Distribution Analysis

This section presents charts depicting the distributions of the comparison scores as well as the individual and collective reported crime rates shown in *City Crime Rankings* to provide a mechanism of comparison beyond the rankings included in each analysis. The histograms in this section illustrate the distribution of values for the comparison score analyses as well as for the overall, violent, and property crime rate analyses. Along with each histogram, measures of central tendency, such as median, mean, standard deviation, and minimum and maximum values, are reported to provide further description of each distribution.

In each histogram (formatted as area charts for easier viewing), the values of the scores or rates are shown along the bottom (x-axis) and the frequency of cases (i.e., metro areas or cities) are shown along the left (y-axis). The values along the bottom are ranges for which the frequency of cases is totaled. These ranges and frequencies are different for each distribution, in this case, each histogram.

The median indicates the middle value of the distribution, meaning that 50% of the metro areas or cities have scores or rates above that value, and 50% have scores or rates below it. The mean is the average value of the distribution, and the standard deviation, described generally, is the measure of spread of all the values from the mean. The minimum and maximum values are the lowest and highest values of the distribution, respectively.

These statistics are based on a normal curve, so one standard deviation above and below the mean contains 68% of the distribution, two standard deviations above and below the mean contain 95% of the distribution, and three standard deviations above and below the mean contain 99.7% of the distribution. The use of these statistics is purely descriptive, but it does help the reader assess the distribution as a whole as well as illustrate where an individual value sits in terms of all the other values. For example, if a score is two or three standard deviations above or below the mean, it may be considered an outlier because it falls with only 5% or .3% of the values, respectively.

For example, Figure 1 depicts the comparison scores for metro areas in 2013. The median is –6.4, the mean is –0.4, the standard deviation is 40.8, the minimum value is –72.7, and the maximum value is 205.6. These statistics are interpreted as follows:

- The lowest comparison score for metro areas is –72.7.
- The highest comparison score for metro areas is 194.2.
- The range of scores (maximum minus minimum) is 205.6.
- 50% of the metro areas have comparison scores lower than –6.4, and 50% have scores higher than –6.4.
- The average comparison score for metro areas is –0.4 and the standard deviation is 40.8.
- 68% of the metro areas have scores between –41.2 and 40.4.
- 95% of the metro areas have scores between –81.2 and 82.0.
- 99.7% of the metro areas have scores between –122.8 and 122.0. (The fact that the lower end of this range (–122.8) and the 95% range (–81.2) is less than the minimum value of the distribution (–72.7) indicates the distribution is skewed in that there are very high outliers).

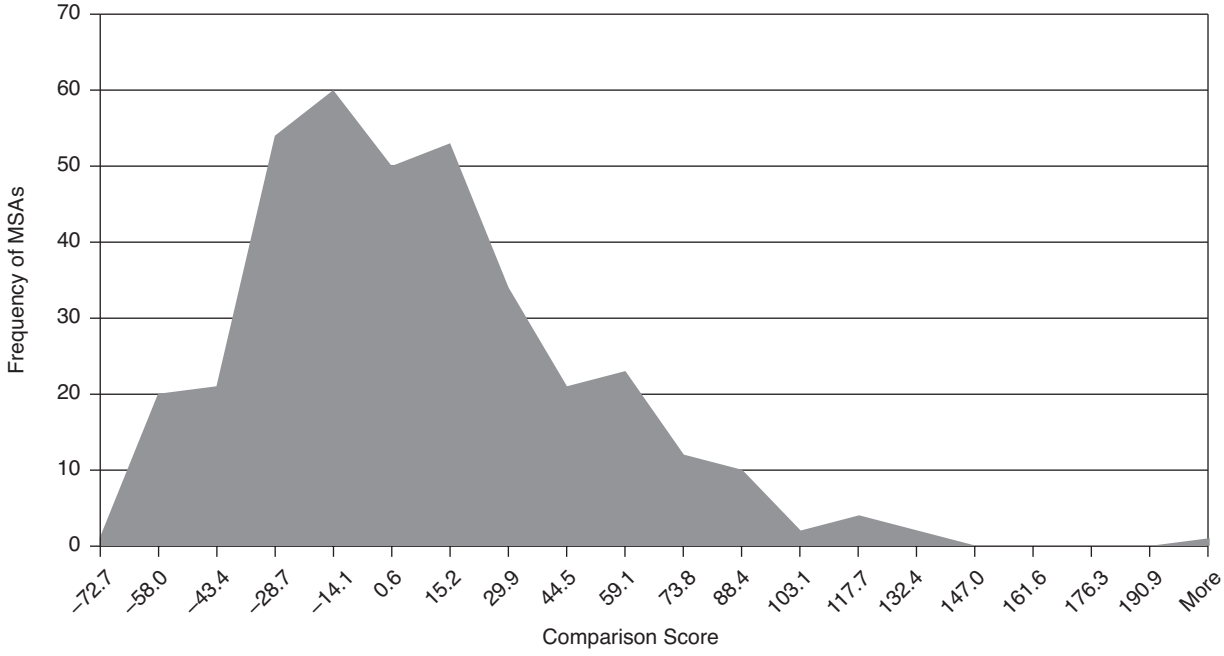
Assessing the score of –61.50 for the metropolitan area of Elizabethtown-FortKnox, KY, for example, reveals that it is in the lower 50% of all the scores (below the median of –6.4) and falls between the first and second standard deviation below the mean indicating that it is within the 95% interval of the distribution.

The remainder of this section presents a total of eight charts and sets of statistics for both metropolitan areas and cities in the categories listed here:

1. Comparison Score
2. Overall Reported Crime
3. Reported Violent Crime
4. Reported Property Crime

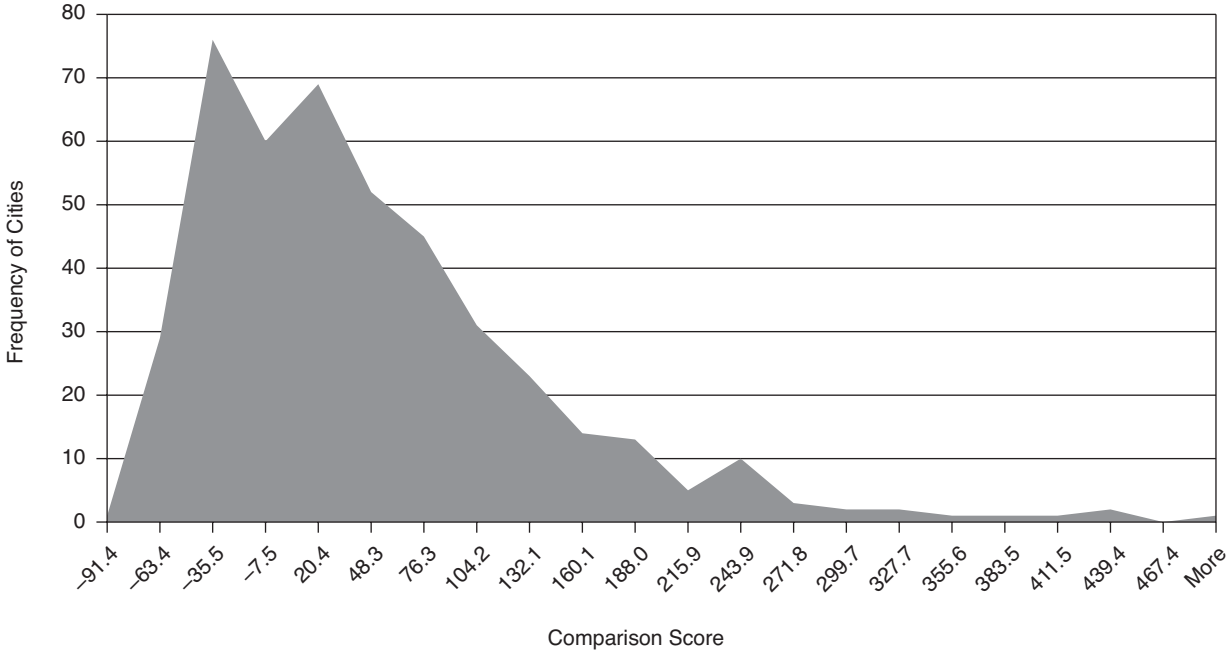
A word of caution: These distribution analysis charts and statistics are provided to help the reader understand the nature of the values within each analysis, but the analyses are still based on data that must be interpreted within the constraints noted earlier. These charts are only descriptions of the data and do not provide predictions or explanations of why these values are different.

Figure 1 Metropolitan Areas Comparison Score Distribution Analysis for 2013



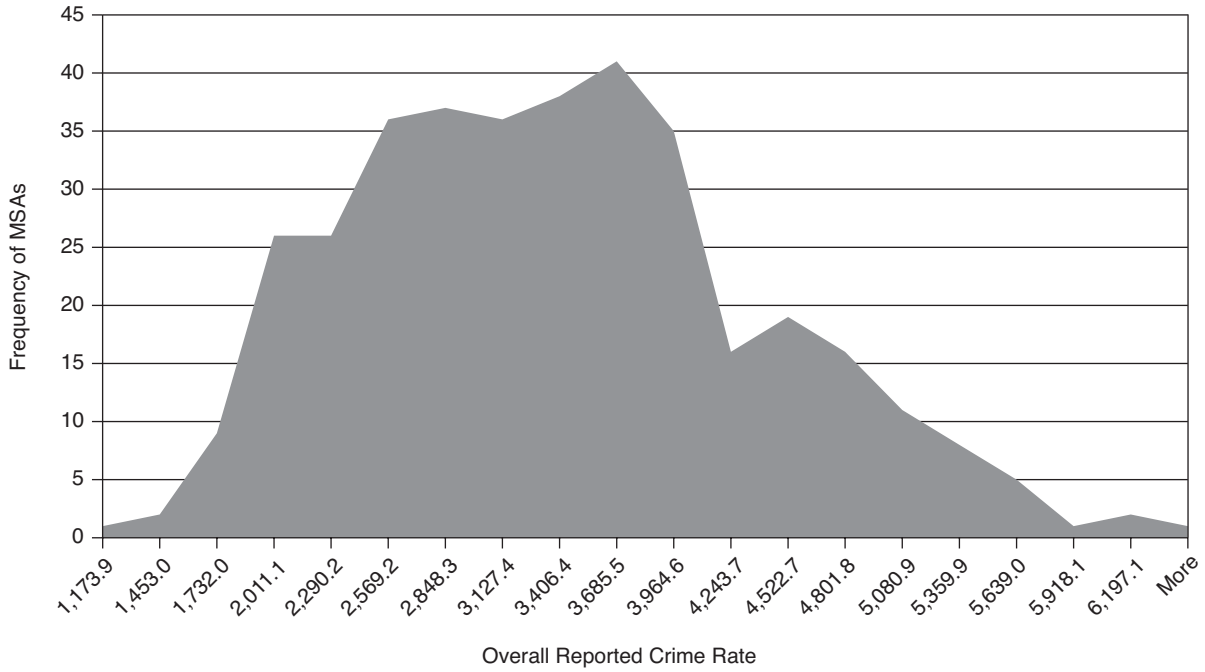
Median	–6.4		Minimum	–72.7		Standard Deviation	40.8
Mean	–0.4		Maximum	205.6		Number of Cases	368

Figure 2 Cities Comparison Score Distribution Analysis for 2013



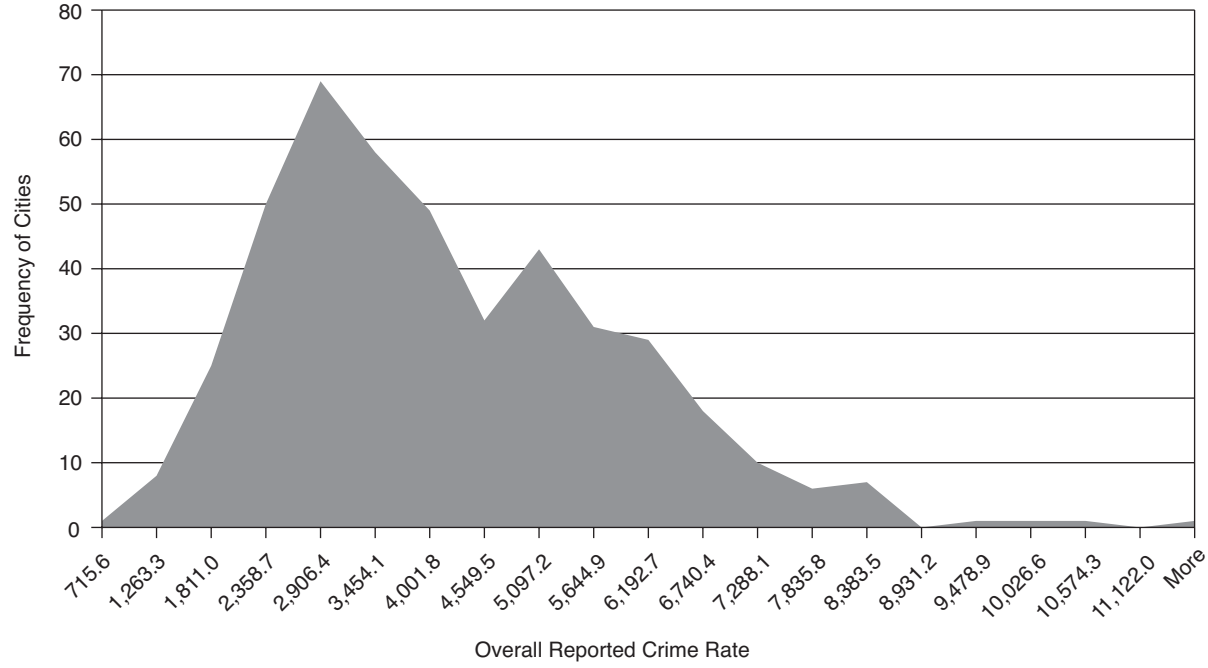
Median	14.8		Minimum	–91.4		Standard Deviation	90.5
Mean	34.1		Maximum	495.3		Number of Cases	441

Figure 3 Metropolitan Areas Overall Reported Crime Rate Distribution Analysis for 2013



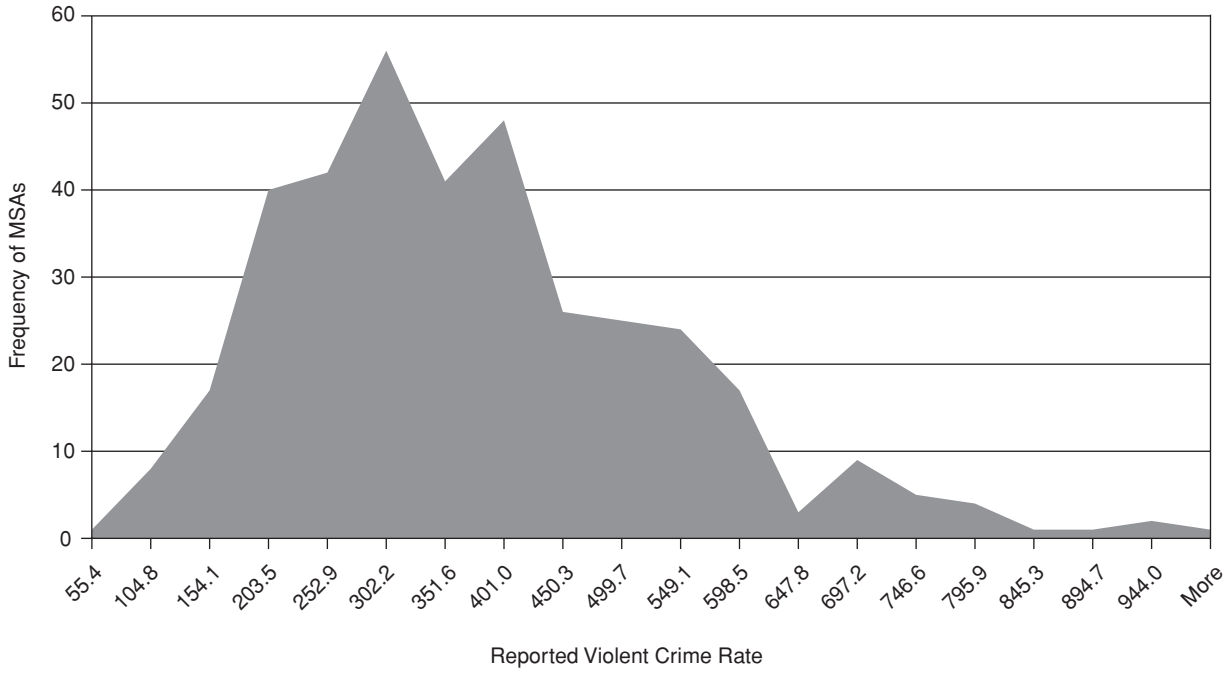
Median	3,214.7		Minimum	1,173.9		Standard Deviation	986.3
Mean	3,253.7		Maximum	6,476.2		Number of Cases	366

Figure 4 Cities Overall Reported Crime Rate Distribution Analysis for 2013



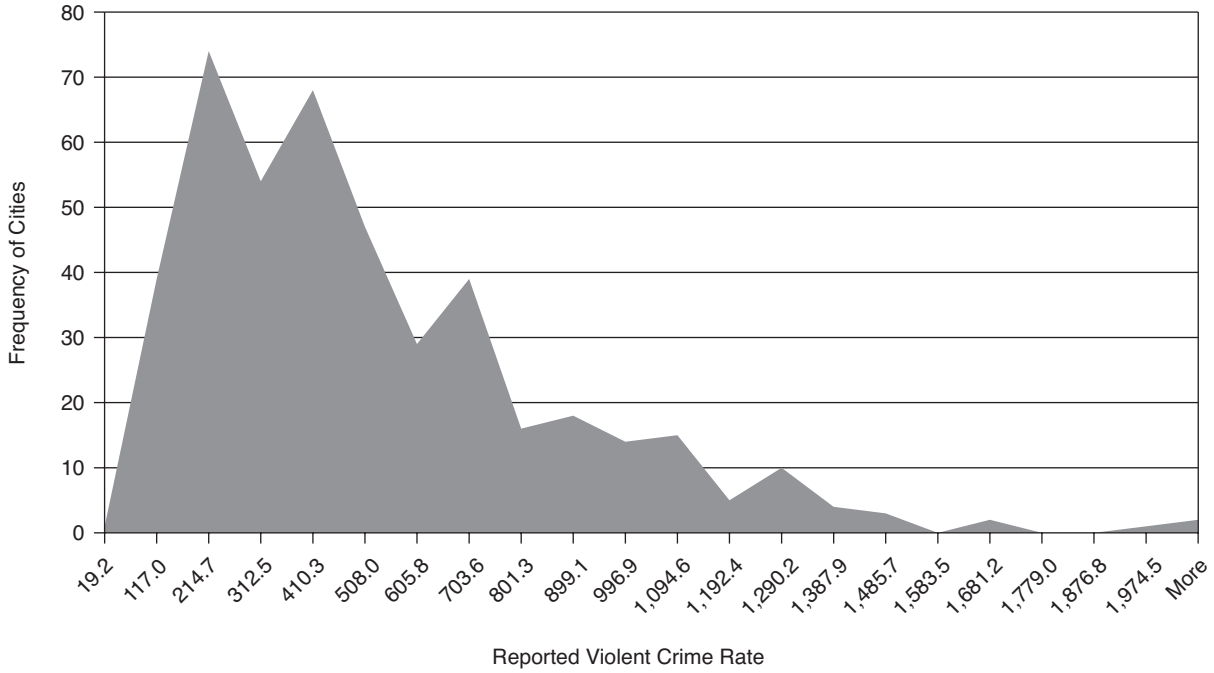
Median	3,554.1		Minimum	715.6		Standard Deviation	1,736.6
Mean	3,890.0		Maximum	11,669.7		Number of Cases	440

Figure 5 Metropolitan Areas Reported Violent Crime Rate Distribution Analysis for 2013



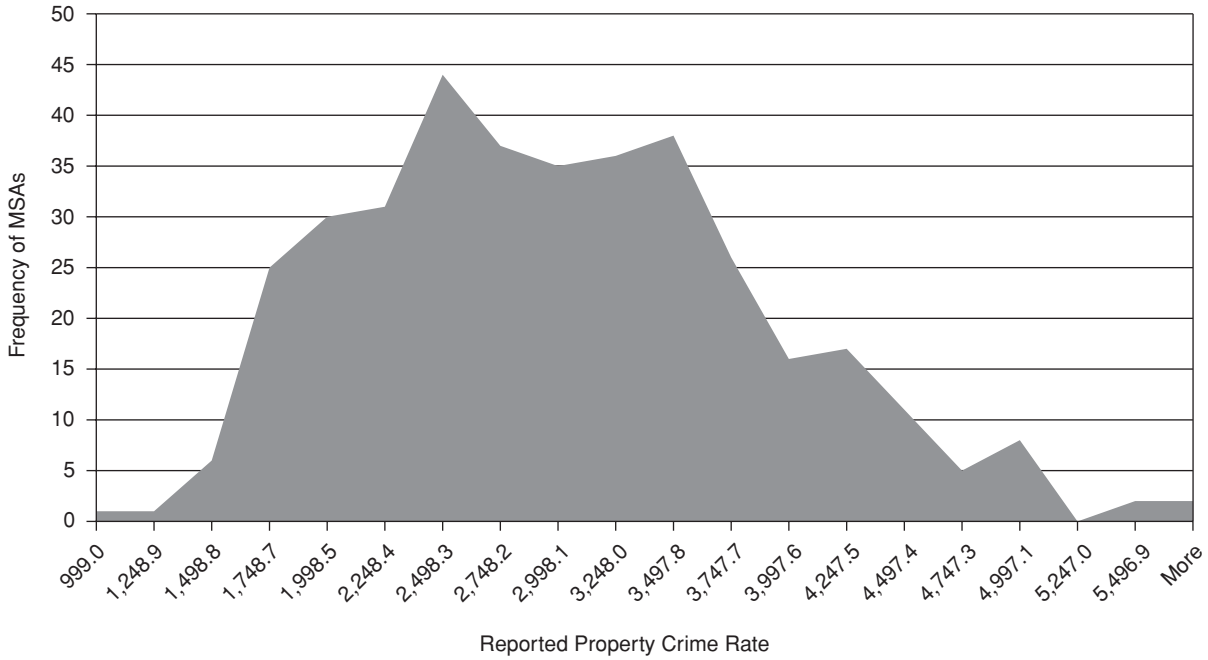
Median	331.9		Minimum	55.4		Standard Deviation	166.9
Mean	355.9		Maximum	1,047.8		Number of Cases	372

Figure 6 Cities Reported Violent Crime Rate Distribution Analysis for 2013



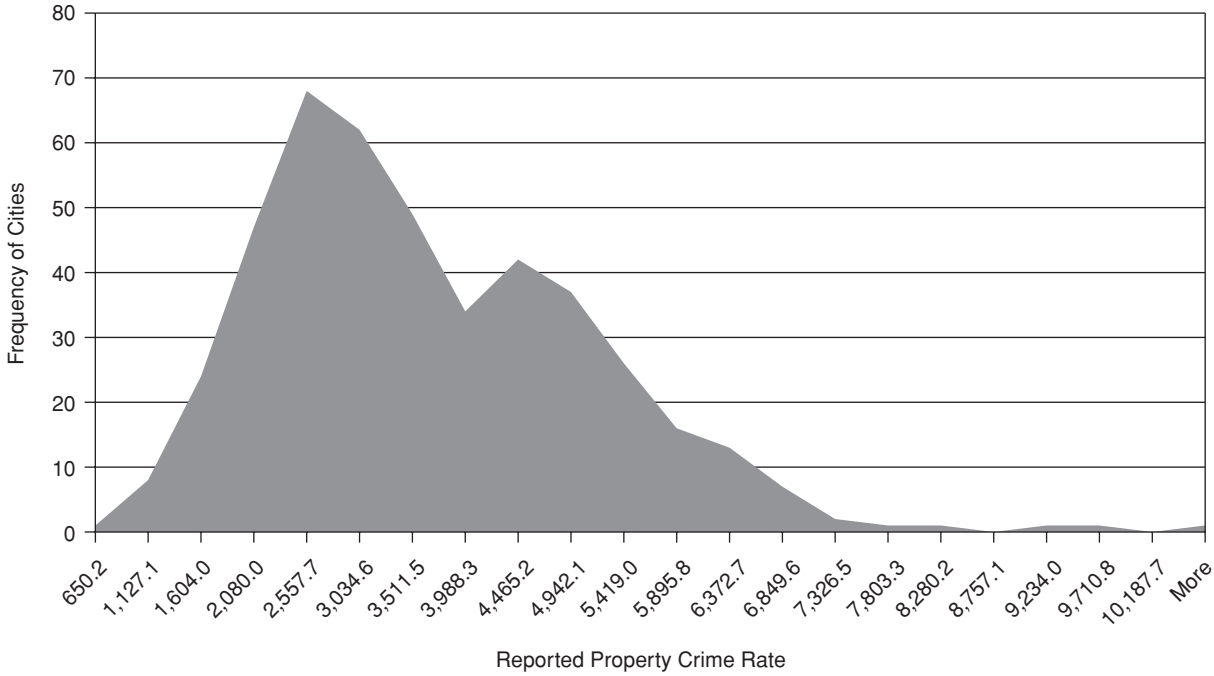
Median	386.7		Minimum	19.2		Standard Deviation	348.8
Mean	476.4		Maximum	2,072.3		Number of Cases	441

Figure 7 Metropolitan Areas Reported Property Crime Rate Distribution Analysis for 2013



Median	2,830.2		Minimum	999.0		Standard Deviation	876.1
Mean	2,900.6		Maximum	5,746.8		Number of Cases	371

Figure 8 Cities Reported Property Crime Rate Distribution Analysis for 2013



Median	3,108.9		Minimum	650.2		Standard Deviation	1,489.1
Mean	3,415.1		Maximum	10,664.6		Number of Cases	441