Building Code Enforcement Evaluation Report

Selections from the reviews of the

Charles Co

Building Code Enforcement Agency

In the County of Charles

In the State of Maryland

7/6/2015 Evaluation

Building Code Effectiveness Grading Schedule (BCEGS®)

Table of Contents

Section 1 Executive Summary

Not all communities have rigorous building codes, nor do all communities enforce their codes with equal commitment. Yet the effectiveness of local building codes can have a profound effect on how the structures in your community will fare in a hurricane, earthquake, or other natural disaster.

Studies conducted following recent natural disasters concluded that total losses might have been as much as 50% less if all structures in the area had met current building codes. Building-code enforcement can have a major influence on the economic well-being of a municipality and the safety of its citizens. Insurance Services Office (ISO) helps distinguish amongst communities with effective building-code adoption and enforcement through comprehensive program called the Building Code Effectiveness Grading Schedule (BCEGS®).

ISO is an independent statistical, rating, and advisory organization that serves the property/casualty insurance industry. ISO collects information on a community's building-code adoption and enforcement services, analyzes the data, and then assigns a Building Code Effectiveness Classification from 1 to 10. Class 1 represents exemplary commitment to building-code enforcement. The concept behind BCEGS is simple. Municipalities with well-enforced, up-to-date codes demonstrate better loss experience, and their citizens' insurance rates can reflect that. The prospect of minimizing catastrophe-related damage and ultimately lowering insurance costs gives communities an incentive to enforce their building codes rigorously.

The following management report was created specifically for Charles Co based on a BCEGS survey conducted on 7/6/2015. This report can help you evaluate your community's building-code enforcement services utilizing benchmarking data collected throughout the country. The report is designed to give your management team an expanded prospective for dealing with the important issues surrounding effective building code enforcement. This is accomplished through comparisons of your code enforcement to that of others in your area and state. The analysis goes further to allow you to compare your jurisdiction to others across the country with similar permit, plan review and inspection activity. ISO thanks you for your participation and we encourage you to take advantage of the information contained in this report to assist in making decisions regarding the level of code enforcement best suited for Charles Co.

The survey conducted has resulted in BCEGS class of 3 for 1 and 2 family dwellings and a class 2 for all other construction. More information regarding how this recent survey compares to previous surveys is provided below.

Table 1 details the points your department earned during the most recent survey as well as the points earned in the previous survey including a comparison of the two. This information may be used to track local trends or pin-point improvement target areas.

Table 1

Building Code Effectiveness Grading Point Comparison

	Point Totals						
	Current Grading Yr: 2015		Maximum Point Possible	Previous Grading Yr: 2010		Difference	
	Com	Res		Com	Res	Com	Res
Section I - Administration of Codes	42.91	42.91	54.00	39.85	39.85	3.06	3.06
Section 105 - Adopted Codes	8.00	8.00	8.00	8.00	8.00	0.00	0.00
Section 108 - Additional Code Adoptions	3.35	3.35	4.00	3.35	3.35	0.00	0.00
Section 110 - Modification to Adopted Codes	4.00	4.00	4.00	4.00	4.00	0.00	0.00
Section 112 Method of Adoption	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Section 115 - Training	11.14	11.14	13.00	7.29	7.29	3.85	3.85
Section 120 - Certification	8.50	8.50	12.00	10.89	10.89	-2.39	-2.39
Section 125 - Building Official's Qualification / Exp/ Education	2.75	2.75	4.00	2.15	2.15	0.60	0.60
Section 130 - Selection Procedure for Building Official	0.50	0.50	0.50	0.25	0.25	0.25	0.25
Section 135 - Design Professionals	0.24	0.24	2.00	0.05	0.05	0.19	0.19
Section 140 - Zoning Provisions	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Section 145 - Contractor / Builder Licensing & Bonding	0.23	0.23	1.00	0.40	0.40	-0.17	-0.17
Section 155 - Public Awareness Programs	2.50	2.50	2.50	1.77	1.77	0.73	0.73
Section 160 - Participation in Code Development Activities	0.50	0.50	0.50	0.50	0.50	0.00	0.00
Section 165 - Administrative Policies & Procedures	0.20	0.20	0.50	0.20	0.20	0.00	0.00

Building Code Effectiveness Grading Point Comparison (continued)

	Point Totals						
	Current Grading Yr: 2015		Maximum Point Possible	Previous Grading Yr: 2010		Difference	
	Com	Res		Com	Res	Com	Res
Section II - Plan Review	22.89	18.95	23.00	22.55	17.74	0.34	1.21
Section 205 - Existing Staffing	9.00	5.06	9.00	9.00	4.19	0.00	0.87
Section 210 - Experience of Personnel	1.39	1.39	1.50	1.05	1.05	0.34	0.34
Section 215 - Detail of Plan Review	11.50	11.50	11.50	11.50	11.50	0.00	0.00
Section 220 - Performance Evaluation for Quality Assurance	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Section III - Field Inspection	22.83	22.20	23.00	22.73	20.36	0.10	1.84
Section 305 - Existing Staffing	9.00	8.37	9.00	9.00	6.63	0.00	1.74
Section 310 - Experience of Personnel	2.83	2.83	3.00	2.83	2.83	0.00	0.00
Section 315 - Managing Inspection and Re-inspection activity	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Section 320 - Inspection Checklist	2.00	2.00	2.00	2.00	2.00	0.00	0.00
Section 325 - Special Inspections	1.00	1.00	1.00	0.90	0.90	0.10	0.10
Section 330 - Inspections for Natural Hazard Mitigation	1.50	1.50	1.50	1.50	1.50	0.00	0.00
Section 335 - Final Inspections	2.50	2.50	2.50	2.50	2.50	0.00	0.00
Section 340 - Certificate of Occupancy	2.00	2.00	2.00	2.00	2.00	0.00	0.00
Section 345 - Performance Evaluations for Quality Assurance	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Subtotal:	88.63	84.06	100.00	85.13	77.95	3.50	6.11
The final score is determined by a relationship between Item 105 and the balances of the scoring.							
Final Score:	88.63	84.06	100.00	85.13	77.95	3.50	6.11

Section 2 Background Information

Introduction

ISO collects information from communities in the United States on their adoption and enforcement of building codes. ISO analyzes the data using its Building Code Effectiveness Grading Schedule (BCEGS) and then assigns a BCEGS Classification number to the community. The classification number-which ranges from 1 to 10-measures a jurisdiction's commitment to the adoption and enforcement of building codes affecting the construction of new buildings. Class 1 indicates the most favorable classification of commitment to the adoption and enforcement of building codes.

ISO's commitment to polling each building code enforcement agency on a regular basis is important to the program - periodic surveying helps determine if a community has made any significant changes since its last field evaluation. This ongoing effort is designed to re-evaluate each community at approximate 5-year intervals or sooner if changes indicate a potential revision to the classification number.

The purpose of this report is fourfold:

1. To summarize a community's scoring under the criterion contained in the BCEGS program.
2. To identify opportunities for communities desiring to improve their BCEGS classification number.
3. To assist a community in understanding how other jurisdictions with similar needs address building code adoption and enforcement.
4. To provide hazard mapping information important in planning and developing a sustainable community.

Data Collection and Analysis

ISO has evaluated over 14,000 code enforcement departments across the United States. In each of these communities, three elements of building code adoption and enforcement are reviewed. These three elements are the administration of codes, plan review and field inspection.

Administration of Codes:

ISO evaluates the administrative support for code enforcement within the jurisdiction -- the adopted building codes and the modifications of those codes through ordinance, code enforcer qualifications, experience and education, zoning provisions, contractor/builder licensing requirements, public awareness programs, the building department's participation in code development activities, and the administrative policies and procedures. This section represents 54% of the analysis in the BCEGS program.

Plan review division:

Consideration is given to determine staffing levels, personnel experience, performance evaluation schedules, and the level of review of construction documents for compliance with the adopted building code of the jurisdiction being graded. This section represents 23% of the analysis.

Field inspection:

Consideration is given to determine staffing levels, personnel experience, performance evaluation schedules, and the level of the agency's review of building construction. This section also represents 23% of the analysis.

The information necessary to determine the BCEGS classification number was collected from the community building officials through a combination of on-site interviews and completed questionnaires.

Section 3 Code Adoption

Recognizing that building codes are continually being reviewed and updated to reflect emerging technology and best practices, the BCEGS program encourages communities to make every effort to adopt the latest edition of one of the building codes without amendments. The program is sensitive to the reality that building code adoption is not always a local issue, nor do the wheels of progress turn rapidly all the time. To receive maximum BCEGS credit for this very important section a community must adopt and implement the revised code within two years of the publication of the building code.

As detailed in Figure 3-1 below, eight points are the maximum available for the adoption of a building code. The final calculation to determine a jurisdiction's BCEGS classification employs the ratio of the points possible and the points earned in the building code adoption section as a factor for all other points earned in the system. Therefore, a jurisdiction enforcing the latest building code will have a ratio of 1 and no adjustment will be made to the points earned. A department enforcing a building code that was published six years prior to the survey date would have a ratio of 6.88/8 or .86 so the jurisdiction would receive credit for 86% of the points earned throughout the evaluation process.

Table 3-1 Criteria for Building Code Adoption Points

If the published date of the listed codes is within 5 years of the date of the grading:
Building Code(s) addressing commercial and /or residential construction .... 8.00 points

If the published date of the listed codes is within 6 years of the date of the grading:
Building Code(s) addressing commercial and /or residential construction .... 6.88 points

If the published date of the listed codes is within 10 years of the date of the grading:
Building Code(s) addressing commercial and /or residential construction .... 2.21 points

If an earlier edition of the listed codes is adopted:
Building Code(s) addressing commercial and /or residential construction .... 0.85 point

For departments surveyed in 2015 the BCEGS program uses the following as the latest edition of Building codes available.

Table 3-2 Latest Edition Available

	Publisher	Publication Year
Commercial Building Code	ICC/NFPA	2012/2015
Residential Building Code	ICC	2015

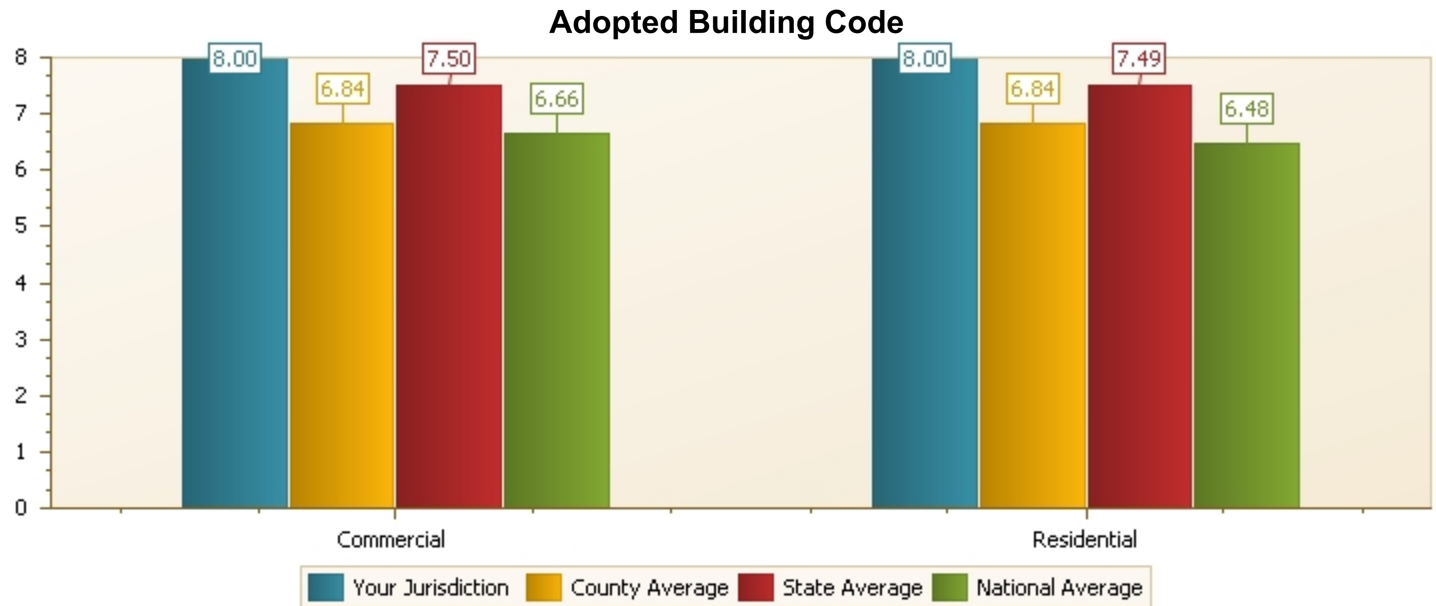
Table 3-3 Building Codes Enforced in Charles Co

	Publisher	Publication Year	Effective Year
Commercial Building Code	ICC	2015	2015
Residential Building Code	ICC	2015	2015

The following is the first of many “Benchmarking Information” sections located in this report. The purpose of the benchmarking information is to provide data ISO has collected in the course of its evaluations of code enforcement departments throughout the country. The data should not be considered a standard but rather information which allows you to compare operations in your jurisdiction to those conducted by other jurisdictions with similar conditions. Benchmarking information will be distinguished from other information in this report by a green Benchmarking Information bar above the table or figure.

Benchmarking Information

Chart 3-4 BCEGS points awarded comparison



Item 108. Additional Code Adoptions:

This section reviews the adoption and enforcement of electrical, mechanical, plumbing, energy, and wildland urban interface codes. Adopted codes are evaluated by year of publication including amendments and enforcement efforts. Table 3-5 details the criteria for earning points under this section.

Table 3-5 Criteria for sub-code adoption points

If the published date of the listed codes is within 5 years of the date of the grading: 0.67 point for each of the five subcodes
If the published date of the listed codes is within 6 years of the date of the grading: 0.33 point for each of the five subcodes
If the published date of the listed codes is within 10 years of the date of the grading: 0.18 point for each of the five subcodes
If an earlier edition of the listed codes is adopted: 0.004 point for each of the five subcodes

For departments surveyed in 2015 the BCEGS program uses the following as the latest edition of sub -codes available.

Table 3-6 Latest edition of Sub-Codes Available

Type of Code	Publisher	Publication Year
Commercial:		
Electrical Code	NFPA	
Plumbing Code	ICC / IAPMO	
Mechanical Code	ICC / IAPMO	
Fuel Gas Code	ICC / NFPA	
Energy Code	ICC / ASHRAE	
Wildland Urban Interface Code	ICC	
Residential:		
Electrical Code	NFPA	
Plumbing Code	ICC / IAPMO	
Mechanical Code	ICC / IAPMO	
Fuel Gas Code	ICC / NFPA	
Energy Code	ICC / ASHRAE	
Wildland Urban Interface Code	ICC	

ASHRAE - American Society of Heating, Refrigeration and Air Conditioning Engineers
ICC - International Code Council
IAPMO - International Association of Plumbing and Mechanical Officials
NFPA - National Fire Protection Association

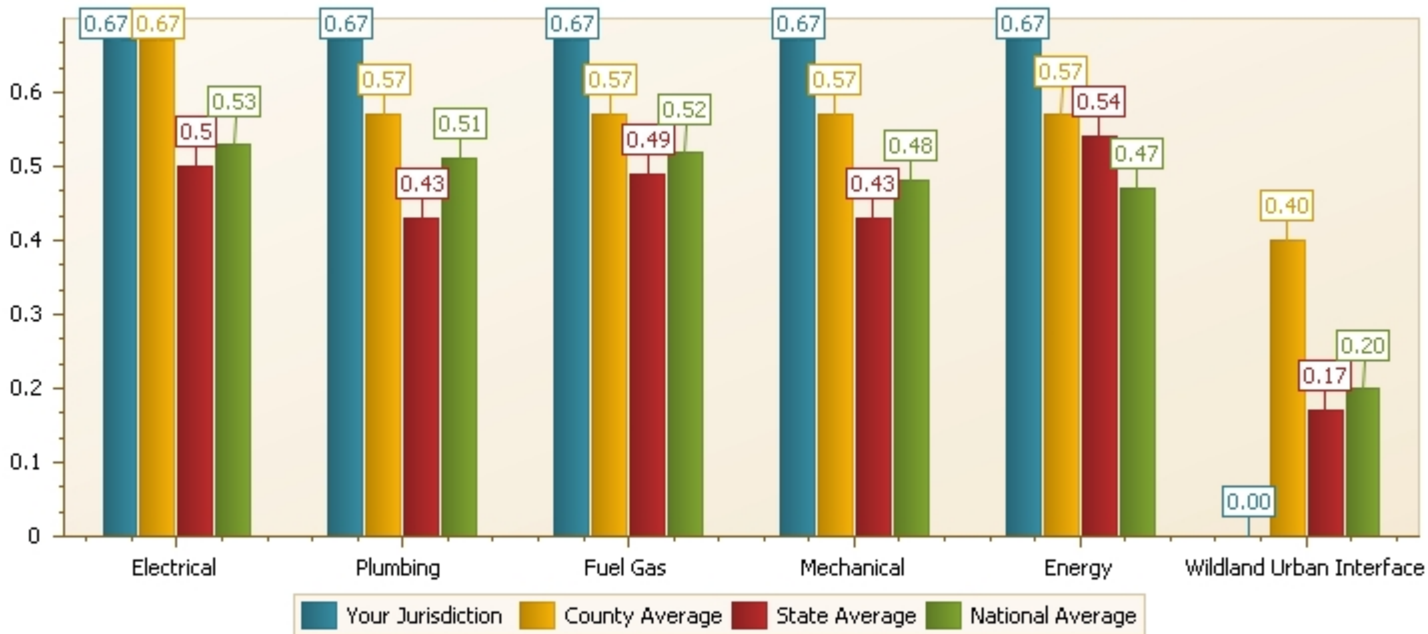
Table 3-7 Sub Codes Enforced in Charles Co

Type of code	Publisher	Publication Year	Effective Year
Commercial:			
Electrical Code	NFPA	2011	2015
Plumbing Code	ICC	2015	2015
Mechanical Code	ICC	2015	2015
Fuel Gas	ICC	2015	2015
Energy Code	ICC	2015	2015
Wildland Urban Interface Code			
Residential:			
Electrical Code	NFPA	2011	2015
Plumbing Code	ICC	2015	2015
Mechanical Code	ICC	2015	2015
Fuel Gas	ICC	2015	2015
Energy Code	ICC	2015	2015
Wildland Urban Interface Code			

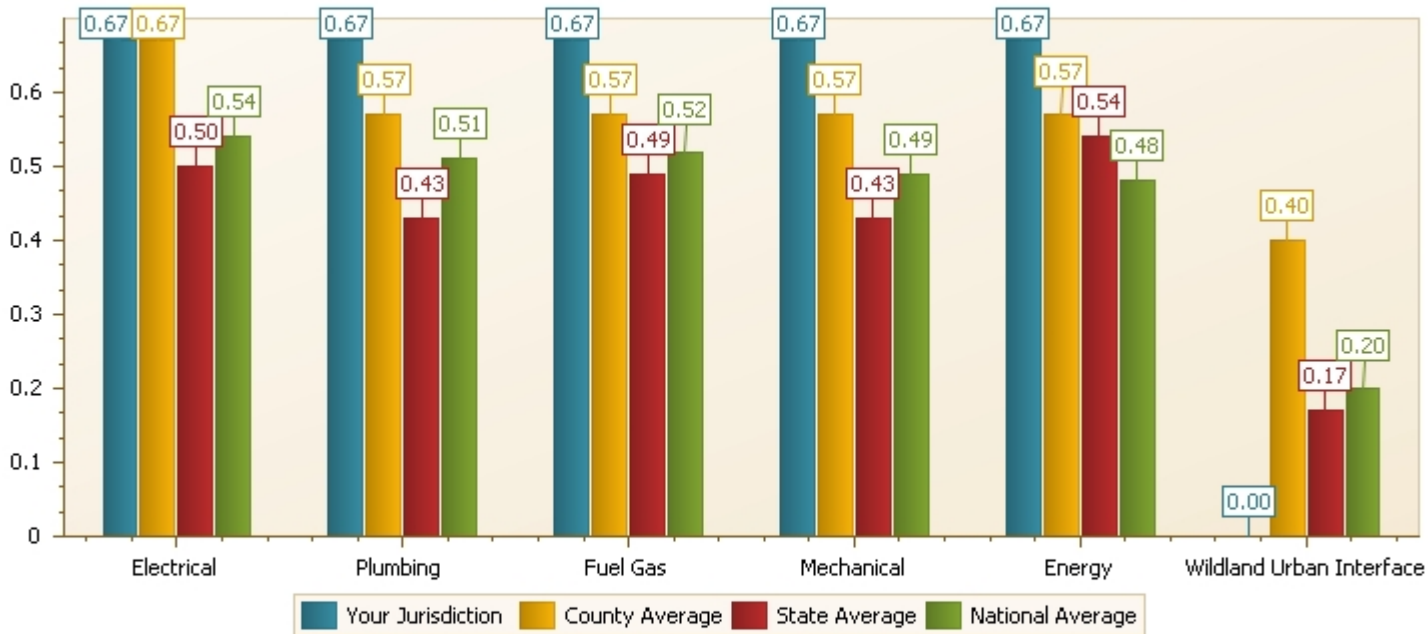
Benchmarking Information

Chart 3-8 additional code adoption

Commercial



Residential

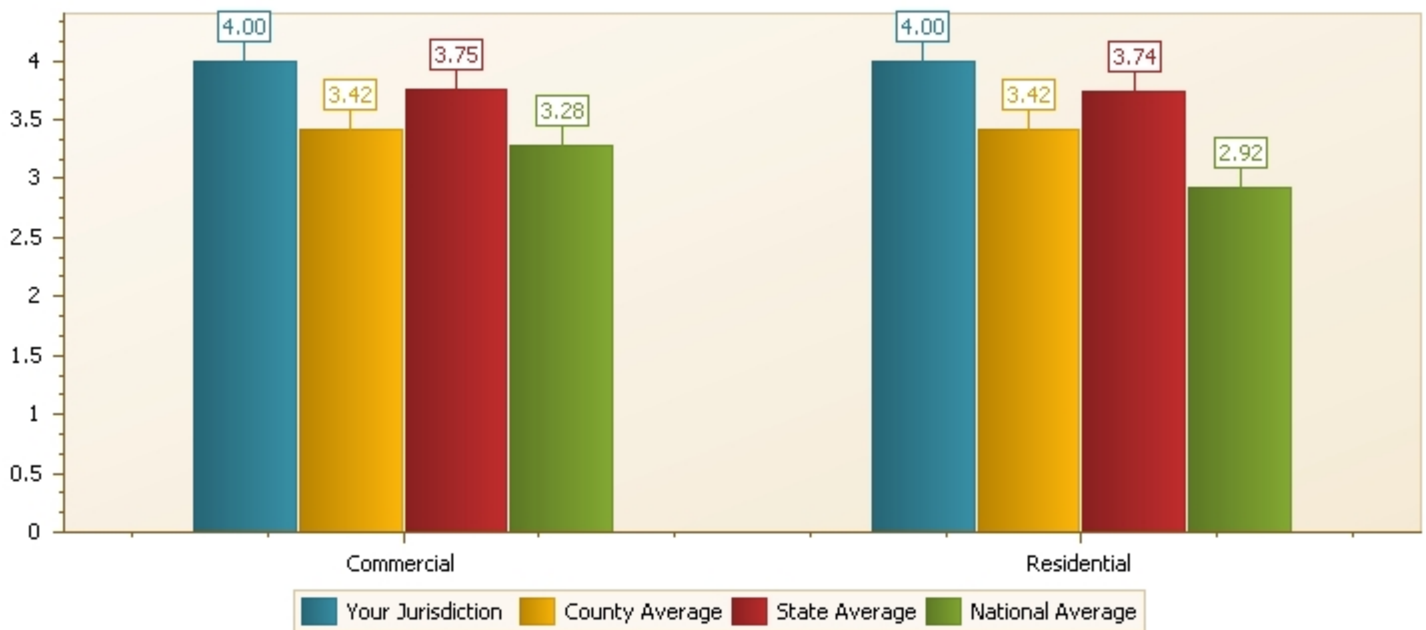


Item 110. Modification to adopted codes:

The BCEGS program encourages timely and unmodified adoption of the latest edition available of the building code. It is not uncommon for a jurisdiction to adopt a code and then modify it in some way. The most common modifications are administrative, which the BCEGS program is not overly concerned with. Some jurisdictions, however, modify the structural aspects of the code. Modifications are viewed as favorable when the intention is to strengthen the code. Due to the difficulty and expense of finitely determining the effect on a code of a specific action which weakens the code, no partial credit is available for this section. Note, however, that due to the formula: (Points credited in section 105 x 0.125 x 4.0) the points awarded for this item are reduced if the latest building code is not adopted and enforced. There is a direct correlation between the points earned for the adopted building code and the points available for this section. When modification serves to weaken the intent or effectiveness of the adopted building code relative to structural aspects or natural hazard mitigation features, no points will be awarded for this section.

Benchmarking Information

Chart 3-9 Comparison of Points Earned for Section 110

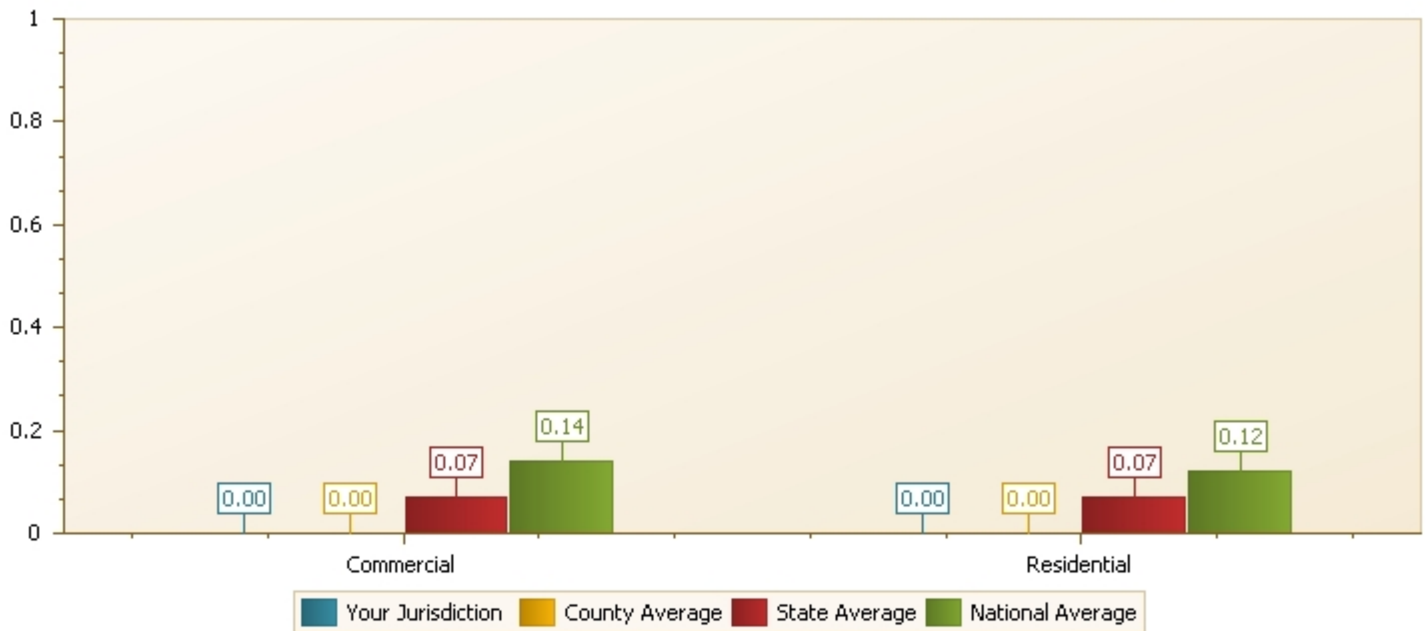


Item 112. Method of Adoption:

Updating the adopted codes to the latest code published by a nationally recognized building code development and publication organization within 12 months of the publication of the code is beneficial for the jurisdiction. It provides the latest and most modern technology for natural hazard mitigation. This section allows the opportunity to recognize the timely un-amended adoption of a nationally promulgated building code

Benchmarking Information

Chart 3-10 Points Earned for Timely (within one year of the publication date) Un-Amended Code Adoption



Section 4 Education, Training, and Certification

The Building Code Effectiveness Grading Schedule reviews the tools available to a building code department to determine what level of protection the jurisdiction has decided to offer. In this section we review the qualifications of the code enforcement personnel. By maintaining highly qualified, well trained staff the building code enforcement department is better equipped to encourage the construction of code compliant buildings.

The BCEGS program does not mandate any level of training certification or experience but it does recognize the technical and evolving nature of construction code enforcement. Therefore, 39% of the available points in the analysis are dependent on education, training and experience. The evaluation is much diversified. For instance, credit can be earned for hours of training taken, dollars spent on training, incentives for outside training, and hiring requirements. After review of this information a building code department may determine that a higher caliber employee or more incentives to current employees could assist them in performing their duties more efficiently and professionally.

The number of personnel is an important factor when comparing and correlating education and training. To standardize these numbers this report converts all employees to full time. Therefore a department with two full time code enforcers the number of employees will be two. If a department has five full time code enforcers and seven part time code enforcers each working twenty hours per week the department will show as eight and one half employees.

Charles Co employs 18.19 code enforcement personnel. This staffing level is equal to one code enforcement personnel for each 8,058 citizen or one code enforcement personnel for each 411.44 permits issued. If the jurisdiction was divided equally, each code enforcer would be responsible for an area of 25.18 square miles.

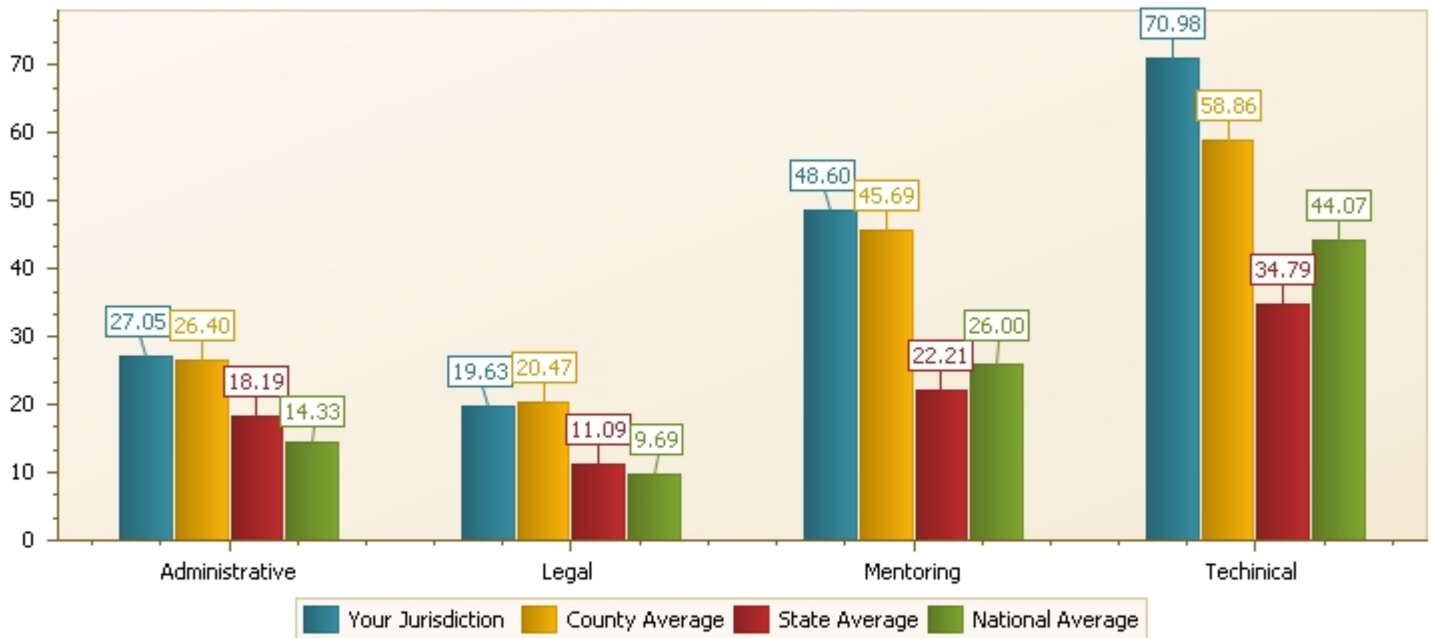
Table 4-1 displays the total and the average number of hours spent in training by code enforcement personnel in Charles Co. Training is broken down into four categories; a maximum of 1.25 points may be earned for the first 12 hours of training in administrative aspects of code enforcement, legal aspects of code enforcement, and being mentored in code enforcement. The first 60 hours of training in technical aspects of code enforcement may also earn maximum credit of 4.25 points. To receive the maximum available points in this area each employee must train a minimum of 96 hours per year and the subject must follow the details above.

Table 4-1 Training hours for Charles Co

	Total hours for department	Average hours of training
Administrative	492.00	27.05
Legal	357.00	19.63
Mentoring	884.00	48.60
Technical	1291.00	70.98

Benchmarking Information

Chart 4-2 Comparison of average hours of training



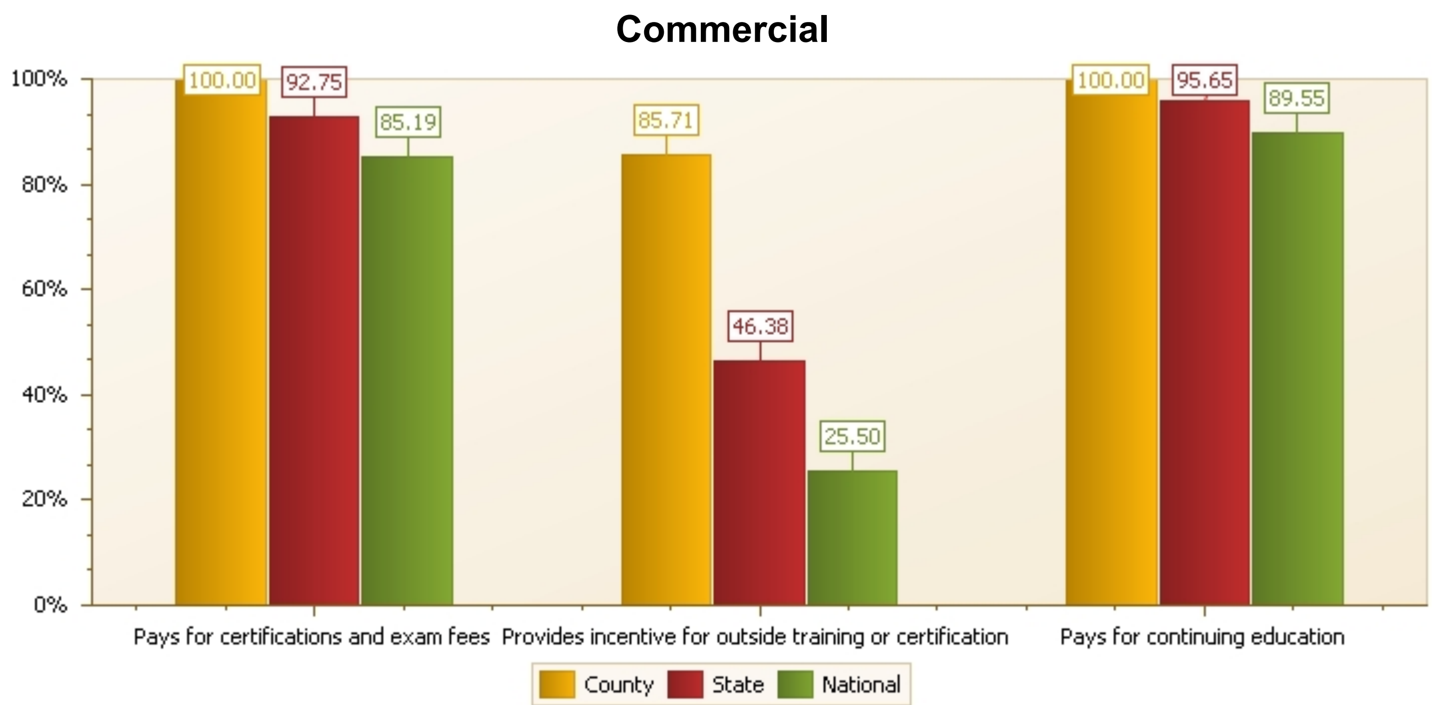
Building code enforcement departments may choose to emphasize their commitment to training and education through incentives, such as funding certification, exam fees, and continuing education or providing incentives for outside training. The following table is broken down for residential and commercial construction and indicates the incentives provided by Charles Co.

Table 4-3 BCEGS points earned by Charles Co for training incentives

	Commercial	Points Earned	Residential	Points Earned
Department pays for certifications and exam fee	Yes	0.50	Yes	0.50
Provides incentive for outside training or certification	Yes	0.50	Yes	0.50
Pays for continuing education	Yes	0.50	Yes	0.50

Benchmarking Information

Chart 4-4 Comparison of communities providing training incentive



Hiring only certified code enforcement employees or allowing a short probationary period for new hires to earn their certification are valued practices which elevate the quality and consistency of the code enforcement process. The following two charts compare your jurisdiction's policies regarding certification with those of other departments within your county, state and across the country. The charts represent the percent of plan reviewers and inspectors that held appropriate certification for the duties they performed at the time of the latest BCEGS survey. Chart 4-5 represents commercial work and Chart 4-6 represents residential work.

Chart 4-5 Comparison of Certified Personnel Performing Commercial Duties

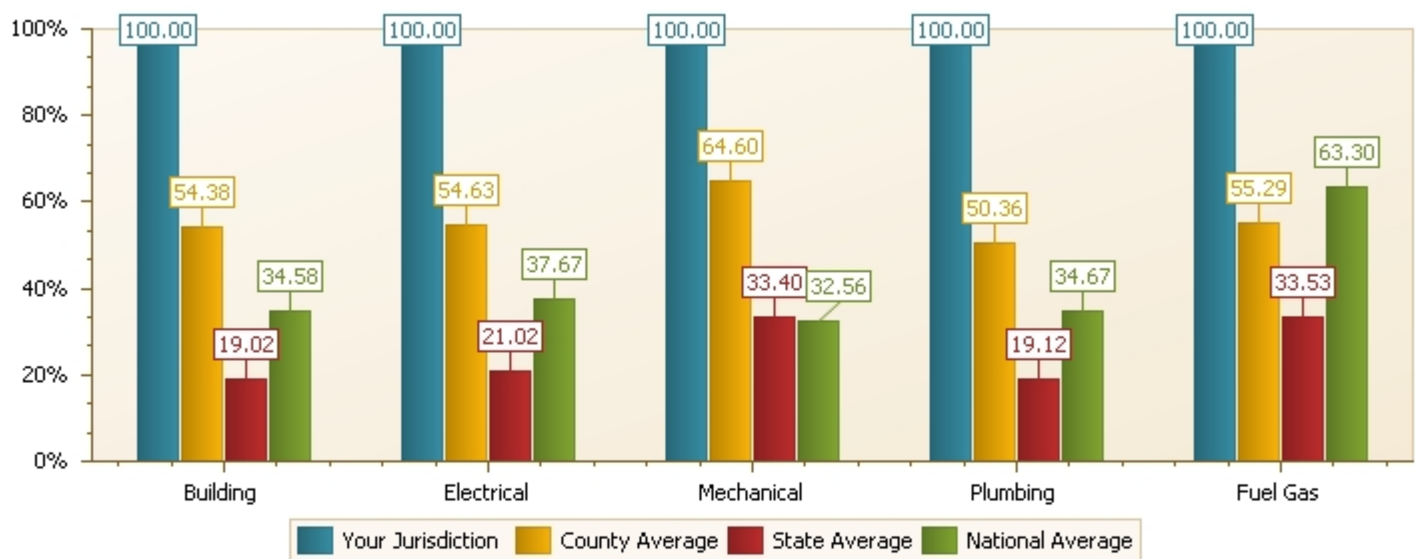
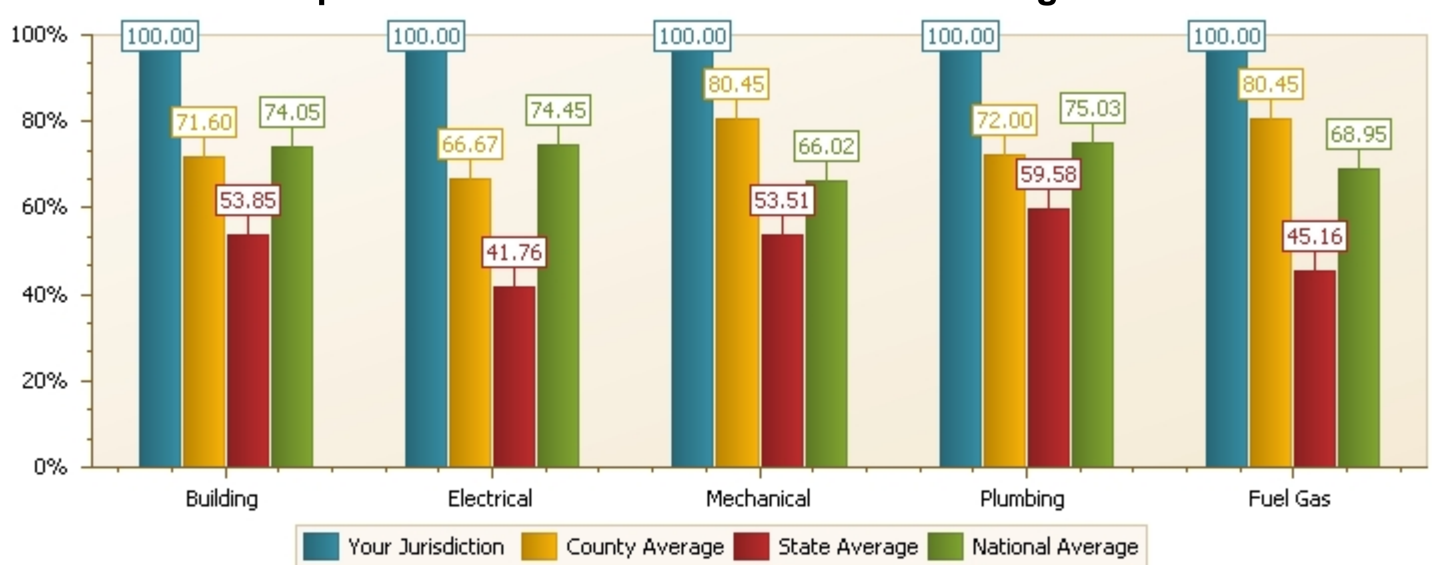


Chart 4-6 Comparison of Certified Personnel Performing Residential Duties



Requiring certification as a condition of employment is an important factor. However, the evolving nature of the building technology and the wide variety of situations encountered by plan reviewers and inspectors dictate the need for continuing education. The following two charts are based on the period of time allowed to complete the required amount of continuing education requirements for building inspectors in order for them to renew their license / certification. Information in these charts represents data gathered across the country.

Chart 4-7 Building Certification Renewal Period Commercial

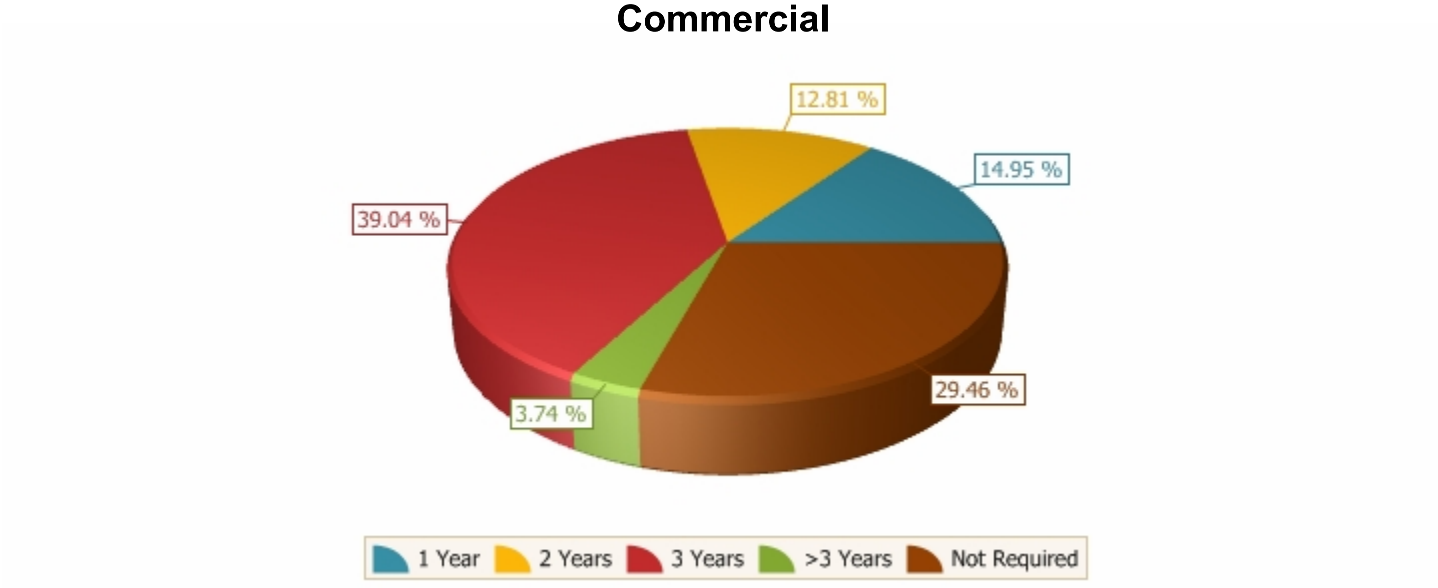
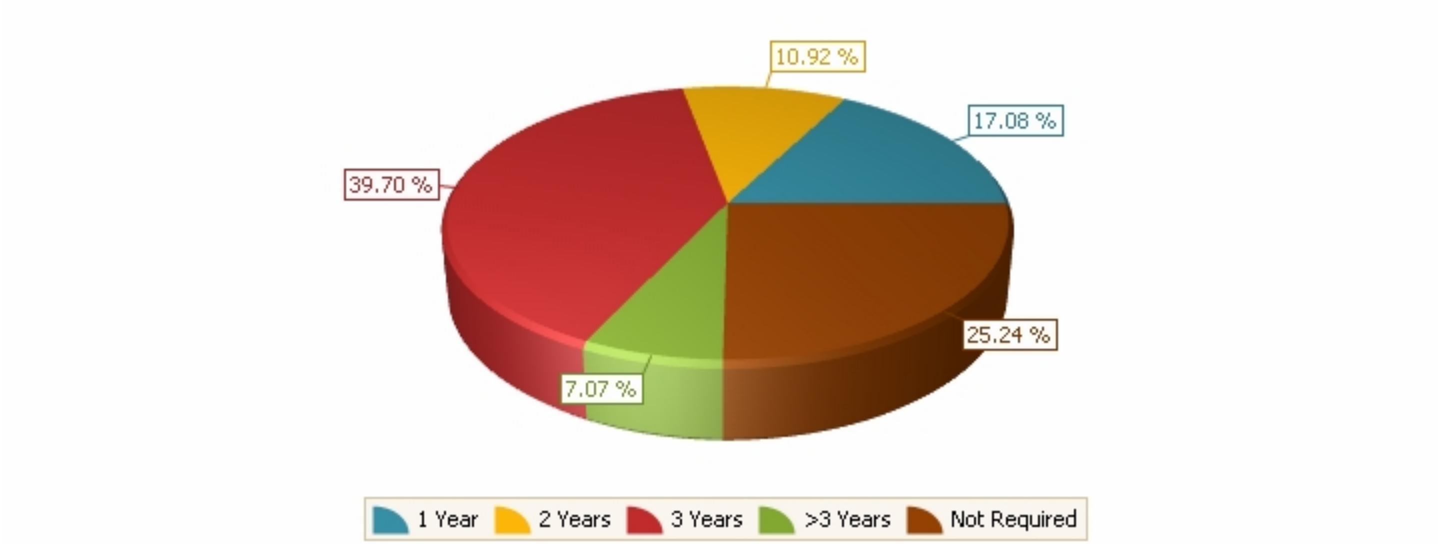


Chart 4-8 Building Certification Renewal Period Residential



Section 5 Staffing Levels

One of the most frequently asked questions from community administrators and building officials is: How many inspectors and plan reviewers do we need to supply the desired level of service to our community? This section will provide valuable information to assist in this vital decision. The BCEGS schedule uses the following benchmarks to calculate the staffing levels:

- 10 inspections per day per full time inspector
- 1 commercial plan review per day per full time plan reviewer
- 2 residential plan review per day per full time plan reviewer

These are average numbers of the entire department over the course of a year. Some inspectors because of the type of work they are assigned will exceed these benchmarks while others will not be able to reach them, the same is true of plan reviewers. The fact is that these benchmarks have proved to be realistic over the course of surveying 14,000 code enforcement departments.

However, we realize that your community may have varying circumstances and may want to base staffing decision on other information. In the following set of charts we have scoured our database to find communities that are of similar size, and population to your community to provide data that may be helpful in your decision process. The next key element of staffing decision is the workload; again we queried our records to find communities with similar number of permits issued, inspections and plan reviews completed. This data can be useful in further defining your staffing levels. Realizing that some jurisdictions cover vast area while others are metropolitan we did some calculations and arrived at a unique category of permits per square mile. You may find that this category affords benchmarking opportunities that take into account workload and travel time for your inspecting staff.

Table 5-1

Your community falls into the following ranges

Population	>25,000
Square Miles	>38
Permits Issued	>2,000
Number of inspections conducted	>5,700
Building Plan reviews conducted	401-1400
Permits per Square Mile	15.01-17

Benchmarking Information

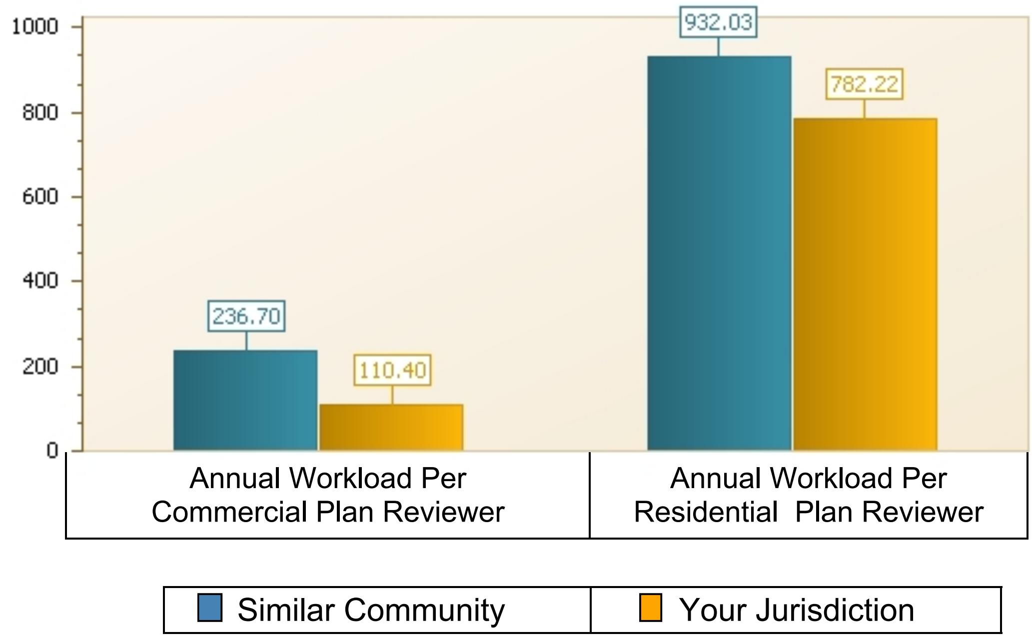
The information in Charts 5-3 through 5-14 depicts the staffing levels of your jurisdiction along with the average staffing levels of all the communities that fall within the range for each category as defined in Table 5 -1. To standardize these numbers this report converts all employees to full time equivalents. Therefore, in a department with two full time employees the number of personnel will be two. If a department has five full time code enforcers and seven part time code enforcers each working twenty hours per week the department is considered to have eight and one half full time employees. The data is further broken down by the responsibilities of each code enforcer. For example a department may allocate time as follows:

Table 5-2 Time Allocation Example

	Time allocation (hrs) employee #1 40 hrs per week	Time allocation (hrs) employee #2 30 hrs per week	Time allocation (hrs) employee #3 20 hrs per week	No. of equivalent full time employees
Commercial Plan Review	16	1.5	0	0.44
Residential Plan Review	8	1.5	0	0.24
Commercial Inspection	14	24	2	1.00
Residential Inspection	2	3	18	0.58
Total equivalent full time employees				2.25

The calculations used to make up the graphs for the example above would be the number of commercial plan reviews conducted in your jurisdiction divided by 0.44 (the number of commercial plan reviewers employed by your jurisdiction). Similarly assuming 732 residential inspections divided by the number of residential inspectors (0.58) returns a workload of 1,262 inspections per full time inspector per year. The calculation for the control group is the same except that the results are averaged.

Chart 5-3 Building Plan Review Staffing Comparisons of Communities Serving Similar Populations



Based on plan reviews completed for new buildings and additions.

Chart 5-4 Inspection Staffing Comparisons of Communities Serving Similar Populations

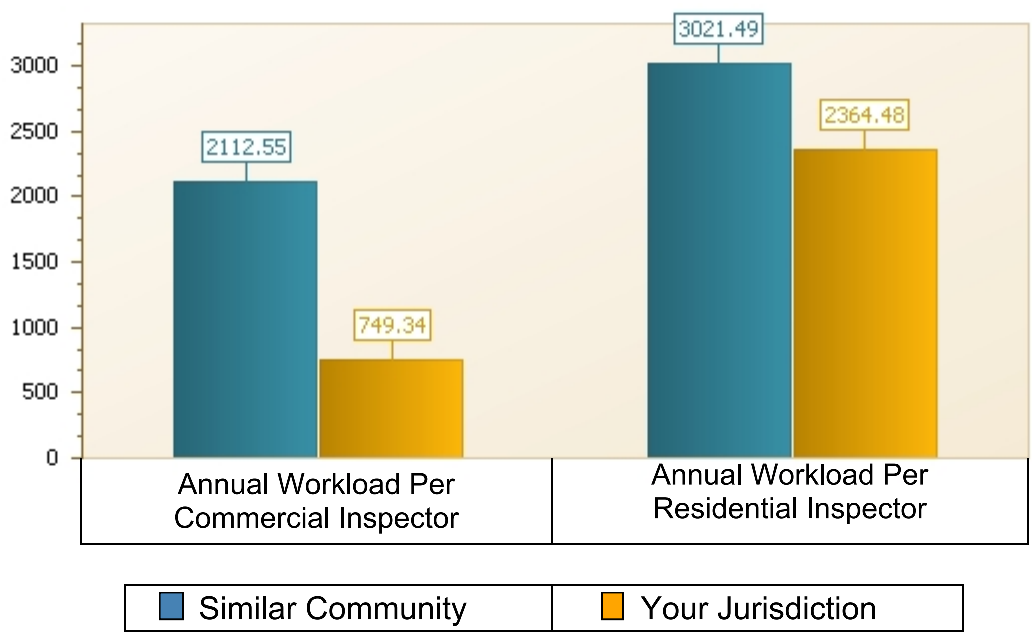
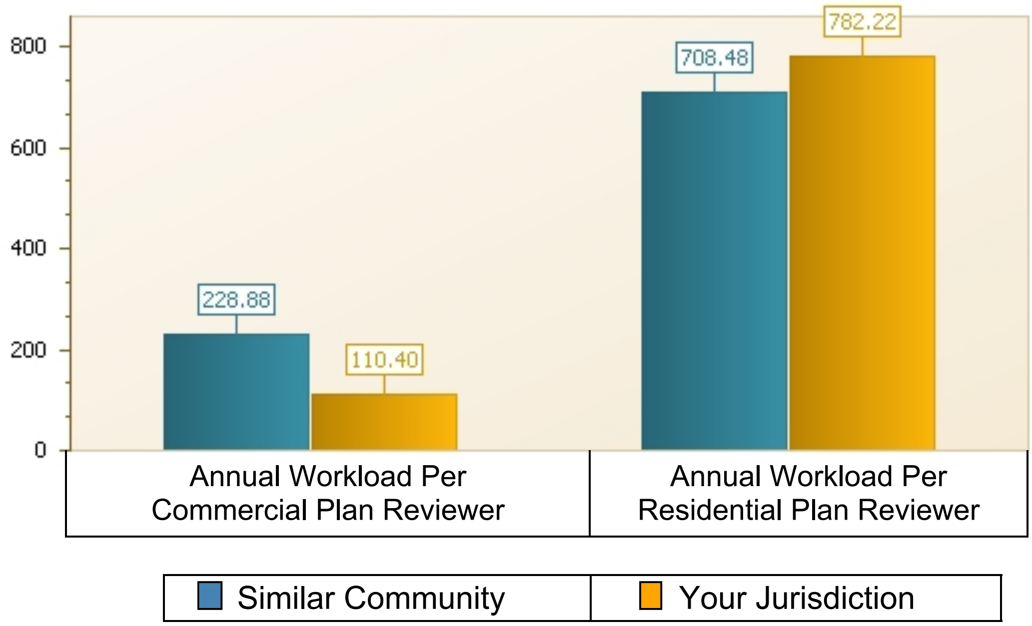


Chart 5-5 Building Plan Review Staffing Comparison of Communities Serving Similar Square Miles



Based on plan reviews completed for new buildings and additions.

Chart 5-6 Inspection Staffing Comparison of Communities Serving Similar Square Miles

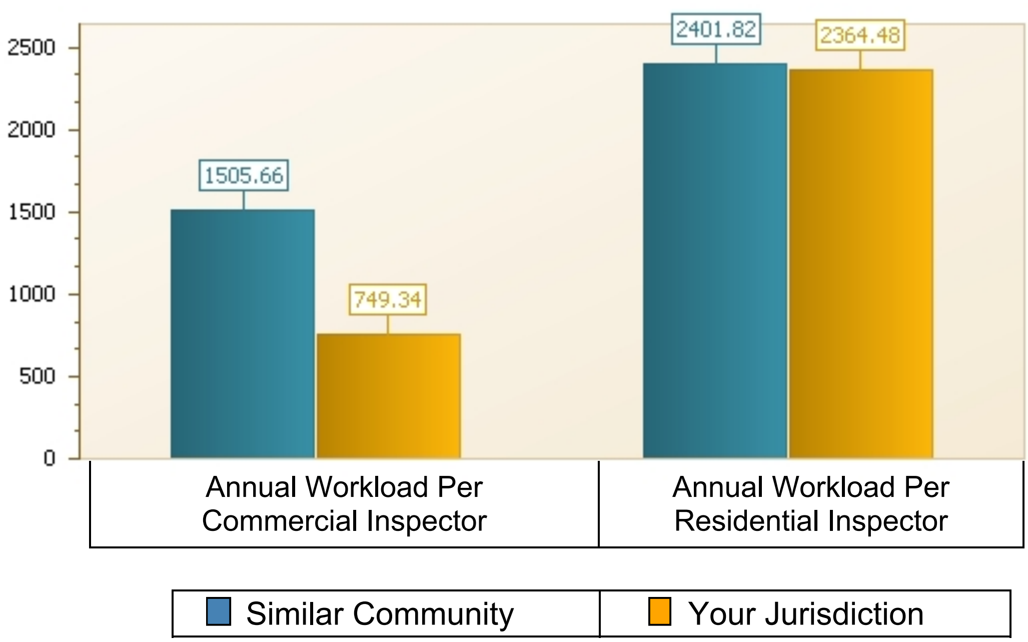
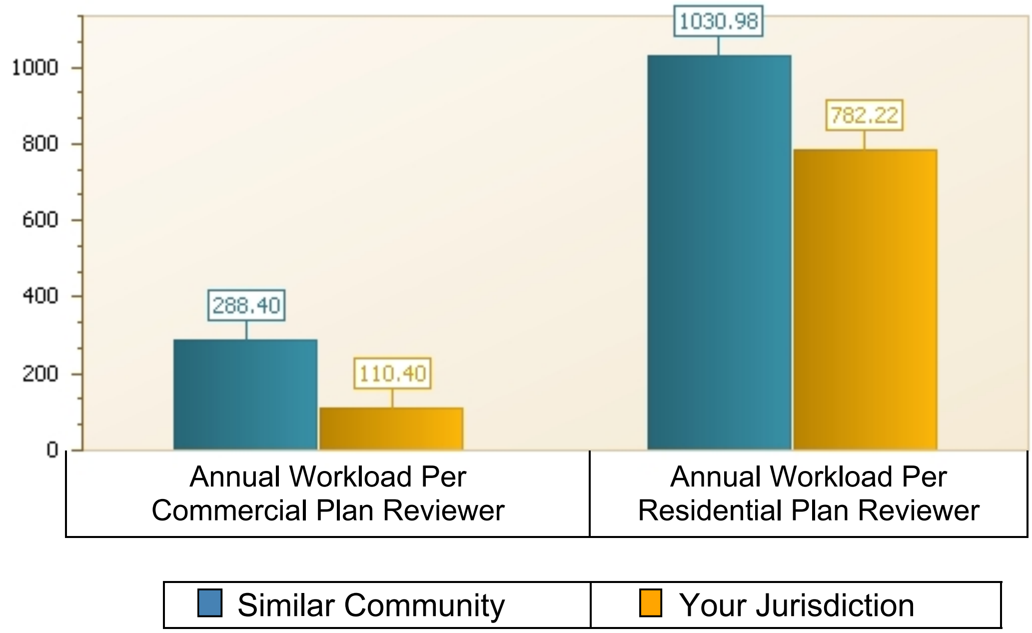


Chart 5-7 Building Plan Review Staffing Comparison of Communities Similar Number of Permits



Based on plan reviews completed for new buildings and additions.

Chart 5-8 Inspection Staffing Comparison of Communities Issuing Similar Number of Permits

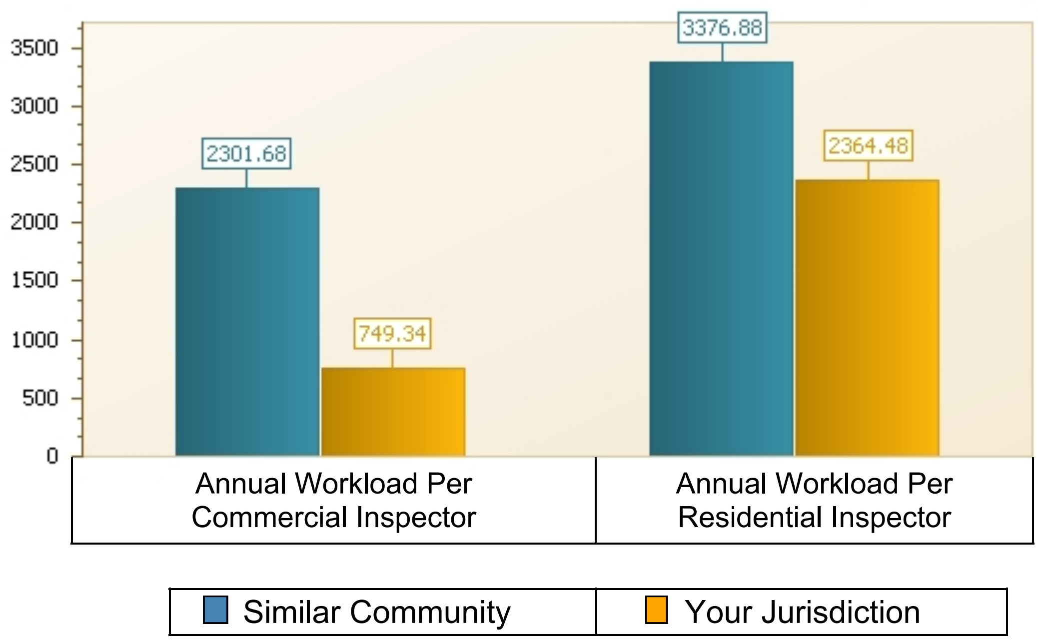
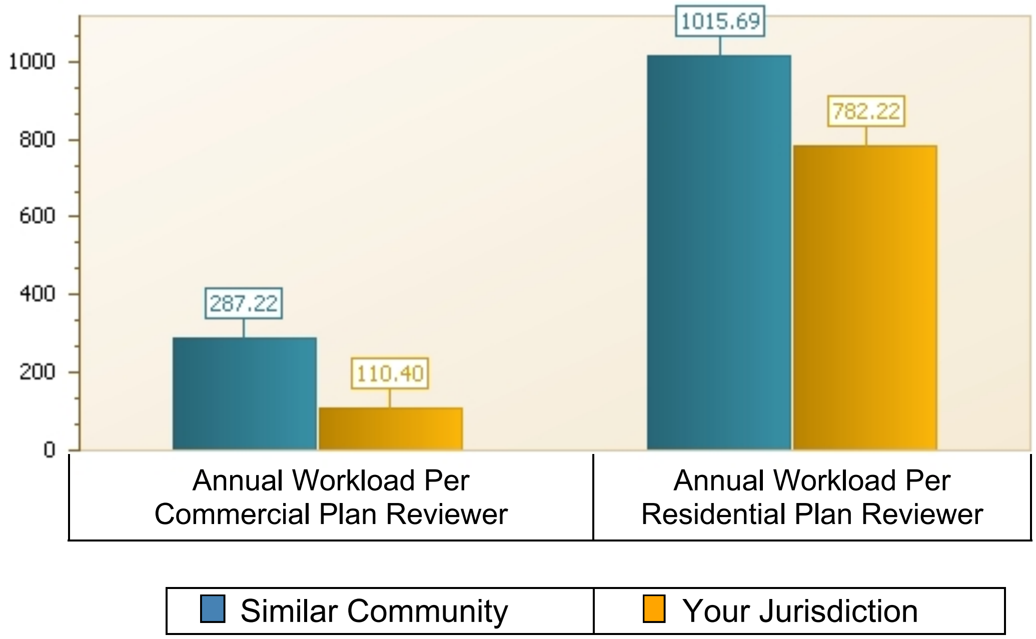


Chart 5-9 Building Plan Review Staffing Comparison of Communities Conducting Similar Number of Inspections



Based on plan reviews completed for new buildings and additions.

Chart 5-10 Inspection Staffing Comparison of Communities Conductiong Similar Number of Inspections

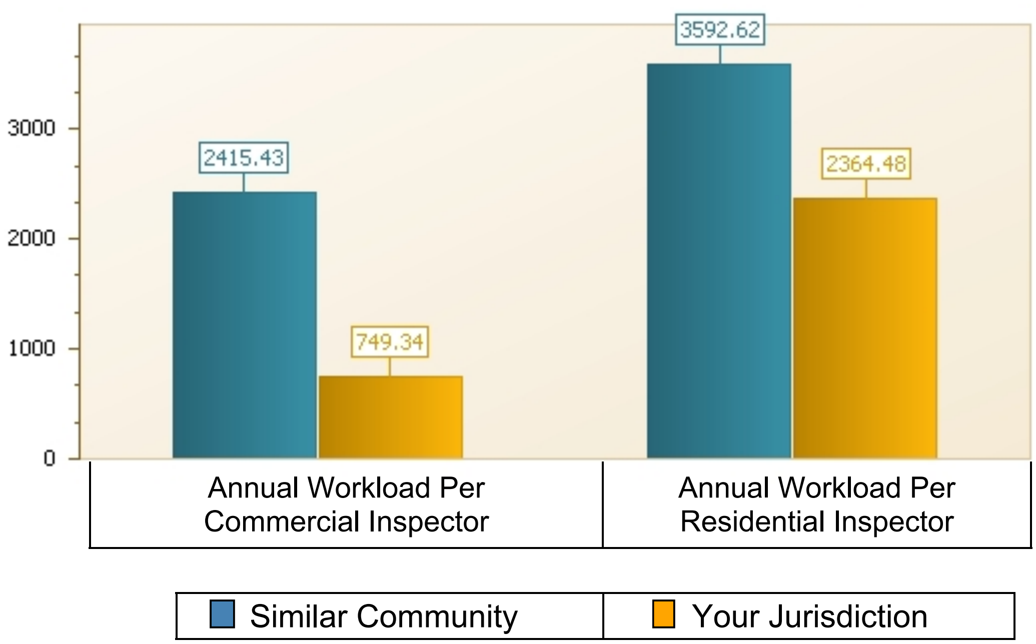
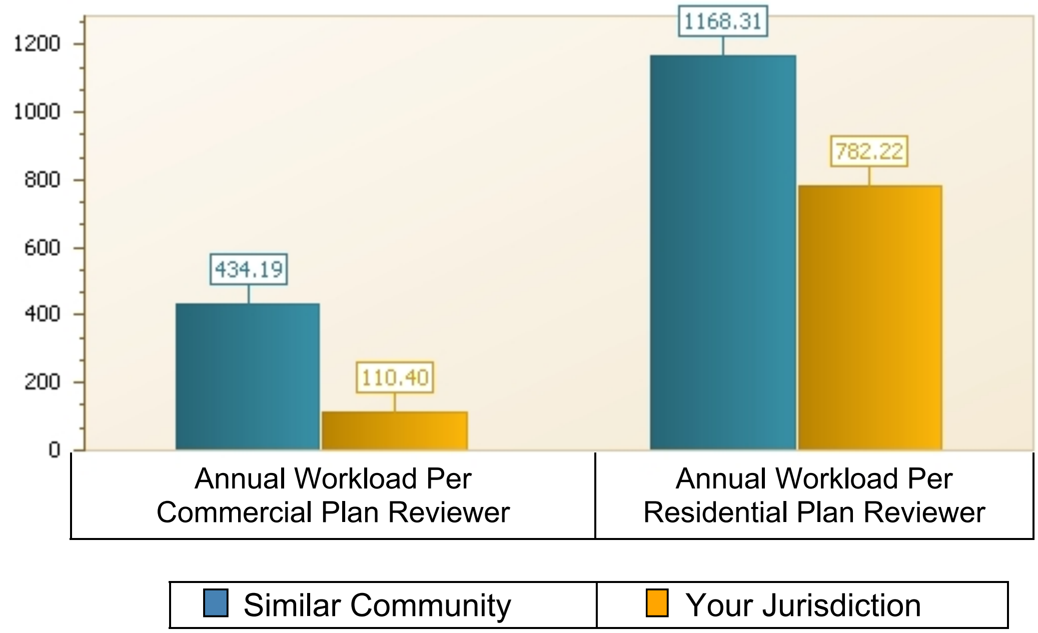


Chart 5-11 Building Plan Review Staffing Comparison of Communities Conducting Similar Number of Plan Reviews



Based on plan reviews completed for new buildings and additions.

Chart 5-12 Inspector Staffing Comparison of Communities Conducting Similar Number of Plan Reviews

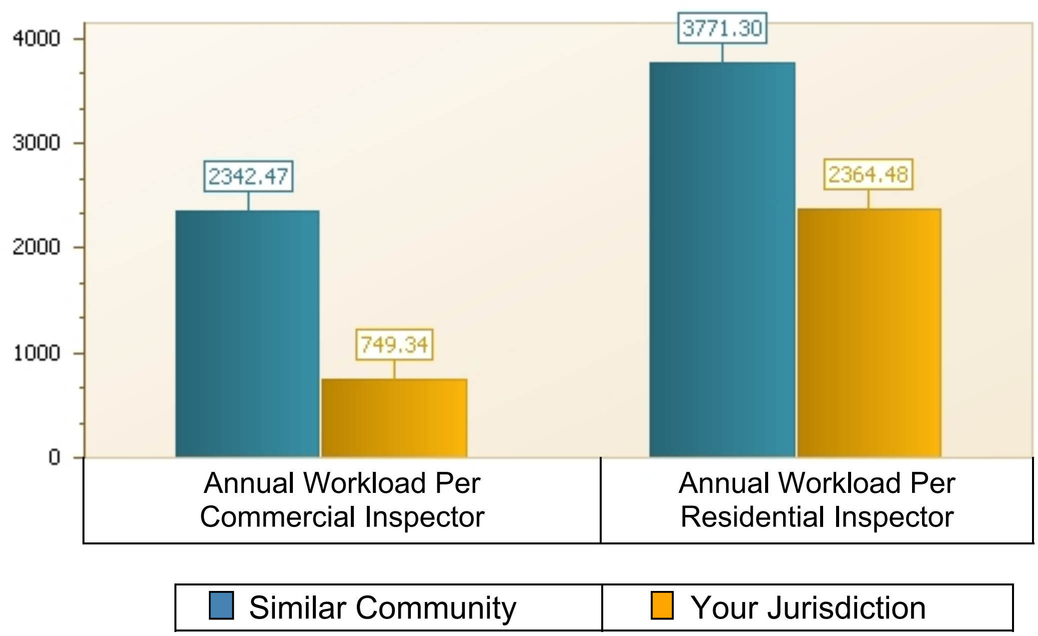
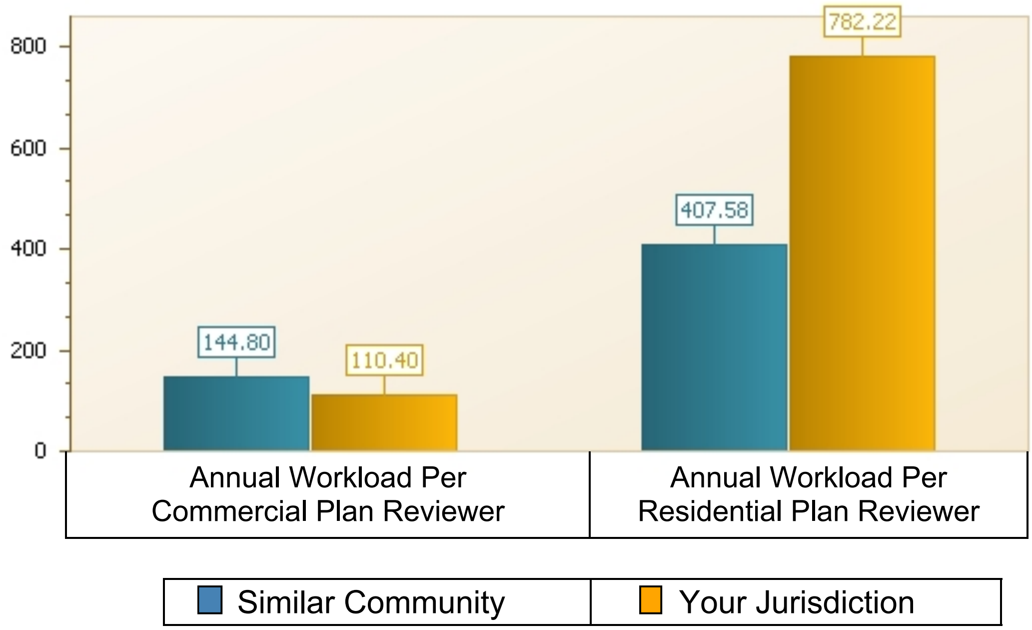
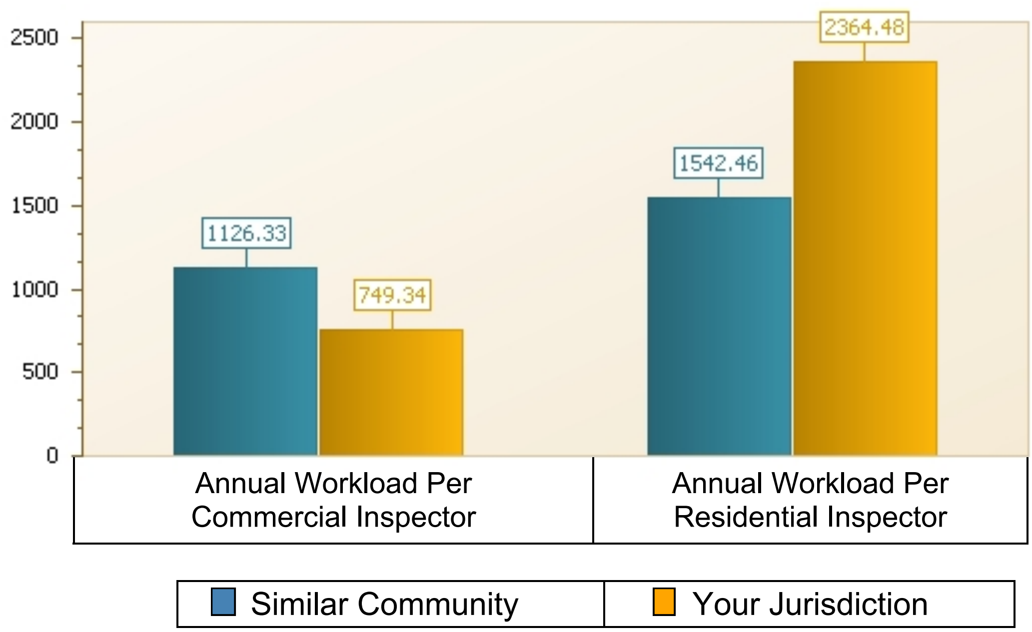


Chart 5-13 Building Plan Review Staffing Comparison of Communities Issuing Similar Number of Permits Per Square Mile



Based on plan reviews completed for new buildings and additions.

Chart 5-14 Inspector Staffing Comparison of Communities Issuing Similar Number of Permits Per Square Mile



Section 6 BCEGS Points Analysis

ISO has been surveying and evaluating building code adoption and enforcement in communities around the country since 1995. To maintain relevant information the BCEGS program is designed to conduct surveys on a 5 year cycle. The information in this section will give you some insight to trends in your jurisdiction, your state and across the country.

Benchmarking Information

Charts 6-1 through 6-2 compare the points earned by your department in each Section to the points earned by other departments in your state, county, and across the country. The charts are broken down by commercial and residential. You may use Table 1 as a guide for how points are earned in each section.

Chart 6-1 Comparison of Commercial Points Scored

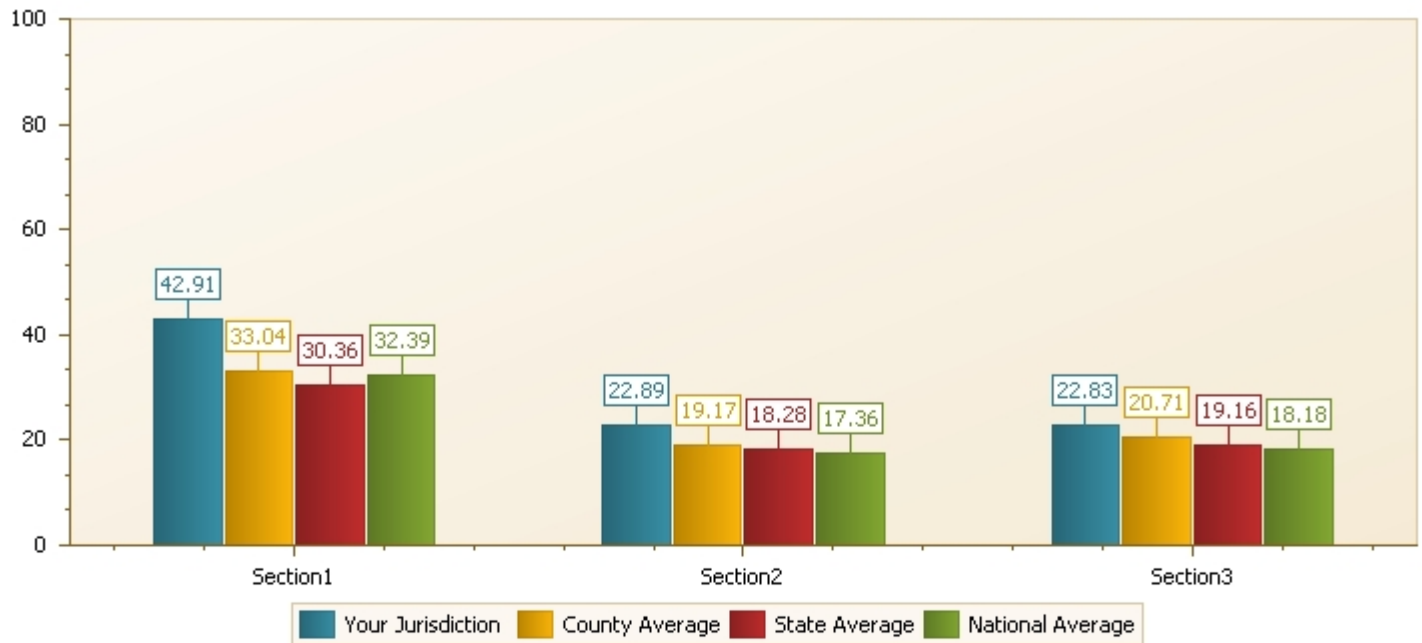
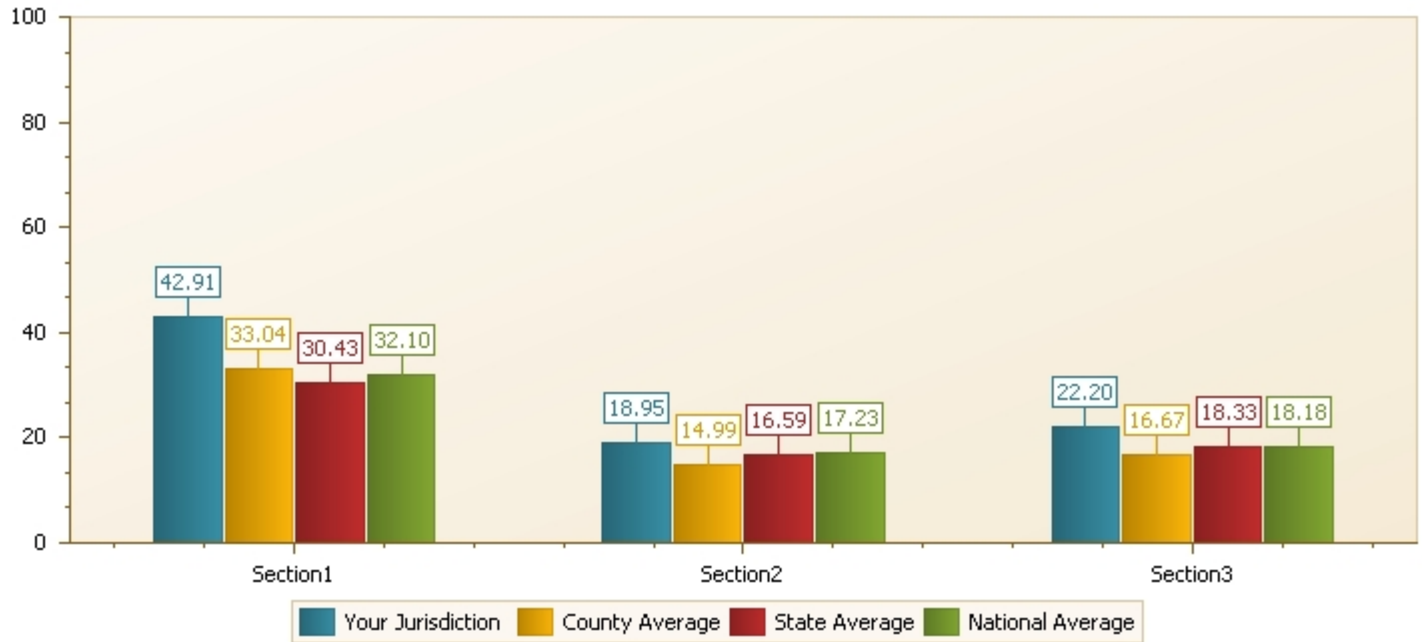


Chart 6-2 Comparison of Residential Points Scored



Section 7 Natural Hazards

Different parts of the country are subject to a variety of potential natural hazards. The map below is an overview of those potentials:

In cooperation with AIR (an ISO company) we have prepared the following hazard report using the municipal building address you supplied during the survey meeting. A full explanation of how to read and interpret the following profiles can be found in Appendix A.

Single Location Hazard Profile

New Address

Location Name:

Entered Address: 200 Baltimore Street, LaPlata, MD 20646

Catastrophe Hazard Information

Matched Address: 200 BALTIMORE ST, LA PLATA, CHARLES County, MD 20646
Geocode Match: Relaxed Address
Latitude: 38.530658° North
Longitude: -76.978477° East

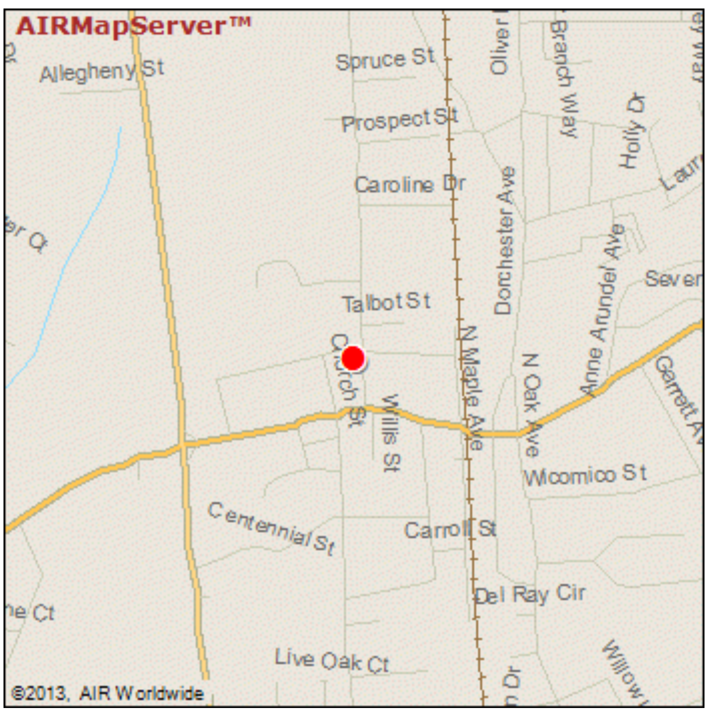
Warning:
The geocoding engine did not find an "exact" match for your address. The high resolution of CATStation data makes it important to achieve an "exact" match for the most accurate results.
Please go back and review the address for errors.

For Catastrophe Hazard only
If the address was entered correctly, please use an alternative geocoding website and enter the geocode (latitude and longitude) in the Location edit page.

More Maps: -- select a map -- View Map   Disclaimer   Google™ Earth

NW N NE

W E



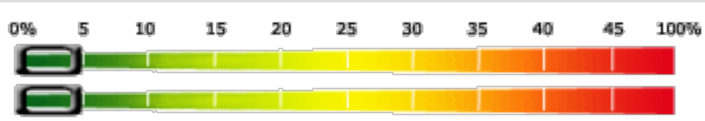
SW S SE

Zoom In
Zoom Out

Hurricane Profile

Risk

(Percentage Loss)



100-year loss level:
250-year loss level:
Average Annual Loss: <0.1 %

Relative Risk

(Percentile)

within county:

within state:

Hurricane Information

Storm Surge Potential:	No
Distance to effective coast:	25 - 50 miles
Distance to actual coast:	Greater than 25 miles
Coastal County:	No
Elevation:	150 - 200 feet above mean sea level
Terrain/Land Use:	Developed Open Space

Historical Hurricanes

Name	Date of Landfall	Intensity at Landfall (Saffir-Simpson)	Distance of Track to Property (mi)	Intensity Closest to Property (Saffir-Simpson)
Connie	August 12, 1955	3	43	2
Hazel	October 15, 1954	4	47	2
Unnamed	September 14, 1904	1	60	1
Bertha	July 12, 1996	2	49	1
Unnamed	August 23, 1933	2	3	1

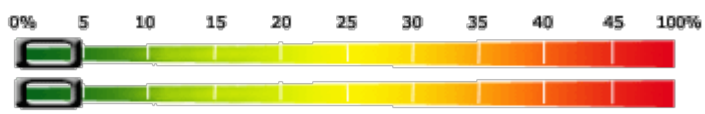
Severe Thunderstorm Profile

Risk

(Percentage Loss)

100-year loss level:

250-year loss level:



Average Annual Loss: <0.1 %

Relative Risk

(Percentile)

within county:

within state:

Hazard Information

Tornado:	Very High/High /Moderate /Low / **Very Low**
Hail Storm:	Very High/High /Moderate /Low / **Very Low**
Straight-line Wind:	Very High/High /Moderate /Low / **Very Low**

Nearest Historical Tornadoes

Date	Distance (mi)	Intensity (Enhanced Fujita Scale)
April 28, 2002	0.10	4
September 24, 2001	47.78	4
January 26, 1978	17.51	3

September 5, 1979	18.07	3
November 2, 1966	40.67	3

Nearest Historical Hail Storms

Date	Distance (mi)	Intensity by Average Hail Size (in)
July 2, 1968	39.58	>=4.0
April 28, 2002	0.09	>=4.0
June 8, 1990	42.90	3.0-4.0
April 28, 2002	2.72	3.0-4.0
May 30, 1960	45.29	3.0-4.0

Nearest Historical Straight-Line Wind Storms

Date	Distance (mi)	Intensity by Average Wind Speed (mph)
May 8, 2008	31.52	90-100
April 21, 2000	33.16	80-90
June 26, 1988	34.80	80-90
June 2, 2000	44.56	80-90
July 14, 1996	30.32	80-90

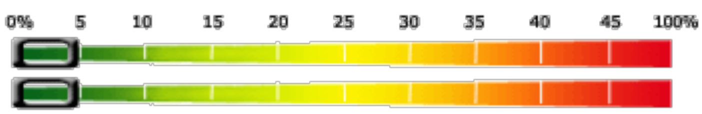
Winter Storm Profile

Risk

(Percentage Loss)

100-year loss level:

250-year loss level:



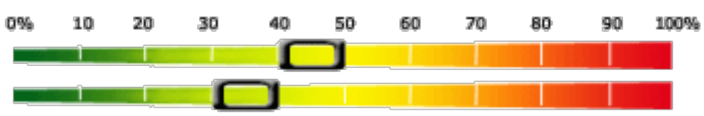
Average Annual Loss: <0.1 %

Relative Risk

(Percentile)

within county:

within state:



Hazard Information

Wind Frequency: Very High / High / Moderate / Low / **Very Low**

Snow Frequency: Very High / **High** / Moderate / Low / Very Low

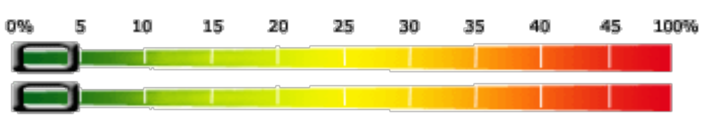
Earthquake Profile

Risk

(Percentage Loss)

100-year loss level:

250-year loss level:



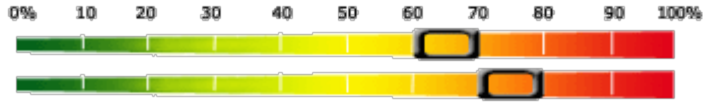
Average Annual Loss: <0.1 %

Relative Risk

(Percentile)

within county:

within state:



Earthquake Information

CA DOI Zone:	Not Applicable
Liquefaction Potential:	Data Not Available
Landslide Zone:	
Alquist-Priolo Fault Zone:	Not Applicable
Soil Type:	Stiff clay and Sandy soil(firm soil)

Intensity by Probability of Exceedance (PE):

Modified Mercalli Intensity	VI	VII	VIII	IX	X	XI	XII
30 Year PE	0.12%	0.05%	0.01%	0%	0%	0%	0%

Intensity by Return Period:

Return Period	100 Year	200 Year	250 Year	475 Year
Modified Mercalli Intensity	3.0	3.0	3.0	3.0

Fault Information

No significant active fault has been mapped within a 200 mile radius of the address.

Historical Earthquakes

No significant historical earthquake has been recorded within a 200 mile radius of the address.

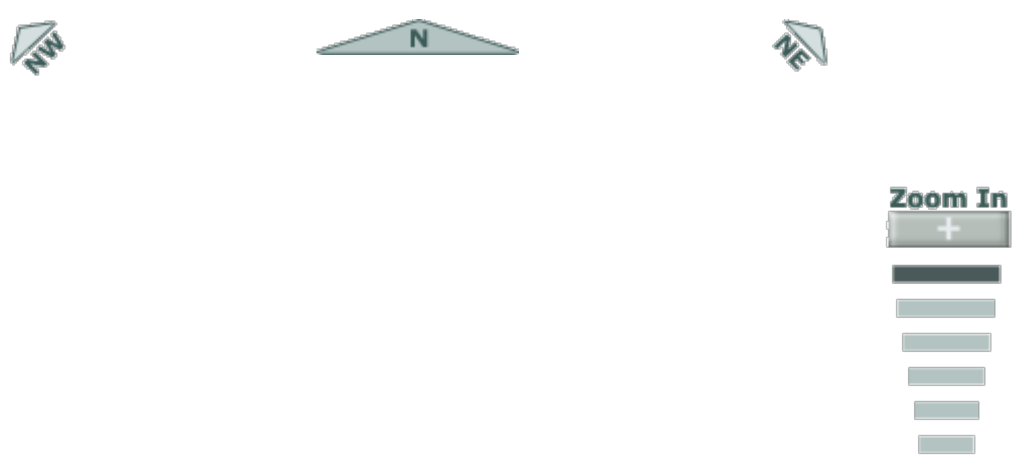
Flood Profile

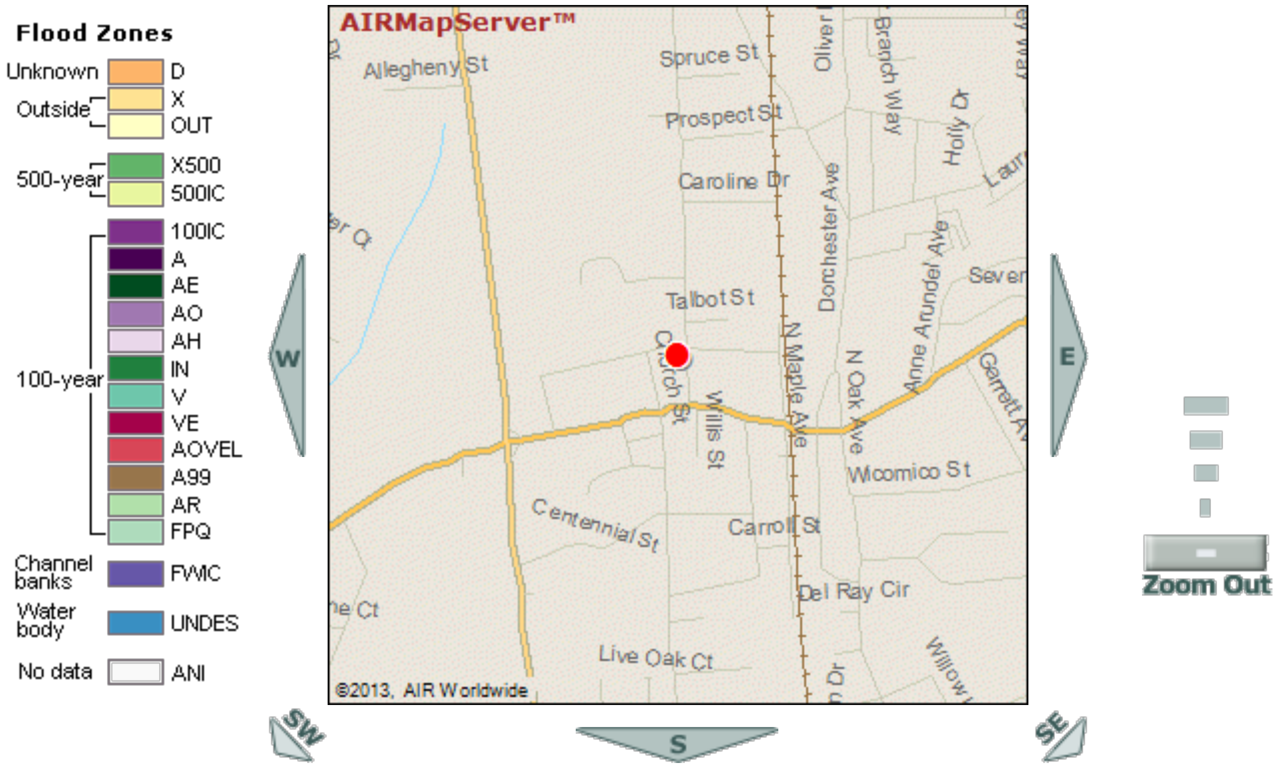
Flood Information

Source:	DFIRM
Flood Zone:	Outside Flood Zone
FEMA Flood Zone:	X Flood Zone
Elevation:	150 - 200 feet above mean sea level

Shortest Distance to:

Water Body:	More than 5 miles
100 Year Flood Plain:	0.5 miles
500 Year Flood Plain:	0.5 miles





Print | Close | New Address

Appendix A - Natural Hazard General Information

AIR*Profiler* is designed to provide users with vital, peril-specific characteristics of the property location, such as storm surge potential and distance to nearest active fault, as well as risk scores, which are quick measures of the risk and relative risk associated with the property.

This release of AIR*Profiler* includes hurricane profiles for all states in the continental U.S. at risk from hurricanes, as well as earthquake, severe thunderstorm and flood profiles for the forty-eight contiguous states.

- The Address Profile displays important information regarding the accuracy of the look-up for the entered address, the geocode of that address and a street map. The Hurricane Profile provides hurricane risk information for the location as well as other related hazards including storm surge potential and distance to nearest historical hurricane track.

- The Earthquake Profile, in addition to showing risk level and ranking, shows susceptibility of the location to different hazards. Those hazards include liquefaction, landslide potential, and fault zone information.

- The Flood Profile provides the proximity of a location to one of five flood zone categories as well as the location's distance to various flood plain boundaries based on FEMA Digital Q3 flood data.

- The Severe Thunderstorm Profile provides information about risk from tornado, hail, and straight-line windstorms for a given location, including distance to nearest historical storms and annual frequency.

Based on the address information provided, AIR*Profiler*® displays the corrected and standardized address following USPS® rules and guidelines, as well as the geocode (latitude and longitude), county, and ZIP Code of the location. AIR*Profiler*® performs a look-up in the LOCATION™ database. The hazard is then assessed based on an exact address or ZIP Code match.

AIR's geocoding algorithm, based on the TIGER® geographical database, is used to convert the location address entered by the user into the corresponding latitude and longitude. Depending on the address match, either the exact geocode, or the geocode of the appropriate ZIP Code centroid, is used for assessing the risk.

- The Address Profile also provides a street map of the location.

Given a location, the loss potential from specific perils is represented by various risk scores. Risk scores are determined by performing a loss analysis on a typical residential building at that location. The analysis is performed using AIR's state-of-the-art modeling technologies. Note that content and time element (loss of use) calculations are excluded from the analysis. Based on this analysis of the location, AIR*Profiler*® provides two sets of scores:

Risk Scores. The user can obtain indications of risk based on three measures of potential loss: the 100-year loss level, the 250-year loss level, and the average annual loss. These levels represent, respectively, the loss likely to occur in one year out of every 100 years, one in every 250 years, and every year on average over a period of many years. The resulting risk scores are expressed in percentage terms, as below:

Low Risk		Moderate Risk				High Risk			Very High Risk
<5%	5-10%	10-15%	15-20%	20-25%	25-30%	30-35%	35-40%	40-45%	>45%

Relative Risk Scores. In addition to the risk score of a given location, AIR*Profiler*® also displays the location's relative risk by county and state. Relative risk ranks the loss potential of a location with respect to the loss potential of other locations in the county or state. The format of the ranking is based on percentile values from 10% to 100% percent.

The AIR*Profiler*® Hurricane Profile provides users with information about the hurricane risk potential for a specific location. Risk scores for 100-year, 250-year and annual average losses, as well as relative risk ranking within county and state, are displayed. The profile also displays the following hurricane risk information:

- Storm surge potential
- Distance to coast
- Elevation
- Terrain/Land use
- Intensity and nearest distance to historical storm track for nearest historical hurricanes

In addition to strong winds and tides, storm surge can pose significant danger to life and property during hurricanes. Storm surge is caused by winds pushing water toward the shore. When combined with high tide, storm surge can cause an increase in the mean water level and so result in severe flooding and substantial property loss. The densely populated Atlantic and Gulf coastlines that lie less than ten feet above mean sea level are particularly vulnerable to storm surge.

The AIR*Profiler*® Hurricane Report indicates whether or not the property is at risk from storm surge.

The AIR*Profiler®* Earthquake Profile provides users with information about the earthquake risk potential for specific location. Risk scores for 100-year, 250-year and average annual losses, as well as relative risk ranking within county and state, are displayed. The profile also displays the following risk information:

- The California Department of Insurance (DOI) zone
- Liquefaction potential
- Landslide zone
- Earthquake fault (Alquist-Priolo) zone
- Soil type
- Seismicity
- Fault information
- Historical earthquakes

When seismic waves pass through water-saturated, loosely packed sandy soils, contact pressure between the individual grains is lost. The grains become more densely configured, causing pore pressure to increase. If drainage is inadequate, what was once solid ground now behaves as a dense fluid, incapable of supporting buildings. Structures that may have survived the effects of shaking can deform, tilt or sink. They may remain structurally intact, but have become unusable and unsalvageable.

Liquefaction risk at a given site is represented by that site's potential to experience damage resulting from liquefaction. Liquefaction potential is a measure of a soil's susceptibility to liquefaction combined with a location's level of earthquake risk. AIR applies standard methodologies used by the Division of Mines and Geology (DMG), United States Geological Survey (USGS), to calculate liquefaction potential. The AIR*Profiler®* Earthquake Profile describes a location's liquefaction potential by one of five levels: very high, high, moderate, low, or very low.

The underlying soil type may have a determining effect on potential earthquake damage to structures. Certain types of soils, such as soft soils, are capable of amplifying seismic waves, hence causing more severe damage. Also, some types of soil, such as bay mud, sandy soil, and stiff to soft soil, are also more susceptible to liquefaction. Soil is classified according to its mechanical properties.

The AIR*Profiler®* Earthquake Profile for a particular location uses ten soil type classifications:

- Hard rock
- Rock
- Very dense soil
- Stiff soil
- Soft soil
- Rock to very dense soil
- Very dense to stiff soil
- Stiff to soft soil
- Bay mud Water

One measure of earthquake intensity is the level of ground shaking at any particular location. Over the years, several intensity scales have been proposed, but the Modified Mercalli Intensity (MMI) scale is the most commonly used, especially in the United States. The MMI scale describes the intensity of an earthquake based on human reaction and observed damage to natural and man-made structures. This is useful because it allows for an attribution of intensity to events that occurred prior to the advent of modern measuring devices, as well as in instances in modern times where those devices were not available. The drawback to this standard of measure is that the MMI scale is highly subjective. The following table lists the MMI scales and definitions.

MMI	Definition
I.	People do not feel any movement.
II.	A few people might notice movement if they are at rest and/or on the upper floors of tall buildings.
III.	Many people indoors feel movement. Hanging objects swing back and forth. People outdoors might not realize that an earthquake is occurring.
IV.	Most people indoors feel movement. Hanging objects swing. Dishes, windows and doors rattle. The earthquake feels like a heavy truck hitting the walls. A few people outdoors may feel movement. Parked cars rock.
V.	Almost everyone feels movement. Sleeping people are awakened. Doors swing open or close. Dishes are broken. Pictures on the wall move. Small objects move or are turned over. Trees might shake. Liquids might spill out of open containers.
VI.	Everyone feels movement. People have trouble walking. Objects fall from shelves. Pictures fall off walls. Furniture moves. Plaster in walls might crack. Trees and bushes shake. Damage is slight in poorly built buildings. No structural damage.
VII.	People have difficulty standing. Drivers feel their cars shaking. Some furniture breaks. Loose bricks fall from buildings. Damage is slight to moderate in well-built buildings; considerable in poorly built buildings.
VIII.	Drivers have trouble steering. Houses that are not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Well-built buildings suffer slight damage. Poorly built structures suffer severe damage. Tree branches break. Hillsides might crack if the ground is wet. Water levels in wells might change.
IX.	Well-built buildings suffer considerable damage. Houses that are not bolted down move off their foundations. Some underground pipes are broken. The ground cracks. Reservoirs suffer serious damage.
X.	Most buildings and their foundations are destroyed. Some bridges are destroyed. Dams are seriously damaged. Large landslides occur. Water is thrown on the banks of canals, rivers, lakes. The ground cracks in large areas. Railroad tracks are bent slightly.
XI.	Most buildings collapse. Some bridges are destroyed. Large cracks appear in the ground. Underground pipelines are destroyed. Railroad tracks are badly bent.
XII.	Almost everything is destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move.

The data presented in AIR*Profiler*® is developed by calculating MMI values for each location. It incorporates all potential seismic sources, the distance of those sources from the location of interest, and local site conditions. Because MMI is considered as a measure of what the ground is doing during an earthquake, rather than an index of damage to structures, damageability of building at the site is not included in the calculation. Those who are more interested in damage estimation should refer to 100- and 250-year loss levels.

The MMI values are represented in two ways in the Earthquake Profile:

- Intensity by PE (probability exceedance)
- Intensity by Return Period

The first representation, defined by probability of exceedance, is the probability that at least one event of that MMI will occur within 30 years. The second representation, based on return period, depicts the maximum intensity of an event that is likely to occur within the designated return period; that is, the intensity corresponds to the maximum event that is likely to occur within the return period displayed.

Proximity to an active fault is an important indication of seismicity for a specific location. The AIR*Profiler*® Earthquake Profile displays the property's distance to the nearest known active faults. Important characteristics of these faults are displayed, including fault length, and the magnitude and frequency of the "characteristic" event associated with that fault. (Scientists believe that many faults tend to produce earthquakes of a particular size, or magnitude, that is "characteristic" of that particular fault, and that occur with a particular frequency, or recurrence rate).

The AIR*Profiler*® Flood Profile provides users with information about the flood risk potential for a specific location. Each location is characterized by its proximity to one of five flood zone categories as follows:

- Water body: Includes large lakes and rivers
- 100-year flood plain: Areas where there is 1% chance of being flooded
- 500-year flood plain: Areas where there is 0.2% chance of being flooded
- Outside flood plain: Areas outside of water body, 100- and 500-year flood plains
- No data: Areas where there is no data available

The proximity of the location to FEMA defined flood zones is also provided:

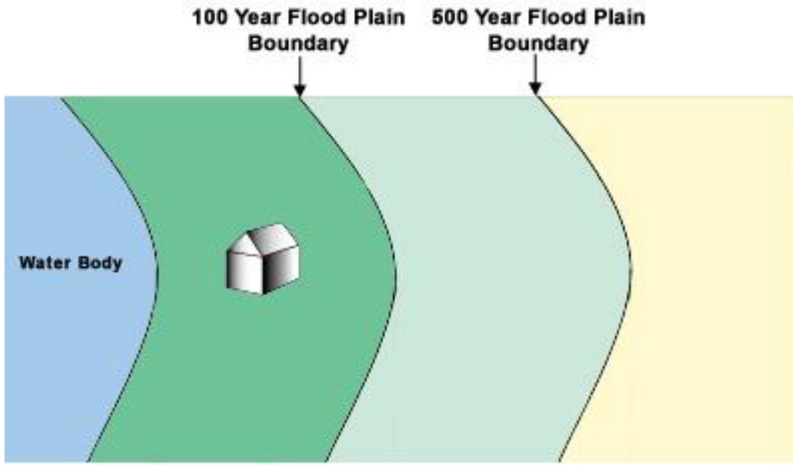
FEMA Zone	Description
V	An area inundated by 100-year flooding with velocity hazard (wave action); no BFE*s have been determined.
VE	An area inundated by 100-year flooding with velocity hazard (wave action); BFEs have been determined.
A	An area inundated by 100-year flooding, for which no BFEs have been determined.
AE	An area inundated by 100-year flooding, for which BFEs have been determined.
AO	An area inundated by 100-year flooding (usually sheet flow on sloping terrain), for which average depths have been determined; flood depths range from 1 to 3 feet.
AOVEL	An alluvial fan inundated by 100-year flooding (usually sheet flow on sloping terrain), for which average flood depths and velocities have been determined; flood depths range from 1 to 3 feet.
AH	An area inundated by 100-year flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet.
A99	An area inundated by 100-year flooding, for which no BFEs have been determined. This is an area to be protected from the 100-year flood by a Federal flood protection system under construction.
D	An area of undetermined but possible flood hazards.
AR	An area inundated by flooding, for which BFEs or average depths have been determined. This is an area that was previously, and will again, be protected from the 100-year flood by a Federal flood protection system whose restoration is federally funded and underway.
X500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100-year flooding.
X	An area that is determined to be outside the 100- and 500-year floodplains.
100IC	An area where the 100-year flooding is contained within the channel banks and the channel is too narrow to show to scale. An arbitrary channel width of 3 meters is shown. BFEs are not shown in this area, although they may be reflected on the corresponding profile.

500IC	An area where the 500-year flooding is contained within the channel banks and the channel is too narrow to show to scale. An arbitrary channel width of 3 meters is shown.
FWIC	An area where the floodway is contained within the channel banks and the channel is too narrow to show to scale. An arbitrary channel width of 3 meters is shown. BFEs are not shown in this area, although they may be reflected on the corresponding profile.
FPQ	An area designated as a "Flood Prone Area" on a map prepared by USGS and the Federal Insurance Administration. This area has been delineated based on available information on past floods. This is an area inundated by 100-year flooding for which no BFEs have been determined.
IN	An area designated as within a "Special Flood Hazard Area" (or SFHA) on a FIRM. This is an area inundated by 100-year flooding for which BFEs or velocity may have been determined. No distinctions are made between the different flood hazard zones that may be included within the SFHA. These may include Zones A, AE, AO, AH, A99, AR, V, or VE.
OUT	An area designated as outside a "Special Flood Hazard Area"(or SFHA) on a FIRM. This is an area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; an area protected by levees from 100-year flooding; or an area that is determined to be outside the 100- and 500-year floodplains. No distinctions are made between these different conditions. These may include both shaded and unshaded areas of Zone X.
ANI	An area that is located within a community or county that is not mapped on any published FIRM.
UNDES	A body of open water, such as a pond, lake, ocean, etc., located within a community's jurisdictional limits, that has no defined flood hazard.
*BFE = Base Flood Elevation	

The Flood Profile provides the shortest distance of the location to the various flood plain boundaries. Three types of distance measurement is provided:

- Shortest distance to the boundary of water body
- Shortest distance to the boundary of 100-year flood plain
- Shortest distance to the boundary of 500-year flood plain

The following map illustrates the way distance from flood plain boundaries are calculated:



The AIR*Profiler*® Severe Thunderstorm Profile provides users with information about the severe thunderstorm risk potential for a specific location. The Severe Thunderstorm Profile includes risks due to tornado, hail, and straight-line wind. Risk scores for 100-year, 250-year and annual average losses, as well as relative risk ranking within county and state, are displayed. The profile also displays the following risk information:

Annual Frequency

This field represents the annual frequency of occurrence for tornado, hail, and straight-line windstorms. A qualitative description of the frequency (very high, high, moderate, low, or very low) is displayed.

Historical Severe Thunderstorms

In this section of the Severe Thunderstorm Profile, AIR*Profiler*® identifies information on the five most severe tornado, hail, and straight-line wind events within 50 miles of the given location. The following characteristics are displayed: year, date, distance from location, and intensity. The description of intensity varies by peril. For tornadoes, the Fujita scale is used. The intensity of hailstorms is measured by average hailstone size and the intensity of straight-line windstorms is derived from a measurement of maximum wind speed.

A description of the listed hazards follows:

A. **Brush and Forest Fires:** Areas with heavy vegetation and a dry season can be subject to forest and brush fires. Local building and zoning regulations address this hazard in some areas of the country. Buffer zones which are free from brush and other fuel sources, as well as the use of fire resistive exterior siding and roofing can be utilized to mitigate this hazard.

B. **Earthquake:** Earthquakes are caused by a tension release from the earth's tectonic plates that causes the ground to shake or vibrate. Most casualties associated with earthquakes are caused by structural failures in buildings and fires caused from electrical shorts and gas leaks. All of the model codes have seismic zones where buildings should be constructed to withstand at least a moderate earthquake. The codes are currently geared towards avoiding a structural collapse. This is a life safety issue and a building can still sustain enough physical damage to render it unusable after the earthquake occurs. Since 1900 earthquakes have occurred in 39 states and caused damage in all 50.

C. **Floods:** Floods are one of the most common disasters in the United States, and cause damage to thousands of structures annually. Floodplain construction is addressed in most building codes and many zoning regulations. Flood mitigation is addressed through the National Flood Insurance Program which provides insurance credit incentives for complying with FEMA regulations. Flood as a hazard falls outside the scope of the BCEGS program.

D. **Hail:** Consists of icy pellets of various sizes that are usually associated with thunderstorms or tornadic activity. Large hail can cause substantial damage to roof surfaces. In a typical year the insurance industry pays out $1.5 billion in hail damage claims. In rare cases hail has caused structural damage and building collapses. Building codes usually do not address potential damage from hail.

E. **High Winds:** High strait line winds can occur anywhere in the United States and are caused by pressure and temperature variances in the Earth's atmosphere. High strait line winds are common in thunder storms, in the open plains were there are no obstructions to slow down the wind, in mountainous areas from upslope and downslope wind effects, on the East Coast from "Northeasters", and on the Pacific Coast from Santa Anna winds. Model Code groups have formulated maps based on 50 year mean recurrence intervals. The model codes currently apply the concept of "fastest wind speed" which is determined by an anemometer 33 ft. above the ground in open terrain. The anemometer measures the time it takes for one mile of air to pass its location. Wind maps are not based on potential maximum wind gust, but on "fastest wind speed," which has created confusion in media coverage of storms.

F. **Hurricane:** This is a tropical low pressure system with a circular wind rotation of 74 mph or greater usually accompanied by rain, lightning, and sometimes tornadoes. These storms have the ability to travel inland for hundreds of miles, maintaining hurricane force winds.

G. The Saffir-Simpson scale is used to rate the strength of a hurricane from 1 to 5 with 5 being the most severe. The Saffir-Simpson scale uses wind speed and storm surge to rate the hurricane's strength and potential for devastation. Model codes have addressed the probability of hurricanes by creating wind zones that range from 110 mph on barrier islands to 70mph inland. Structures must be designed and built to compensate for the potential additional stress placed on structures by the wind in these zones. The structural designs must take into account both Positive and Negative Wind Loads. Roof systems must be anchored to the wall systems to resist the wind loads. The wall systems must also be strapped or bolted to the foundation and footing system to create a continuous resistive system. Building codes also address the potential storm surge for coastal construction, by requiring structures to be elevated on pilings.

H. **Landslide/mudflow/debris flow:** This hazard is more common in, but not limited to mountainous areas. Earthquakes and heavy rains cause landslides. Mudflows and debris flows can be caused by heavy rains as well as volcanic eruptions in areas with snow and ice present. This is usually a localized occurrence, and is more of a zoning than a building code issue.

I. **Lightning:** All states are subject to lightning in varying degrees. Lightning rods can be installed on structures in high probability areas, but most building codes do not address when lightning rods are required. In a typical year the insurance industry pays out over $1 billion in residential lightning damage claims.

J. **Snow Loads:** This is a concern in snow belt areas in northern states and in mountainous areas. There are snow load maps created by the model code groups that address this situation. Some areas require a minimum roof pitch and higher design factors to compensate for the additional weight imposed on roofs by snow.

K. **Soil Liquefaction:** This is a seismic concern. There are some soil types which, in the presence of a high enough water table, will take on the physical properties of a liquid when shaken by an earthquake. Buildings constructed in areas subject to liquefaction need to be designed to reduce or eliminate the possibility of uneven settling or tilting during an earthquake.

L. **Soil Subsidence:** This is the shrinking or settling of soil due to its composition. Some soils compact or or shrink excessively and this could cause foundation failure if not compensated for by foundation reinforcement. Some areas are subject to sink holes. These are typically caused by lime deposits being dissolved by underground water.

M. **Swelling Soils:** This is common in clay based soils that do not drain well and needs to be compensated for by foundation reinforcement. Footings or foundations placed on or within expansive soils need to be designed to resist differential volume changes to prevent structural damage to the supported structure. As an alternative to special design the soil can be removed and replaced or stabilized.

N. **Tornado:** Tornadoes are formed from mesocyclones or supercell thunderstorms. Tornadoes can strike in many places in the United States, but the greatest probability of tornadic activity is in a corridor from Texas to Wisconsin known as tornado alley. They occur usually in the spring or fall of the year during the late afternoon when the atmosphere is least stable. Tornadoes are measured by the Fujita Scale (F-SCALE), which measures the wind speed and damage potential. The scale ranges from F0 to F5 with F5 being the most severe storm. Damages from a direct hit by the strongest tornadoes cannot be mitigated, but the collateral damages that occur in surrounding areas can be reduced. The wind provisions of the model codes can help to limit damages from the most common, weaker tornadoes.

O. **Tsunamis:** (tidal wave) These are large sea waves usually caused by earthquakes or volcanic eruptions, and are most common in the Pacific Ocean. The potential devastation of a Tsunami is enormous, but little is being done to mitigate this hazard. Several Pacific Coast States have enacted zoning regulations to prevent schools and hospitals from being built in low areas subject to tsunamis.

P. **Volcanoes:** There are numerous dormant and active volcanoes in the Western United States, and the potential danger is catastrophic near these volcanoes. Collateral damage could occur for hundreds of miles. Building codes can do little to address this danger, but some areas require additional roof structure design to compensate for volcanic ash load. Zoning restrictions are a more viable means of mitigation.