NEW ORLEANS RENTAL MARKET STUDY

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GNOHA
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WHAT IS EEFA?

Energy Efficiency for All (EEFA) is a project dedicated to linking the energy and housing sectors together in order to deliver the benefits of energy efficiency to millions of low-income families. We work with electric and gas utilities and their regulators interested in innovative energy efficiency program designs. We advise housing finance agencies on best practices in building owner engagement and finance products. We collaborate with owners, managers, businesses and advocates in order to achieve energy savings in multifamily properties. Our project is a partnership of the Energy Foundation, Elevate Energy, National Housing Trust and Natural Resources Defense Council. This project was made possible with funding support from The JPB Foundation.

EXECUTIVE SUMMARY

"We have too many people in New Orleans paying more than they can afford for their housing, and high energy bills are part of the problem. We need energy efficient solutions for New Orleanians now."

– Andreanecia Morris, Greater New Orleans Housing Alliance

Rental properties account for a majority of the residential housing market in New Orleans, Louisiana. A healthy rental housing market is therefore essential to New Orleans' economic growth and vitality. This report – the New Orleans Rental Market Study – was undertaken to present a data-based picture of New Orleans' rental market related to energy use and the opportunity for greater energy efficiency. Facts about New Orleans rental property and energy use in rental properties must inform policy and regulatory decisions about housing.

There are five key reasons that energy efficiency programs should be applied to rental properties in New Orleans.

1. Most New Orleanians Rent. New Orleans is a renter-majority city; 54% of households in New Orleans, or 84,014 total households, live in rental housing.[1] A survey of rental property owners who collectively own 1,400 rental units reveals that approximately 91% of renter households are responsible for their own electric bills.

This fact informs the primary policy implication of this report. Spending on energy efficiency improvements in rental properties, like adding insulation or installing high efficiency air conditioners, directly increases the quality and sustainability of a New Orleans' housing stock, which accrues to owners, residents, and future residents. Funds spent by Entergy through its primary energy efficiency program, Energy Smart, are used to help property owners and residents make energy efficiency improvements. These projects are a pathway to improving the quality and resiliency of housing stock in New Orleans.

2. Rental Costs often Overwhelm Family Incomes. Rents in New Orleans have risen by over 50% since Hurricane Katrina.[2] A majority of renter households (61.9%) are cost-burdened, which is defined as paying more than 30% of monthly income on housing costs (rent plus utilities).[3] Cost burden has grown over time because of rising rents and static incomes for renters. Making housing more energy efficient for residents is a primary pathway to make it more affordable, because utility expenses are a major part of the total cost of housing.[4] Analysis in this report and from other studies shows that New Orleans has a wide variation in monthly utility expenses, and that a large number of low-income customers have very high monthly bills. Data suggests that a subset of customers have annual expenses of $2,000 to $3,000. Another subset of customers live in energy deprivation, denying themselves comfortable living spaces in order to keep expenses low.[5]

1 American Community Survey 2015 1-year data, based on households paying cash rent.

2 HousingNOLA, 2015, "HousingNOLA 10 Year Strategy and Implementation Plan." Available at http://housingnola.com/main/uploads/File/HousingNOLAReport.pdf.

3 American Community Survey 2015 1-year data.

4 Greater New Orleans Housing Alliance, 2015, "HousingNOLA 10-Year Strategy and Implementation Plan."

5 1 `Ariel Drehobl and Lauren Ross, 2016, "Lifting the High Energy Burden in America's Largest Cities," ACEEE, p. 5. Available at http://aceee.org/sites/default/files/publications/researchreports/u1602.pdf.

3. Subsidized Housing Cannot Meet All Needs. Rent subsidies play a large role in the New Orleans rental market – 25% of renters receive some form of rent reduction or subsidy.[6] Despite the major role of these subsidies in the market, many households remain cost-burdened, and would benefit from decreased utility bills. In addition, existing subsidized properties also face an ongoing need to meet operations and maintenance costs with a restricted cash flow. Energy efficiency interventions can help keep these properties affordable by reducing utility expenses.

4. Property Owners and Tenants Will Benefit from Increased Information on Energy Usage. There is a common understanding that some property owners do not make efficiency improvements, even those that would "pay for themselves" from energy savings, because tenants pay utility bills. Yet there is also strong evidence to suggest many property owners are willing to make efficiency improvements when they receive better information about high usage, and when prospective tenants are able to access information on property utility bills. Currently, the utility (Entergy New Orleans) does not provide modern tools for landlords to obtain basic usage information for the property.[7] The authors of this study encountered this problem first-hand, as basic electricity and gas usage information was not available for analysis in doing this report and Entergy New Orleans (ENO) was not receptive to proposals to access aggregated, anonymized information.

Apartment building owners in New Orleans have encouraged ENO to implement a "landlord portal" system that will allow landlords to monitor the energy use of their properties. This allows owners to manage energy use, identify efficiency improvements, and take advantage of incentives that require benchmarking of energy efficiency improvements. Such a portal system would also give ENO the ability to access new property information entered by owners. The Advanced Metering infrastructure and new customer-service interface that ENO is currently implementing could form the basis for this portal system.

5. The City Has Established a Goal to Reduce Emissions 50% by 2030. According to the City of New Orleans-authored strategy Climate Action for a Resilient New Orleans, energy efficiency interventions and the Energy Smart program are critical components for reaching the goal of reducing New Orleans' carbon emissions 50% by 2030 – thereby combating climate change, which threatens the safety of all of the city's residents. The report notes that "electricity use is the biggest proportion of our greenhouse gas emissions."[8] Expanding the use of the Energy Smart program and energy efficiency interventions to rental properties, which are more than half of the City's housing stock, will help meet this goal.

USING RENTAL PROPERTY DATA TO INFORM ENERGY EFFICIENCY PROGRAM DESIGN

Given the clear importance of energy efficiency in achieving the City's goals to provide affordable housing for its residents and reduce carbon emissions, this study also examines the landscape of rental property and energy payments in New Orleans in order to determine how to most effectively implement energy efficiency programs. The results of the analysis show three key facts that can help to inform program design.

1. Energy Costs to Households are High, Which Impacts Affordability. Some households have extremely high energy costs on a monthly basis, while others live in energy deprivation in order to keep costs low. The burden is particularly significant for low-income families; according to ACEEE analysis, New Orleans has some of the highest energy burdens for low-income families in the country.

The below graph shows the wide distribution of self-reported electric payments in New Orleans rental properties from the American Community Survey Public-Use Microdata Sample (PUMS) data.

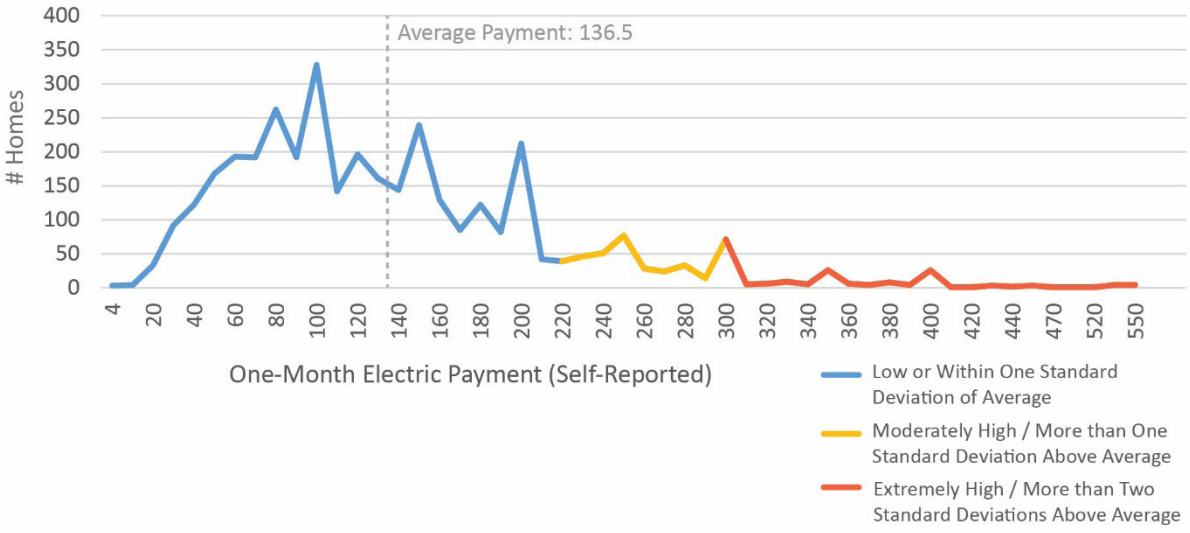
6 American Housing Survey, 2015.

7 Landlord portal requests submitted as a letter from the Housing Authority of New Orleans in 2016, and as a request from the Greater New Orleans Housing Alliance as part of Entergy's most recent IRP process.

8 City of New Orleans, 2017, "Climate Action for a Resilient New Orleans," p. 24. Available at https://www.nola.gov/nola/media/Climate-Action/Climate-Action-for-a-Resilient-New-Orleans.pdf.

An analysis of the distribution of one-month reported payments in the PUMS data reveals that 14% of renter households are paying moderately or extremely high costs that are over ***$220 per month*** – one or more standard deviations greater than the average monthly payment. The median annual income of this group of households is $22,000. These high payments are therefore a significant impediment to equity and affordability in New Orleans' rental landscape.

Figure ES.1: Distribution of PUMS One-Month Electric Payment Reports



Source: ACS Public-Use Microdata Sample, 2011-2015.

2. High Electric Payments are More Likely in Smaller Buildings. The majority (56%) of New Orleans' rental stock is concentrated in smaller buildings of 1-4 units in size, and most households reporting payments more than one standard deviation above average (over $220 per month) are located in these smaller buildings.

Table ES.1: Percentage of "Moderately" and "Extremely" High Electric Payments by Units in Structure

	% of Moderately/Extremely High Payment Units	Average HH Income
Single-family	62%	$41,557
2-4 units	32%	$44,037
5+ units	5%	$29,493

3. Large Properties Offer an Efficient Means to Reduce Emissions. While most households reporting high payments are located in smaller structures, the per-square-foot average cost of electricity appears to be similar across all of the size/age typologies of rental structures. This implies that concentrating a portion of energy efficiency interventions on larger rental properties with more units would be an effective strategy,

as renovating these properties would address a large amount of square footage and reduce emissions efficiently.

CONCLUSION: AN ENERGY EFFICIENCY STRATEGY FOR NEW ORLEANS RENTAL PROPERTIES

The findings of this study lead to two essential conclusions. First, energy efficiency should be an element of the city's affordable housing strategy. Energy costs are a substantial portion of total housing costs, and costs can be managed with effective energy efficiency programs, such as expanding Entergy's Energy Smart program to address rental properties. Second, to harness the power of the market to spur energy efficiency improvements, modern utility systems for landlord energy usage information are needed. These systems would help owners identify opportunities to improve their own properties; would assist tenants in making decisions about what properties to rent; would help utilities to locate properties in need of energy efficiency; and would allow effective analysis to support policy decisions on energy efficiency programs.

The data available suggests a strategy for energy efficiency programs that targets and addresses three priority customer segments:

1. Low-income households with high energy bills who live in smaller (1-4 unit) structures;
2. Low income households with weatherization needs and moderate bills suggesting energy deprivation; and
3. Households living in large properties that use the most energy overall, such as buildings with central heating and cooling systems.

This multi-target approach appears ideal in light of the data to use efficiency programs to capture efficiency while also fulfilling the need for equity and affordability in the rental landscape. Our analysis suggests that ENO, with the participation of stakeholders, could use energy usage information combined with housing data to identify the customers and property owners fitting into these profile categories for purposes of energy efficiency program delivery.

Energy efficiency programs for rental properties can and should focus on a dual-pronged approach that manages the equity and affordability implications of high energy bills for renters, and effectively reduces climate change and carbon emissions. Creating a strategy that accomplishes both goals requires reliable data on both the costs of energy and utilities to households, and the overall usage of energy within buildings.

THE LANDSCAPE OF RENTAL PROPERTY IN NEW ORLEANS

THE COST OF RENTAL HOUSING

In New Orleans, the cost of housing for renters remains a challenge and continues to increase. The U.S. Department of Housing and Urban Development (HUD) defines "cost burdened" household as those households paying 30 percent or more of their income on housing costs. According to HousingNOLA's ***2016 Annual Report*** Card, renters disproportionately experience cost burden in the City of New Orleans.[9]

In 2015, there were 84,014 renter-occupied units in Orleans Parish; 75,726 of these units paid cash rent on a monthly basis, and 61.9% of renters who paid cash rent were cost burdened.[10]

Table 1: Cost-Burdened Renters in Orleans Parish, 2015

	Total Units	Percentage
30.0 to 34.9 percent	7,098	9.4%
35.0 percent or more	39,771	52.5%
Cost Burdened (>=30 percent)*	46,869	61.9%

The cost burdened total units and percentage were calculated using the "Selected Housing Characteristics" table from the 2015 American Community Survey (ACS) 1-year estimates.

This cost burden challenge is largely caused by the discrepancy between continually rising rents and consistently low incomes for renters. Between 2011 and 2015, renters' median incomes have fluctuated between approximately $21,000 and $25,000, and the percentage of cost-burdened renters has remained near 60%.[11]

Table 2: Renter Household Median Incomes and Cost Burden, 2011-2015

Year	Median Income	Cost Burdened Percentage
2011	$22,143	62.7%
2012	$21,502	60.7%
2013	$24,532	58.4%
2014	$23,881	61.1%
2015	$25,035	61.9%

This data was collected from the 2011, 2012, 2013, 2014 and 2015 ACS tables, "Median Household Income in the Past 12 months by Tenure" with inflation-adjustments for Orleans Parish; and the 2011, 2012, 2013, 2014, and 2015 ACS tables, "Selected Housing Characteristics."

9 HousingNOLA, 2016, "HousingNOLA 2016 Report Card." Available at http://housingnola.com/main/uploads/File/HousingNOLA2016ReportCard.pdf.
10 American Community Survey 2015 1-year data.
11 American Community Survey 2015 1-year data; American Community Survey 2014 1-year data; American Community Survey 2013 1-year data; American Community Survey 2012 1-year data; American Community Survey 2011 1-year data.

The below map shows median rents by census tract in New Orleans. The three categories correspond to rents affordable to 4-person households of differing Area Median Income (AMI) levels.[12] The census tracts in light gray have median monthly rents below $750, which is an affordable rent for households earning 50% AMI, the census tracts in deeper gray have median monthly rents between $750-1200, which is an affordable rent range for households earning 50-80% AMI, and the census tracts in darker gray have median monthly rents between $1200-1800, which is an affordable rent range for households earning 80-120% AMI. Only 22 census tracts of 177 total tracts (12%) have median rents that are affordable to households earning 50% AMI or less.

Figure 1: Median Gross Rent by Census Tract

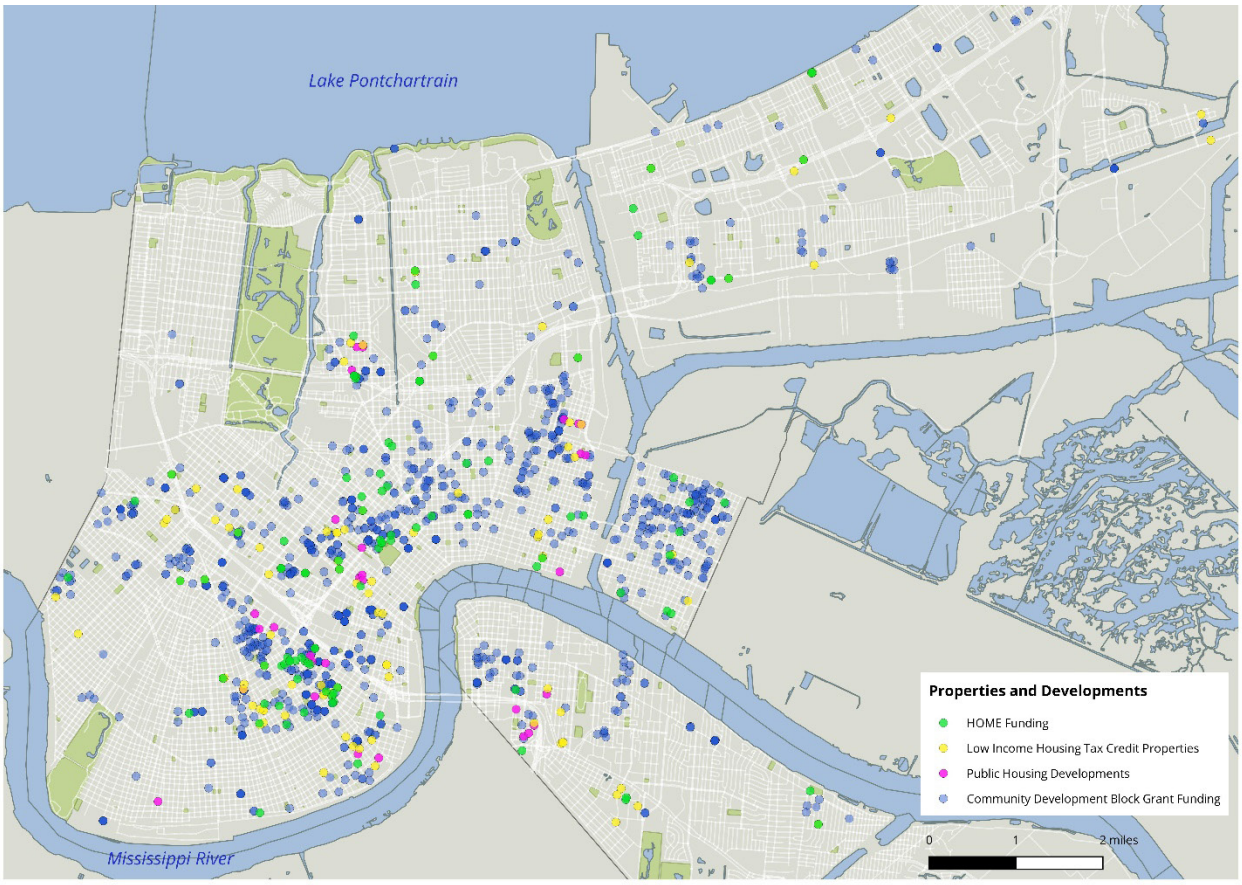
12 Affordable monthly rents by AMI level calculated using income limits for 4-person households defined by the U.S. Department of Housing and Urban Development Area Median Income Limits for Orleans Parish, 2016. Available at https://www.huduser.gov/portal/datasets/fmr/fmrs/FY2015_code/2015summary.odn.

SUBSIDIES IN THE NEW ORLEANS RENTAL MARKET

Based on the discrepancy between New Orleans rents and residents' income levels, the rental market is heavily dependent on subsidy to assist lower-income renters. The 2015 American Housing Survey documents 48,300 individuals who self-report having some form of "rent reduction," or 25% of all individual renters. Of these individuals, 9,800 receive reductions directly from property owners because they work for or are related to the owner, while 38,500 receive some form of subsidy requiring income verification.[13] Many of these individuals receive Housing Choice Vouchers, which offer low-income households a subsidy to rent units on the private market. According to HousingNOLA's ***2016 Annual Report Card***, the Housing Authority of New Orleans allocated 18,193 total vouchers in 2016.[14] Voucher-holders therefore represent 22% of the total rental market in New Orleans.

Many of the 22 census tracts indicated above as affordable to households earning 50% AMI or less have concentrations of subsidized housing units. These subsidies include Low-Income Housing Tax Credit Properties, public housing developments, HOME funding, and Community Development Block Grant (CDBG) funding.

Figure 2: Subsidized Affordable and Mixed-Income Developments



Source: HUD USER eGIS, 2016.

13 American Housing Survey, 2015.
14 HousingNOLA, 2016, "HousingNOLA 2016 Report Card."

THE RENTAL HOUSING STOCK

The rental housing stock in New Orleans is concentrated in relatively small-scale buildings; 56% of New Orleans' rental units are located in single- or two-family structures, and 70% of rental units are located in structures of four units or less.[15]

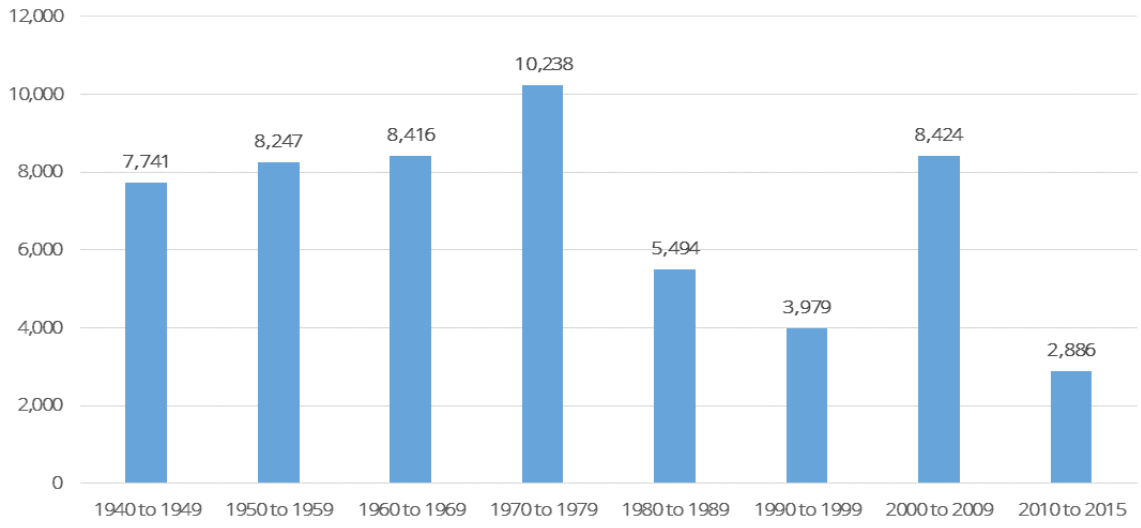
Table 3: Distribution of Rental Units by Total Units in Structure	
	Total Rental Units
Single-family structure (detached or attached)	25,116
Two-family structure	22,078
Small multifamily: 3-4 units	12,150
Mid-sized multifamily: 5-19 units	10,668
Large multifamily: 20 or more units	13,485

Source: ACS 2015 1-year estimates,, "Tenure by Units in Structure."

AGE OF RENTAL HOUSING STOCK

28,589 total rental units in New Orleans, representing 34% of the total rental market, were built before 1940. The below graph displays the number of currently occupied rental units that were built during each decade since 1940. Unit construction reached a peak in 1970-1979 before the oil crash in the early 1980's, and reached another peak in 2000-2009 during the recovery from Hurricane Katrina.[16]

Figure 3: Year Built for Rental Units Constructed 1940-2015

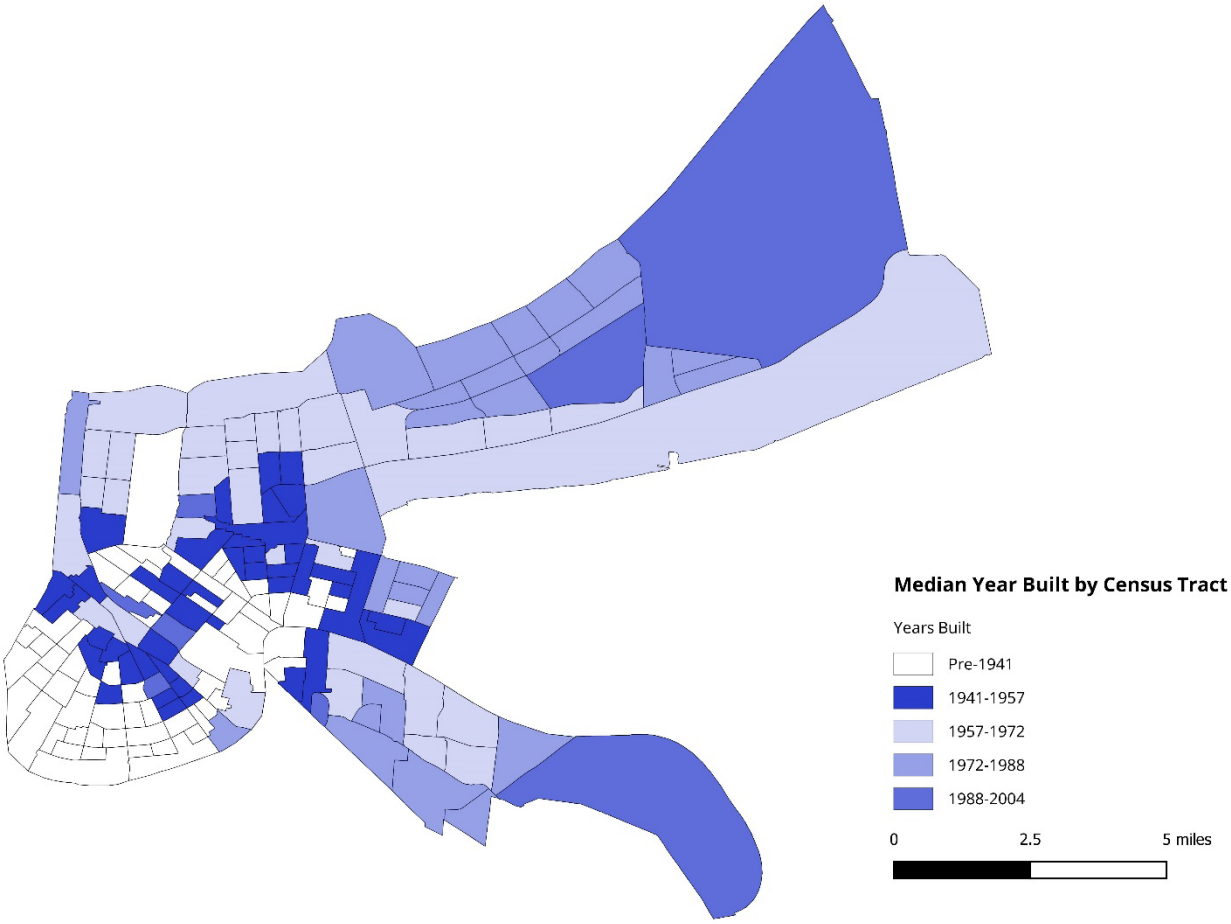


Source: 2015 1-year ACS estimates, "Tenure by Year Structure Built."

The below map represents the median year built for renter-occupied structures by census tract. This map shows the trajectory of development from the historic neighborhoods of the French Quarter, Algiers Point, Mid-City, St. Roch, the Marigny, Holy Cross, and Uptown; to the post-World War II buildout of Gentilly, Lakeview, the West Bank, and New Orleans East. The map also reflects more recent post-Katrina redevelopment in areas particularly hard-hit by flooding, such as the Lower Ninth Ward and portions of New Orleans East; and recent building activity in the form of the mixed-income housing developments of Faubourg Lafitte, Marrero Commons, Harmony Oaks, and Columbia Parc.

15 American Community Survey 2015 1-year data.
16 Ibid.

Figure 4: Median Year Built for Rental Properties by Census Tract



Source: 2015 American Community Survey, "Tenure by Median Year Structure Built."

TYPOLOGIES OF RENTAL HOUSING STOCK

New Orleans has distinct typologies of rental property that correlate with the size and age of rental structures. The majority of single-family rental units were constructed between 1940 and 1979, as New Orleans' population expanded into more "suburban" neighborhoods like Gentilly, Lakeview, and New Orleans East. In contrast, the majority of small multifamily rental structures (2-4 family structures) were built before 1940; the double shotgun is the most recognizable and common example of these structures, which tend to be located in historic urban neighborhoods like St. Roch, the Seventh Ward, Uptown, Bywater, the Lower Ninth Ward, and the Marigny. Mid-sized multifamily buildings of 5-19 units are relatively evenly split between pre-1940, 1940-1979, and 1980-2015 construction dates; while large multifamily buildings of over 20 units emerged as a popular rental housing typology after 1940 and became an even more prominent part of the housing stock in 1980-2015.

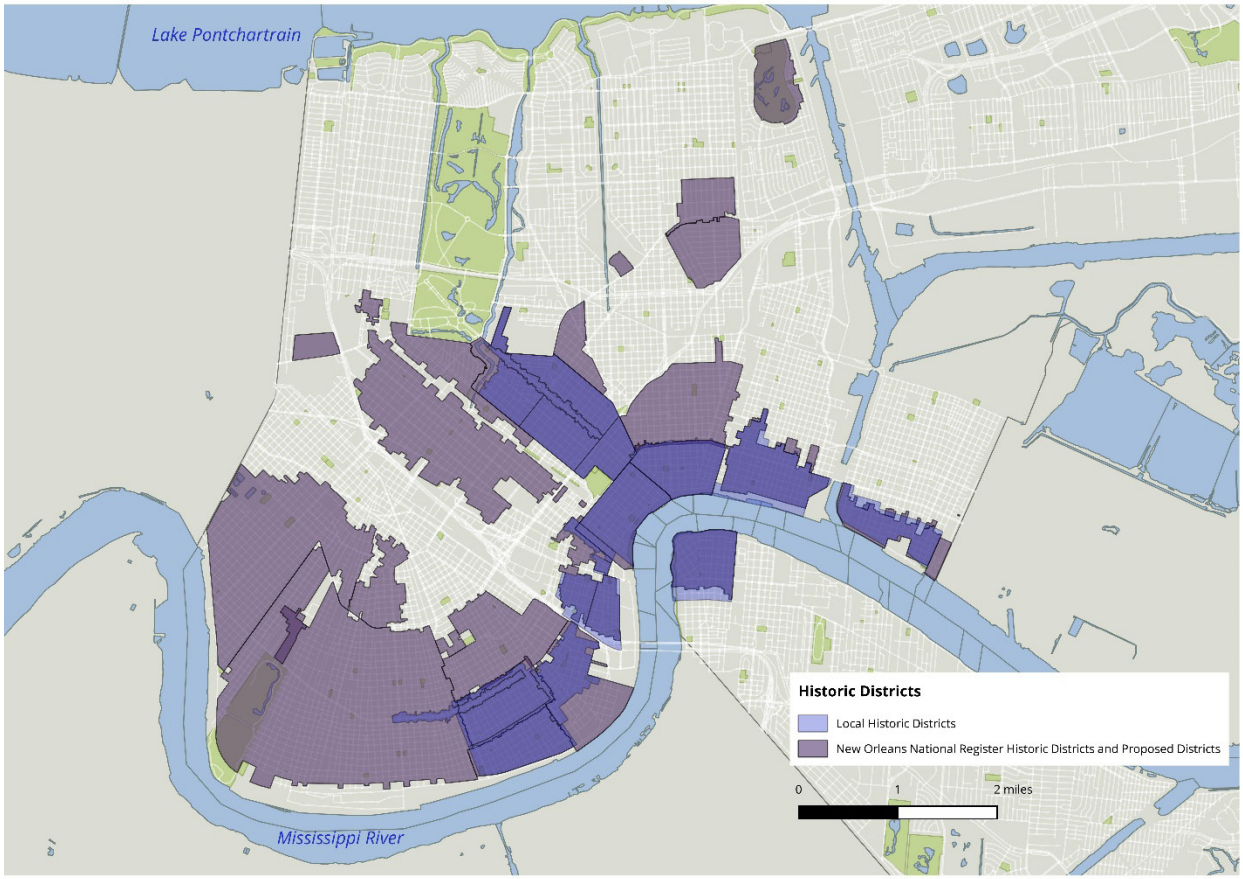
Table 4: Total Rental Units in Structure by Year Structure Built

	Total Rental Units	Pre-1940	1940-1979	1980-2015
Single-family structure (detached or attached)	25,116	5,994	13,483	5,639
Small multifamily: 2-4 units	34,228	17,979	11,612	4,637
Mid-sized multifamily: 5-19 units	10,668	3,011	3,980	3,677
Large multifamily: 20 or more units	13,485	1,605	5,247	6,633

Source: ACS 2015 1-year estimates, "Tenure by Units in Structure by Year Structure Built."

Historic Districts and Impact on Typology: Areas with active historic districts tend to experience more historic preservation of existing buildings rather than new construction, and tend to have smaller-scale rental structures. Uptown, the Marigny/Bywater, Holy Cross, St. Roch, Mid-City, and Gentilly Terrace have concentrations of local and National Register historic districts.

Figure 5: National Register Historic Districts and Local Historic Districts



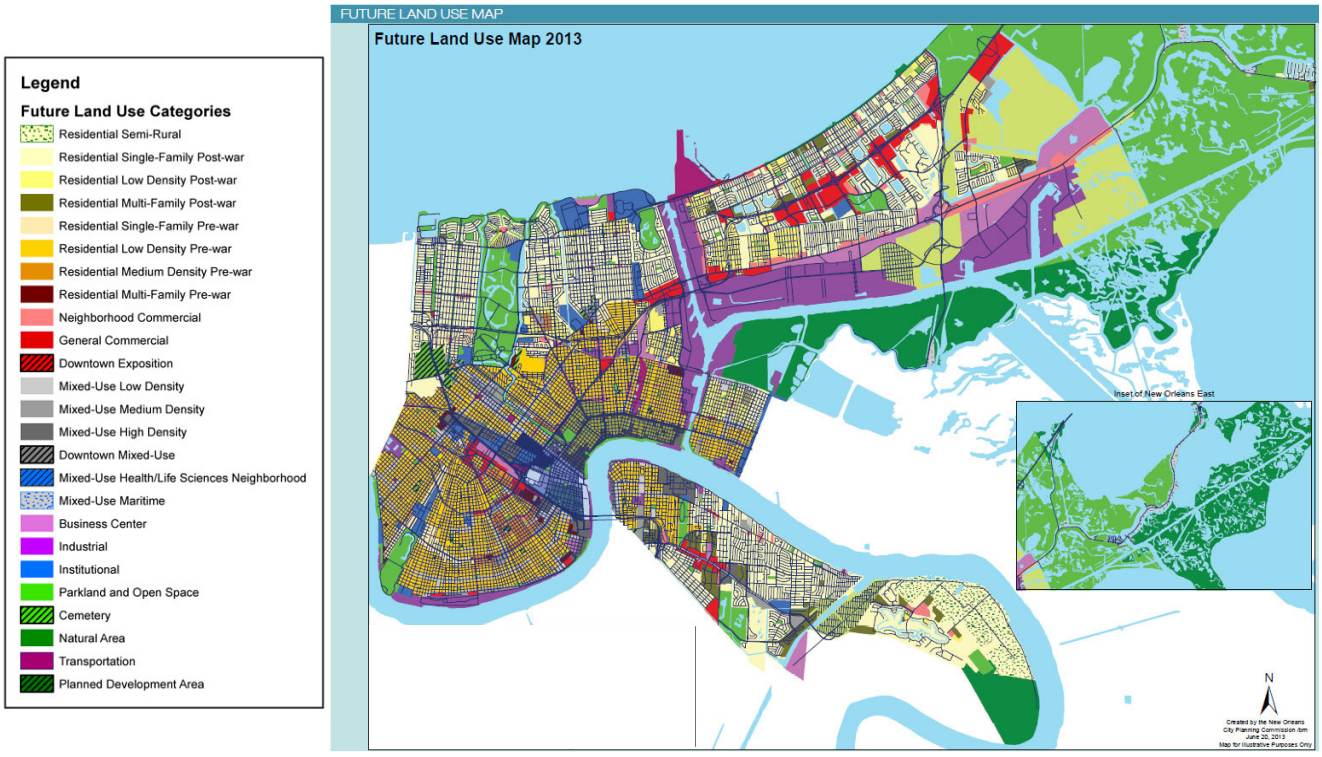
Source: Data.nola.gov; New Orleans National Register Historic Districts and Local Historic Districts data.

Master Plan Typology Definitions: The New Orleans Master Plan defines "future land use categories" based on a detailed character study of New Orleans' neighborhoods and corridors, which also assists in displaying the locations of various typologies of rental housing a map of these categories can be found on the following page. The categories define the character, use, and development density that are permitted in particular areas of New Orleans. Relevant future land use categories that may help define focus areas for various types of energy efficiency and building system improvements include:

- Residential Low-Density Pre-War: This future land use category is concentrated in the historic urban neighborhoods of Carrollton, Uptown, Mid-City, the Seventh Ward, Gentilly Terrace, the Upper Ninth Ward, Holy Cross, the Lower Ninth Ward, and Algiers Point. Often this designation includes neighborhood fabric but excludes major corridors, which may have a higher-density designation. Rental units in these areas are most likely to be single-family or two-family properties, though historic three-to-four unit developments may also be present on some blocks.

- Residential Medium-Density Pre-War: This future land use category encompasses the St. Charles Avenue corridor east of Napoleon Avenue, which has a number of historic 20+ unit apartment and condominium complexes, as well as many smaller 10-20 unit buildings; portions of Central City where fewer large multifamily properties currently exist; and the new mixed-income housing developments of Faubourg Lafitte and Marrero Commons.
- Residential Multi-Family Pre-War and Post-War: These categories, which are scattered along St. Charles Avenue, in New Orleans East, and on the West Bank, generally encompass existing large-scale multifamily development of 20 units or more.
- Mixed-Use High Density: This future land use category is concentrated along Tulane Avenue, which has several current large multifamily complexes and is likely to be a locus of future large multifamily redevelopment, due to the recently-constructed University Medical Center and Veterans' Affairs hospitals in the area; and in Federal City, a projected large redevelopment project of a former military property on the West Bank.
- Downtown Core Mixed-Use and Downtown Core Neighborhood Mixed-Use: These designations are focused in the Central Business District and Warehouse District, which have concentrations of historic large office and warehouse buildings, many of which have been or are in the process of being converted to residential and hotel development.

Figure 6: New Orleans Future Land Use Map



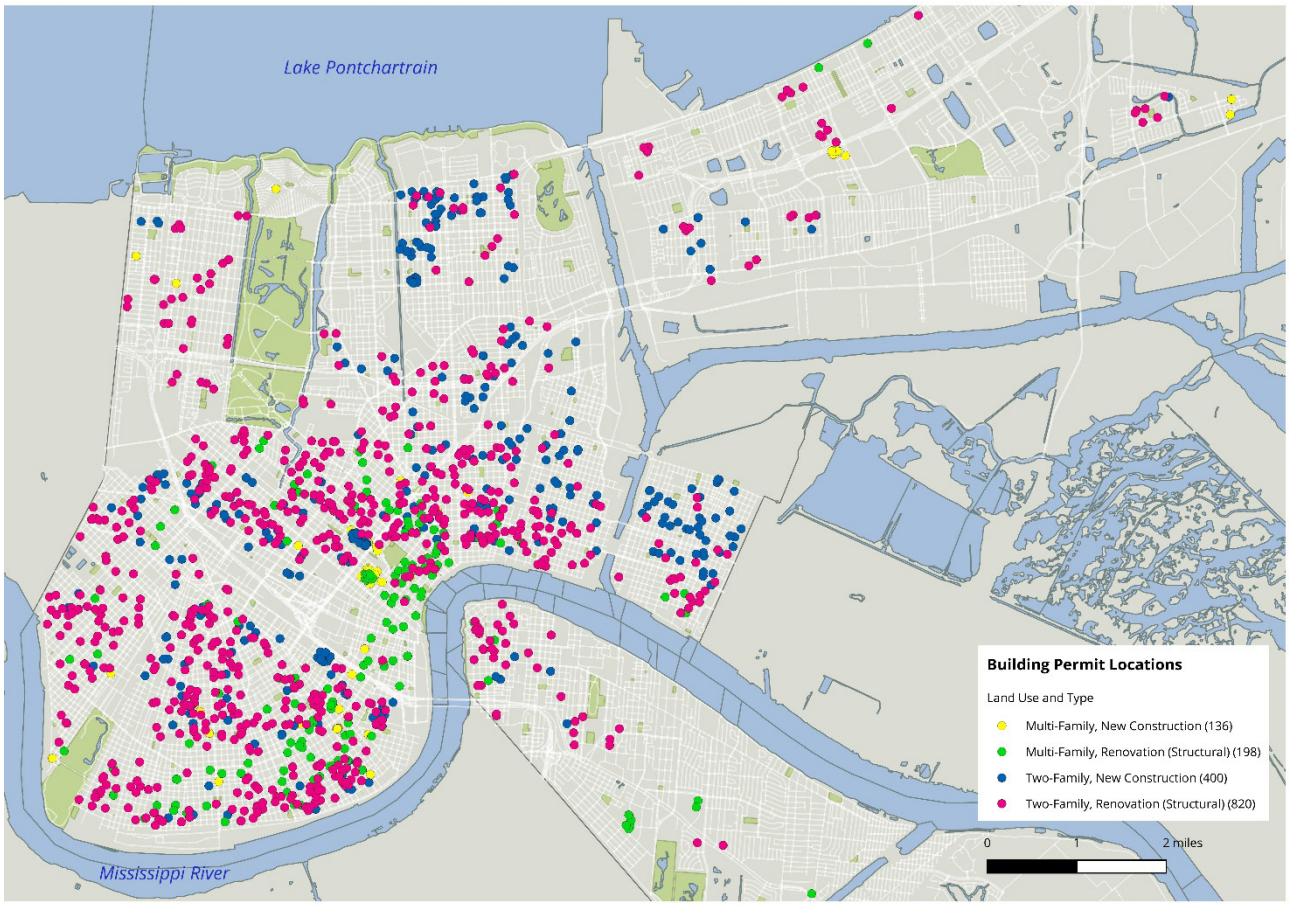
Source: New Orleans City Planning Commission, 2013.

NEW CONSTRUCTION AND RENOVATION ACTIVITY

Publicly-available building permit data collected in the five-year period between 2012 and 2017 provides additional insight into the location of the multifamily building stock in New Orleans, and the areas that are experiencing significant concentrations of new construction and renovation of multifamily properties. Because building permits in New Orleans do not include clear and consistent information characterizing whether a particular building is a rental property, the map and information below intentionally omits single-family buildings, which are more likely to be owner-occupied than renter-occupied (71% owner-occupied vs 29% renter-occupied). In contrast, multifamily buildings in New Orleans are far more likely to be renter-occupied (14% owner-occupied vs. 86% renter-occupied).[17]

Building permits for multifamily (3+ unit building) structural renovation have been most commonly issued for properties in Uptown neighborhoods along St. Charles Avenue; in the Central Business District and French Quarter; and along Esplanade Avenue, with scattered properties in the Carrollton and Mid-City areas. Multifamily (3+ unit) new construction permits issued since 2012 are fewer and more scattered, with a concentration of new construction/renovation permits at Canal and Basin representing the Iberville mixed-income redevelopment; several permits in New Orleans East; and others scattered in Uptown, Tulane/Gravier, and Lakeview/Lake Vista. Two-family renovation and construction permits are found across New Orleans' historic neighborhoods.

Figure 7: New Construction and Structural Renovation Building Permits for Residential Structures with Two or More Units, 2012-2017



Source: Data.nola.gov; Permits – BLDS data.

17 American Community Survey 2015 1-year data.

RENTAL BUILDING SYSTEMS AND CONDITION

There are few publicly available data sets that document the condition of the rental stock in New Orleans and the heating, cooling, water, and electric systems that define how buildings use energy and water; this section therefore includes data on building condition and systems drawn from publicly available sources as well as a survey of local rental property owners that captured building systems data on a total of 1,400 rental units.

PREVALENCE OF DEFICIENCIES IN THE CONDITION OF RENTAL HOUSING

The 2015 American Housing Survey (AHS) provides data on certain condition deficiencies in New Orleans' rental housing. Many of the deficiencies identified by AHS do not have a direct relationship to energy and water usage: for example, the AHS examines the presence of mold, vermin, and rodents. However, certain items that indicate an inadequately sealed building envelope, such as the presence of cracks or holes, lack of insulation, and water leakage, may be indicators of poor-quality housing that could benefit from weatherization and energy efficiency improvements.

- General deficiencies:
  - 15,100 rental units have open cracks or holes in the interior of the structure
  - 3,700 rental units have one or more holes in the floor
  - 2,100 rental units have one or more holes in the roof
- Causes of units being "uncomfortably cold for 24 hours or more":
  - 4,500 renter households report "inadequate heating capacity"
  - 4,600 renter households report "inadequate insulation"
  - 1,300 renter households report that the cost of heating has caused their lack of heating
- Causes of water leakage from the exterior of the structure:
  - 7,500 rental units have roof leakage
  - 5,700 rental units have leakage through the walls, windows, or doors.[18]

GNOHA and the Alliance for Affordable Energy have worked with partners to propose and support a "rental registry" that would enable annual inspections of rental units and would enable additional collection of information on building envelopes and condition as related to energy efficiency and utility usage.

18 U.S. Census Bureau, American Housing Survey, 2015.

HEATING FUEL FOR RENTAL HOUSING

The majority of rental properties in New Orleans (71%) use electric heating systems, followed by gas heating (26%).[19]

Table 5: House Heating Fuel for Rental Units	
	Total Units
Utility gas	21,956
Bottled, tank, or LP gas	285
Electricity	59,455
Fuel oil, kerosene, etc.	17
Solar energy	40
Other fuel	18
No fuel used	526

Source: ACS 2011-2015, "Tenure by House Heating Fuel" for Orleans Parish.

RESULTS OF BUILDING SYSTEMS SURVEY

The research team conducted a building systems survey with rental property owners in New Orleans during March and April of 2017. The survey captured data on 76 buildings that house 1,400 rental units. Survey questions are available in Appendix A and included questions on basic building characteristics such as location and square footage, as well as details on energy, gas, and water systems. The survey reached a statistically significant number of rental units at the 99% confidence level with +/- 5% margin of error based on the total number of 84,014 rental units in New Orleans (ACS 2015). However, the surveyed set of properties are not similar to the population of properties in New Orleans generally. This leads to discrepancies from the expected total of units surveyed in each category that are shown in the following table. The units are much newer than the average rental property. Far more of the surveyed units are subsidized than the total landscape of rental units in New Orleans would suggest, and far more are located in large buildings of 20 units or more compared to the total landscape of rental units in New Orleans. Table 6 shows information about these sample characteristics compared to expected values.

Table 6: Building Systems Survey: Selected Sample Characteristics Compared to Rental Landscape			
	Expected Percentages of Rental Units (ACS 2015)	Actual Percentages of Surveyed Rental Units	Actual Number of Surveyed Rental Units
Subsidized Housing			
Subsidized Units	37%	93%	1,307
Non-Subsidized Units	63%	7%	93
Size of Structure (# Units) Breakdown			
Unit is Single-Family Structure (Detached or Attached/Townhome) (30%)	30%	2%	24
Unit is in Two-Family Structure	26%	3%	48
Unit is in 3-4 Unit Structure	14%	2%	23
Unit is in 5-19 Unit Structure	13%	0%	0
Unit is in 20+ Unit Structure	16%	93%	1,305

19 U.S. Census Bureau, American Community Survey 2015 1-year data.

OVERALL BUILDING CHARACTERISTICS

Most of the surveyed properties and units (88%) were built or substantially renovated over the last 10 years, which corresponds with the renovation and building booms observed after Hurricane Katrina hit in 2005.

Just 85 units (6%) of the 1,400 units surveyed utilized gas service, compared to the AHS estimated that 26% of rental units in New Orleans rely on gas heating fuel. This may be a result of the over-sample of newer, larger properties in the survey compared to rentals in New Orleans overall.

RATES AND METERING

Three of the 76 buildings surveyed, incorporating 302 total units, have secured agreement to pay a commercial rate for electricity; all of these buildings have master metering, and the landlord of each building pays the electric bills. The remaining 73 buildings pay residential rates for electricity.

Overall, most units (71%) have individual electric metering; electric costs are borne by the tenants in all of those units. The landlord pays electric costs for the 29% of units surveyed with master metering for electricity. Weighting the survey results by the percentage of units in the rental inventory as a whole reveals that approximately 91% of tenants in New Orleans pay their own electricity bill.

In contrast, the vast majority of units in the survey (95%) are under a master metering arrangement for water service; in all of those cases, the landlord pays the water bill.

AIR CONDITIONING

The vast majority of surveyed units (99%) had air conditioning systems that had been installed or replaced in 2007 or later. Systems ranged in type from:

- Traditional split systems (most common in 1-4 unit buildings)
- Ductless split systems (most common in 1-4 unit buildings)
- Rooftop ducted systems (most common in large 20+ unit buildings)
- PTACs within individual units, combined with a central common area system (most common in large 20+ unit buildings)

585 of 1,400 units (42%) relied primarily on window air conditioners for cooling; the remaining 58% relied on central air conditioning systems.

SPACE HEATING

Heating systems in New Orleans rental units include a range of system types, from central electric and gas furnaces, to gas boilers, to combined heating/cooling window units. Almost all surveyed properties have electric heating systems (99%). However, anecdotal evidence and other survey information suggest gas-fired furnaces and wall heaters are common in older houses and buildings. Electric heat pump heating appears to be much more prevalent in new properties and properties after renovation.[20] A better indication of heating fuel could be obtained by analysis of energy usage information in winter months, which could be performed by the utility.

WATER HEATING

94% of units surveyed utilize electric water heating systems. 83 of 1,400 units (6%) had gas water heaters; of these, 70 units are located in a large building with a central gas boiler, while the other 13 are located in smaller 1-4 unit buildings with individual water heaters per unit. While the sample is weighted to newer properties, other reports suggest a trend to electric water heaters.[21]

20 See, e.g., EIA Release from 2015 RECS "Whats New in the Energy Used at Home," Located at https://www.eia.gov/consumption/residential/

21 See e.g., EIA, Today in Energy Reports, Sept. 14. 2014, "Everywhere but Northeast, fewer homes choose natural gas as heating fuel." (located at: https://www.eia.gov/todayinenergy/detail.php?id=18131)

ENERGY USE AND COSTS IN RENTAL PROPERTIES

ENTERGY NEW ORLEANS UNABLE TO PROVIDE USAGE DATA

We began this study assuming Entergy New Orleans (ENO) would cooperate to provide summary energy usage and cost information that could be associated with building characteristics and building system data. Despite best efforts of the study's sponsors, ENO staff were unable to find a way to provide aggregated or anonymized data results tied to building characteristics for a sample of buildings in New Orleans.

Energy usage information tied to information about properties (e.g., type of air conditioning systems) would be useful to better understand energy usage in New Orleans rental properties. We expected Entergy would also find value in the results. Without Entergy's cooperation, this report is unable to provide data associating rental building characteristics with actual per-unit electricity or gas usage, which would be one of the most effective means of informing an energy-efficiency program for rental properties. For example, we sought to identify the average energy usage per square foot of different property types, which could be averaged over many addresses of each type (e.g., shotgun houses built before 1940, new homes, units in buildings of 5 units or more) in order to not reveal any personally identifiable information of any customers.

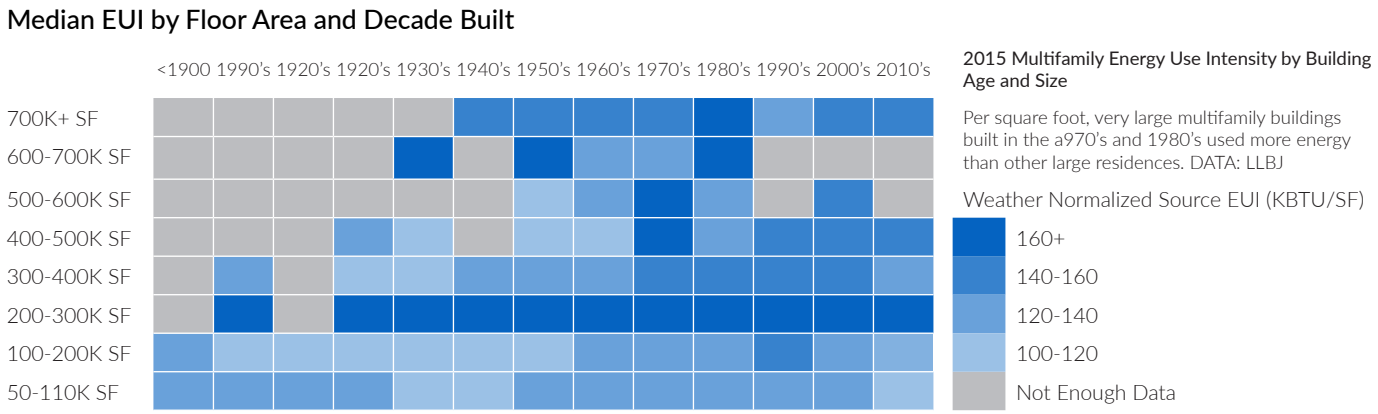
Better information on energy usage is a building block of good policy decisions. The city has several options. One option is to follow the lead of cities such as Washington DC, Atlanta, Houston, Orlando, and many other cities which require owners of certain properties (e.g., buildings with 10 units or more, or buildings over 10,000 square feet) to annually report an energy efficiency score of their properties to a city-run database.[22] The reporting function can be automated and directly from the utility to the database so that the burden on the owner is only to set-up an account and authorize the data transfer.

The primary purpose of the policy is to inform the owner and prospective tenants of how a specific property compares to averages on energy use, which is expected to drive improvements, but the database can also be used for research to derive insights.

For example, below is a graph from a research report based upon the information reported by New York City buildings to the city database, showing energy usage per square foot of multifamily buildings, sorted by age of property in columns, and size of property in rows. This information allows for the analysis that shows that in New York, smaller and older buildings are often more energy efficient than very large buildings and newer buildings.

22 See Reports of the City Energy Project, located at http://www.cityenergyproject.org/cities/

Figure 8: Energy Use in New York City Multifamily Buildings, taken from 2017 benchmarking report.



Source: New York City's Energy and Water Use 2014 and 2015 Report, by Urban Green Council, October 2017. Located at: http://urbangreencouncil.org/sites/default/files/energy_and_water_use_report_spreads.pdf

Better information for property owners is a pre-condition of better information for researchers and policy analysis. It is important to enable property owners to obtain usage information on their properties even if occupied by one or more separately metered tenants. A roadmap to accomplish this is provided in a recent report on Landlord Portals – utility systems that deliver out whole-building usage information and can automatically deliver usage totals to other systems for owner use, including for reporting to the city.[23]

According to the report on utility customer systems for landlords, many utilities provide systems that allow property owners to obtain usage information on their properties for purposes of energy management and reporting to city databases, including Xcel, Eversource, Consumers Energy, Commonwealth Edison, Pepco, and more.

We also note that California investor owned utilities overseen by the Public Utilities Commission are required to maintain a process for accredited researchers to use certain usage information subject to non-disclosure requirements.[24]

PUBLIC-USE MICRODATA SAMPLE INFORMATION ON UTILITY COSTS TO HOUSEHOLDS

In the absence of usage data from the utility, the research team determined that the American Community Survey's Public-Use Microdata Sample (PUMS) could provide useful information about costs for electric and gas service within New Orleans rental properties. Unfortunately, because rates for electricity, gas, and water vary over time based on numerous factors, no clear relationship could be established between the PUMS cost data and the usage of electric, gas, and water within New Orleans rental properties. This section therefore focuses on renter household utility costs and does not comment on utility usage, per se.

The data in this section is drawn from the 2011-2015 PUMS sample for Orleans Parish rental properties. PUMS data is a Census-provided sample of the data used to generate the American Community Survey results. All PUMS data is self-reported by respondents, as is the standard for Census data collection. Data reported by respondents includes the amount they paid in the previous month for electricity, gas, and

23 See Utility Customer Systems for Landlords, a report of the Energy Efficiency for All project, July 2017 (located at: https://www.nrdc.org/resources/utility-customer-systems-landlords).

24 See California Public Utility Commission Decision D.14-05-016

water; their gross rent costs in the previous month; their household income over the last 12 months; and the year their home was built.

In order to use the data, the research team first extracted all Orleans Parish properties from the State of Louisiana PUMS sample using PUMA codes 2400, 2401, and 2402, then extracted all rental units using the TEN (tenure) variable, to produce a database of exclusively Orleans Parish households living in rental units. A substantial database of 4,007 Orleans Parish renter households remained upon completing this extraction; the following analysis is based on this large sample.

ELECTRICITY COSTS FOR RENTER HOUSEHOLDS IN ORLEANS PARISH

One of the questions for households in the ACS, which is reflected in the PUMS data, asks the respondent to state how much they paid for electricity in the previous month. PUMS data is not collected longitudinally from households; each data point related to energy and gas payments therefore reflects just one month out of the year, which has disadvantages given that electric costs vary on a seasonal basis depending on needs for heating and cooling. Because PUMS is a rolling sample taken throughout the year, however, averaging the large sample allows rough overall one-month averages for electricity and gas costs to be obtained.

Within the PUMS sample, some households reported not paying for electricity because it was included in their rent; others did not recall or report a previous-month payment for electricity. Households who did not recall or did not provide data are not included in this analysis. The remaining sample includes 3,647 individual households living in separate rental units. The average one-month reported payment for all renter households was ***$136.50***, which translates to a total annual cost of $1,638 per renter household.

Table 7, on the following page, breaks down the sample by the year a structure was built and the number of units in a structure.

Table 7: Reported One-Month Electric Payments by Year Structure Built and Units in Structure

1939 or earlier	Avg. 1-Month Elec. Payment	# Units
All Units	**$134**	**1310**
One Family Detached	$170	191
One Family Attached	$150	219
Two-Family	$142	422
3-4 Units	$118	234
5-9 Units	$101	93
10-19 Units	$84	51
20-49 Units	$83	32
50 or More Units	$76	68
1940 to 1949	**Avg. 1-Month Elec. Payment**	**# Units**
All Units	**$154**	**382**
One Family Detached	$192	81
One Family Attached	$168	82
Two-Family	$146	106
3-4 Units	$125	62
5-9 Units	$154	19
10-19 Units	$90	7
20-49 Units	$64	6
50 or More Units	$74	17
1950 to 1959	**Avg. 1-Month Elec. Payment**	**# Units**
All Units	**$142**	**429**
One Family Detached	$175	128
One Family Attached	$158	89
Two-Family	$127	87
3-4 Units	$103	45
5-9 Units	$124	19
10-19 Units	$70	14
20-49 Units	$82	18
50 or More Units	$89	29
1960 to 1969	**Avg. 1-Month Elec. Payment**	**# Units**
All Units	**$146**	**400**
One Family Detached	$188	97
One Family Attached	$164	74
Two-Family	$138	77
3-4 Units	$125	49
5-9 Units	$128	19
10-19 Units	$85	13
20-49 Units	$109	20
50 or More Units	$75	50
1970 to 1979	**Avg. 1-Month Elec. Payment**	**# Units**
All Units	**$140**	**510**
One Family Detached	$185	89
One Family Attached	$165	78
Two-Family	$145	79
3-4 Units	$139	55
5-9 Units	$105	40
10-19 Units	$112	37
20-49 Units	$108	58
50 or More Units	$96	69

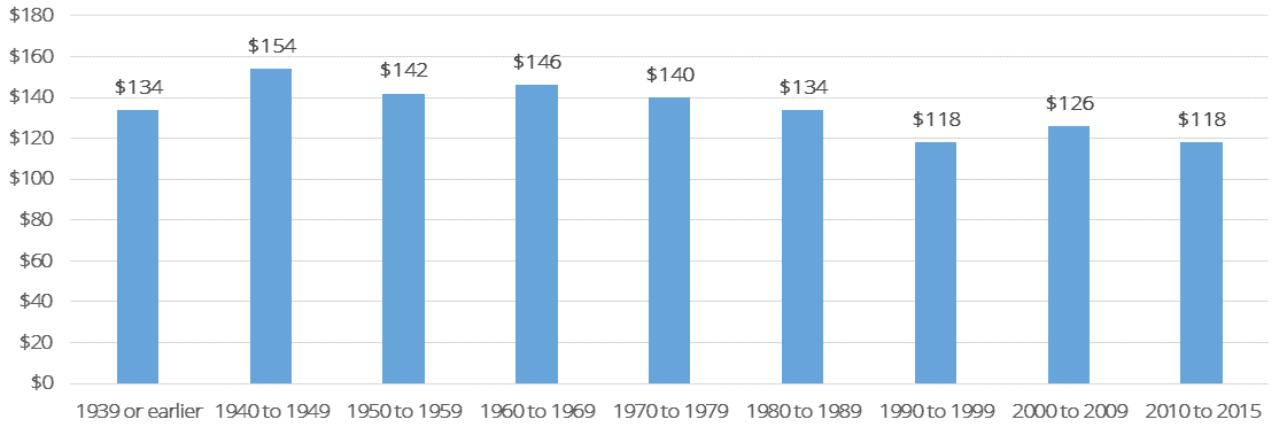
1980 to 1989	Avg. 1-Month Elec. Payment	# Units
All Units	**$134**	**244**
One Family Detached	$197	41
One Family Attached	$144	48
Two-Family	$129	35
3-4 Units	$122	22
5-9 Units	$96	26
10-19 Units	$126	27
20-49 Units	$92	12
50 or More Units	$74	22
1990 to 1999	**Avg. 1-Month Elec. Payment**	**# Units**
All Units	**$118**	**169**
One Family Detached	$189	25
One Family Attached	$143	15
Two-Family	$131	25
3-4 Units	$127	11
5-9 Units	$81	16
10-19 Units	$82	13
20-49 Units	$86	19
50 or More Units	$85	41
2000 to 2009	**Avg. 1-Month Elec. Payment**	**# Units**
All Units	**$126**	**438**
One Family Detached	$176	68
One Family Attached	$172	57
Two-Family	$168	53
3-4 Units	$113	34
5-9 Units	$119	29
10-19 Units	$99	37
20-49 Units	$83	36
50 or More Units	$76	122
2010 to 2015	**Avg. 1-Month Elec. Payment**	**# Units**
All Units	**$118**	**125**
One Family Detached	$176	23
One Family Attached	$121	13
Two-Family	$137	11
3-4 Units	$103	16
5-9 Units	$123	15
10-19 Units	$100	9
20-49 Units	$77	7
50 or More Units	$83	31

Source: ACS Public-Use Microdata Sample, 2011-2015

Examining these average one-month electric payment reports by year built and number of units in structure reveals several important trends related to cost of electricity for renter households:

Year Built: Renter households living in properties built since 1990 report lower one-month electric payments than households in pre-1990 properties. Households living in properties built in 1939 or earlier have lower average electric payments than those in properties built in 1940-1979; this likely results from the high property values and demand for historic structures that has resulted in significant renovation activity in New Orleans' historic areas.

Figure 9: Average One-Month Electric Payments by Year Structure Built



Source: ACS Public-Use Microdata Sample, 2011-2015.

Size of Structure: Rental households living in properties with fewer units tend to have higher one-month electric payments than rental properties with a larger number of units, regardless of the year in which the property was built. Dividing these costs on a square footage basis, however, shows relatively similar results for per-square-foot costs throughout the rental stock. Therefore, the largest factor in this differential is likely the larger size of units in single-family and 2-4 family structures compared to units in properties with five or more units.

Table 8: Average One-Month Payments and Per Square Foot Costs by Units in Structure

	Average One-Month Electric Payment	Average Square Footage of Unit	Average One-Month Electric Cost PSF
Single-Family	$169.25	1151	$0.15
2-4 Units	$133.60	812	$0.16
5+ Units	$92.63	642	$0.14

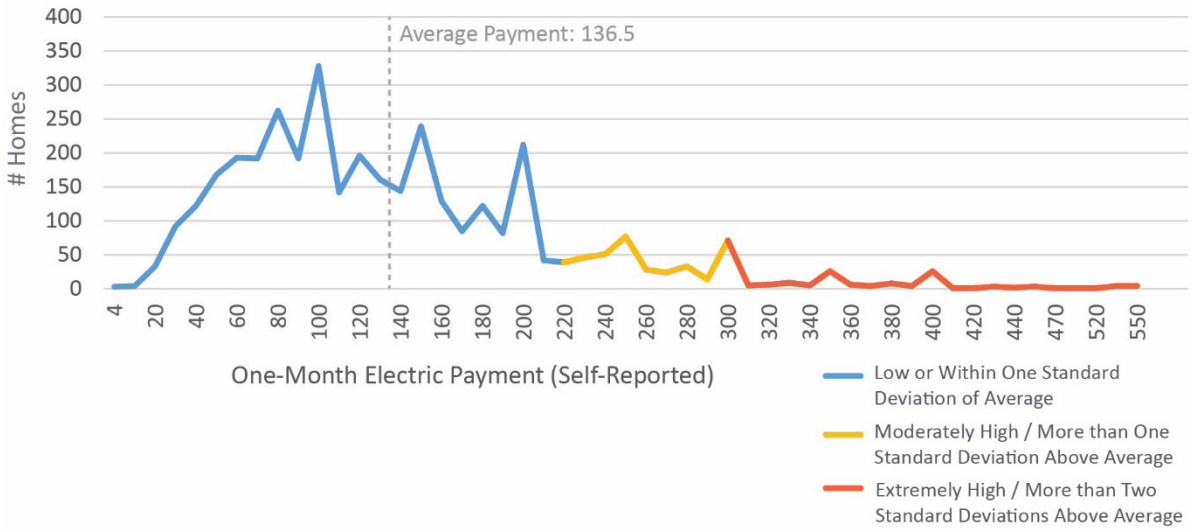
Sources: ACS Public-Use Microdata Sample, 2011-2015 (Average One-Month Electric Payment); Building Systems Survey conducted by Asakura Robinson, 2017 (Average Square Footage of Unit)

Despite the fact that average costs per square foot are relatively consistent across the rental inventory, there are some outlier properties with high one-month electric payments in the PUMS sample. These costs can create "energy poverty" for households who are less able to afford their Figure 9 below shows the distribution of the one-month electric payment reports generated by respondents over the course of the five-year period between 2011 and 2015. The range of responses extended from $4 to $550.

An analysis of the distribution of one-month reported payments in the PUMS data reveals that 14% of renter households are paying moderately or extremely high costs that are one or more standard deviations greater than the average cost – and most of these households live in smaller rental properties. Households

in the moderately and extremely high electric payment categories have an average annual income of $41,757, but this is skewed by some of the higher incomes in the sample – the median annual income of this group of households is $22,000. These high payments are therefore a significant impediment to equity and affordability in New Orleans' rental landscape.

Figure 10: Distribution of PUMS One-Month Electric Payment Reports



Source: ACS Public-Use Microdata Sample, 2011-2015.

Table 9: Percentage of "Moderately" and "Extremely" High Electric Payments by Units in Structure		
	% of Moderately/Extremely High Payment Units	Average HH Income
Single-family	62%	$41,557
2-4 units	32%	$44,037
5+ units	5%	$29,493

Source: ACS Public-Use Microdata Sample, 2011-2015.

Households in the moderately and extremely high electric payment categories have an average annual income of $41,757, but this is skewed by some of the higher incomes in the sample – the median annual income of this group of households is $22,000, based on analysis of the PUMS sample. This is even lower than the median renter household income for Orleans Parish, which was $25,035 in 2015.[25] An income of $22,000 means that the median household in this group is able to reasonably spend approximately $550 total on all housing costs per month, including rent and utilities combined, according to HUD's 30% standard for monthly housing costs as a percentage of income. Clearly, payments of $220 to $550 on electricity alone are therefore unaffordable to many of the households who must pay these bills. While the Low-Income Home Energy Assistance Program (LIHEAP) is available to assist low-income families who cannot pay their energy bills, it is only available to households twice per year and is meant to be a temporary rather than permanent solution to energy poverty.

25 American Community Survey 2015 1-year data.

GAS COSTS FOR RENTER HOUSEHOLDS IN ORLEANS PARISH

Approximately half of the households in the PUMS sample (48%) gave a report on their previous month's for gas costs; the remaining 52% did not recall their costs, did not have gas service, or were not responsible for paying their gas bill. The average one-month reported expense for gas is $25.

WATER COSTS FOR RENTER HOUSEHOLDS IN ORLEANS PARISH

Because the building systems survey indicated that landlords are very likely to pay water bills, meaning that tenants have less ability to self-report water expenses on a monthly basis, the PUMS data was not used to analyze one-month water costs for renters in Orleans Parish. Future efforts should be made to work with the Sewerage and Water Board of New Orleans to obtain monthly cost data for ratepayers.

CONCLUSIONS

Policy decisions about housing in New Orleans must include information on utility costs and energy efficiency, because ***utility costs matter to households*** – particularly lower-income households who may be culture bearers, teachers, first responders, hospitality or service workers, and others who are essential to preserve culture and sustain the economy. Energy costs can significantly impact whether a particular home is affordable to a household. No New Orleanian should have to choose between heating their home and feeding their family.

The data in this report show that ***energy efficiency for rental properties should be an element of the city's affordable housing strategy.*** Rental properties make up the majority of New Orleans housing stock, and over 60% of New Orleans renters are cost-burdened. Energy efficiency for rental properties can help reduce these burdens, and help New Orleans reduce its carbon emissions as well. In order to successfully implement an energy efficiency program, there are several conclusions that can be drawn from the data in this report.

1. ***Better information is essential.*** While this report draws on publicly available sources to provide initial suggestions on targeting an energy efficiency program, there is no replacement for having utility-provided data that allows specific targeting of properties based on need and usage. One option is to institute a benchmarking requirement which would populate a database automatically from Entergy New Orleans' databases. The results would inform energy efficiency strategies, showing the subset of housing types most likely to have residents with very high utility expenses and where energy efficiency program intervention (Energy Smart incentives) would deliver the most value. These systems would also help owners identify opportunities to improve their own properties; would assist tenants in making decisions about what properties to rent; would help utilities to locate properties in need of energy efficiency; and would allow effective analysis to support policy decisions on energy efficiency programs.
2. ***Programs will need to balance efficiency and equity goals.*** Small properties with 1-4 rental units may require more labor to implement energy efficiency interventions than larger buildings that can be completed with the agreement of a single owner. However, available data suggests that the majority of low-income households with high energy bills live in smaller properties. Benchmarking data can further assist in identifying households with high energy burdens, or households that may live in energy deprivation, denying themselves heating or cooling in order to afford their bills. The city's energy efficiency programs must balance assisting these households most in need, and the need for efficient reduction of carbon emissions and energy usage.
3. ***Three priority customer segments emerge from available data***. The data available suggests a strategy for energy efficiency programs that targets and addresses three priority customer segments residing in rental properties. One segment is low-income households with high energy bills who live in smaller (1-4 unit) structures. A second segment is

low-income households with weatherization needs and moderate bills suggesting energy deprivation. The final segment to address is households living in large properties that use the most energy overall, such as buildings with central heating and cooling systems. This multi-target approach appears ideal in light of the data to use efficiency programs to capture efficiency while also fulfilling the need for equity and affordability in the rental landscape. Our analysis suggests that ENO, with the participation of stakeholders, could use energy usage information combined with housing data to identify the customers and property owners fitting into these profile categories for purposes of energy efficiency program delivery.

Energy efficiency programs for rental properties can and should focus on a dual-pronged approach that manages the equity and affordability implications of high energy bills for renters, and effectively reduces climate change and carbon emissions. Creating a strategy that accomplishes both goals requires reliable data on both the costs of energy and utilities to households, and the overall usage of energy within buildings.

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