CONSTRUCTION, CODES AND COMMERCE

The Economic Impact of Commercial Energy Codes in the Southeast

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

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ABOUT THE SOUTHEAST ENERGY EFFICIENCY ALLIANCE (SEEA)

The Southeast Energy Efficiency Alliance (SEEA) is one of six regional energy efficiency organizations in the United States working to transform the energy efficiency marketplace through collaborative public policy, thought leadership, outreach programs and technical advisory services. SEEA promotes energy efficiency as a catalyst for economic growth, workforce development and energy security across 11 southeastern states. These states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia.

Visit SEEA online at www.seealliance.org.

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CONSTRUCTION, CODES AND COMMERCE:

THE ECONOMIC IMPACT OF COMMERCIAL ENERGY CODES IN THE SOUTHEAST

This report, titled "The Economic Impact of Commercial Energy Codes in the Southeast," is based upon SEEA's in-depth analysis of commercial construction data purchased from Reed Construction Data, Inc., a provider of business information for the North American construction industry. SEEA undertook an analysis of Reed's commercial building data to better understand overall commercial construction trends in the southeastern states, and specifically to get a more complete understanding of the impact that newer state-level energy codes have had, and may have in the future, on the commercial building market across the region.

Our hope is that this analysis will be of assistance and value to state energy offices, planners and construction industry professionals in the Southeast, providing them with a useful tool for planning and outreach, and for addressing the concerns of industry stakeholders. We also hope this research can help to answer important questions about how much energy a new code can save per state, and where each state might consider focusing its resources and efforts for optimal impact.

Finally, we hope these findings will spur new conversations among stakeholders about the kinds of codes and economic activity that can best serve the region's long-term need for affordable energy, construction-sector job growth and economic development.

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PEER REVIEW ACKNOWLEDGEMENTS

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INTRODUCTION

The following analysis, conducted by the Southeast Energy Efficiency Alliance (SEEA), examines the relationship between implemented energy codes and commercial construction starts, by southeastern state, from 2005 to 2013. It is based on "pulled permits," also referred to as construction starts, and on construction cost data purchased from Reed Construction Data, Inc., which we benchmarked against energy code implementations for each of the 11 states in SEEA's region .[1]

This study was undertaken in order to accurately and quantitatively assess the relationship between energy codes and construction starts in the Southeast. We present the results in both narrative and chart formats, showing commercial construction trends by state from 2005 to 2013, benchmarked against each southeastern state's energy code.

APPLYING CONSTRUCTION TRENDS ANALYSIS

To date, accurate, data-driven commercial construction trend information has been publicly unavailable for the southeastern region. As a result, inaccurate perceptions about the impact of energy codes have plagued efforts by stakeholders including developers, planners, utilities and local governments to determine where, and on what kinds of construction projects, to focus their efforts and resources for maximum economic impact.

It is our sincere hope that state energy offices, local planning departments and utilities, among others, find this data-based analysis valuable in their ongoing effort to upgrade the region's building stock, as well as the energy performance of that stock. We also hope this work will prove encouraging to the many hard-working developers in the field, who should know that their efforts to comply with new energy codes are making an important and positive difference.

This paper focuses specifically on commercial energy codes and building starts because information pertaining to this sector, while long needed, has not been readily available. On the other hand, information about residential housing starts continues to be freely available for anyone wishing to conduct a similar residential analysis.

If, in reading this paper, there are other questions about the impact of energy codes that you believe SEEA can help to address, we hope you will reach out to us to discuss your ideas and suggestions. Contact information is included in the previous introductory pages.

1 States in the SEEA territory include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia.

WHY NOW? THE IMPETUS FOR CHANGE

Since 2008, several southeastern states - including all of the states in SEEA's territory, less Tennessee - have implemented more stringent commercial energy codes. In order to obtain funding under the 2009 American Recovery and Reinvestment Act (ARRA), southern governors pledged to adopt the 2009 International Energy Conservation Code (IECC) by 2015, at a minimum. In addition, they pledged to attain 90 percent compliance with their new energy codes by 2017. This was an important advance for the Southeast, one that significantly accelerated the time to energy code adoption and compliance.

While the move toward stronger energy codes has been an encouraging trend in the southeastern states, concerns have remained in many quarters about the economic impact of these new codes, which many assume have had negative effects on jobs and local economies.

Specifically, a large sample of construction industry professionals and much of the general public tend to think that because stronger energy codes increase the first cost of construction, they lead to a direct decrease in local construction activity and hence, a decline in the local economy. It is these kinds of beliefs that have historically made it difficult for states to implement new energy codes, or even to enforce their existing codes.

To exacerbate misunderstandings about energy codes, the widespread but erroneous idea that commercial construction trends mirror those of residential construction has led some to use housing data, which is free, as a de facto evaluation tool for all construction. Accurate information on commercial construction trends has been absent from the discussion, due primarily to the costly and time-consuming nature of purchasing and rigorously analyzing the data that is available. As a result, state energy offices and other planning professionals have been left without a data-supported means to address charges that energy codes are detrimental to commercial construction starts, and hence to their local economies.

This paper seeks to address this absence of data by offering a detailed analysis of commercial construction trends from 2005 to 2013, using publicly available construction data purchased from Reed Construction Data, Inc., and correlating construction starts, in the form of "permits pulled" and construction costs, with changes in the commercial energy code, on a state by state basis.

Summary graphs included in this report present the relationship between the implementation of new energy codes and trends in commercial construction by state.

METHODOLOGY

To create this analysis, SEEA reviewed data tracked by Reed Construction Data on commercial "permits pulled," by year, using a series of Microsoft Excel® charts that correlated permits with implemented energy codes. The term "permits pulled" used throughout this report, describes construction permits that have been activated, which made it possible for SEEA to accurately count commercial construction starts.

In first reviewing the raw data provided by Reed Construction Data, SEEA removed several types of construction from the data set in order to capture only the construction starts that are traditionally affected by building energy codes. This ensured we eliminated the possibility of counting non-relevant permits, such as those for repairs made to bridges and roadways, which would have skewed our results to show greater commercial construction than what had actually occurred.

SEEA then analyzed the data set to identify the top ten counties, by construction starts; by total square footage; and by total cost of construction by county. SEEA repeated this analysis for building construction type, e.g. hospitals, elementary schools, etc.

This made it possible to view the construction data on a year-by- year basis, as well as over the aggregate 2005-2013 period. Finally, SEEA sorted the data by construction project type, i.e. renovation or new construction.

Finally, SEEA used the Consumer Price Index from the U.S. Bureau of Labor Statistics to adjust the monetary value of all projects undertaken between 2005 and 2012 to account for inflation during that time frame. As a result, all monetary values presented in this report are expressed in 2013 dollars.

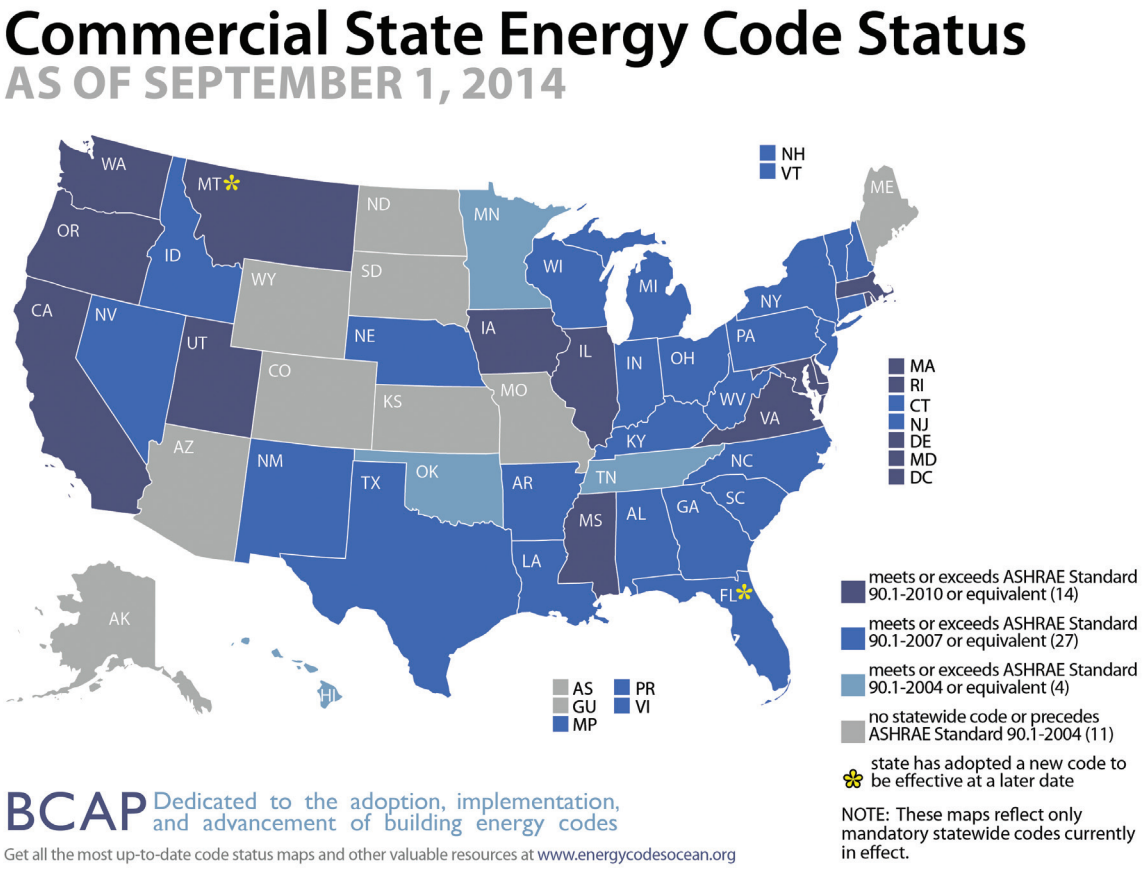
The complete analysis included more than 136,000 lines of data, and was based on several different formulas and pivot tables in Microsoft Excel.

2 Reed Data is divided into three categories: Civil, Nonresidential and Multifamily Residential. Our analysis removed all data designated "Civil" as this category includes horizontal construction types, such as roadways and bridges. Our analysis also removed the following Nonresidential building types: amusement parks, med misc, parking garages, and transportation terminals. These categories typically do not have heated and/or cooled spaces and would not be significantly affected by energy codes.

A BRIEF HISTORY OF ENERGY CODES IN THE SOUTHEAST

Energy code 2009 IECC, when implemented, results in an 8.7 percent decrease in building energy use compared to 2006 IECC, its predecessor. ASHRAE 90.1-2007 when implemented, results in a 6.4 percent energy savings compared to ASHRAE 90.1-2004.

With the exception of Tennessee, all states in SEEA's territory have adopted the 2009 IECC and/or ASHRAE 90.1-2007 or better, and a majority of this adoption activity occurred between 2011 and 2013. A majority of U.S. states have also adopted ASHRAE 90.1-2007 or greater, as shown on the following map, which was created by the Building Code Assistance Project (BCAP).



Based on BCAP's map data, the current commercial codes in place in the southeastern states, and the date on which they became effective, are as follows:

State	Current Commercial Code	Effective Date
Alabama	2009 IECC/ASHRAE 90.1-2007	10/1/2012
Arkansas	ASHRAE 90.1-2007	1/1/2013
Florida	Florida Building Code: Energy Conservation (ASHRAE 90.1-2007 equivalent)	3/15/2012
Georgia	2009 IECC/ASHRAE 90.1-2007	1/1/2011
Kentucky[1]	2007 Kentucky Building Code (2009 IECC equivalent)	6/1/2011
Louisiana	2009 IECC/ASHRAE 90.1-2007	7/20/2011
Mississippi	ASHRAE 90.1-2010	7/1/2013
North Carolina	2012 North Carolina Energy Conservation Code (2009 IECC/ASHRAE 90.1-2007 equivalent)	1/1/2012
South Carolina	2009 IECC	1/1/2013
Tennessee	2006 IECC	7/1/2011
Virginia[2]	2009 Virginia Energy Conservation Code (2009 IECC equivalent)	3/1/2011

1. As of October 1, 2014, the 2013 Kentucky Building Code will require all commercial buildings to comply with the 2012 IECC.

2. Virginia has adopted the 2012 Virginia Energy Conservation Code (2012 IECC equivalent); however, permit holders have the option to choose between the 2009 Virginia Energy Conservation Code and the 2012 Virginia Energy Conservation Code until 7/1/2015.

ENERGY CODES: GOOD, BAD OR NEUTRAL?

As has been previously noted, due to a lack of accurate information, there are many misconceptions about energy codes and how they do and do not help states that seek to improve the energy performance of both new and existing buildings.

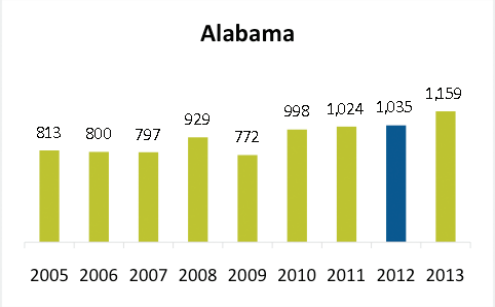
Primary among these charges is the popular belief that strong energy codes hinder construction due to the greater effort and cost they bring to a project. This, in turn, is assumed by many to substantially dampen local commercial construction work, forcing developers to move on in search of states with easier-to-meet energy codes.

This is an old argument, similar to the one that says developers won't build where there are high impact fees. It is countered by the fact that residential permit numbers clearly show that many states with strong codes have continued to see construction growth. Florida is a prime example; it adopted a more stringent energy code well in advance of its neighboring states, yet has experienced no slow-down in residential construction.

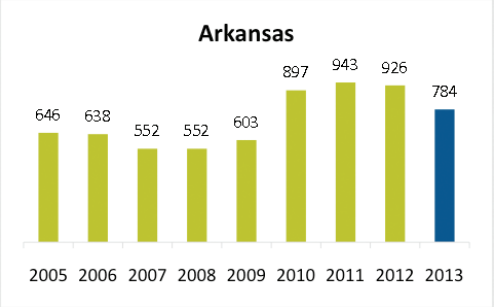
Graph 1 through Graph 11 below shows that nine out of the 10 SEEA states that implemented stronger energy codes also enjoyed a greater number of commercial construction starts in 2013, as compared to 2008, the heyday of pre-recession building. Every one of these nine states had a stronger energy code in place in 2013 than it did in the period from 2005 to 2008.

Kentucky was the only exception to this trend toward greater construction starts following the adoption of a stronger energy code.

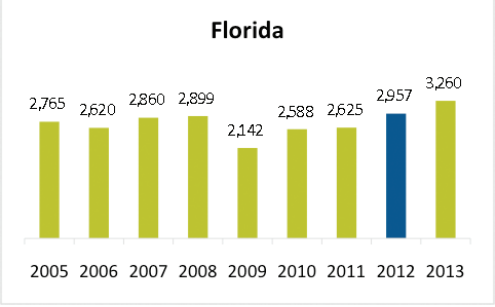
GRAPHS 1- 11: NUMBER OF COMMERCIAL CONSTRUCTION PERMITS FROM 2005-2013



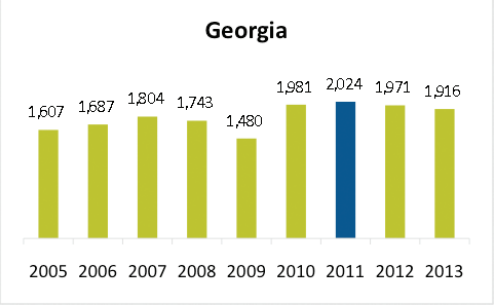
Graph 1



Graph 2

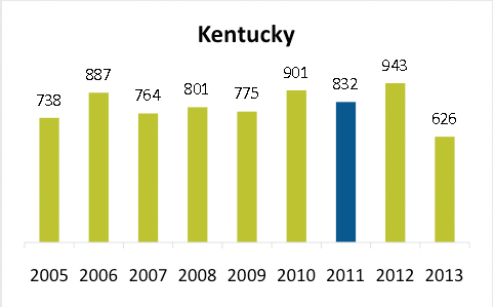


Graph 3

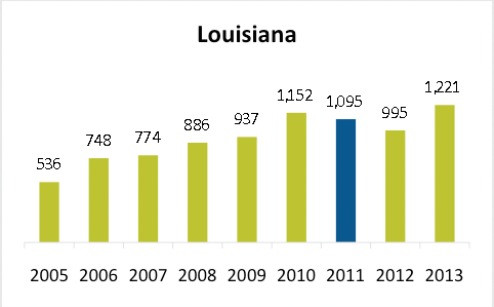


Graph 4

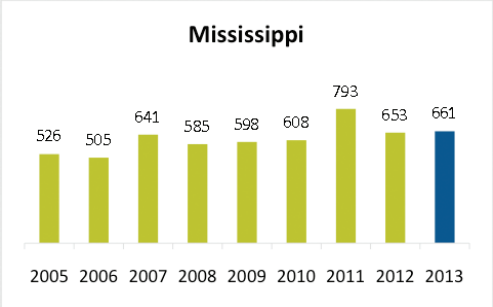
Indicates year new energy code



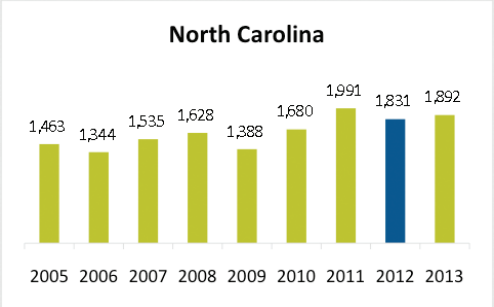
Graph 5



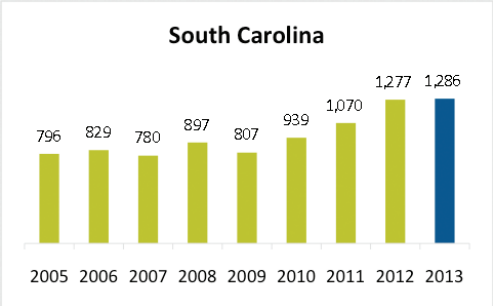
Graph 6



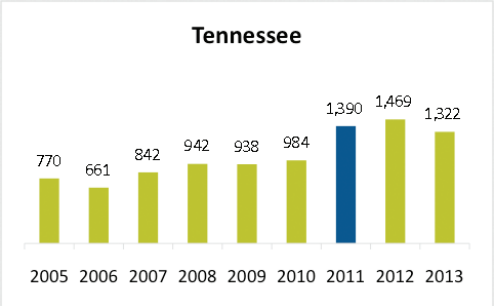
Graph 7



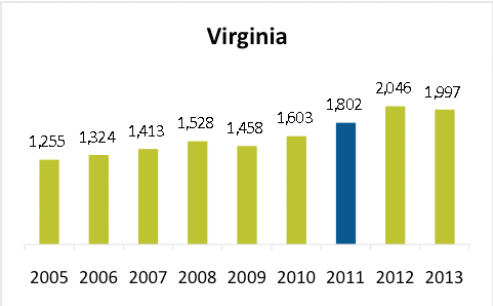
Graph 8



Graph 9



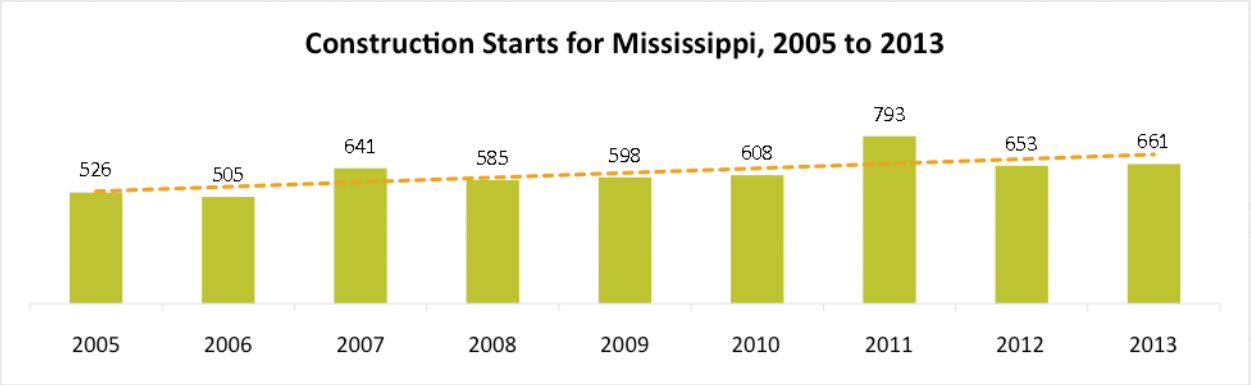
Graph 10



Graph 11

Indicates year new energy code

Mississippi provides another indication that codes do not appear to directly impact commercial construction. Mississippi, which did not have an energy code prior to July 2013, also did not experience an influx of developers from its neighboring states, seeking to build in a less stringent code jurisdiction. In fact, Mississippi's commercial construction starts have remained fairly consistent from 2005 to 2013:



Returning to Graphs 1 through 11 above, when looking at construction starts in the year following the implementation of a stronger energy code, it is notable that of the ten states that upgraded their codes, eight experienced no adverse impact to commercial construction starts in subsequent years.

There are many factors that may be responsible for this result, and SEEA acknowledges that many factors come into play in commercial site selection decisions, including access to transportation and city services; the nature of the surrounding businesses and clientele; the local business climate; building accessibility for potential employees, and more.

However SEEA's analysis, based on Reed Construction's permit data, suggests that if codes do depress commercial construction starts, then this data set would offer an obvious place for such evidence to present itself. Having studied the data, SEEA finds no direct evidence of that relationship. Rather, it seems the factors listed above have a collectively greater role in influencing commercial buildings starts than do energy codes.

In addition, extensive data[3] suggests that buildings which meet or exceed energy codes often create their own market advantage, and tend to be more sought after by knowledgeable buyers and tenants. This is because they are generally more comfortable for their occupants, which correlates to higher productivity, and they are more cost effective to operate over time. Together, these factors can represent an important competitive advantage.

3 The Institute for Market Transformation (IMT) complied several studies illustrating the premium associated with energy efficient buildings, referenced here: http://www.imt.org/uploads/resources/files/2Added_Value_of_Greener_Buildings_-_Sale_Price.pdf

BUILDING MOMENTUM IN THE COMMERCIAL CONSTRUCTION SECTOR

U.S. Census data and homeowner experience show that across the country, and especially in the Southeast, residential construction experienced a steep decline as a result of the 2008 economic recession.

Comparable public benchmarks are not available for commercial construction. However, many have drawn the conclusion that there is considerable similarity between how all types of construction fared during the recession.

The data SEEA analyzed showed that while all of the southeastern states experienced a decline in commercial construction starts over the recession, this decline was not of the same magnitude as the monumental drop that resulted from the collapse of the housing bubble. Rather, it was more of secondary effect, driven by the economy-wide ripple caused by the housing market crash.

Derived from the graphs on pages 6-7 above, the following chart shows commercial construction starts in the year before each of the southeastern states adopted its energy code, and the starts in the years following code adoption:

		Construction Starts			
State	Year of New Code	Year Before New Code	Year of New Code	Year After New Code	Trend
Alabama	2012	1,024 in 2011	1,035 in 2012	1,159 in 2013	↗
Arkansas	2013	926 in 2012	784 in 2013	N/A	↘
Florida	2012	2,625 in 2011	2,957 in 2012	3,260 in 2013	↗
Georgia	2011	1,981 in 2010	2,024 in 2011	1,971 in 2012	↗
Kentucky	2011	901 in 2010	832 in 2011	943 in 2012	→
Louisiana	2011	1,152 in 2010	1,095 in 2011	995 in 2012	↘
Mississippi	2013	653 in 2012	661 in 2013	N/A	↗
North Carolina	2012	1,991 in 2011	1,831 in 2012	1.892 in 2013	→
South Carolina	2013	1,277 in 2012	1,286 in 2013	N/A	↗
Tennessee	2011	984 in 2010	1,390 in 2011	1,469 in 2012	↗
Virginia	2011	1,603 in 2010	1,802 in 2011	2,046 in 2012	↗

For seven states, Alabama, Florida, Georgia, Tennessee, Mississippi, South Carolina and Virginia, the number of permits pulled during the year they adopted a new energy code is higher than the previous year. In fact, for Georgia, its largest-ever number of commercial permits pulled coincides with the adoption of its new energy code.

For two states, Kentucky and North Carolina, the year they adopted a more stringent energy code shows a decrease in the number of permits from the previous year; however, in the year after the new code was adopted, they show an increase in permit numbers.

Arkansas and Louisiana are the exception. For these two states, the data shows a downward trend of permitting numbers, which drop the year the code is adopted and continue to drop the year after as well. While a detailed discussion of these results is beyond the scope of the paper, credible sources inside both states suggest factors that may account, at least in part, for these downward permitting trends include the overall business climate, employment levels and available financing.

Taking into account the outlier results in Arkansas and Louisiana, the permits pulled analysis still shows a regional trend toward growth in commercial construction starts following code adoption, which is consistent with our observation that there is no clear evidence that energy codes directly affect commercial building activity in the Southeast. And while some may argue that had the codes not been adopted, the states of the region could have experienced an even stronger uptick in commercial starts, the absence of construction gains in Tennessee and Mississippi, based on Tennessee's adoption of the less stringent IECC 2006 and Mississippi's very recent code adoption, suggests this was not a highly likely outcome.

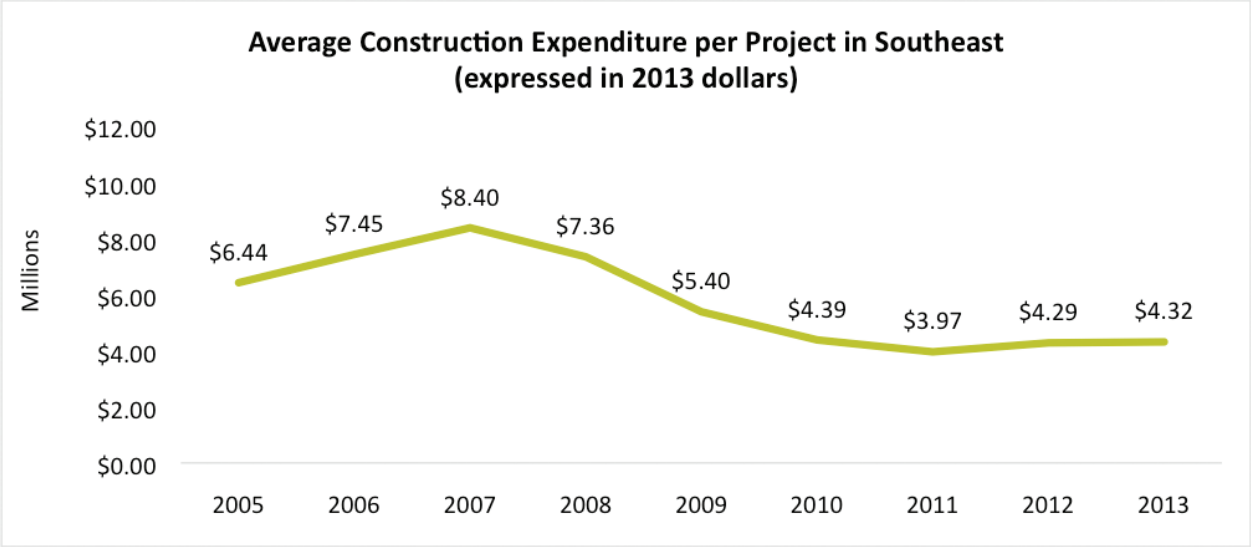
MEASURING IMPACT BEYOND PERMITS PULLED

In addition to commercial construction starts, construction trends can also be evaluated by analyzing the construction expenditures associated with each permit pulled. In this kind of analysis, we assume construction expenditures represent an investment in a local economy, such that the greater the aggregate construction investment, the more economic benefit accrues to the economy, in terms of increased employment in the construction sector, the industries that supply it and the overall economy, which benefits from people with more disposable income to spend.

Unfortunately, this form of analysis does not result in clear-cut, obvious trends such as those found in an analysis of permits pulled because construction expenditures do not provide obvious patterns. Still, by applying a construction expenditure filter to the Reed data, Florida comes out as the region's top performer. Its year of code adoption, 2012, shows greater construction investments in the local economy than 2011, the year immediately preceding code adoption. This strong performance is reinforced again in 2013, where despite the more stringent energy code in place, Florida's total construction expenditures, representing investments in its economy, exceed those of all previous years.

Unfortunately, construction expenditure analysis does not paint such a strongly positive picture in states like Arkansas, Kentucky, Louisiana and Virginia, all of which remain at investment levels that are below the 2005 to 2008 peak years. Still, these states continue to experience growth in their construction investments in the years following their adoption of stronger energy codes.

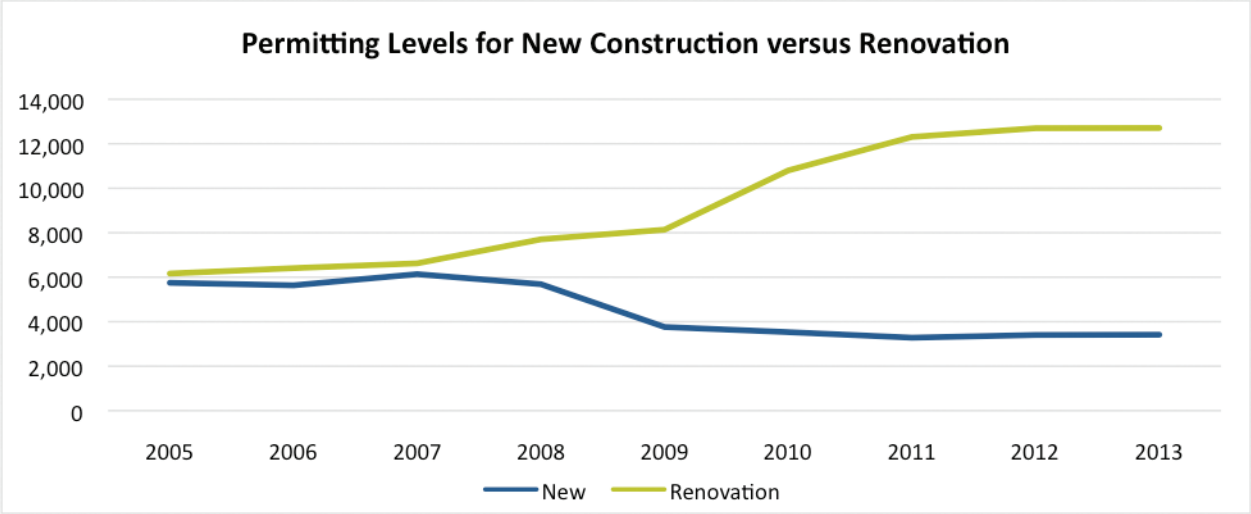
Other states, including Georgia, Mississippi, North Carolina, South Carolina and Tennessee, have not seen their construction expenditures return to the levels achieved during the peak years from 2005 to 2008, and their construction investments continue to remain flat or in decline.



One of the factors that appears to be strongly influencing these steady and declining construction costs is that there appears to have been a clear shift in the type of construction permits being pulled in the post-recession world, which has created a marked change in the cost per project. Renovation permits now represent a greater percentage of construction work than new building construction.

The graph below shows this uptick in renovation activity, which counterbalances the decline in new construction activity. In numerical terms, the shift looks like this: At the pre-recession peak of commercial construction, the average construction expenditure per permit in the Southeast, expressed in 2013 dollars, was $7.48 million. In 2011, the Southeast hit its lowest level of construction investment when expenditures dropped to $3.83 million per permit. However in 2013, the region began to show signs of increasing construction costs, as demonstrated by a rise in average expenditure to $4.32 million per permit.

It seems likely that this trend will continue for some time to come.



CONCLUSIONS

As a result of this analysis of construction data in the Southeast from 2005 to 2013, SEEA finds the following:

1. Permit numbers are on the rise, and most southeastern states have surpassed their pre-recession peak, despite region-wide implementation of more stringent energy codes.

2. Renovation activity is growing more rapidly in the region than new construction projects, which are currently in decline.

3. Based on clear increases in permit numbers in seven of 11 states, SEEA concludes that there is no evidence that energy codes depress commercial construction activity, as other factors appear to be more influential in determining construction activity levels. If codes do depress commercial building starts, the data in this study would provide an obvious place for this evidence to present itself. Instead, we find no evidence of this relationship.

MOVING FORWARD: POTENTIAL USES FOR THESE FINDINGS

The data and findings of this report can be useful, we hope, in many applications. The following is a list of suggested, but not comprehensive, ways in which both organizations and individuals could make use of this information.

The report authors recognize there are many additional analyses that could be completed from this data, and we invite your ideas and suggestions on the kinds of analyses that would be of real application and value. Please email us your input using the contact emails provided at the beginning of this report.

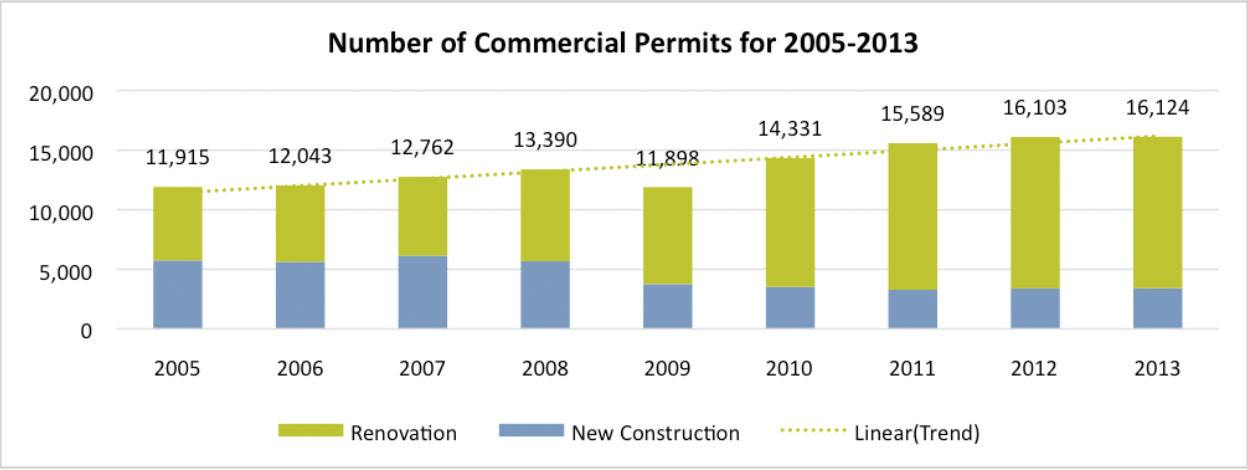
- If you or your organization works with energy code adoption, we hope this information will be helpful in addressing misconceptions that may exist among your stakeholders about the impact of stronger energy codes on employment and economic activity.

- If you or your organization is involved with developing educational resources and trainings on energy codes, we invite you to tailor the state-based information to address your specific needs. For example, by knowing the prominent building types (e.g. shopping, colleges/universities) and types of construction (i.e. new construction or renovation) in your area, your teaching materials can be made more impactful for your audience.

- If you or your organization is involved in planning, the state-based information in this report provides the locations of commercial construction, which we hope offers a complementary means for determining growth, versus housing starts data alone.

REGIONAL ANALYSIS: THE SOUTHEAST

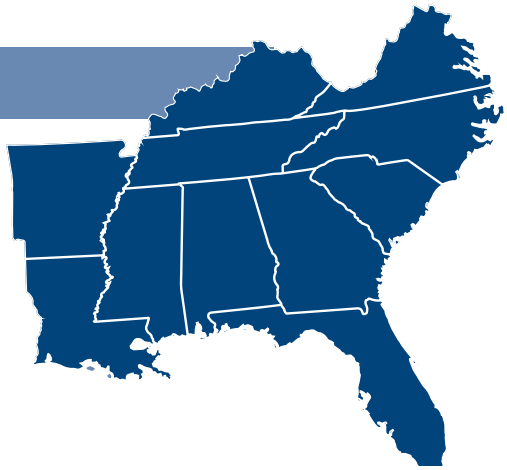
The following charts present an overview of the Southeast as a whole, identifying various data in graphical format to better highlight trends and opportunities.

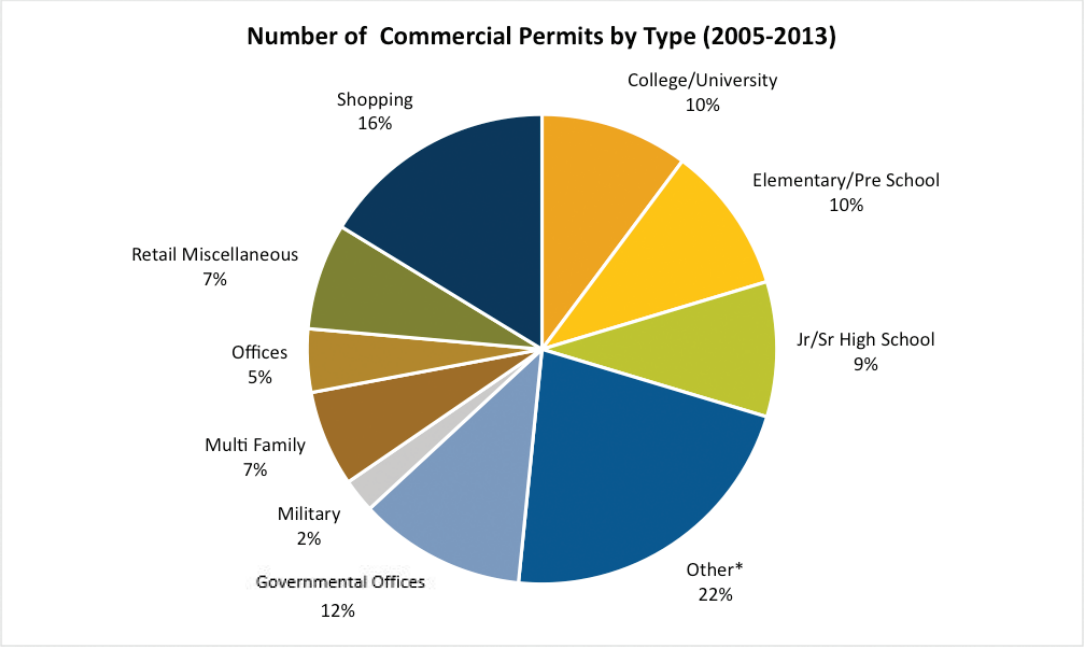


Number of Commercial Permits for 2005-2013

State	Population	New Construction	Renovation	Total
Florida	19,552,860	9,512	15,204	24,716
Georgia	9,992,167	5,088	11,125	16,213
North Carolina	9.848,060	5,668	9,084	14,752
Virginia	8,260,405	4,033	10,393	14,426
Tennessee	6,495,978	2,807	6,511	9,318
South Carolina	4,774,839	2,944	5,737	8,681
Louisiana	4,625,470	2,064	6,280	8,344
Alabama	4,833,722	2,526	5,801	8,327
Kentucky	4,395,295	2,244	5,023	7,267
Arkansas	2,959,373	2,052	4,489	6,541
Mississippi	2,991,207	1,661	3,909	5,570
Total		**40,599**	**83,556**	**124,155**

REGIONAL ANALYSIS: THE SOUTHEAST

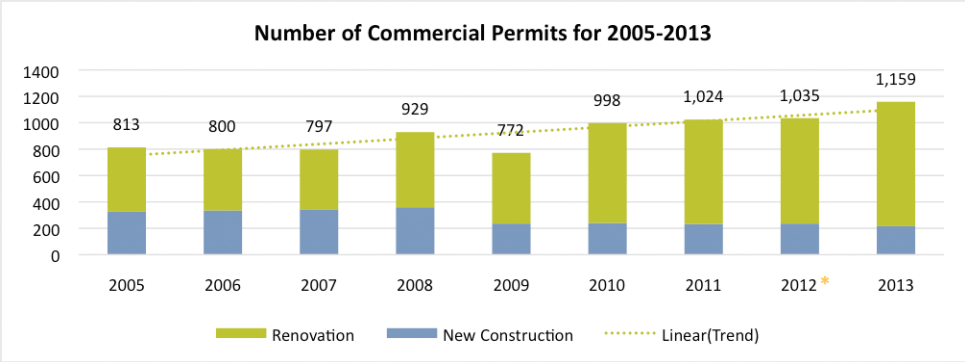




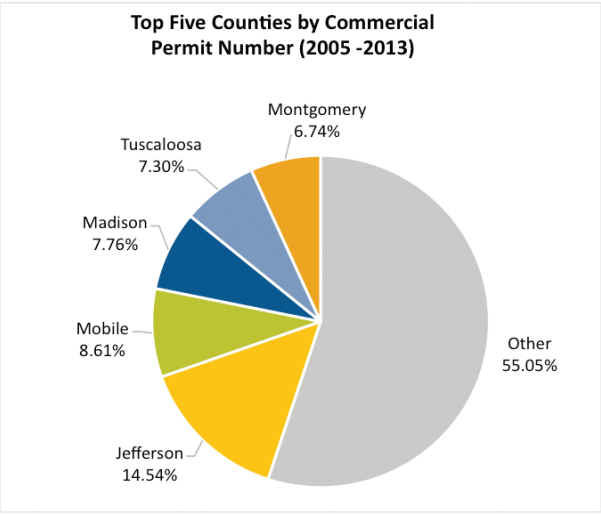
*Other includes (in order of number of permits): Hospitals/Clinics,Religious,Warehouses,Police/Fire,Military,Library/Museum,Prisons, Hotels/Motels, Courthouse, Nursing Homes/Assisted Living, Sport/Convention Center, Manufacturing, and Industrial Labs/Labs/School Labs.

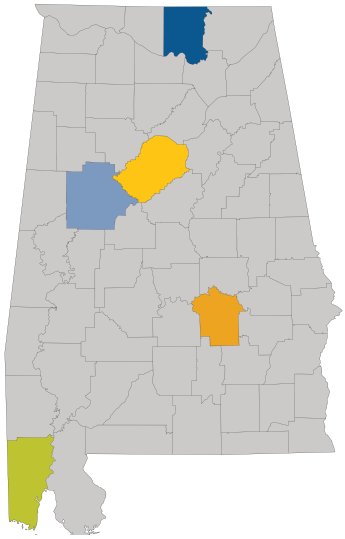
STATE ANALYSIS: ALABAMA

Current Commercial Code	2009 IECC/ASHRAE 90.1-2007
Effective Date	10/1/2012
Population	4,833,722
Median Household Income	$43,160
Total Number of Commercial Projects (2005-2013)	8,327
New	2,526
Renovations	5,801

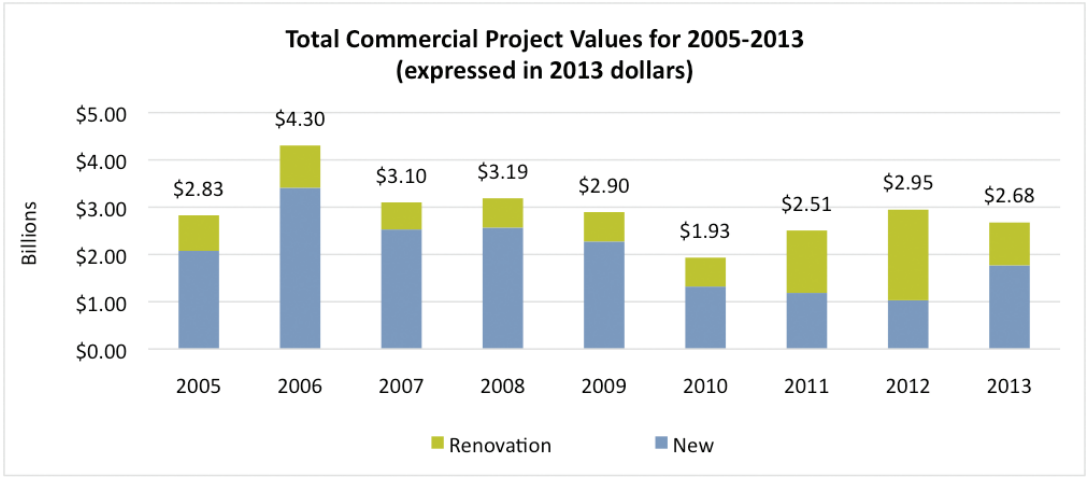


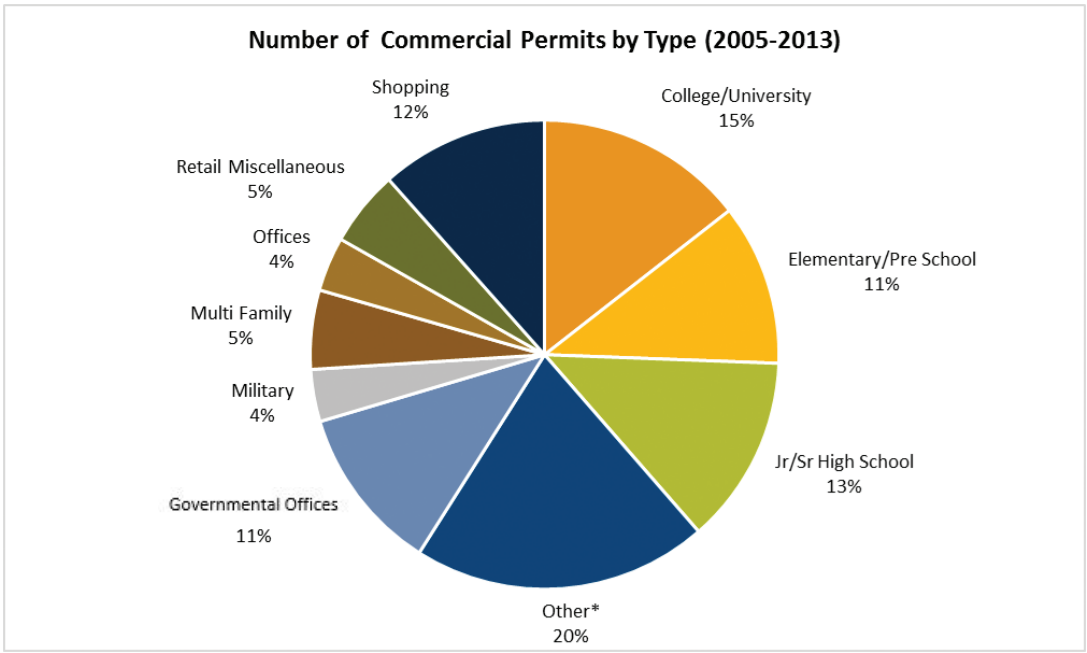
* Indicates year new energy code became effective





STATE ANALYSIS: ALABAMA





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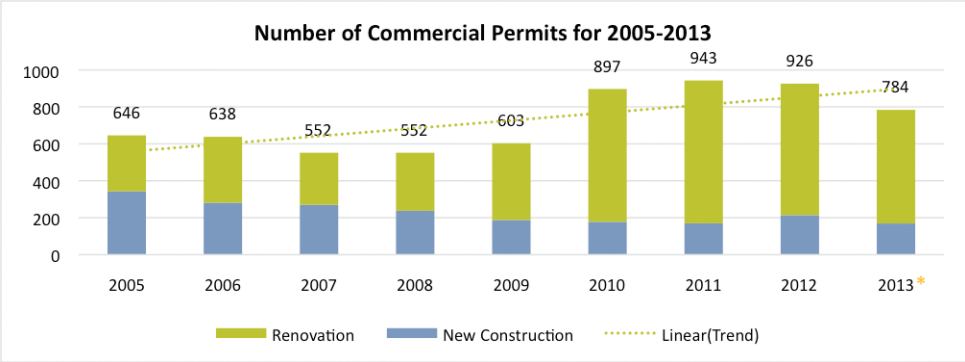
STATE ANALYSIS: ARKANSAS

Current Commercial Code	ASHRAE 90.1-2007
Effective Date	1/1/2013
Population	2,959,373
Median Household Income	$40,531
Total Number of Commercial Projects (2005-2013)	6,541
New	2,052
Renovations	4,489



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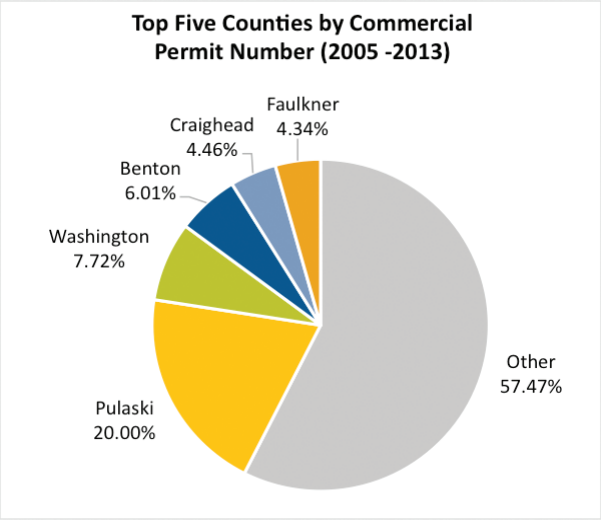
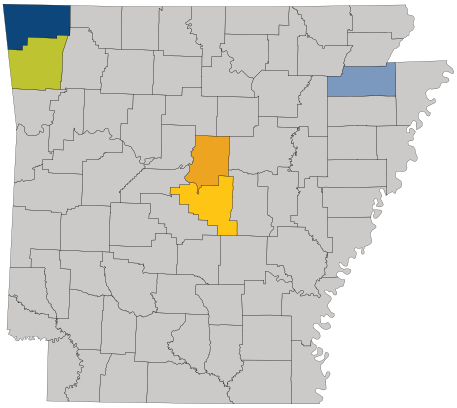
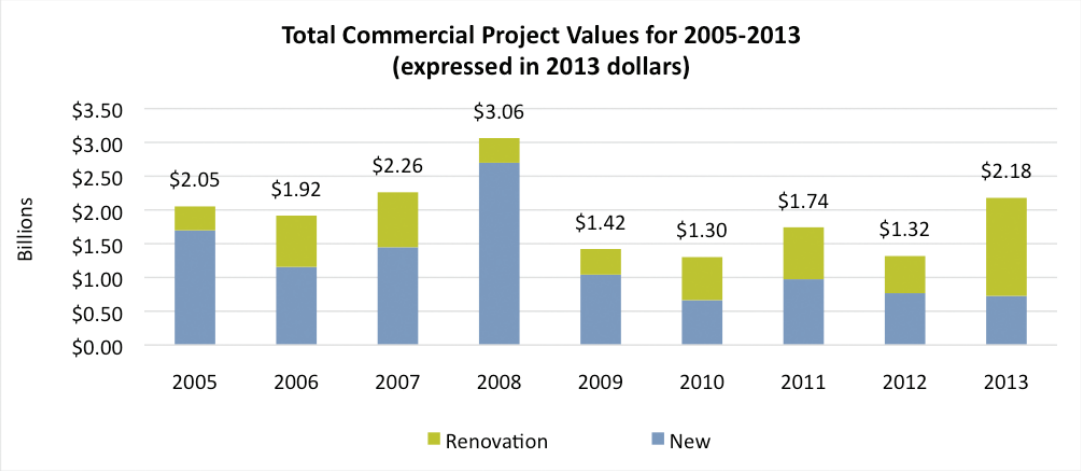
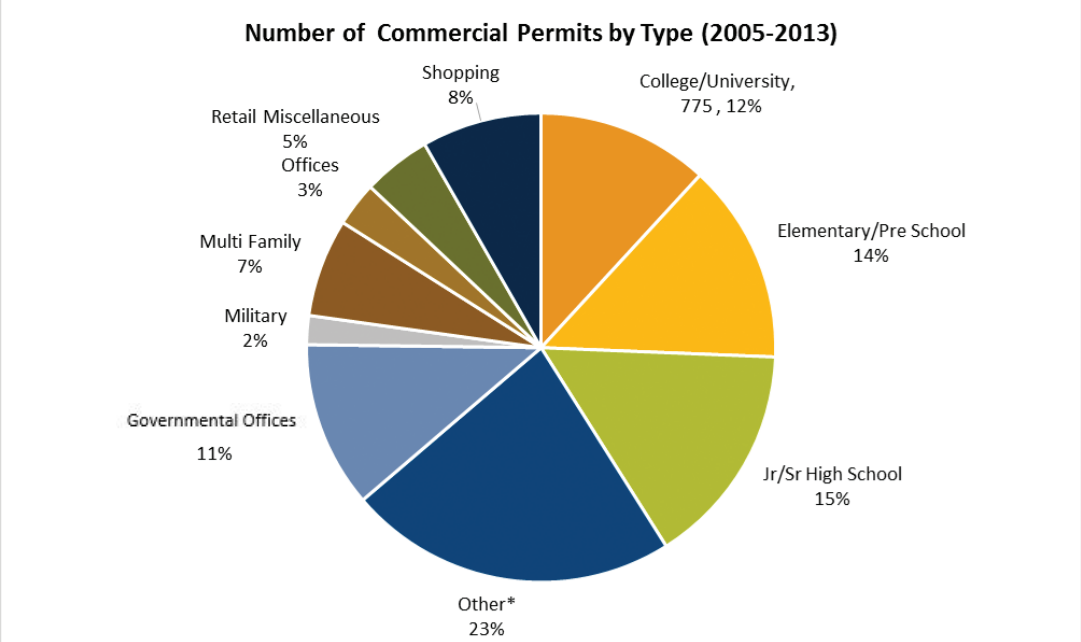




STATE ANALYSIS: ARKANSAS





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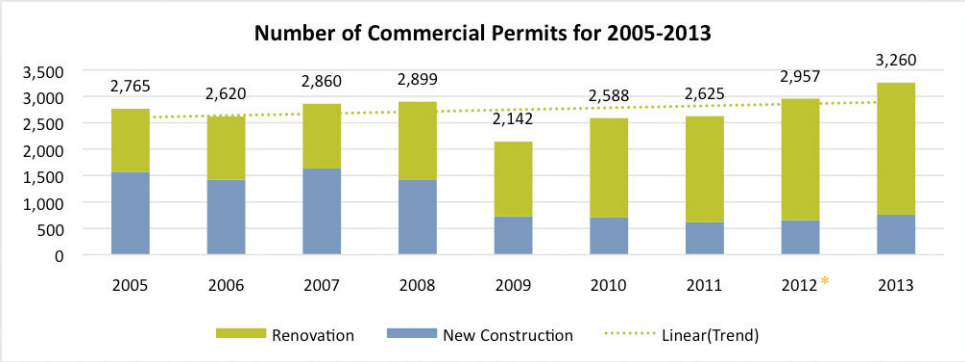
STATE ANALYSIS: FLORIDA

Current Commercial Code	2010 Florida Energy code (ASHRAE 90.1-2007 equivalent)
Effective Date	3/15/2012
Population	19,552,860
Median Household Income	$47,309
Total Number of Commercial Projects (2005-2013)	24,716
New	9,512
Renovations	15,204



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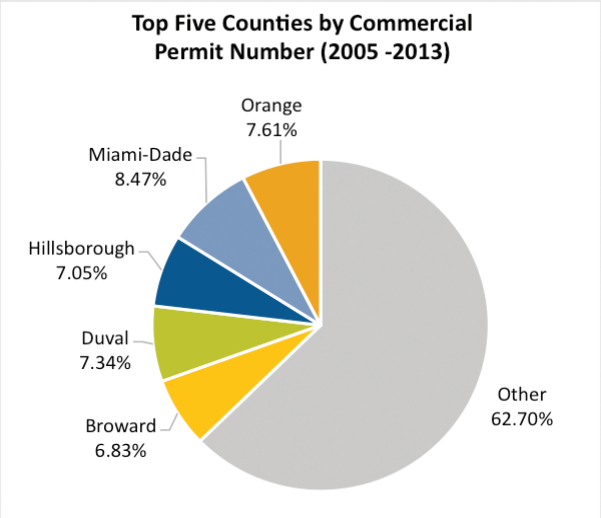
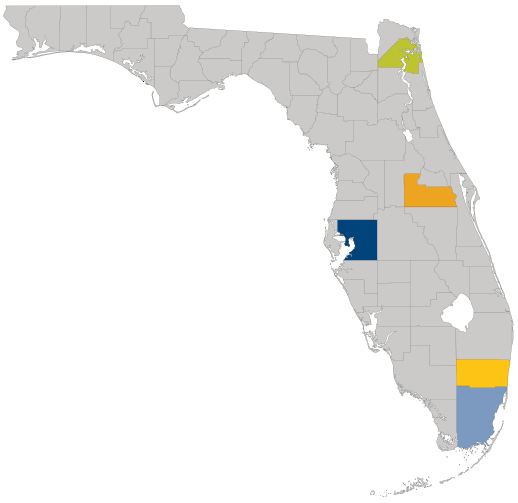
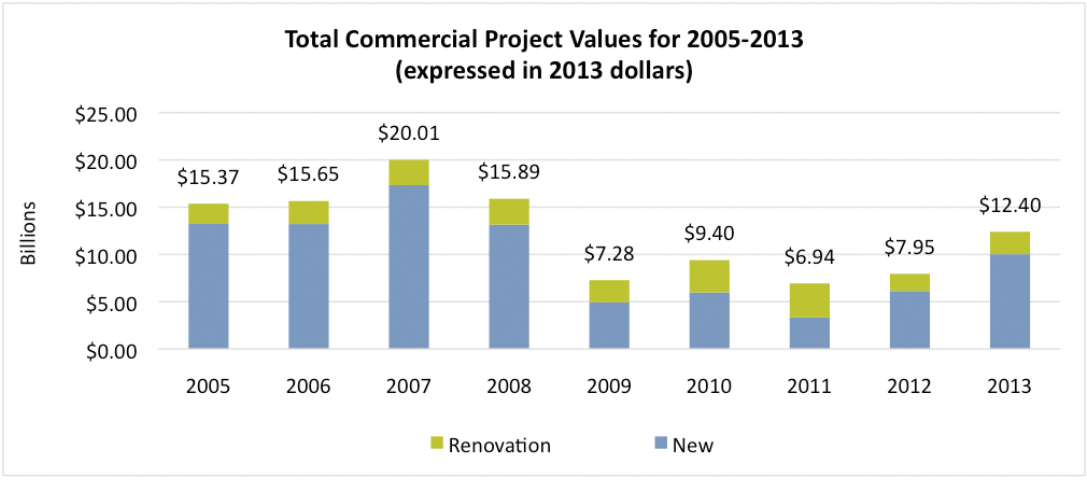
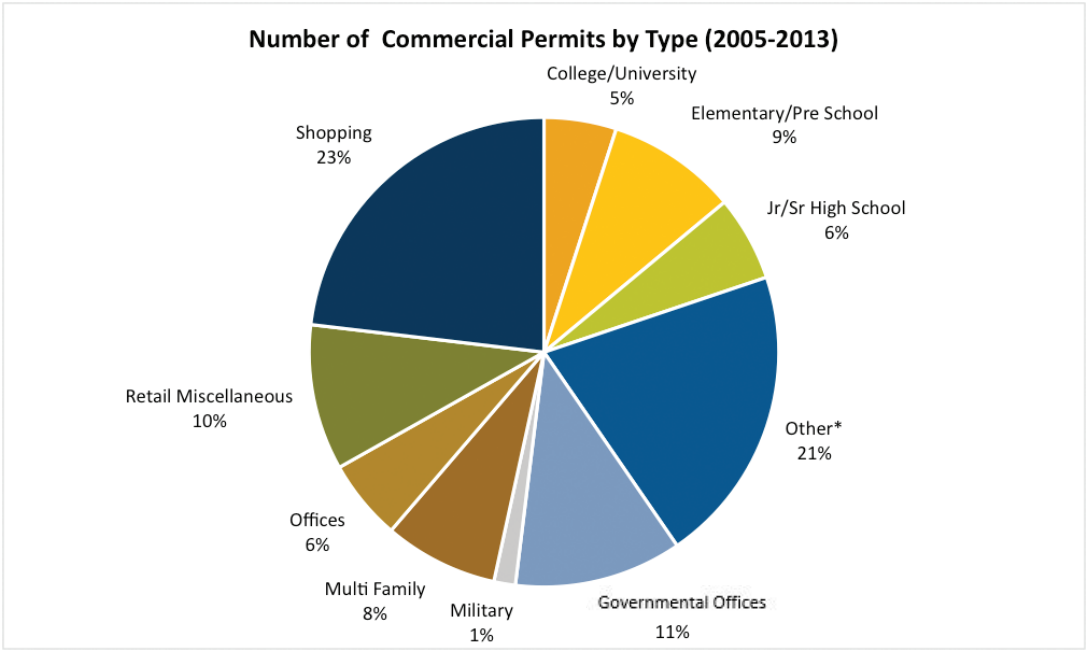




STATE ANALYSIS: FLORIDA





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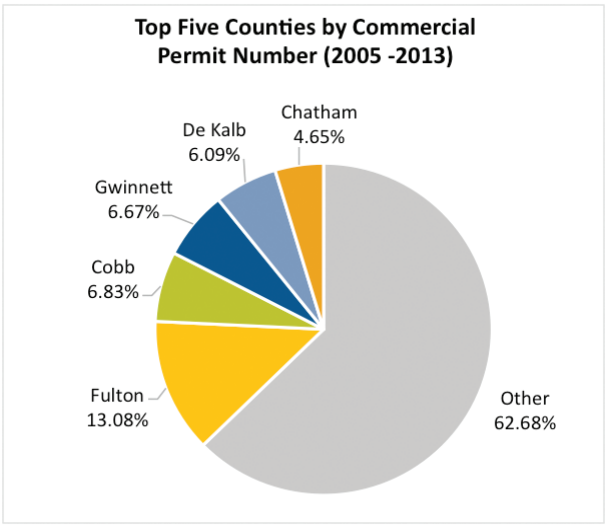
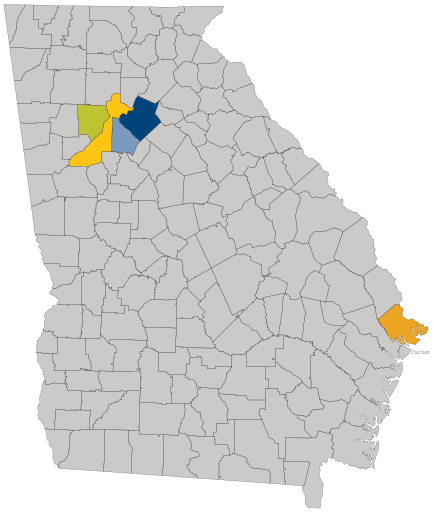
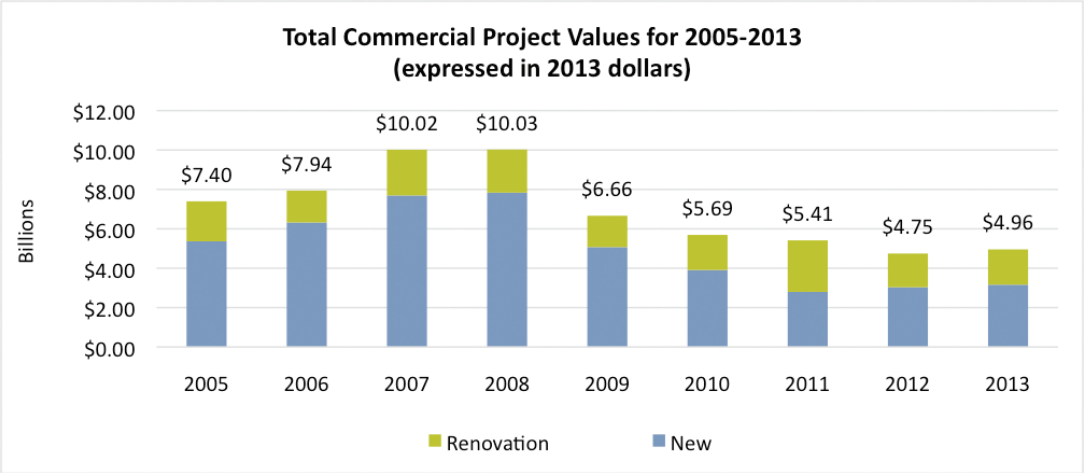
STATE ANALYSIS: GEORGIA

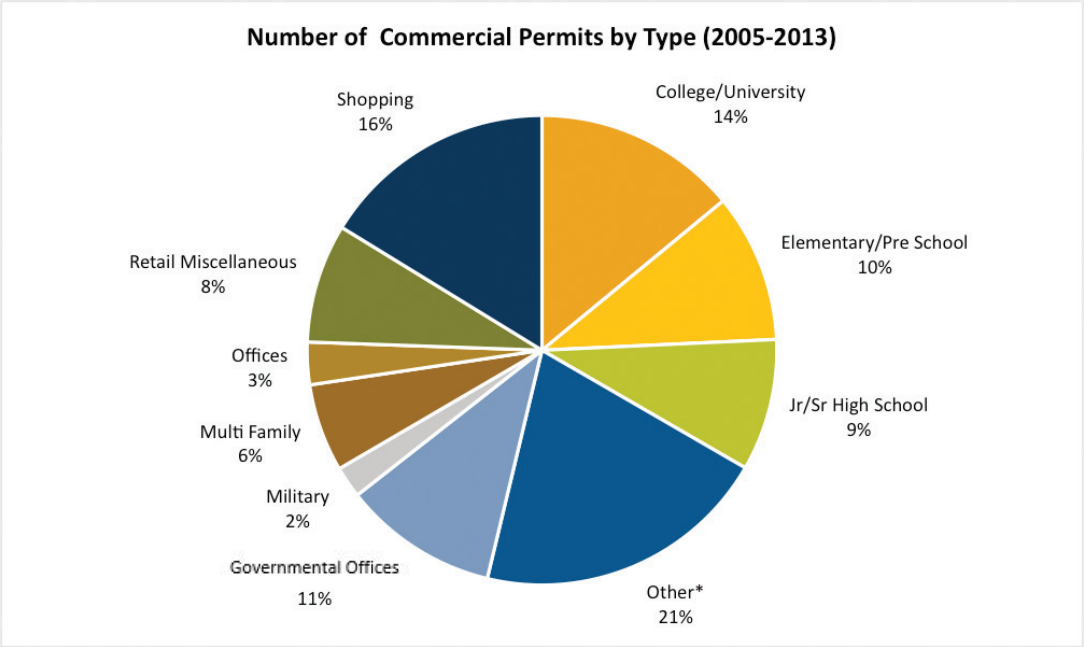
Current Commercial Code	2009 IECC/ASHRAE 90.1-2007
Effective Date	1/1/2011
Population	9,992,167
Median Household Income	$49,604
Total Number of Commercial Projects (2005-2013)	16,213
New	5,088
Renovations	11,125





STATE ANALYSIS: GEORGIA





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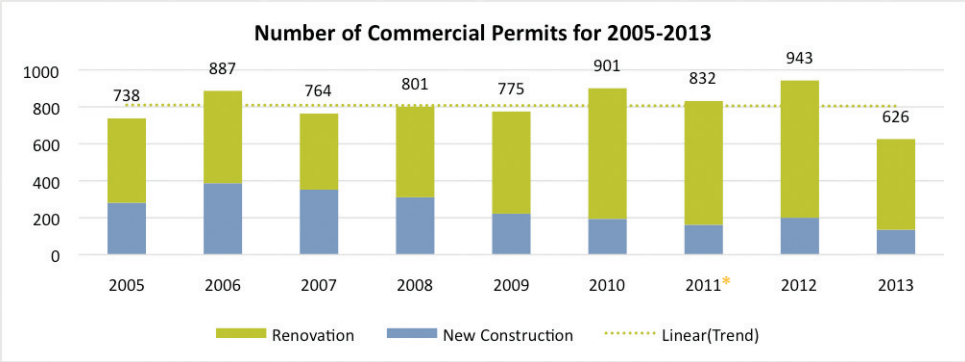
STATE ANALYSIS: KENTUCKY

Current Commercial Code	2007 Kentucky Energy code (2009 IECC equivalent)
Effective Date	6/1/2011
Population	4,395,295
Median Household Income	$42,610
Total Number of Commercial Projects (2005-2013)	7,267
New	2,244
Renovations	5,023



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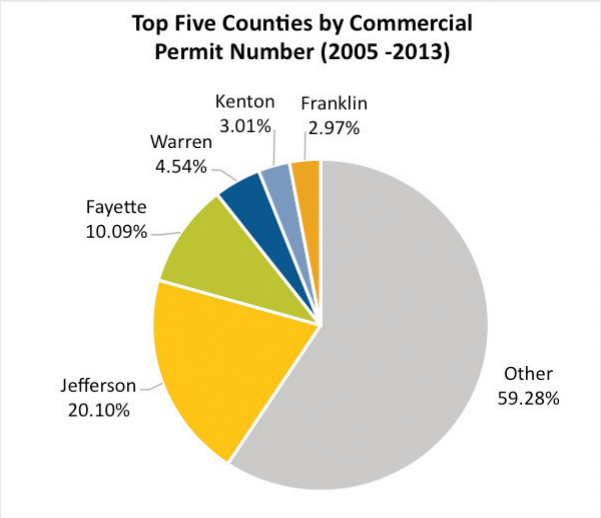
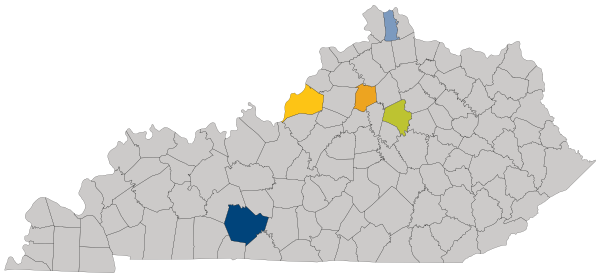
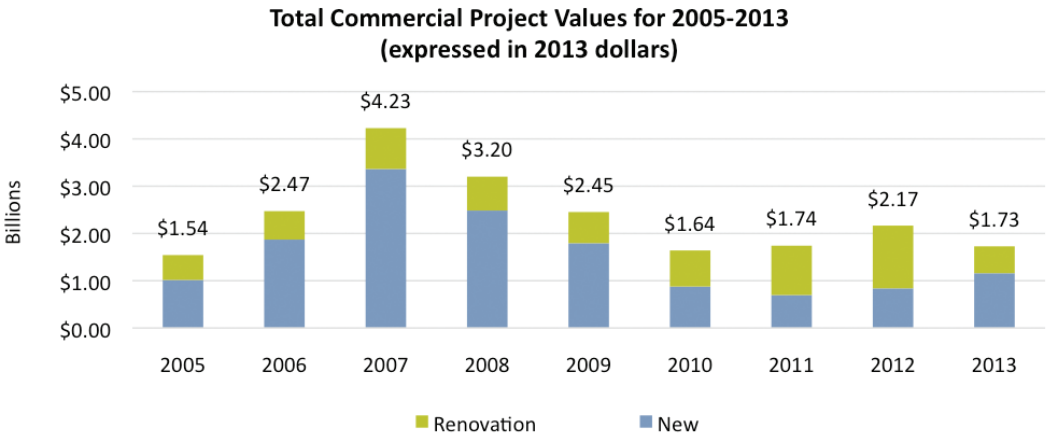
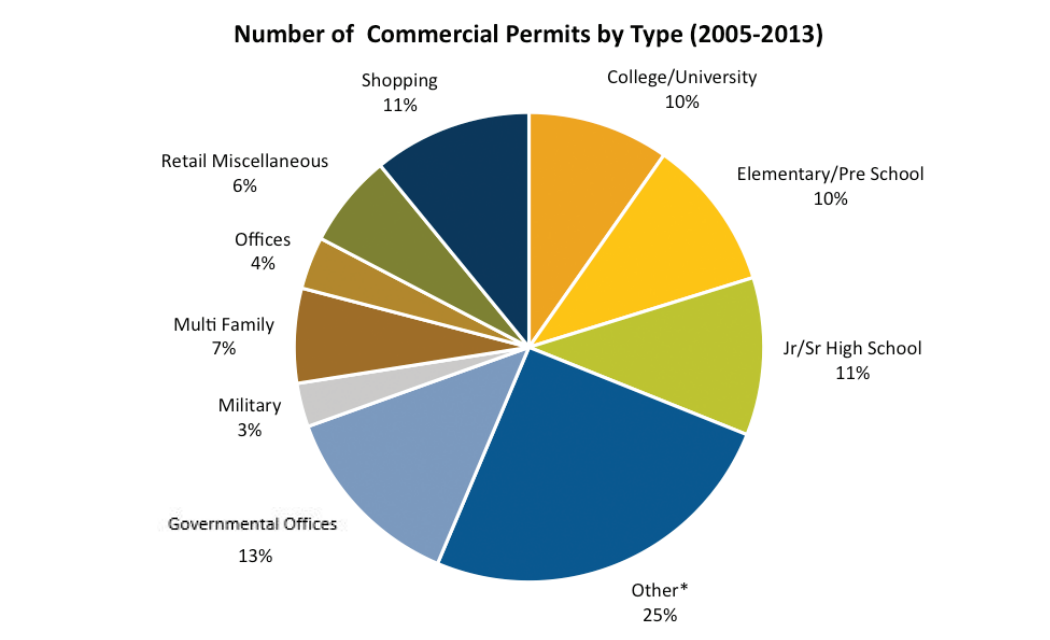




STATE ANALYSIS: KENTUCKY

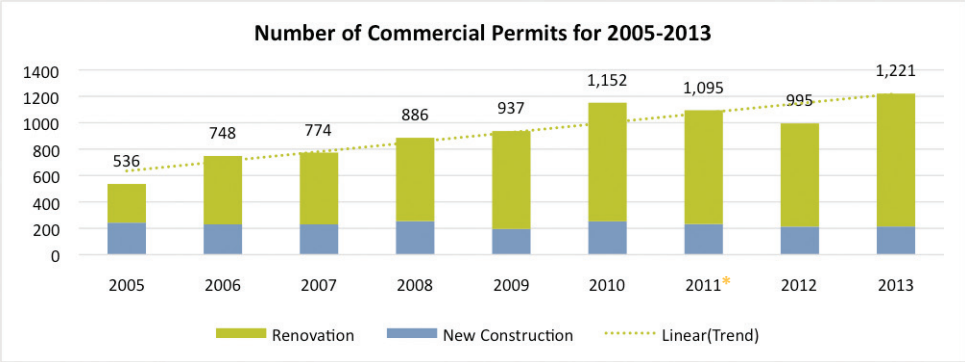




*Other includes (in order of number of permits):
Warehouses, Religious, Military, Library/Museum, Police/Fire, Courthouse, Special/Vocational, Prisons, Sport/Convention Center, Nursing Homes/Assisted Living, Manufacturing, Hotels/Motels, and Industrial Labs/Labs/School Labs.

STATE ANALYSIS: LOUISIANA

Current Commercial Code	2009 IECC/ASHRAE 90.1-2007
Effective Date	7/20/2011
Population	4,625,470
Median Household Income	$44,673
Total Number of Commercial Projects (2005-2013)	8,344
New	2,064
Renovations	6,280



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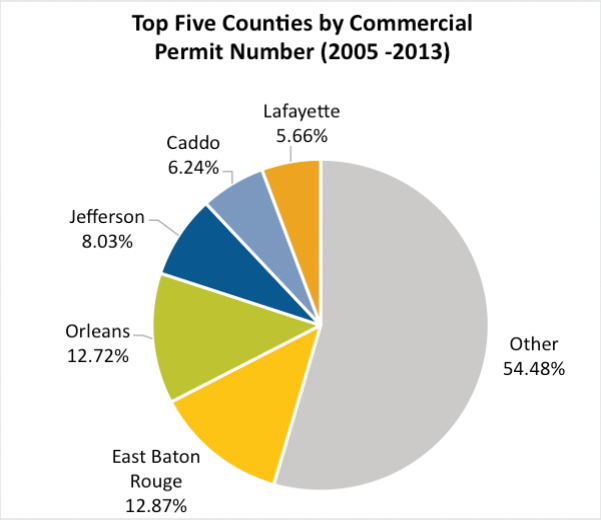
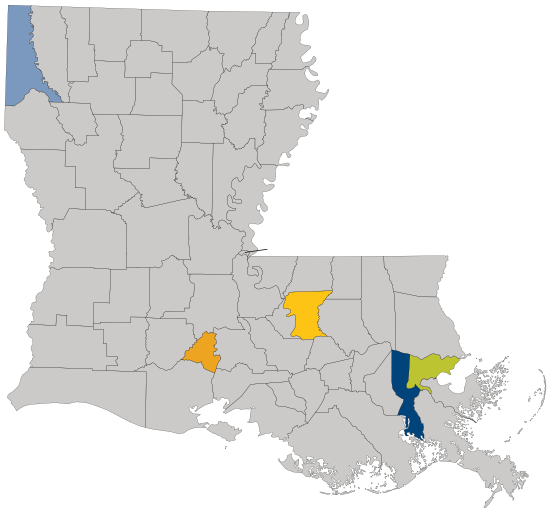
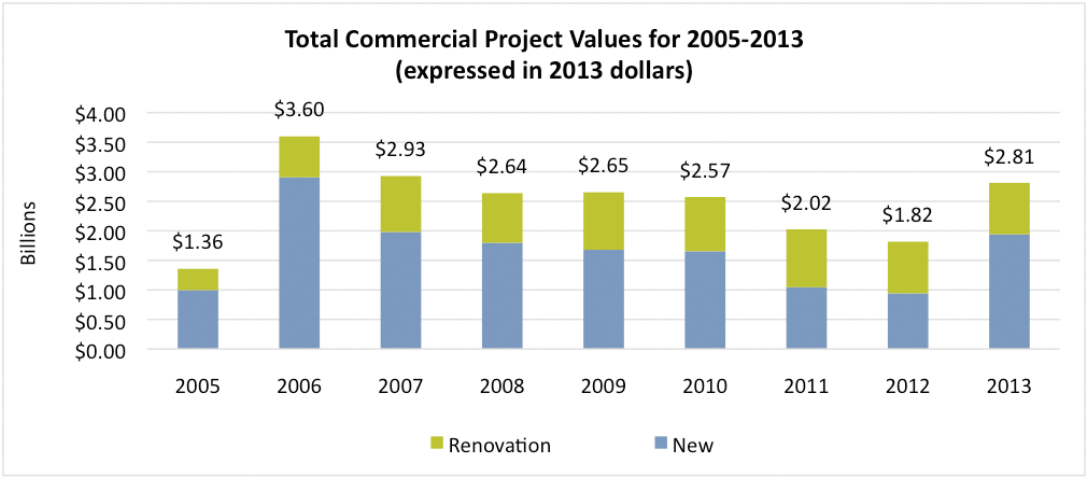
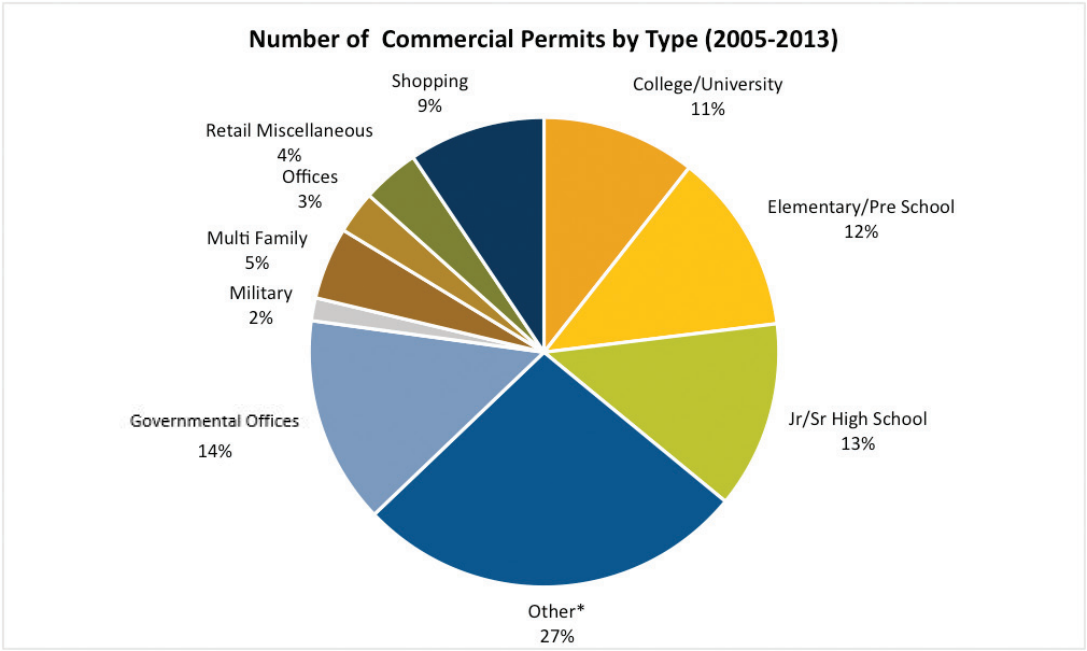




STATE ANALYSIS: LOUISIANA





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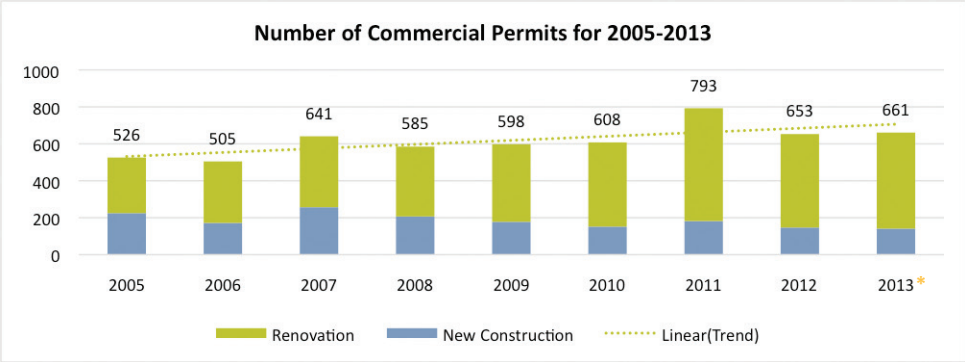
Warehouses, Offices, Library/Museum, Religious, Special/Vocational, Military, Prisons, Courthouse, Sport/Convention Center, Hotels/Motels, Nursing Homes/Assisted Living, Manufacturing, and Industrial Labs/Labs/School Labs.

STATE ANALYSIS: MISSISSIPPI

Current Commercial Code	ASHRAE 90.1-2010
Effective Date	7/1/2013
Population	2,991,207
Median Household Income	$38,882
Total Number of Commercial Projects (2005-2013)	5,570
New	1,661
Renovations	3,909



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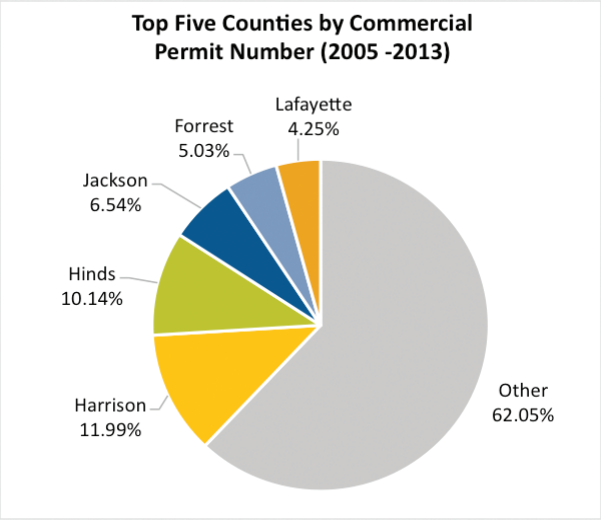
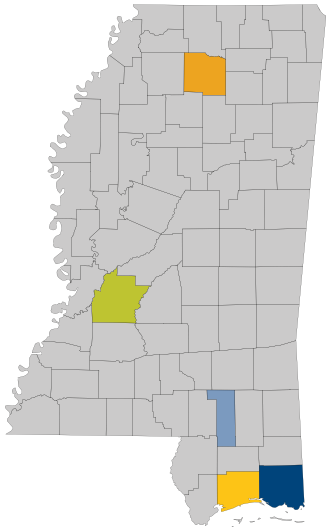
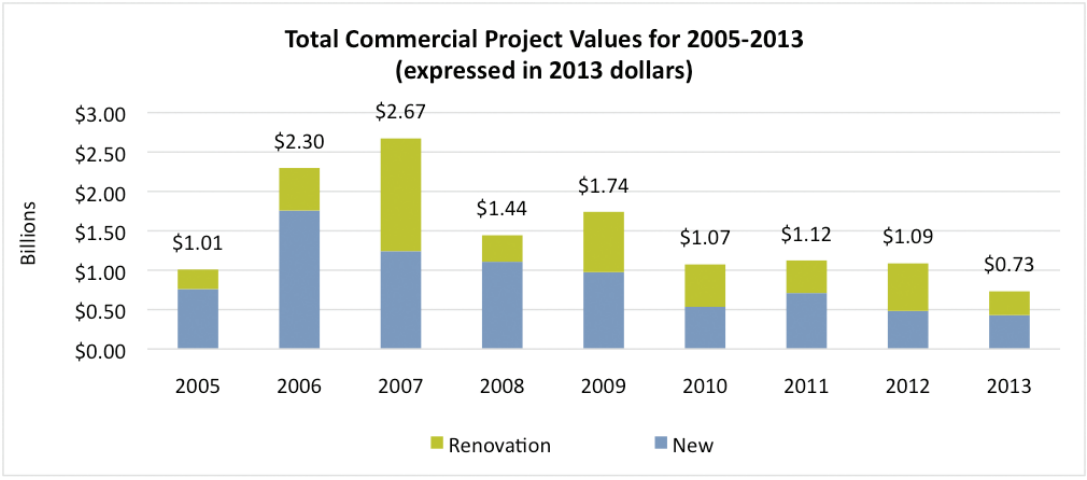
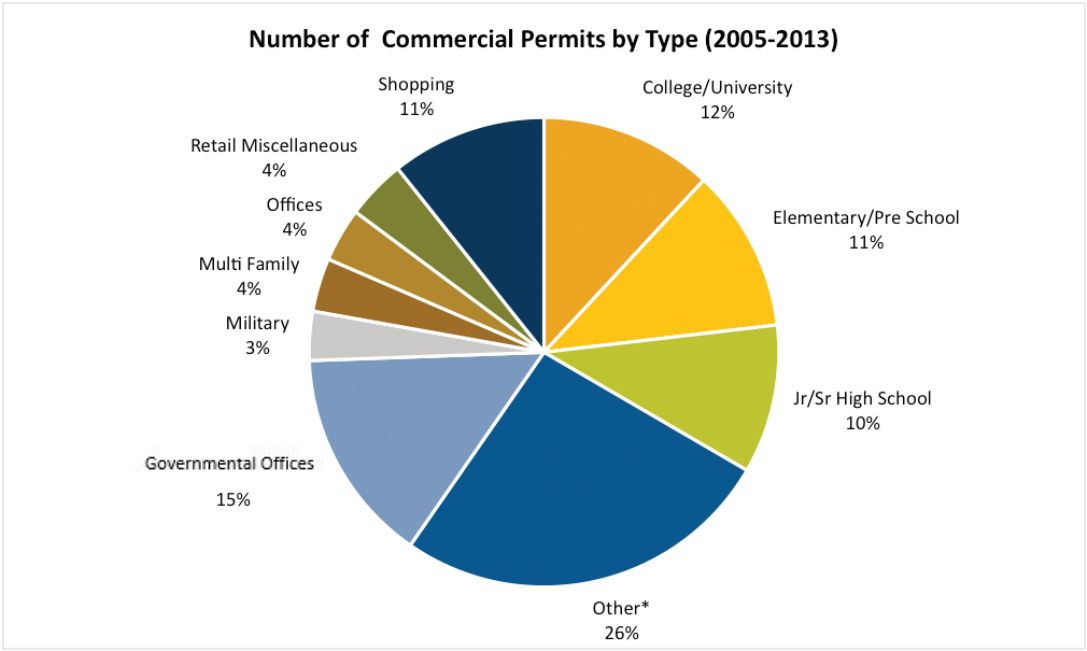




STATE ANALYSIS: MISSISSIPPI





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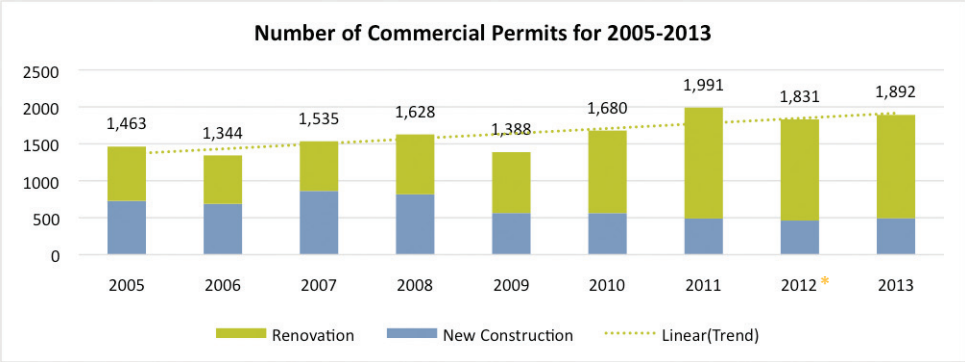
Military, Religious, Police/Fire, Library/Museum, Warehouses, Special/Vocational, Courthouse, Hotels/Motels, Prisons, Sport/Convention Center, Manufacturing, Nursing Homes/Assisted Living, and Industrial Labs/Labs/School Labs.

STATE ANALYSIS: NORTH CAROLINA

Current Commercial Code	2009 IECC/ASHRAE 90.1-2007
Effective Date	1/1/2012
Population	9,848,060
Median Household Income	$46,450
Total Number of Commercial Projects (2005-2013)	14,752
New	5,668
Renovations	9,084



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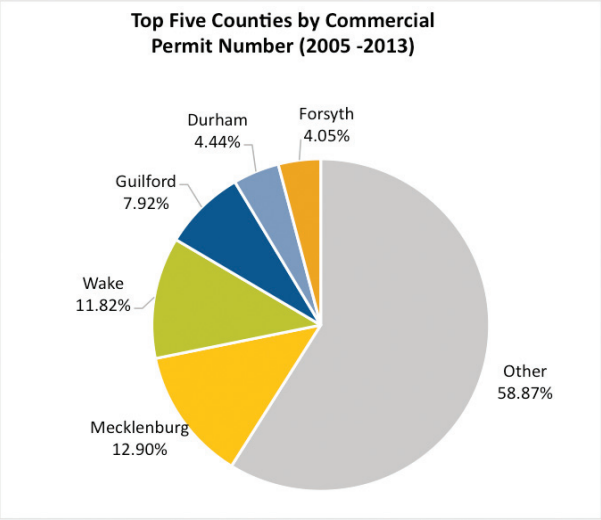
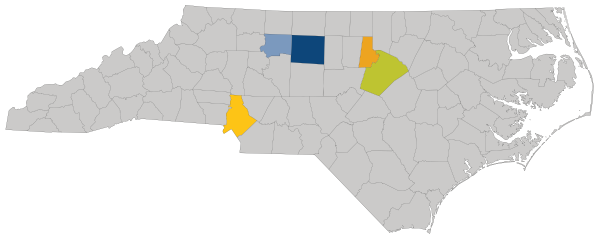
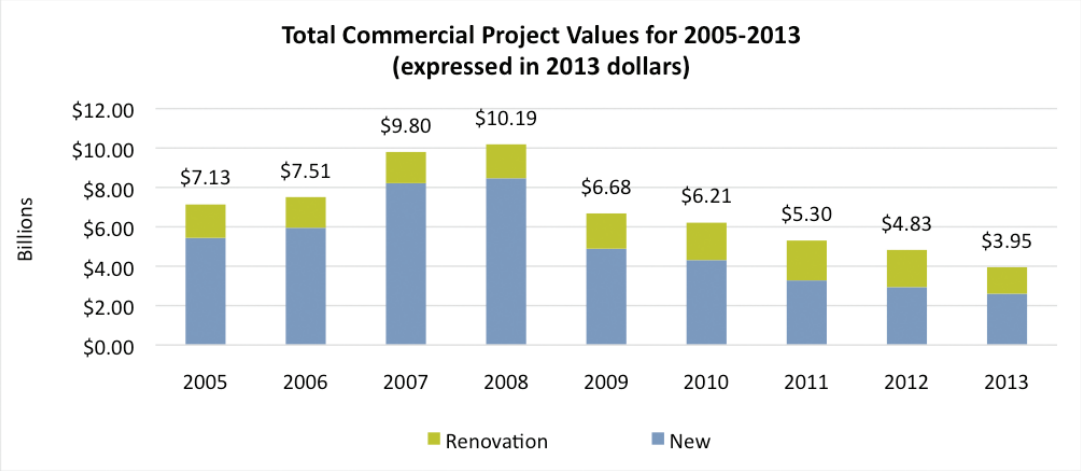
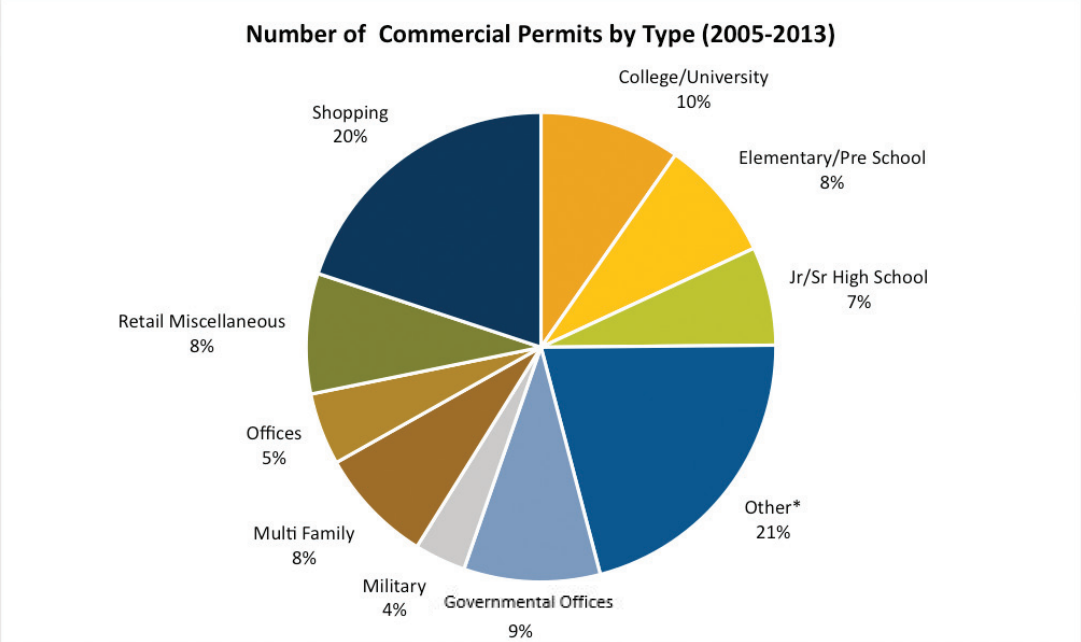




STATE ANALYSIS: NORTH CAROLINA





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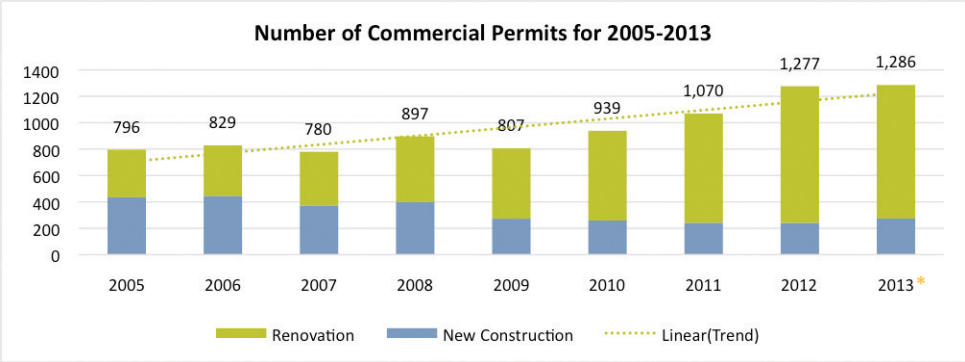
STATE ANALYSIS: SOUTH CAROLINA

Current Commercial Code	2009 IECC
Effective Date	1/1/2013
Population	4,774,839
Median Household Income	$44,623
Total Number of Commercial Projects (2005-2013)	8,681
New	2,944
Renovations	5,737



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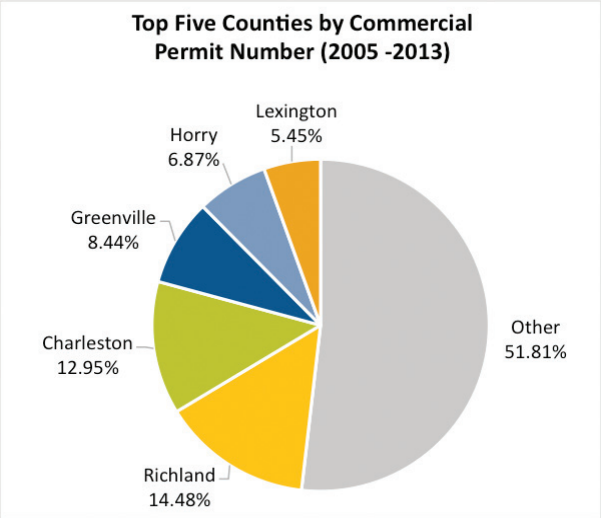
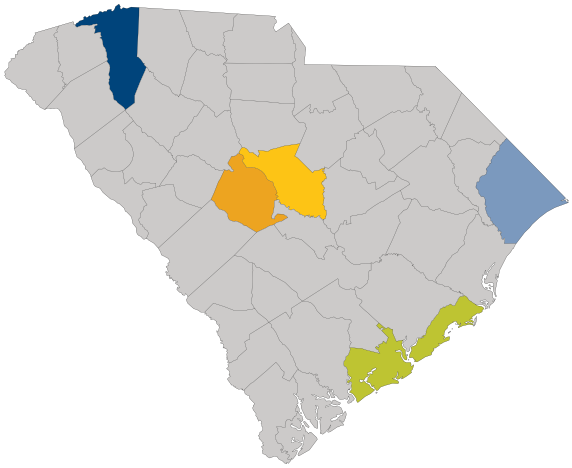
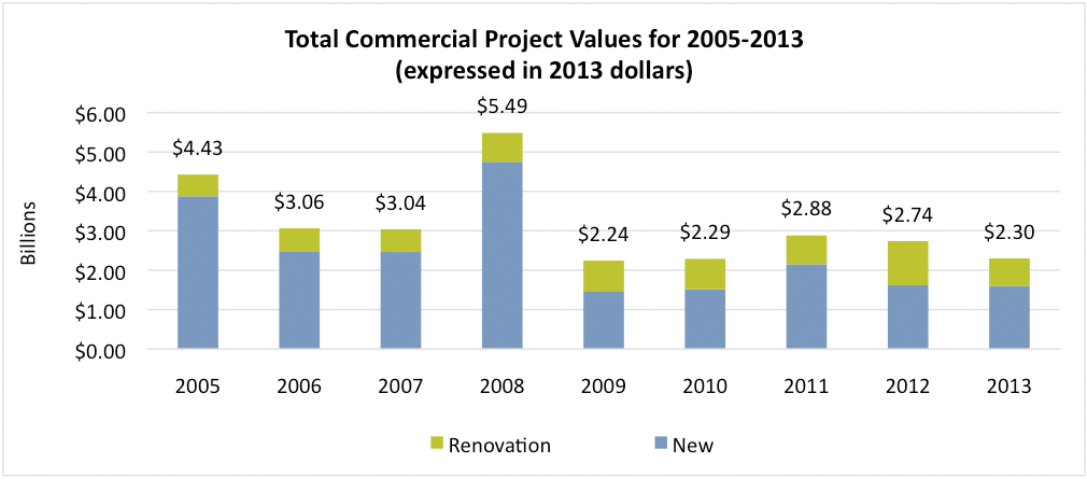
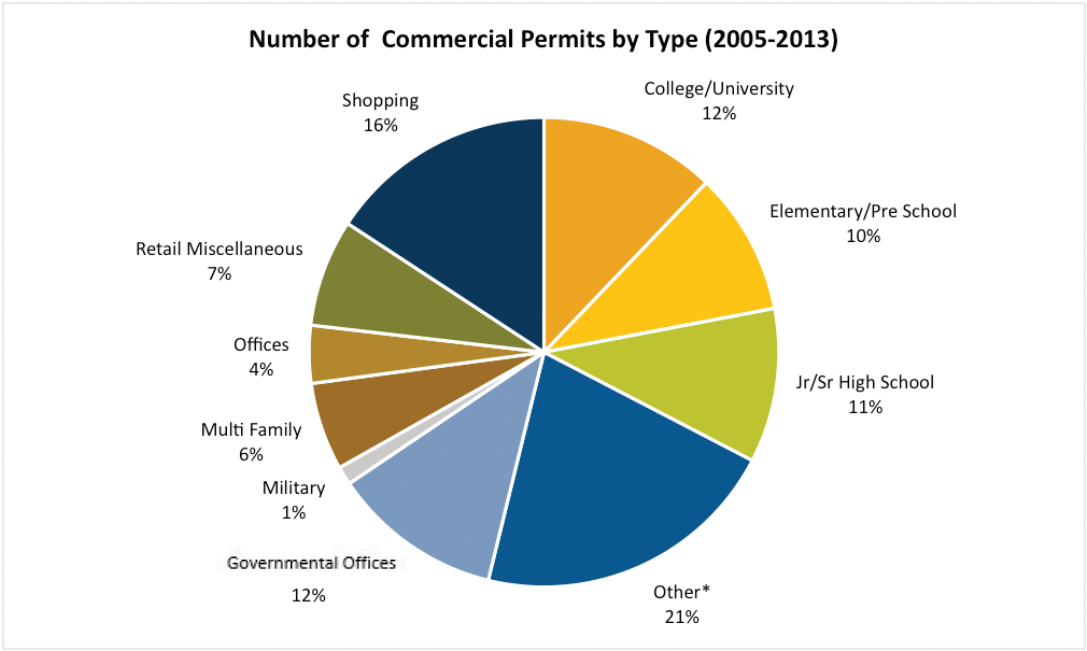




STATE ANALYSIS: SOUTH CAROLINA





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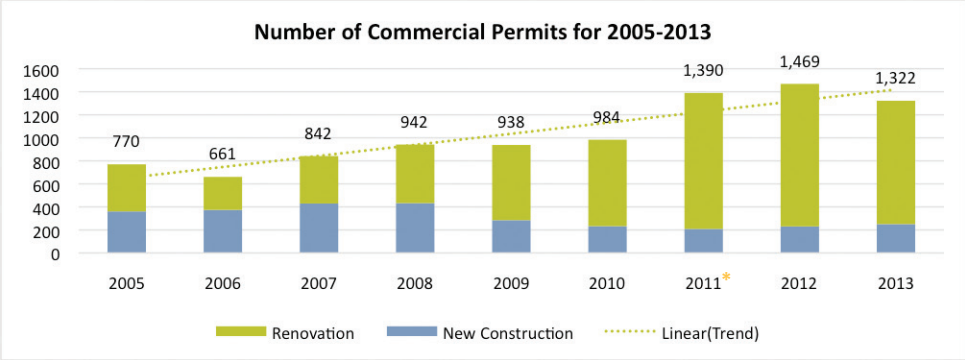
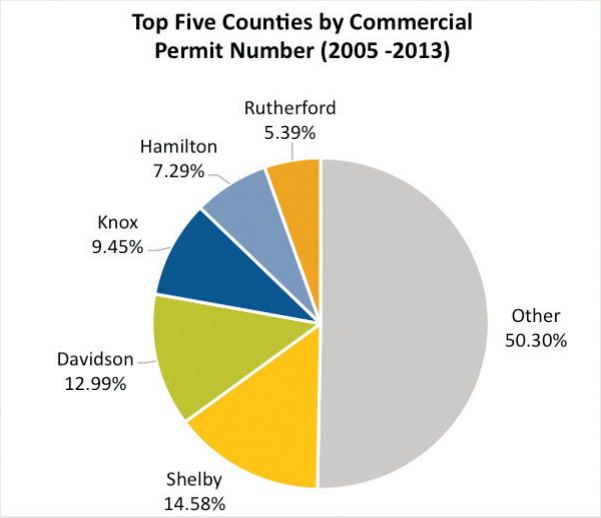
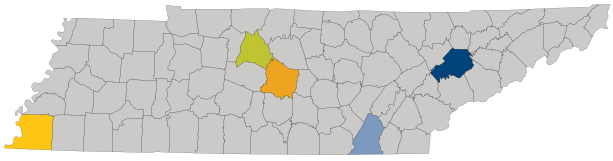
STATE ANALYSIS: TENNESSEE

Current Commercial Code	2006 IECC
Effective Date	7/1/2011
Population	6,495,978
Median Household Income	$44,140
Total Number of Commercial Projects (2005-2013)	9,318
New	2,807
Renovations	6,511

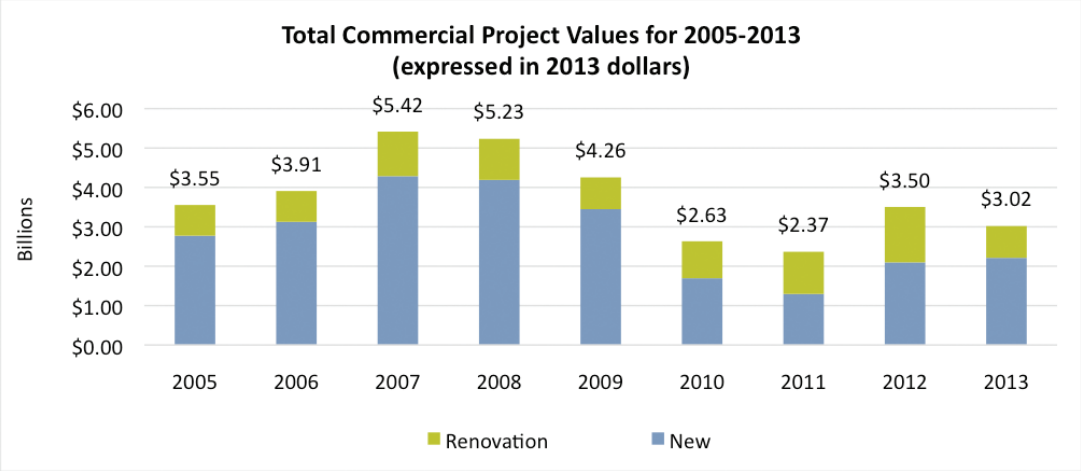


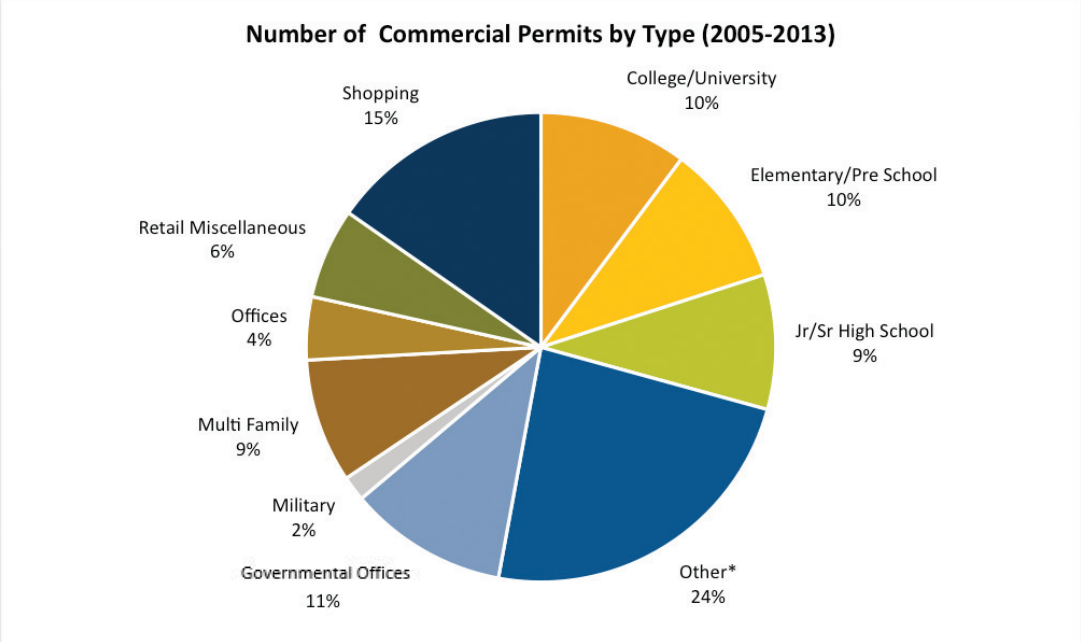
* Indicates year new energy code became effective





STATE ANALYSIS: TENNESSEE

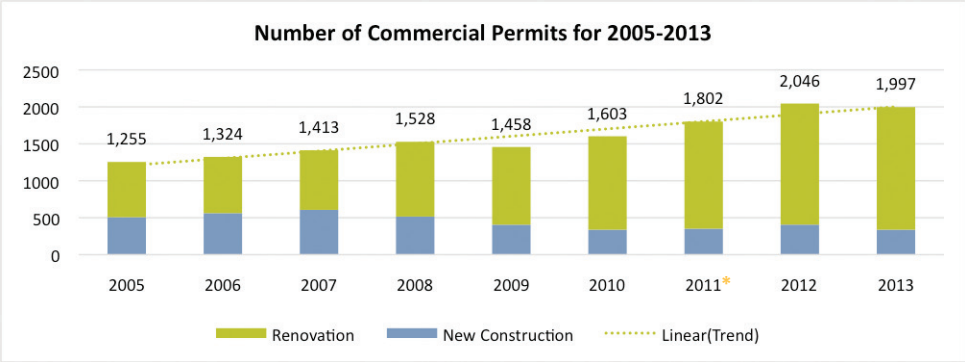




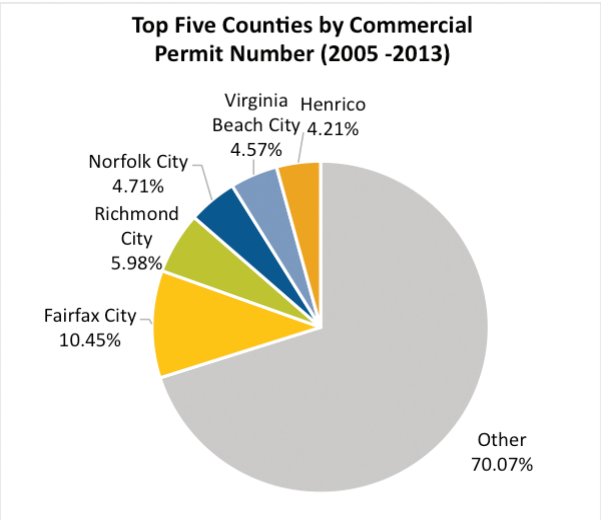
*Other includes (in order of number of permits):
Warehouses, Religious, Police/Fire, Military, Library/Museum, Prisons, Special/Vocational, Courthouse, Hotels/Motels, Nursing Homes/Assisted Living, Sport/Convention Center, Manufacturing, and Industrial Labs/Labs/School Labs.

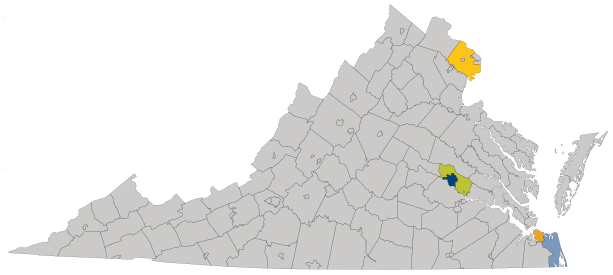
STATE ANALYSIS: VIRGINIA

Current Commercial Code	2009 IECC
Effective Date	3/1/2011
Population	8,260,405
Median Household Income	$63,636
Total Number of Commercial Projects (2005-2013)	14,426
New	4,033
Renovations	10,393

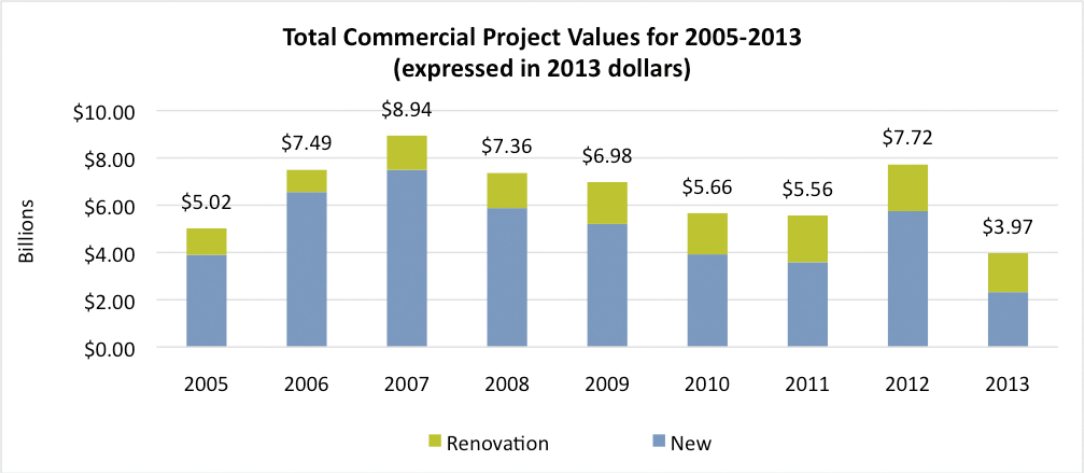


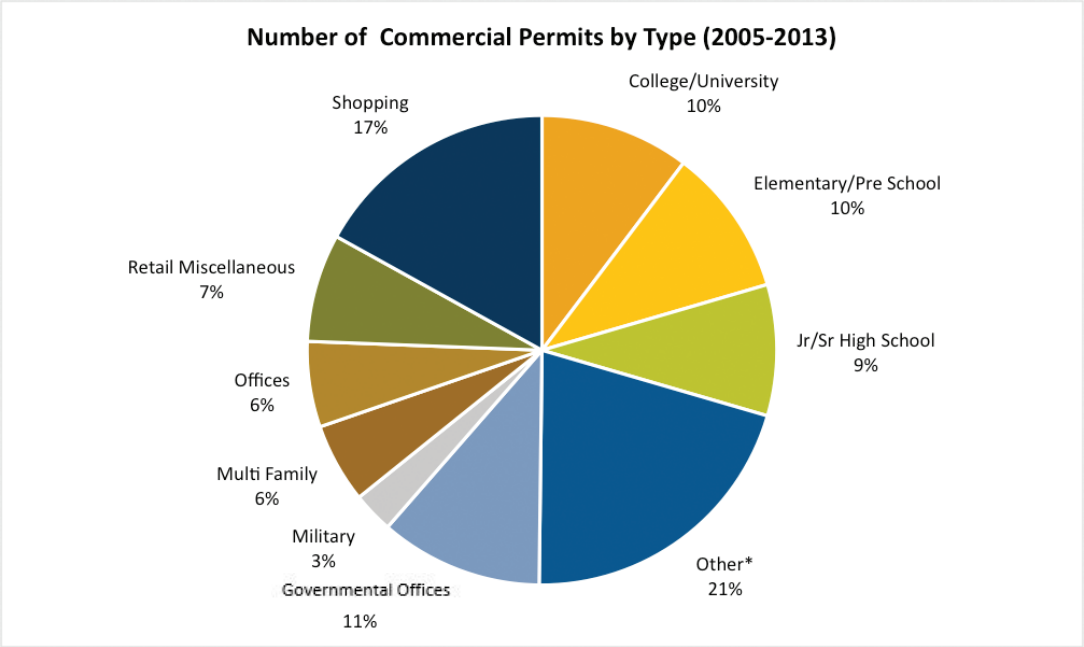
* Indicates year new energy code became effective





STATE ANALYSIS: VIRGINIA





*Other includes (in order of number of permits):
Hospitals/Clinics, Military, Warehouses, Library/Museum, Police/Fire, Courthouse, Special/Vocational, Prisons
Hotels/Motels, Nursing Homes/Assisted Living, Industrial Labs/Labs/School Labs, Sport/Convention Center, and Manufacturing.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