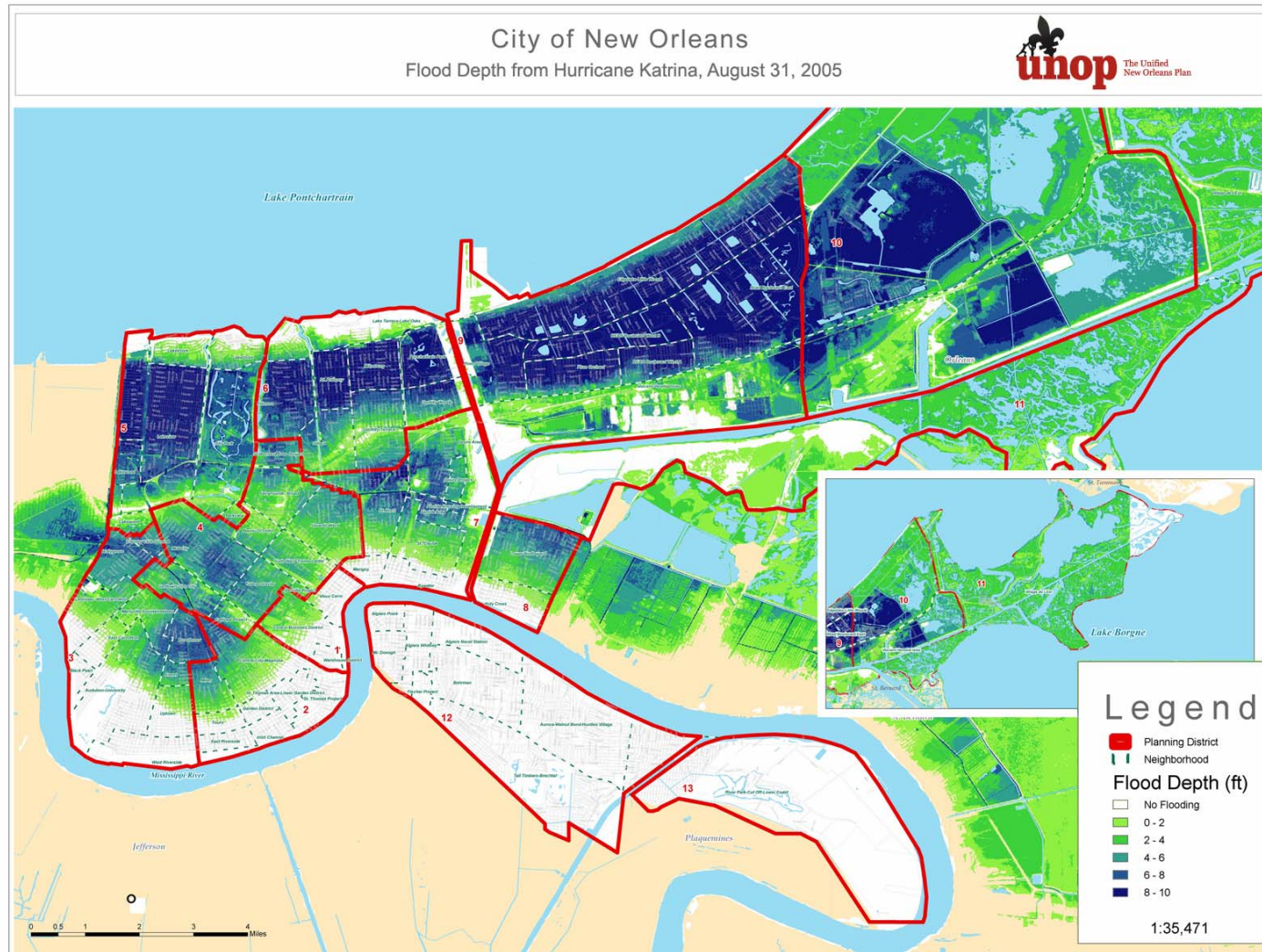
In the eastern region of the City, including New Orleans East and the Lower Ninth Ward, the flooding was caused primarily by levee overtopping, as well as levee and floodwall failures caused by the intense pressure of storm surge heights. The Mississippi River Gulf Outlet (MR-GO) funneled water from Lake Borgne inwards towards the Industrial Canal, overtopping and breaching levees in New Orleans East. Floodwalls on both sides of the Industrial Canal were first overtopped and then breached. Later, one mile

of floodwall protecting New Orleans East from Lake Pontchartrain was overtopped, adding to the already severe flooding in that area.

In the central portion of the City, most of the flooding was caused by failures of floodwalls in the three drainage outfall canals leading to Lake Pontchartrain. Breaches occurred in several places: first on the east side of the London Avenue Canal (flooding Gentilly), then on the east side of the 17<sup>th</sup> Street Canal (flooding Lakeview), and finally on the west side of the London Avenue Canal (adding to the Gentilly flooding). Surge from Lake Pontchartrain also overtopped a section of embankment (lower than the surrounding floodwalls) and flooded City Park. Brackish water continued to pour into the City for three days, until midday on September 1, 2005, when flood levels began to equalize with the surrounding lake levels. In all, roughly 80% of the City was inundated. The depth of flooding varied most notably by elevation; see Figure 2-3.

Studies performed in recent years had highlighted the vulnerabilities of the hurricane protection system to a storm of this size, and in the days prior to landfall, the City and State implemented a successful evacuation of residents with automobiles. Estimates show that over 80% of the City's population – and about 1 million people from the metro area - evacuated successfully. Many residents did not evacuate for a variety of reasons, including health or financial reasons, caring for pets, and other personal reasons. Many of these had to be later rescued in the days that followed, while others perished as floodwaters rose too quickly for them to escape. As the city continued to fill up with water, the Mayor announced a mandatory evacuation of all non-essential personnel remaining in the City.

**Figure 2.3 Depth of Flooding (As measured on August 31, 2005)**



The method of flooding, depth of flooding, and flood duration all affected the response efforts as well as the initiation of recovery across the City. On September 5, the first levee breach was finally sealed and most of the City was “unwatered” (a term used by the USACE to describe removing surface waters) by September 9<sup>th</sup>. Then, Hurricane Rita made landfall in south-central Louisiana on September 28, which caused additional flooding in parts of the Lower Ninth Ward, Gentilly, and New Orleans East. Former residents of the “dry” areas were the first to return in mid- to late-September, but, it took several more weeks to unwater parts of the City that had flooded a second time.

In all, Hurricane Katrina took more than 1,600 lives, over 1,000 of which were in Orleans Parish. Nearly 80% of the housing stock in the City was destroyed or severely damaged, the flood protection system was obliterated, the water and sewerage treatment and distribution systems were rendered useless, and electricity and communications were all but wiped out.

## 2.3 Population Loss and Recovery – Current and Future

For weeks in September 2005, the City of New Orleans was a virtual ghost town. While recovery of population in other disasters in other cities has been relatively quick in modern times, none had the widespread destruction or degree of forced and long-term displacement as New Orleans. Demographers note that the longer residents are displaced, the less likely they are to return.

It has become a matter of great debate as to what the actual population of New Orleans – defined as the number of people sleeping in New Orleans overnight – is. Estimates have ranged from 190,000 to 230,000. For planning purposes, estimates of both short- and long-term population of New Orleans have been developed by UNOP, based upon a number of data sources, including FEMA inspection reports, FEMA trailer counts, historical building permit activity, and post-Katrina economic analyses. Our estimates indicate that at the end of 2006, about 210,000 to 230,000 of New Orleans’ pre-Katrina population (460,000) was back. This estimate is not much higher than estimates made in early 2006, suggesting that those residents who did not sustain much damage, or had the financial means and jobs to return to, came back as soon as they could, but population growth overall has been slow since then.

In November 2006, electric utility activity was analyzed to examine population trends in smaller geographical areas. Electricity usage at the block level was compared between November 2004 and November 2006. This analysis revealed that levels of repopulation vary dramatically across the City. The following table summarizes the current population estimates for each planning district. It should be noted that these are estimates and not an exact tally of residents currently living in each district. This analysis indicates that the population in undamaged neighborhoods has recovered and even grown in some cases. Not surprisingly, those areas with less flooding rebounded more quickly than the more heavily damaged areas. Construction is making progress in areas that were moderately or only slightly damaged, while many of the mostly heavily damaged neighborhoods have little activity.

### 2.3.1 Short-Term Population Forecast

The scarcity of post-Katrina housing has been a major impediment to recovery of residents and businesses across New Orleans. Short-term population forecasts depend heavily upon the level of flooding sustained in particular neighborhoods. Flood depth-specific rates of return for the pre-Katrina housing stock and population were developed and then adjusted to reflect the socio-economic profile of neighborhoods. Based upon field observations, the forecasts assume that areas with higher-levels of home ownership and flood insurance and relatively high median incomes will recover more quickly than other neighborhoods. Rates were also adjusted to account for the locations of FEMA group trailer sites and the population associated with those households. The results of the short-term forecasts are shown in the following tables.

**Table 2-3 Short-Term Population Forecasts**

2007 Population Totals					
	Pre-Katrina Households	Pre-Katrina Population (2000)	January 1, 2007 Projected Population Low Scenario	January 1, 2007 Projected Population Moderate Scenario	January 1, 2007 Projected Population High Scenario
Citywide Total	188,251	484,674	209,893	225,257	232,269
Citywide Total as Percentage			43.31%	46.48%	47.92%

2008 Population Totals					
	Pre-Katrina Households	Pre-Katrina Population (2000)	January 1, 2008 Projected Population Low Scenario	January 1, 2008 Projected Population Moderate Scenario	January 1, 2008 Projected Population High Scenario
Citywide Total	188,251	484,674	254,787	267,631	287,570
Citywide Total as Percentage			52.57%	55.22%	59.33%

2009 Population Totals					
	Pre-Katrina Households	Pre-Katrina Population (2000)	January 1, 2009 Projected Population Low Scenario	January 1, 2009 Projected Population Moderate Scenario	January 1, 2009 Projected Population High Scenario
Citywide Total	188,251	484,674	286,152	299,278	323,169
Citywide Total as Percentage			59.04%	61.75%	66.68%

Source: GCR & Associates, Inc..

Over the first half of 2007, population growth is likely to proceed slowly, but then accelerate somewhat later in 2007 and early 2008, once more of the Road Home funds are disbursed and rebuilding activity increases. From 2008 onward, higher rates of rebuilding activity are likely for many years.

### 2.3.2 Long-term Population Forecast

Projecting New Orleans’s population more than one year into the future is challenging. Nonetheless, there are several reasonable assumptions that can be made. The first assumption is that vacant housing within the undamaged areas of the city will be filled by August 2007. Currently, the overall vacancy rate is slightly higher than pre-Katrina rates since many houses are for-sale and residents are still making long-term decisions. By August 2007, buying and selling activity is expected to stabilize and excess vacancies will be absorbed.

It is also assumed that higher levels of rebuilding activity are likely to occur in neighborhoods that were minimally flooded, are near intact employment and commercial centers, and are already experiencing observable activity. In essence, certain neighborhoods are expected to reach a “tipping point” whereby housing, infrastructure, and the commercial sector are sufficiently viable. Once this “tipping point” is reached, then recovery activity is expected to accelerate considerably. In other neighborhoods where damage was heavier, it is assumed that similar levels of viability will take much more time to reach. Therefore, the long-term population forecasts are expected to vary significantly from neighborhood to neighborhood across the city. Furthermore, there are also going to be geographic shifts in population over time. Some neighborhoods will exceed their pre-Katrina population while others will house only a fraction of their pre-Katrina residents.

A major factor that will drive geographic shifts in population is the location and rates of new housing construction. Vacant office buildings and industrial buildings, surface parking lots, and the underutilized upper floors of commercial buildings provide opportunities for new construction. Incentives, such as expanded New Market Tax Credits and federal Historic Rehabilitation Tax Credits, will provide a major catalyst for this type of “infill” growth. Planning districts 1 and 2 are well positioned to capture this residential growth, as demonstrated by the number of new projects announced in both areas.

Taking these myriad factors into account, the long term population estimates are shown in the tables below. By January 2017, the City’s population may finally approach its pre-Katrina level, with estimates ranging from about 389,000 to 461,000 residents. The exact rate at which population growth occurs in New Orleans is highly variable and hinges on a variety of issues affecting the pace of recovery. Strategic management of the recovery process, coupled with a strong economy and outside investment, could strengthen the City’s ability to achieve its pre-Katrina population by 2017. Alternatively, there are also many factors that could negatively affect long-term forecasts. In 2017, New Orleans’ population could be far less than its pre-Katrina population, even with over a decade of reconstruction.

**Table 2-4 Long-Term Population Forecasts**

2012 Population Totals					
	Pre-Katrina Households	Pre-Katrina Population (2000)	January 1, 2012 Projected Population Low Scenario	January 1, 2012 Projected Population Moderate Scenario	January 1, 2012 Projected Population High Scenario
Citywide Total	188,251	484,674	333,709	357,050	404,341
Citywide Total as Percentage			68.85%	73.67%	83.43%

2017 Population Totals					
	Pre-Katrina Households	Pre-Katrina Population (2000)	January 1, 2017 Projected Population Low Scenario	January 1, 2017 Projected Population Moderate Scenario	January 1, 2017 Projected Population High Scenario
Citywide Total	188,251	484,674	389,477	429,155	460,844
Citywide Total as Percentage			80.36%	88.54%	95.08%

Source: GCR & Associates, Inc.

Irrespective of the exact population tally, in 2017, the density and geographical distribution of New Orleans’ residents will be substantially different than today. The areas that had minimal to no flooding are likely to have more residents than today, while even the most optimistic population forecasts do not assume a full recovery of severely flood damaged neighborhoods by 2017.

## 2.4 Recovery Assessment by Sector

During the first year of recovery, agencies prioritized restoration of water, sewerage, drainage and power. Traffic signals and street lights were repaired. Phone service resumed. Homeowners, businesses and renters salvaged what they could and began the arduous task of filing insurance claims, seeking other forms of financial assistance, and reconstructing their lives. This period culminated (most notably in September 2006) with the renovation and grand re-opening of the Louisiana Superdome and in October the restoration of potable water in the Lower Ninth Ward. At that time it was announced that all areas of the City had functioning basic infrastructure. Yet, while an overall degree of normalcy has gradually been achieved in the City, there were still many gaps.

By the end of 2006, recovery and restoration in the City of New Orleans had reached a new plateau. Unlike the weeks and months immediately following the flood, the streetscape of recovery across the City was now calmer and less hectic. We have entered a new period that could be called the “beginning of the long haul,” wherein the action has largely shifted from restoration efforts to resettlement efforts.

New Orleans’ residents, businesses, public and non-profit agencies have submitted thousands of claims for reimbursement to insurers and federal agencies. They have filed a similarly tall stack of applications for grants and loans to rebuild homes, businesses, and public facilities. Over \$50 billion is estimated to either have been allocated or paid for claims, grants, and loans in Orleans Parish alone. For public agencies, the first round of funding was used for the basics: emergency response, debris removal and clean-up, and basic repairs and restoration of utilities and services. Now, the City and other public agencies are beginning a next phase of recovery that will take many years as major structures lost in the storm are rebuilt (e.g. criminal justice buildings, schools, hospitals). An overhaul of the City’s infrastructure (e.g. roads, water, sewers), which had been deteriorating pre-Katrina, will also be needed and cannot be fully carried out with the limited funds for repairs that FEMA Public Assistance and insurance claims provide.

The next wave of activity is expected to be defined, in large part, by the decisions made by individual homeowners and business owners as they decide how to use the funds available from insurance proceeds, Small Business Administration (SBA) loans and the Louisiana Recovery Authority (LRA) Road Home grants to repair, reconstruct, or sell their homes. During this next period, thousands of individuals will be making decisions about their – and their families’ – futures. These decisions range from where to live, to whether or not to reopen a business and this decision-making process will be affected by a number of issues. The UNOP process identified two overarching issues that frame the future recovery: the pace of repopulation in neighborhoods and the current and future level of flood risk within drainage basins.

In previous sections we have already discussed how the rate of population recovery is uneven across the City and how it correlates to depth of flooding in specific neighborhoods, the degree of damage to structures, and the socio-economic status of the residents of those neighborhoods prior to Katrina. In the following sections we will review other sectors that can affect the rate of population return, starting with the current and future levels of risk for flooding. While it might be said that some sectors should have priority over others – flood protection over libraries, for example – that is not necessarily the case. It is more accurate to say that a number of sectors must be advanced simultaneously – i.e., flood protection;

water, sewerage, and street repairs; housing, economic recovery; healthcare; and education – and that it is more important to prioritize projects within sectors than across sectors.

## 2.4.1 Current and Future Risk of Flooding

New Orleans is both a river city and a coastal city and must be protected from both riverine and tidal flooding. The original settlement of the City occurred adjacent to the Mississippi River on some of the highest ground, the natural levee of the Mississippi, or the “sliver by the river.” Topography and the evolution of flood protection techniques have dominated the City’s settlement pattern ever since. Development spread first along the highest ground to the east and west of the French Quarter along the river. Then, wetlands were drained and pumps installed to allow development to progress northward towards Lake Pontchartrain and, in the last 50 years, across the Industrial Canal to New Orleans East. Similarly, on the west bank, development spread south and east along the natural levee from Algiers Point and eventually into lower-lying ground.

The City of New Orleans exists in a very watery world. In addition to being surrounded by lakes to the north and east and bisected by the Mississippi River, the City is also surrounded by water above (humid atmosphere and sixty inches average annual rainfall) and below (a high water table). The three main threats for flooding for the City of New Orleans are: (1) seasonal flooding of the Mississippi River, (2) heavy spring rains in the form of thunder storms and (3) storm surge flooding and heavy rains associated with tropical cyclones/hurricanes. Over time, the City devised measures to protect against these threats – measures which have not always been successful - and must now continue to be vigilant as these threats change.

### 2.4.1.1 *Mississippi River Flooding*

The U. S. Army Corps of Engineers (USACE) has the responsibility to control the flow of the Mississippi River to prevent flooding of the adjacent countryside. This is done with a system of levees and spillways (such as Morganza and Bonnet Carré). In the New Orleans area, the Mississippi River levees are about twenty-five feet above mean sea level (MSL). It should be noted that the City of New Orleans has never been flooded by the river in modern times.

### 2.4.1.2 *Storm Surge Flooding from Tropical Storms*

Storm surges come in through tidal passes and man-made navigation channels to the east of the City and can raise the level of Lake Pontchartrain (some fourteen feet in the case of Katrina) which, coupled with strong north winds resulting from the counterclockwise circulation of the cyclone, drives the surge southward towards the City. It is the potential for storm surge entering Lake Pontchartrain that determines the height of the levees along the lakefront, which average about +17 feet MSL. To protect the flanks of the City on the east and west, the USACE has connected the Mississippi River levees to the Lake Pontchartrain levees, creating the familiar “bowls” that serve as the hurricane protection levee system.

### *2.4.1.3 Flooding from Spring Rains*

Thunderstorms in the spring can bring heavy rains. Between May 1978 and May 1995, there were more than a half dozen rainfall events that were described as once-in-a-hundred-years storms. In 1995, it rained eight inches on Monday and sixteen inches on Tuesday, causing widespread flooding in Orleans, Jefferson and St. Tammany Parishes. Because much of New Orleans lies below sea level and is surrounded by its rings of levees, all the rain that falls inside the bowls and becomes run-off must be collected, channeled to a pumping station, lifted over the levee and discharged into a surrounding body of water.

### *2.4.1.4 The Current Hurricane Protection System*

The City is often described as a bowl, rimmed by man-made levees with interior surface levels ranging from a few feet above sea level to as much as 10 feet below sea level. Generally, the levees extend from the large earthen levees along the Mississippi River to smaller earthen levees to protect against Lake Pontchartrain to the north and Lake Borgne to the east. Both of these lakes connect to the Gulf of Mexico.

In reality, most of the City of New Orleans and parts of the adjacent parishes reside within five separate bowls, or drainage basins. (See Figure 2-4.) These basins are largely a creation of the U.S. Army Corps of Engineers (USACE) which, after the widespread flooding caused by Hurricane Betsy in 1965, was charged with developing the Lake Pontchartrain and Vicinity Hurricane Protection Plan. The fact that the basins cross municipal and parish boundaries is an indication of the regional approach to flood protection that the USACE took. These basins include:

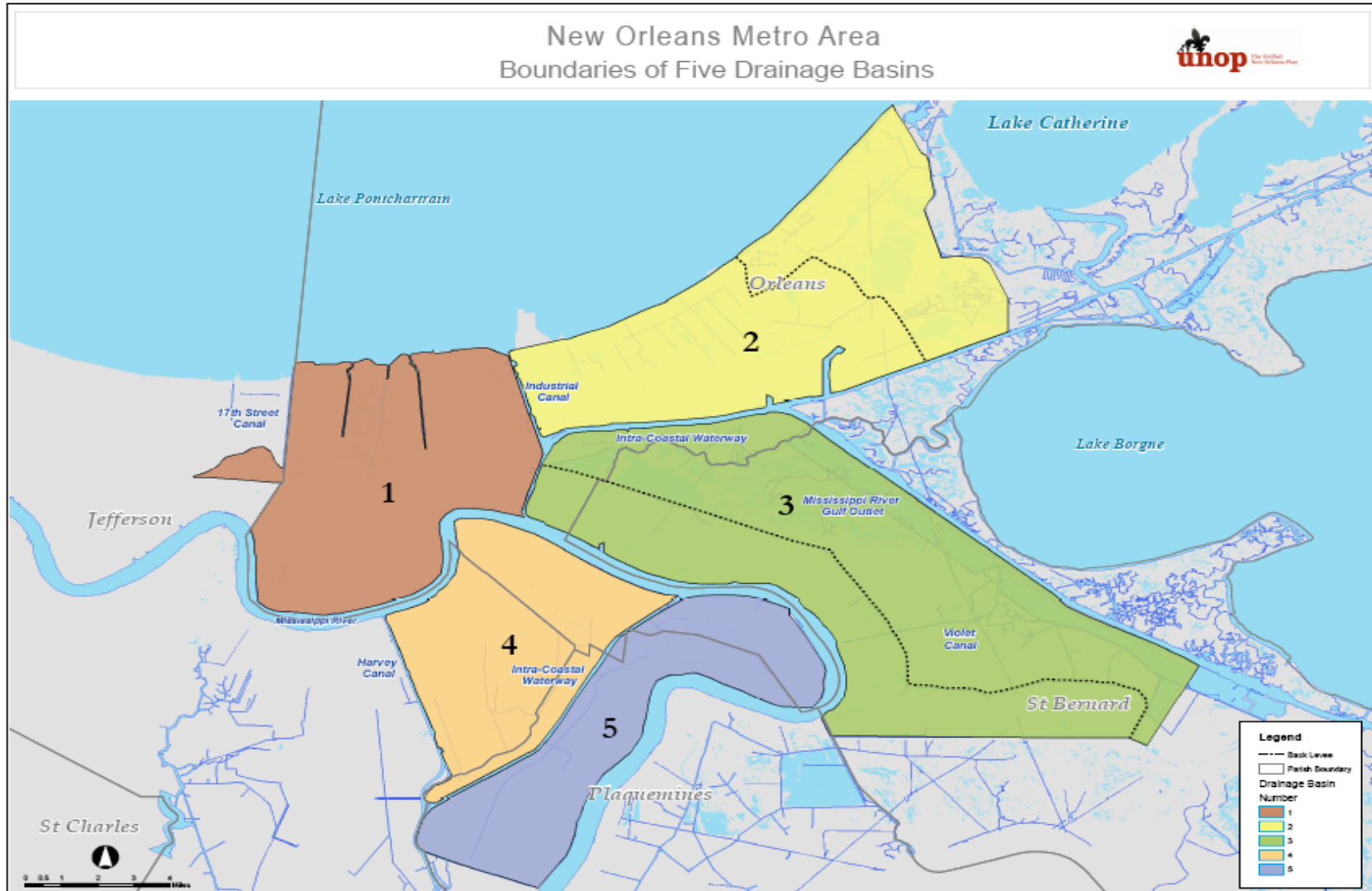
- 1) The original city, extending from the river to the lake and from the Industrial Canal to the 17<sup>th</sup> Street Canal
- 2) New Orleans East, from the Industrial Canal to Irish Bayou and from the Intracoastal Waterway to Lake Pontchartrain
- 3) The Lower 9<sup>th</sup> Ward shares a large drainage basin with St. Bernard Parish
- 4) Upper Algiers shares a drainage basin with Gretna and Harvey
- 5) Lower Coast Algiers shares a drainage basin with Belle Chasse.

During Katrina, the USACE's hurricane protection system levees on the east side of the Mississippi River took a terrible beating. Some levees were overtopped by the storm surge and then destroyed by scouring on the un-reinforced back sides. Along the Industrial Canal and the three drainage outfall canals, floodwalls failed before they were overtopped, leading to catastrophic flooding of the historic city.

At a cost of more than \$350 million in the first year of recovery (through August 2006), the U.S. Army Corps of Engineers (the USACE) repaired 220 miles of damaged levees and floodwalls in Basins 1, 2 and 3, completely replacing more than 25 of those 220 total miles. But, Katrina exposed a number of other glaring weaknesses in the City's hurricane levee protection system. These weaknesses will take years to correct and leave the City vulnerable in the interim. Two flaws were paramount: (1) storm surge was

allowed to penetrate deep into the heart of the City through the pumping station outfall canals at 17<sup>th</sup> Street, London Avenue, and Orleans Avenue; and (2) storm surge was concentrated at the confluence of the MR-GO and the Intracoastal Waterway (GIWW) levee systems, forming a bottleneck that forced the surge up and over the levees, flooding New Orleans East and the Lower Ninth Ward. The Lower Ninth Ward was also the victim of a catastrophic floodwall failure along the Industrial Canal.

Figure 2.4: Five (5) Drainage Basins for the City of New Orleans



To remedy the first problem, the USACE has constructed temporary storm surge gates at the lakefront mouths of the outfall canals as part of a longer-range plan to construct permanent pumping stations at the lakefront. However, while the temporary storm surge gates solve one problem, they reduce the pumping capacity of the canals, causing another problem. When the gates are closed for storm surge protection, the diminished outflow could cause rainwater to back up in the canals and then spill over into nearby low-lying residential neighborhoods. This risk will persist until either temporary pumping capacity is increased or the new pumping stations are constructed, which is planned for completion in 2010.

The second problem – storm surge in the eastern part of the City – is less amenable to such a quick fix. It will take years to plan, design, obtain environmental permits, and then construct engineered systems in the coastal zone that will retard and redirect future storm surge so that it doesn't overwhelm the City's hurricane protection levee system. Until these systems are well underway, the eastern part of the City will continue to be vulnerable to storm surge. The USACE's current program of improvements is planned for completion in 2010. Until at least that year, all of the City – Eastbank and Westbank will continue to be susceptible to flooding from even moderate storms. Beyond 2010, the eastern part of the City and St. Bernard Parish will continue to be susceptible to storm surge until coastal restoration projects come to fruition, which may take decades.

District Plans have used data provided by UNOP and the City to identify areas of the Districts that are at low elevations and have flooded repeatedly. In the greatest flood (Katrina) much of the older housing stock (50 years plus) was elevated on piers and withstood flooding to a greater extent than new slab-on-grade structures. The City adopted FEMA's advisory base flood elevations issued for Orleans Parish in April 2006. All new construction must now comply with FEMA advisory base flood elevation guidelines.

The devastation caused by Hurricanes Katrina and Rita in 2005, resulted in the establishment of three coast-wide restoration and protection planning efforts that are independent, yet interrelated. First, the U.S. Congress directed the USACE New Orleans District, to prepare a Louisiana Coastal Protection and Restoration Project Report (LACPR) that would provide Category 5 level of protection and include a "full range of flood control, coastal restoration and hurricane protection measures." The USACE's Preliminary Technical Report was produced in July 2006 and the draft and final environmental impact statement and technical report are due in July 2007 and December 2007, respectively.

Second, the State of Louisiana directed the Coastal Protection and Restoration Authority (CPRA) to develop a Comprehensive Master Plan with the guiding principles being: 1) integration of protection and restoration, 2) public and stakeholder involvement, 3) adaptive management and other processes, 4) recognition of constraints, and 5) land use. The CPRA held a series of stakeholder meetings and public outreach between August and October 2006. It delivered a Preliminary Plan and held public meetings on that plan in November and December, 2007, respectively. A Draft Plan is due in January 2007 with public hearings in February 2007 and a Final Plan will be presented in April 2007.

Third, the State of Louisiana established the Louisiana Recovery Authority (LRA) to formulate alternative redevelopment scenario to develop a sustainable, long term vision for South Louisiana in the

wake of destruction caused by Hurricanes Katrina and Rita. All three of these plans are currently under review.

### ***2.4.1.5 Risk of Flooding by Planning District***

The assessment of flood risk is a highly complicated and specialized field of endeavor, far beyond the purview of the UNOP process. However, the USACE's Interagency Performance Evaluation Task Force (IPET) is conducting such a risk analysis of the potential for flooding in all geographic areas of New Orleans. This analysis is expected to be released in April of 2007 and should be used to guide the decision-making process in both the public and private sectors.

In the absence at the present time of definitive data regarding future flood risk levels, the following planning level information is organized by the five basins in which the City of New Orleans resides. This information includes identification of the basin, a listing of the Planning Districts within that basin and the status of USACE repairs and planned improvements, by year, for that basin. It should be noted that this analysis is for information purposes only and only discusses the relative level of risk between basins. The IPET risk analysis should be used for detailed planning when it becomes available.

#### **2.4.1.51 Drainage Basin 1 (Planning Districts: 1, 2, 3, 4, 5, 6, 7)**

Katrina flooding in Basin 1 was due to design flaws that caused the floodwalls to fail. Currently planned (and funded) projects to be completed by 2010 will correct that problem and significantly improve storm surge protection and reduce risk in this drainage basin as they are completed.

Further, prior to Katrina, the USACE has been involved in a federally funded program – the Southeast Louisiana Urban Flood Control Project (or SELA) – to reduce interior flooding by providing better drainage to neighborhoods. The aim of SELA is both to improve channels, drainage lines and expand pumping stations in Orleans, Jefferson and St. Tammany Parishes. This drainage basin has been the recipient of some of the larger projects to reduce flooding in low-lying areas.

#### **Planned Improvements**

2006. All failed levee and floodwall sections have been repaired. Temporary flood gates have been constructed at the mouths of the 17<sup>th</sup> Street, Orleans and London Avenue canals. This represents a significant improvement, as the storm surge will no longer be able to penetrate into the outfall canals. Temporary pumps have been installed at the floodgates in the event of closure of the gates during a tropical storm with surge; however, pumping capacity of the temporary pumps is only approximately 50% of the existing pumping stations. This means that Drainage Basin 1 is currently at risk of flooding during a tropical storm with heavy rainfall. Topographic maps prepared by the USACE show that a 9-inch rain in six hours could cause 3 to 4 feet of flooding in the lowest-lying parts of Broadmoor, Central City, Hollygrove, Lakeview, Gentilly, and Florida/Desire.

2007. The USACE expects to increase temporary pumping capacity to 67% of pre-storm pumping station capacity by June 2007. Levee walls in the Industrial Canal are to be raised to authorized height by September 2007.

2010. The USACE expects to replace the temporary gates at the outfall canals with permanent, flood-proofed pumping stations by the end of fiscal year 2010. New floodgates to keep storm surge from entering the Industrial Canal will be constructed at the Seabrook Bridge, the Gulf Intracoastal Waterway (GIWW) and, perhaps, the Mississippi River-Gulf Outlet (MR-GO).<sup>8</sup>

2010+. Proposals to build barrier structures at the Rigolets and Chef Pass and in Lake Borgne to prevent storm surge from entering Lake Pontchartrain will provide Drainage Basin 1 with better protection than it has ever had and should make this the best protected basin in the City.

#### 2.4.1.52 Drainage Basin 2 (Planning Districts: 9, 10)

The levees of New Orleans East did not fail during Hurricane Katrina so much as they were overtopped by storm surge. The eastern perimeter of the Greater New Orleans Metropolitan Area (GNOMA) has become increasingly vulnerable with ongoing subsidence and wetlands retreat. Katrina showed that Lake Borgne and the east end of Lake Pontchartrain is an open portal to the Gulf of Mexico and solutions to the storm surge problem in New Orleans East must be comprehensive and long-term. Stakeholders in New Orleans East should carefully monitor flood protection proposals and implementation by the USACE and CPRA.

##### Planned Improvements

2006. All storm damaged levees repaired (completed).

2007. Levees will be raised to authorized height by September 2007.

2010. Levee heights expected to be increased by 2 to 8 feet to meet 100-year flood requirements by 2010. Flood gates at Seabrook Bridge and the GIWW are to be built by 2010<sup>9</sup>.

2010 +. The USACE is to develop alternative scenarios for protecting the City of New Orleans and all of coastal Louisiana from storms greater than the 100-year storm and present them to Congress by December 2007. These projects, currently undefined, will likely be components of the Louisiana Coastal Restoration Program and may take decades to implement. Until these improvements are completed, this drainage basin will continue to be susceptible to storm surge from Category 3 storms or greater.

#### 2.4.1.53 Drainage Basin 3 (Planning District: 8)

Planning District 8 shares a large drainage basin with St. Bernard Parish. Similar to New Orleans East, the levees were overtopped by Katrina and were washed away by subsequent scouring. Other than the

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<sup>8</sup> The proposed floodgate in the GIWW at Paris Road is controversial, with officials in St. Bernard Parish claiming that it will increase the chances of flooding in that parish as well as New Orleans East. Resolution of these conflicts could extend completion of this project beyond the 2010 timeline.

<sup>9</sup> The proposed floodgate in the GIWW at Paris Road is controversial; with officials in St. Bernard Parish concerned that it will increase the risk of flooding in their parish as well as New Orleans East. Resolution of the conflict could extend the completion of this project beyond the 2010 timeline.

possible raising of the levees by 2 to 8 feet by 2010, there are no concrete plans to improve the hurricane protection system at the present time (for example, by armoring the levees).

The USACE is to develop alternative scenarios for the protection of the City of New Orleans and Louisiana's coast and provide that information to Congress by December 2007. For all practical purposes, improved hurricane storm surge protection for the Lower Ninth Ward depends upon the implementation of large-scale coastal restoration projects that will take time to plan, permit, design and implement. Stakeholders in District 8 should carefully monitor flood protection proposals and implementation by the USACE and CPRA.

#### Planned Improvements

2006. Damage to MR-GO levees and Industrial Canal floodwalls repaired (completed). MR-GO levee has been raised to authorized height of about 20 feet.

2007. Industrial Canal floodwalls to be raised to authorized height by September 2007.

2010. Parts of the levee could be raised 2 to 8 feet to meet 100-year standard. Seabrook floodgate to be built at the lake entrance.

2010 +. The USACE is to develop alternative scenarios for protecting the City of New Orleans and all of coastal Louisiana from storms greater than the 100-year storm and present them to Congress by December 2007. These projects, currently undefined, will likely be components of the Louisiana Coastal Restoration Program and may take decades to implement. Until these improvements are completed, this drainage basin will continue to be susceptible to storm surge from Category 3 storms or greater.

#### **2.4.1.54 Drainage Basin 4 (Planning District: 12)**

Ongoing projects to build the West Bank levees to their authorized heights are to be completed by 2007; however, it is generally agreed that protection will not meet the new 100-year standard. Consequently, future rounds of levee-raising will be required. Current surge protection of the west bank is described by Ivor van Heerden, Deputy Director of the LSU Hurricane Center, as "Category 2 hurricane protection."

The key issue with the entire west bank is that it has not been seriously tested in modern times. Van Heerden has stated that "If you had a Katrina that came up to the west of Morgan City, we could potentially see the flooding of the entire West Bank."

#### Planned Improvements

2006. No Katrina-related repairs required. Harvey Canal Gate is under construction and expected to be completed this year.

2007. Levee and levee floodwalls to be raised to authorized heights by September 2007.

2010. Harvey Canal Gate may be raised to meet 100-year flood requirements.

2010 +. The USACE is to develop alternative scenarios for protecting the City of New Orleans and all of coastal Louisiana from storms greater than the 100-year storm and present them to Congress by December 2007. These projects, currently undefined, will likely be components of the Louisiana Coastal Restoration Program and may take decades to implement. Until these improvements are completed, this drainage basin will continue to be susceptible to storm surge from Category 3 storms or greater.

#### 2.4.1.55 Drainage Basin 5 (Planning District: 13)

Similar to Basin 4 (Planning District 12), the main problem with Basin 5 is that the hurricane protection system has not been seriously tested.

##### Planned Improvements

2006. No repairs required. A recent lift of the levee has brought elevations to 9.5 feet, the authorized height. No further improvements have been identified; however, further levee-raising may be required to achieve the new 100-year standard by 2010.

2010 +. The USACE is to develop alternative scenarios for protecting the City of New Orleans and all of coastal Louisiana from storms greater than the 100-year storm and present them to Congress by December 2007. These projects, currently undefined, will likely be components of the Louisiana Coastal Restoration Program and may take decades to implement. Until these improvements are completed, this drainage basin will continue to be susceptible to storm surge from Category 3 storms or greater.

In summary, all areas of the City continue to be vulnerable to flooding from one source or another through the year 2010 and, in some cases, significantly beyond that. Inadequacies in the primary defense system will persist in parts of the City until the USACE and CPRA's long-term plans are fully implemented, which may take 10 or more years.

### 2.4.2 Infrastructure and Utilities

Hurricanes' Katrina and Rita caused extraordinary damage to the City's physical infrastructure, much of which lies underground and was inundated by the brackish waters of Lake Pontchartrain for several weeks. Underground electric utilities corroded, leaving the City without street lights and traffic signals. Gas lines corroded, requiring replacement of key valve components before services could safely resume. Cable service was similarly disrupted for phone and video/internet lines. Repairs to these critical elements are still ongoing, and some areas do not have a full range of services.

The waste water, drainage and water systems of the City also sustained severe damage. Pre-Katrina, a significant amount of water was pumped through the City system to offset pressure losses caused by leakage. Katrina-related damage is exacerbating the leakage. Water pressure now fluctuates in several areas, notably in the French Quarter, where restaurants must have a supply of fresh water or close their operation. A study commissioned by the S&WB and released in December 2006, estimates the short term needs at \$1.9 billion and the total capital needs of the Sewerage & Water Board (S&WB) over the next 25

years is in the range of \$5.7 billion<sup>10</sup>. The S&WB does not have that kind of money, and given the reduced population of the City, it is clear that the S&WB will have to make difficult choices about where to spend its scarce resources.

Private infrastructure, of course, has similar problems, wherein equipment such as compressors or power supplies was submerged in brackish water and needs to be replaced. Entergy New Orleans is patching together working gas and electric grids. The LRA committed \$200 million in CDBG funds to assist Entergy New Orleans with repairs and to offset utility rate increases in the near-term.

### 2.4.3 Transportation and Transit

The Transportation Sector is important because it includes the street and highways systems around which the City is built. Prior to Katrina, the New Orleans street network needed repair. Following voter-approval of a major bond measure in November 2004, the City had allocated \$142 million to reconstruct 100 miles of major/collector streets and rehabilitate more than 450 miles of minor streets across the City.

The street network was further damaged by immersion in floodwaters for several weeks following Katrina. Potholes are increasing in number and size since many are caused by the street substructure being undermined by either un-repaired water leakages or the crushing of subsurface drainage pipes. Traffic signalization still needs to be restored in some areas of the City.

Mass transit is only partially recovered. The Regional Transit Authority (RTA) lost 197 of 372 buses, 30 out of 66 street cars, and 24 of 36 lift vans. They also had significant damage to the lines, facilities and equipment. RTA reimbursements from insurance and FEMA are progressing better than many other public and non-profit agencies in the City. But, as of October 2006, usage was only at 65% of pre-storm levels; restructuring of the route system is likely.

Post-Katrina, the volume of port tonnage at the Port of New Orleans is up to near-record levels; however, the storm destroyed some of the capacity of the Port that needs to be rebuilt: the France Raod Container Terminal and the Jourdan Road Cold Storage Facility. Also, the cruise ship industry is still lagging, which hurts port revenues and the tourism business. Airplane travel is down sharply to about 35% of pre-storm levels. Air travel to and from the Armstrong International Airport is not limited by airport capacity, but the reduced demand for flights into and out of the region is due in part to the City's reduced hotel rooms and a consequently reduced convention schedule.

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<sup>10</sup> Report by Black & Veatch submitted on December 20, 2006.

## 2.4.4 Housing

Damage and destruction of the City's housing stock was substantial (see Figure 1.5). About three out of every four habitable units were either damaged or destroyed, and the City lost almost its entire affordable housing inventory. Most public housing units are slated to remain closed awaiting demolition and eventual redevelopment at lower densities. As of November 2006, there were approximately 11,000 FEMA trailers in the City.

Housing repairs and rebuilding are being financed by many sources: private insurance, National Flood Insurance Program claims, loans from the Small Business Administration, private mortgage lenders and banks, and individual resources. The LRA has allocated \$4.2 billion to homeowner repairs and another \$1.8 billion to mixed income and affordable housing. The Road Home's homeowners program appears to be hitting its stride, while the small rental repair program is just gearing up. Housing recovery is sluggish due to the slow pace of disbursement of the State's Road Home funds to eligible applicants, uncertainty over insurance reimbursements, inability of residents to gut houses, and participants' indecision due to age, infirmity, and lack of financial resources. Over the next year, the implementation of the Road Home Program may result in many individual property sales in many neighborhoods. Planning for the re-use of those properties that are voluntarily sold (to the State in exchange for Road Home funds) is important to retaining the neighborhood fabric across the City. Housing repair and rebuilding efforts are further limited by shortages of workforce and qualified-contractors.

The issue of temporary housing for the labor force at the scale needed to rebuild the local economy has not yet been resolved. Temporary housing is needed, but may be difficult to site in many neighborhoods. There continues to be debate over the Department of Housing and Urban Development's (HUD) decision to demolish four large public housing projects and replace them with less dense, mixed income units, but this is an issue to be decided at the federal level.

The District assessments suggest that, despite the levels of building permits granted in neighborhoods across the city, the level of actual rebuilding activity was lower. A number of homes are being elevated by a variety of methods. Modular housing is starting to appear in some areas, and there are concerns about historic preservation and how these structures will blend in with the rest of the neighborhood. The pace of demolitions is increasing but there are still neighborhoods across the City where damaged houses stand largely untouched.

## 2.4.5 Economic Development

Economic recovery has been surprisingly rapid in some economic sectors, such as the Port of New Orleans' cargo operations, but has lagged in other areas, notably tourism and healthcare and related services. Recovery of the City's two medical schools – Tulane School of Medicine and the LSU Health Sciences Center – provide a vital service to the populace but also are a key source of well-paying and

attractive jobs in the City. In tourism, the current shortfall of approximately 8,000<sup>11</sup> hotel rooms limits both the number of visitors that can be accommodated and the City's ability to book conventions in the competitive hospitality market.

Most re-opened local businesses are small businesses dependent upon local markets that have not fully recovered. Some "big box" retailers are not returning to the City, as they are regional in nature and have suburban sales volumes offsetting the loss of some stores in town. Thus, neighborhood and district recovery is more dependent upon the success of small businesses, many of whom lack sufficient capital to remain viable much longer if the rate of population return does not accelerate. An infusion of capital into this sector is needed and the LRA has approved a program to provide low- or no-interest loans and grants to qualified small businesses in hurricane-impacted areas of the State.

District-level assessments report greatly diminished business activity and a general lack of professional services as well. Grocery stores are slowly returning but have staffing challenges. Businesses that are open have trouble getting and retaining staff as well. Many businesses that have re-opened are family-owned with everyone pitching in to help. Business utility costs and insurance costs have also increased post-Katrina. Many businesses report that they will be unable to continue if tourist traffic does not increase. Crime is also a deterrent to many businesses that report both poor police coverage of their area and slow response times.

## 2.4.6 Healthcare

Prior to Katrina, care for the City's uninsured population was delivered through the Medical Center Louisiana New Orleans (MCLNO) Charity Hospital and a network of public and private clinics. Those with health insurance or funds to pay for treatment went to private hospitals. This led to long waits for services at Charity and a high level of unused hospital capacity in nearby private hospitals. Primary and preventive healthcare services were all but lost with the destruction of the Charity Hospital, outpatient clinics, and virtually all other public and private clinics. Over the past year, a task force of state and federal officials aided by the LRA has been deliberating on the future of the State's medical care delivery system. Despite the importance of this sector to the recovery of New Orleans, it is another sector that is largely out of the control of the City.

Healthcare has also been slow to recover due to both the loss of facilities and loss of primary care providers (doctors) and essential support personnel (nurses). The few hospitals that are open are located in the southern and western portions of the City. There are a small number of limited-service clinics, but primarily hospitals in both Eastbank and Westbank Jefferson have been forced to fill the gap. A shortage of staff medical personnel and support staff has limited hospital bed capacity everywhere.

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<sup>11</sup> As reported in the Times Picayune, January 2007.

## 2.4.7 Education

Education in New Orleans has historically been provided by both public and private systems extending from elementary schools through college. The Catholic school system dominates the private sector, though there are other religious and non-denominational private schools in the City. This recovery assessment was focused on the public school system.

Even before Katrina, the Orleans Parish Public School system had struggled both financially and academically. Estimated capital needs before the storm were in excess of \$500 million. Just prior to Katrina, the State of Louisiana, through the Recovery School District (RSD), took control of most the Orleans School District's facilities and will manage them for five years. The estimated storm damage to facilities, infrastructure and contents is \$600-800 million (80% of schools flooded)<sup>12</sup>. Of 126 public schools in the City, only 7 had no damage, and over half had major damage (from 25% to 50% of their estimated replacement value).

At the end of 2006, a total of 54 public schools were open, with 98% capacity and an enrollment of roughly 27,000 students, compared to 59,000 before the storm. (The Parochial schools had an enrollment of 16,000.) Nine more schools are undergoing renovation with expectations to be open by the next school year, with an additional 10 sites identified for modular structures. The RSD is putting together a long-term plan which is scheduled to be presented in January 2008 relating to school repairs and openings beyond next year. Final decisions have not been made about which schools to re-open or keep closed, but school officials are planning for a reduced population that needs fewer schools.

Again, the quality of the educational system is a high priority for the City, but decisions regarding school operations are largely being made in Baton Rouge, at least for the next four years.

The colleges and universities of the City also suffered substantial physical damage and are operating with considerably reduced enrollments. Public university financial support is predicated on student enrollment and local universities and colleges have suffered large enrollment declines.

## 2.4.8 Historic Preservation and Urban Design

Following Katrina, historic preservation issues have been addressed as, by law, they must. However, to know that many historic structures were damaged and to get repairs underway for those structures are two separate issues. It has been documented that some of New Orleans' most historic areas, located in the "sliver by the river" high ground of the original settlement were but lightly damaged. Repairs in many of these areas are either underway or even completed. The greater damage and the greater housing stock risk is in those historic neighborhoods immediately adjacent to the oldest, those that moved beyond the original settlement into the more flood prone land "back of town" This includes neighborhoods like

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<sup>12</sup> Report from Alvarez & Marzel, 2006.

Tremé, Central City, Mid-City, Tulane-Gravier, Gentilly, South Lakeview, and Broadmoor. Most of these neighborhoods are designated local historic districts while others are eligible and may have already applied.

The New Century New Orleans (NCNO) plan clearly envisioned a leading role for historic preservation efforts both in housing and economic development. The NCNO specifically enumerates three supporting goals relevant to historic preservation.

- ◆ The preservation and enhancement of the city's unique cultural, architectural and historic diversity, including land use mix, building stock and traditionally mixed neighborhoods;
- ◆ Existing neighborhoods throughout the city that are stable, clean, attractive and safe; and
- ◆ Development of new neighborhoods with distinctive character and the capacity to age gracefully. Land use mix, housing options, architectural integrity and cultural potential should all be in harmony with New Orleans tradition and diversity.

UNOP supports these goals in an effort to protect the historical elements, character, and neighborhoods of the city, through the preservation, renovation, and revitalization of the historic resources in collaboration with the economic growth and redevelopment of the city.

The Citywide Plan also supports the concepts of developing a Master Land Use Plan with the force of law behind it, and overhauling the Comprehensive Zoning Ordinance and the Zoning Maps, as well as increased architectural review of proposed developments, in the long term. However, during the Recovery period, the City Planning Commission is likely to be focused on more pressing issues, such as the temporary establishment of commercial trailer parks, the widespread introduction of modular housing and planning for new resettlement areas across the City.

## 2.4.9 Environmental Issues

Environmental issues related to the recovery focused on three items: (1) restoration of reliable solid waste collection system, (2) loss of recycling services and facilities, and (3) possible contamination of the soil due to the flood.

The City's Department of Sanitation has largely operated on a contract basis. A contract with long-time outside vendor Waste Management, Inc. recently expired and three new solid-waste collection contracts – one vendor services the French Quarter and CBD, while the other two service the rest of the city – have commenced.

All recycling efforts have stopped since the recycling center was destroyed in the storm. Post Katrina, FEMA contractors assisted with flood-related debris removal. There remains significant demolition to be done. Since December 31, 2006, the State has been footing 10% of the demolition removal costs, while FEMA pays 90%. Perhaps some materials – like bricks and concrete – could be re-used instead of merely being hauled to a landfill.

Given the extensive flooding, most areas of the City were impacted by saltwater as well as chemical pollutants. The U.S. Environmental Protection Agency (US EPA) and the Louisiana Department of Environmental Quality (LA DEQ) conducted water and soil samples after the flood. Samples were taken in every ZIP code and tests conducted to determine what - or if - chemical compounds were present. Lead, petroleum hydrocarbons, and pesticides were among the most common elements identified. The US EPA and LA DEQ have identified areas and sites within the City that have soil contamination and require remediation.

## 2.4.10 Community Services

Community Services, for the purpose of this analysis, include city agencies concerned with Public Safety (such as Criminal Justice, Police, Fire, and Emergency Medical Services, etc.) as well as “quality of life” services (such as Recreation facilities, Libraries and Cultural facilities). All were profoundly affected by the storm. Each of the agencies managing facilities conducted damage assessments and submitted Project Worksheets to FEMA for Public Assistance. They continue to work with FEMA to identify costs and move forward with repairs.

### Public Safety: Criminal Justice, Police, Fire, and Emergency Medical Services

The flood collapsed the entire criminal justice system. Prisoners were evacuated, and only a partial return to the prison complex has been possible. All courtrooms were shuttered for extended periods. The evidence room and its important contents were destroyed. Police headquarters and the offices of the District Attorney were destroyed. Trials were put on indefinite hold due to a lack of court personnel and the inability to empanel a jury of citizens no longer resident. And most recently, personnel shortages in such critical areas as in the Orleans Indigent Defender Program (OIDP, or ‘Public Defender’) have also been noted as barriers to recovery.

The City’s police force is operating at reduced levels, but an active recruitment campaign is underway. The Louisiana National Guard remains in place, at least through June 2007, although the Governor has called on the City to develop an “exit strategy” for the guard troops within six months.

Within the District assessments, crime is reported to be on the rise. Police response times to calls are reportedly slow and often unpredictable. Looting of vacant structures is less of a problem now, but is still a concern. In some commercial districts, there are reports of criminal activity against pedestrians and motorists, which can inhibit tourism.

Emergency Medical Services (EMS) and fire services suffered substantial losses to trucks and related equipment. Fire protection services are hindered by water pressure and manpower considerations. Firefighters have been reduced in number and a recurring manpower shortage has been the chronic

condition post-Katrina. The EMS worked first from the Convention Center, its quarters at Moss Street having been destroyed. It is now in the process of relocating its quarters. Service continues despite the loss of trucks and specialized equipment.

## Recreation and Library Services

The Citywide assessment focused on public recreation facilities and did not cover private recreation facilities (but damage to those facilities was substantial as well). Some facilities like the State-owned Louisiana Superdome have already re-opened. City Park is without operating revenue and suffered over \$42 million in estimated damages. The Park progresses toward recovery assisted by volunteers and donations. Many neighborhood park and recreation facilities are not open and there is no timetable for resuming service. Residents miss major and minor parks and recreation facilities, and see them as a centerpiece of their neighborhood recovery.

Eight of the 12 branches of New Orleans Public Library (NOPL) were severely damaged and their contents destroyed. A grant from a private foundation will enable NOPL to open 7 temporary locations, and bookmobiles have been loaned by several counties from outside Louisiana. From any perspective, the damage to the public library system, combined with the losses at the public school libraries, greatly impacts the learning resources of the City.

## Municipal and Cultural Resources

Over 260 non-profit cultural institutions, such as museums, arts centers, performance halls and other venues were severely damaged or destroyed. Municipal resources, including the Mahalia Jackson Theatre for the Performing Arts, were also damaged. Total employment in the creative economy of the City has been reduced by more than half.

## 2.5 Summary and Implications for Planning

The Recovery Assessment provides a broad picture of where the City is in its recovery process, but, more than that, it provides a context for understanding how the recovery can be managed going forward. Several things have become apparent through this exercise.

- ◆ The recovery will be long and difficult and will probably take ten years to know if it was successful or is going to be successful.
- ◆ Some things are largely out of the jurisdictional control of the City, such as hurricane protection system improvements, improvement of the healthcare and education systems, public housing and the administration of the Road Home program.

- ♦ The City will need to find additional sources of funds in order to take care of the things that are within its control, such as the repair and renovation of the water and sewerage systems, streets, city-owned buildings, parks and playgrounds, libraries, police, fire and EMS facilities, etc.

As was discussed earlier in this report, it is clear that the City has reached a new stage in the recovery process. This stage is likely to be dominated in the next two years by several types of activities, including:

#### Demolitions

The pace of demolition of houses will pick up quickly as the City moves forward with the demolition of structures considered to be health and safety hazards, as individual homeowners make decisions about their properties based on their Road Home awards, and as the State and/or the City gains control of blocks of houses through the Hazard Mitigation Grant Program. Several high profile building demolitions - symbolizing new energy in the recovery - may also take place to make room for new facilities.

#### Apartment complex construction

Over seventy new apartment complexes have been approved for tax credits and CDBG grants by the LRA and the Office of Community Development (OCD) in the New Orleans Area. These approvals are expected to create more than 15,000 apartments and rental houses and result in \$1.2 billion in private investment by the end of 2008.

#### Infrastructure repair and renovation

The City, the Regional Planning Commission (RPC) and the Federal Highway Administration (FHWA) have identified \$166 million in priority roadway repair and reconstruction projects on the federal aid highway network within the City. Local streets are likewise in need of repair and reconstruction. The S&WB has identified over \$500 million in water distribution and sewerage collection system priority needs, much of it beneath street rights-of-way. These repair and reconstruction activities should be coordinated between agencies.

#### Private home construction

As the Road Home money gets into the hands of individual homeowners, there should be increasing construction of private homes, including new construction and repairs. Also, the City should expedite the adjudication of blighted and abandoned houses so they can be turned over to developers for rehabilitation as soon as possible.

#### Planning and design of new replacement facilities

Several new facilities should soon be in the design stage for construction in two to three years. These include the new LSU/VA Teaching Hospital and three potential projects for the Port of New Orleans; a new container terminal on the Mississippi River, a new cold storage facility on the river, and a new cruise ship terminal in the Bywater.