Article

Understanding the relationship between perception and reality related to public safety: A case study of public opinion on local law enforcement in Andover, MA

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SUMMARY

Living in a small town with low crime rates and relatively high education levels usually gives the perception of a safe and comfortable community. In many, but not in all ways, that perception reflects reality. The following study tries to understand the connection between the perception, as defined by the collected public opinion, and the reality, as defined by the crime data reported by the US census and FBI data. The public opinion on property crime, violent crime, drug related crime, general feeling of safety, and on assessment of local law enforcement was collected from the Massachusetts community of Andover. The study tested the hypothesis that the opinion of the participants reflects the crime data and that citizens of Andover feel safe and are confident that local law enforcement works well. According to the results of the survey, people in Andover indeed have a positive view of the police department. The majority believe that the crime rates to be relatively low and, in general, most participants feel safe in the town. The findings also indicate that there are a few areas where public opinion does not match the FBI data, with the issues of property crime and drug usage possibly being of concern.

INTRODUCTION

Andover is a town located in Essex County, in the northeastern part of Massachusetts (MA). It occupies 32.1 sq. miles, of which 31 sq. miles are land and 1.1 sq. miles are water (1). According to the 2018 census, the estimated population of Andover is 35,898 (1). Of that population, 52% are female and 48% are male (1). Andover's population consists of 79.4% Caucasians, 12.3% Asians, 2.5% Black or African-Americans, 3.7% Hispanics, and 2.1% other (1). Thus, Andover is a predominantly white community with less than 20% of minorities.

According to the US Census Bureau, in 2017 the average income per capita in Andover in the past 12 months was $63,468 (1). This is 25% higher than the average in MA and 59% higher than the national average (2). The median household income in Andover was $143,292, which is higher than the average in MA and higher than the national average (3). The poverty level is also low, at about 4% (3). This makes Andover a relatively wealthy town.

Andover's education system consists of 11 public schools, 5 private schools, and 4 post-secondary schools (4). The Andover school system is rated above average. The Andover public school test scores are around 80%, which is 24% higher than the Massachusetts average and 62% higher than the national average (4). Between 2013 and 2017, 98% of people successfully graduated high school, and 74% of people received a bachelor's degree or higher (5). Based on these statistics, Andover has an educated population, most of which went to college.

Preventing and fighting crime is an important aspect of any town, city, or village. Andover has a low crime rate. The rate of violent crimes in Andover is 83% lower than the MA average and is 84% lower than the national average (6). The rate of property crime in Andover is 61% lower than the MA average and 75% lower than the national average (6). According to public records, Andover appears to be a safe and low-crime community.

Even though Andover appears to be a well-to-do, educated, and safe town, it still has problems, which are often reported in the local media and vocalized by the townspeople. Property crime and drug-related incidents are reported by local newspapers frequently. For example, robberies of unlocked vehicles and a spate of house break-ins occurred in 2007 (7-10). More recently, at the end of 2018, police were asking for the public's help in identifying a burglar who broke into Andover Country Club Lane homes (11). In February of 2019, police reported 14 car thefts (12).

In addition, Andover, as in many other places across the United States, faces a drug problem. In 2014, there were over 1,000 opioid-related deaths across MA (13). Essex County had the second largest number of fatalities, totaling 146 deaths (14). In 2015, 21 heroin overdoses, 5 resulting in deaths, were reported in Andover (15). In October 2018, a man was arrested for trafficking fentanyl drugs (16). At the end of 2018, a couple in Andover was arrested for dealing cocaine (17). At Andover High School, drug usage is prevalent. Between September 2017 and June 2018, the police department has responded to 10 incidents involving drugs at the high school (18). Drug-sniffing dogs were brought to Andover High School to investigate drug dealing and usage in the school (19). One Andover student, Keagan Casey, has made a documentary about the drug use in Andover titled "The Other Side of Andover" (20, 21). The movie describes how teenagers are taking strong painkillers and heroin to cope with stress and emotional problems or simply to experiment. In it, students

recall horrid memories of their addiction and how it affected their families and life. This evidence demonstrates that despite the lower than average crime rate, Andover still has its fair share of criminal problems.

At the center of any community's general safety is the local police enforcement. Policing is a service industry with the main objective of serving the community (22, 23). Understanding the community's opinion may be important for understanding the relationship between citizens and the local law enforcement. It may also provide a way to assess the level of safety in the community. Once this relationship is well understood, police will work more efficiently and will be able to identify areas of improvement.

In this study, we designed a survey based on some of Mastrofski's conceptualizations of police service quality. Mastrofski developed 6 aspects of survey quality in policing, including attentiveness, reliability, responsiveness, competence, manners, and fairness (23, 24). According to Mastrofski's research, citizens want the police to be available and accessible, as indicated by police officers' attentiveness. Citizens also want the police to be predictable and consistent, as indicated by officers' reliability, and client-centered, as indicated by officers' responsiveness. Citizens also want police officers to be effective in their jobs, as indicated by their competence. And lastly, people want the police to treat them with respect and use fair practices, as indicated by officers' manners and fairness.

In designing the survey, we used Mastrofski's concepts to help us understand the public opinion. We collected, analyzed, and compared responses to the crime rates reported by the FBI to understand the relationship between perception and reality. We hypothesized that most respondents would consider Andover a safe town with an effective police force and that public opinion would align with the FBI data.

RESULTS

The study consisted of analyzing 142 surveys. Detailed demographic information was collected (**Table 1**). Most of the participants lived in Andover (88%), while some worked but did not live in Andover (12%). The participants consisted of 44% males and 55% females. The following ethnic groups were represented: White (70%), Asian (11%), African American (8%), Latino (8%), Native American (1.5%), and other (1.5%). Age groups were categorized in the following way: under 13 (8%), 13-17 (7%), 18-24 (6%), 25-34 (16%), 35-44 (17%), 45-55 (21%), 64-60 (10%), and over 60 (15%). The majority of participants had a college degree and were either employed or retired. The income ranged from $10,000 to over $200,000. Additionally, 50% of participants were married, 24% were single, 1% were in a domestic partnership, 4% were divorced, 8% were widowed, and 1% were "too young for a relationship." In terms of political parties, 25% identified as Democrats, 30% as Republicans, 28% as Independent, 0.7% as Libertarian, 1.4% as Green Party, and 7.0% as "Other" (**Table 1**). The demographic breakdown by gender, ethnic group, and income

was representative of the Andover community as documented by public records. Overall, the participants spanned a broad range of demographic attributes.

Based on the responses to the survey, residents of Andover had a positive impression of the local police force

Demographic variable	% of participants
Age group	
Under 13	7.75%
13-17	7.04%
18-24	5.63%
25-34	16.20%
35-44	17.61%
45-54	21.13%
55-60	9.86%
Over 60	14.79%
Gender	
Female	54.93%
Male	44.37%
Other	0.70%
Ethnicity	
White	69.72%
Black	8.45%
Latino	7.75%
Native American	1.41%
Asian	10.56%
Other	1.41%
Household Income	
Below $10k	0.70%
$10k-$50k	11.27%
$50k-$100k	21.83%
$100k-$150k	15.49%
$150k-$200k	19.72%
Over $200k	11.97%
Other	14.79%
Marital Status	
Single	23.94%
Married	50.70%
Partnership	0.70%
Divorced	4.23%
Widowed	8.45%
Other	6.34%
Political Party	
Democrat	25.35%
Republican	30.28%
Independent	28.17%
Libertarian	0.70%
Green party	1.41%
Other	7.04%

Table 1: Participant demographics. Shown is a summary of percentages for different demographic variables analyzed (*n* = 142).

(**Table 2**). They believed that the police force was well-mannered, attentive, responsive, and fair. Our data revealed that 79% of the participants agreed that the Andover police arrived quickly when called. Based on the 85% agreement rate, the participants believed that the Andover police was friendly, respectful, and professional. A large majority of people (80%) stated that the police department was not corrupt. Additionally, 71% of participants confirmed that the Andover police was not intimidating, and 56% of people thought that the Andover police did not use excessive force. Many people (63%) believed that the Andover police was well trained. Most importantly, 71% of people were confident that the Andover police cared about its town and the town's people.

We also assessed public opinion on violent crime, property crime, and drug usage (**Table 2**). Many participants (69%) did not think that the rate of violent crimes in Andover was high. Most people (64%) agreed that Andover police was doing a good job of preventing violent crimes. This indicated that the Andover police was considered competent, reliable, and responsive.

Property crimes appeared to be of some concern (**Table 2**). About 30% of participants stated that the rate of property crimes was high. Approximately half of the participants (46%) agreed that Andover police was doing a good job of preventing property crimes. These results suggested that a significant portion of the Andover public felt somewhat apprehensive about property crimes and their prevention.

A little more than half (55%) of the participants believed that drug usage in Andover was high, and 51% believed that the rate of drug dealing in the town was high (**Table 2**). About 32% believed that the police were making good progress in reducing drug problems in Andover, while 20% did not believe progress was being made, and 46% of people were not sure. Drug dealing and drug use were a concern. The large percentage of unsure responses reflected people's lack of confidence in police effectiveness in drug crime prevention.

Despite some concerns about property crime and a larger concern about drugs, overall, people in Andover felt safe (85%). Almost the same number of people felt safe walking at night (86%). Yet 63% percent of participants preferred to keep their door locked.

In general, race is an important element of how people are treated by the police. Concerns about the interaction between

Question	Mastrofski's concept assessed	Grouped response (percent of participants)			
		Disagree	Not sure	Agree	Missing
Arrives quickly when called	Attentiveness, Responsiveness	8%	11%	79%	3%
Friendly and respectful	Manners	8%	6%	85%	1%
Professional	Manners, Competence	8%	6%	85%	1%
Intimidating to deal with	Manners, Fairness	71%	15%	13%	1%
Cares about the town and its people	Attentiveness, Responsiveness	5%	24%	71%	0%
Corrupt	Fairness	80%	15%	4%	1%
Too much presence in public places	Responsiveness, Reliability	49%	43%	7%	1%
Too little presence in public places	Responsiveness, Reliability	19%	44%	36%	1%
Well trained	Competence	8%	28%	63%	0%
Uses too much force	Manners, Fairness	56%	39%	4%	1%
Is successful in preventing property crimes	Competence, Reliability	25%	28%	46%	0%
Rate of property crimes in the town is high	Competence, Reliability	42%	27%	30%	1%
Is successful in preventing violent crimes	Competence, Reliability	11%	23%	64%	2%
Rate of violent crimes in the town is high	Competence, Reliability	69%	20%	9%	1%
Rate of drug use in the town is high	Competence, Reliability	20%	24%	55%	1%
Rate of drug dealing in the town is high	Competence, Reliability	18%	32%	51%	0%
Police is making a good progress in reducing drug use in the town	Competence, Reliability	20%	46%	32%	1%
I feel safe in the town	Competence, Reliability, Responsiveness	4%	10%	85%	1%
I feel safe walking in the town at night	Competence, Reliability, Responsiveness	8%	8%	84%	1%
I can leave the door unlocked	Competence, Reliability, Responsiveness	63%	13%	23%	1%

Table 2: Summary of survey responses. Shown is summary of participants' (*n* = 142) opinions regarding Andover police. Responses are grouped into 4 categories: disagree, not sure, agree, and missing. Results are shown as percentages. For each question, Mastrofski's concept is identified.

race and the disposition of the police towards citizens are not new (25-28). Many police officers treat everyone fairly, but some may display racial prejudice in their interactions with the public. This could affect how people of different races perceive the police. Therefore, we examined survey responses based on race and asked a subset of questions to assess racial bias. The data indicated that there was no correlation between race and how people view the Andover Police (**Table 3**). However, there were slight variations in the degree of responses for some questions. For example, Latino participants only "somewhat agreed" that the police were friendly and respectful, while White, Black, and Asian participants "strongly agreed" (**Table 3**). There were also differences for assessing whether police were intimidating and if they used excessive force. Black and Latino participants "somewhat disagreed," while White and Asian participants "strongly disagreed" (**Table 3**). Our survey did not identify the origin of these variations. Given the low crime rates in Andover, it is unlikely that many participants had personal interactions with the police. It is possible that participants' opinions were influenced by secondhand stories, media, and potential stereotypes of the police.

To further evaluate the hypothesis, we compared public opinion to the public FBI crime rate data from 2017 (detailed

Selected Questions	White	Black	Latino	Native American	Asian
Corrupt	1	1	1	4	1
Friendly and respectful	5	5	4	3	5
Uses too much force	2	3	2	2	2
Intimidating to deal with	1	2	2	2	1
Is successful in preventing violent crimes	4	5	5	4	5
Rate of drug use in town is high	4	4	4	2	4
I feel safe in the town	5	5	5	3	5
I feel safe walking in the town at night	5	5	5	3	5
Number of respondents	98	12	11	2	15

Table 3: Summary of median responses to selected questions. Shown above is a subset of selected questions and their distribution across racial groups to better understand impact of race on views about the police. Participants self-identified as White, Black, Latino, Native American, and Asian. Participants responded using a scale from 1 to 5: 1 = "strongly disagree"; 2 = "somewhat disagree"; 3 = "neutral/not sure"; 4 = "somewhat agree"; 5 = "strongly agree."

2018 rates are not yet available) (29). Based on public records, crime rates in Andover were low in comparison to the state of MA and the rest of the country (**Table 4, Figures 1 and 2**). Violent crime and aggravated assault incidents per 100,000 inhabitants in Andover were only 0.006% of that of the US. Robbery, burglary, and property crime incidents were 0.003% in comparison to the US. The numbers of violent crime and aggravated assault incidents per 100,000 inhabitants in

Andover were 0.3% compared to MA. The property crime, burglary, and robbery incidents were 0.2% compared to MA. The public data shows that Andover was a safe town with crime rates below the national and MA averages.

Place	Violent crime	Aggravated assault	Burglary	Robbery	Property crime
FBI UCR statistics: total number of incidents					
USA	1,283,220	870,825	1,401,840	319,356	7,794,086
MA	24,560	17,319	17,089	4,871	198,575
Andover	72	64	25	3	287
FBI UCR statistics per 100,000 inhabitants					
USA	394	267	430	98	2,393
MA	358	252	249	71	2,895
Andover	201	178	70	8	799
FBI UCR statistics per 100,000 inhabitants (% difference)					
MA/USA	91%	94%	58%	72%	121%
Andover/ USA	51%	67%	16%	9%	33%
Andover/ MA	56%	71%	28%	12%	28%

Note. Total population for USA = 325,719,178; MA = 6,859,819; Andover = 35,898.

Table 4: FBI Uniform Crime Reporting (UCR) statistics for USA, MA and Andover from 2017. FBI crime data showcasing USA vs. MA vs. Andover (29).
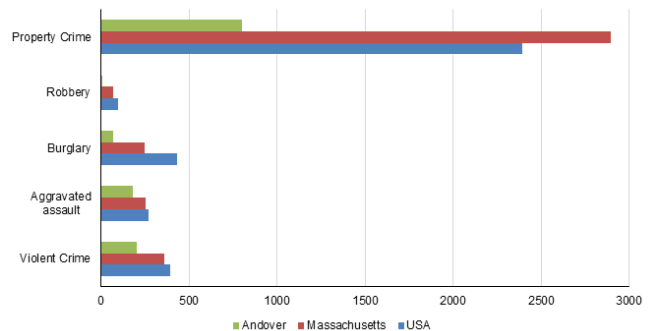

Figure 1: 2017 FBI UCR crime rates. Andover has lower crime rates compared to the rest of MA and the USA. Data are normalized per 100,000 inhabitants.
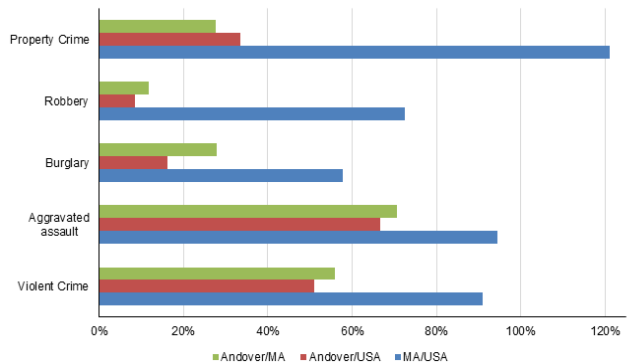

Figure 2: 2017 FBI UCR crime rates % comparison. Andover has lower crimes in comparison to MA and USA. Data are normalized per 100,000 inhabitants.

The FBI data aligned well with the survey data in terms of violent crimes. The survey showed that over 60% participants believed that the rate of violent crime rates in town was low and that police were doing a good job at preventing violent crimes. The positive public opinion matched the very low violent crime rates reported by the FBI. In contrast, the survey indicated that people in Andover were somewhat concerned about property crimes. These concerns were not supported by the FBI data. In fact, 30% of participants believed that the rate of property crimes was high, while the FBI data showed that the reality was just the opposite. The cause of such a divergence was not clear. An interesting observation was that, according to the FBI data, violent crimes and aggravated assaults in Andover were higher than property crimes. However, people thought that property crime was more of a concern.

A significant number of participants agreed that Andover faces a drug problem. As compared to the entire US, MA has a lower rate of drug incidents (**Tables 5 and 6**). Among 10,000 people from MA, about 6 people possessed heroin, cocaine, and their derivatives, and 1 person had some type of synthetic drug. In the US, about 8 people in 10,000 possessed heroin, cocaine, and their derivatives, and 2 people possessed synthetic drugs. In 2017, Andover had 2 deaths caused by drug overdoses and 44 overdoses which lead to calls to EMS.

Furthermore, we attempted to assess what the participants believed were areas for improvement (**Table 7**). Twenty-three participants believed that the Andover police ought to improve drug crime prevention. Eleven participants stated that an increased number of officers was needed. Seven participants declared that property crime prevention and politeness were to be improved. The areas of least concern were decreasing the number of police officers, increasing and decreasing police budgets, and increasing

Drug type	MA	USA	MA/10,000 inhabitants	USA/10,000 inhabitants
Arrests for sales or manufacturing of drugs in 2017, not counting marijuana				
Heroin, cocaine and their derivatives	2,690	66,811	3.9	2.1
Synthetic drugs	419	20,513	0.6	0.6
Other dangerous non-narcotic drugs	287	51,488	0.4	1.6
Total	3,396	138,812	5.0	4.3
Arrests for drug possession in 2017, not counting marijuana				
Heroin, cocaine and their derivatives	4,370	263,744	6.4	8.1
Synthetic drugs	652	62,019	1.0	1.9
Other dangerous non-narcotic drugs	654	303,845	1.0	9.3
Total	5,676	629,608	8.3	19.3

Note. Total population for USA = 325,719,178; MA = 6,859,819.

Table 5: Drug-related crime rates in MA and USA (total and normalized by 10,000 inhabitants) (29).

Incident	Andover	MA	Andover/10,000 inhabitants	MA/10,000 inhabitants
Overdose with a call to EMS	44	22,213	12.3	32.4
Overdose resulting in death	2	1,945	0.6	2.8

Note. Total population for MA = 6,859,819; Andover = 35,898.

Table 6: Drug-related incidents in Andover and MA (total and normalized by 10,000 inhabitants) (29).

Area for improvement	Number of respondents
Politeness	7
Drug crime prevention	23
Violent crime prevention	1
Property crime prevention	7
Increase number of police officers	11
Decrease the number of police officers	1
Increase police budget	1
Decrease police budget	0
Increased training of the officers	2

Table 7: Areas for improvement as identified by the respondents. Shown are the categories that the participants believed Andover Police would need to improve upon.

training of the officers.

DISCUSSION

We designed a survey to test the hypothesis that Andover citizens believe that Andover is a safe town with an effective police force. We evaluated whether the public opinion aligns with the FBI census data. Demographics of the participants reflected the general population of Andover (**Table 1**).

Overall, most people feel safe in the town of Andover (**Table 2**). Many participants feel safe living in town and are comfortable walking alone at night (**Table 2**). In addition, most participants have a positive opinion about the local law enforcement and believe that the police are doing a good job in crime prevention and keeping Andover safe.

The survey results both agreed and disagreed with the FBI census data. Public opinion on violent and aggravated crime occurrences and prevention aligned well with the FBI data. The rates of violent crime and aggravated assaults in Andover are relatively low in comparison to MA and USA. However, many people reported alarm regarding drug-related crime and property crime. This perception does not align with the low FBI statistics regarding drug and property crime as compared to state and national level. To further reiterate these concerns, a large group of participants suggested that drug and property crime prevention were areas for improvement and require further attention (**Table 7**). Some people also indicated that the town may benefit from an increased number of officers and, potentially, more training.

According to the FBI census data, Andover does not have a drug problem (**Table 6**). However, over 50% of respondents

think that drug dealing and use are problems in Andover. Consequently, people do not believe that the Andover police, similar to police in most other localtlies across the United States, are doing a good job in preventing drug dealing and use. We speculate that drug dealing and use in Andover may be underreported to police and EMS but may be well known on the personal level.

There are many factors that influence crime rates in a community, such as geographical location, climate, population density, urbanization, and youth concentration (30). Cultural, recreational, religious, and educational characteristics play a role in shaping crime levels. Economic conditions, employment rates and opportunities, and poverty levels will influence crime. Moreover, local police departments and criminal systems, such as prosecution, judicial, correctional, and probational, may affect crime. Other important considerations are citizens' desire to report crime and to work with the police and public attitude towards crime and police. Although all these factors may contribute to crime, they have not been evaluated directly in our survey. Additional studies will need to be conducted to assess the impact of these issues and their contribution to the public opinion.

In this study, we did not analyze crime rates or their dependencies. Instead, we analyzed perceptions of crime, safety, and police efficiency and compared them with the reality as reflected by crime rates. We also speculated about the causes of divergence of such perceptions from the reality.

It is interesting to explore the relationship between reality and perception. In this study, we compared public opinion with FBI and census data and noted some discrepancies between perception and reality. If people perceive that they live in a safe community with a dependable and efficient police force who cares about the residents they serve, then a favorable impression about the police will form (31). This may be the case for Andover. At the same time, if the police perceive that the residents appreciate their work effort and trust in their abilities, then, most likely, the law enforcement will be more eager to serve and to care. In fact, confidence in police was influenced by impressions that crime has decreased in the community and by having positive encounters with the police (31). This was not evaluated in our study, but in the future, it may be of interest to determine how the Andover police views the public they serve.

However, if some incidents or negative media messages speak of police unfavorably or sensationalize incidents, negative reactions and opinions may appear. This can lead to an unmotivated police force and distrustful public in a negative feedback loop. This was not evaluated in this study but may be yet another explanation of the unfavorable responses regarding drug and property crime prevention

In an NPR analysis, Americans are now more afraid of crime, even though the crime rates are down. The more people consume bad news in the world, the more they believe it is more dangerous than it really is (32, 33). Is this true for Andover? Some studies found differences between newspapers which were classified as "sensational" and which carried proportionally more crime reports and reported crimes in a relatively sensational style than the newspaper that were classified as "non-sensational." Some findings indicated that sensational newspapers (compared to non-sensational newspapers) tended to negatively influence the public's perceptions of fear of crime and attitudes towards police (23, 33). Again, it would be worthwhile to understand if that is the case for Andover, MA.

There is still work to be done to better understand what influences public's perception of safety and police in Andover. It seems that both direct and indirect measures need to be used. Direct measures of police performance include crime rates, as reported in this study, as well as number of arrests, clearance rates, and calls for service response times. Indirect measures of police performance include questionnaires, like the one used in this study, as well as direct observations of social behavior, situational studies, and independent testing. Together, they will give a more accurate picture of the police force and may better assess perception versus reality.

MATERIALS AND METHODS

The survey was designed to analyze public opinion regarding public safety and Andover Police. All the questions in the survey were multiple choice. We developed survey questions that directly and indirectly assessed six aspects, based on Mastrofski's conceptualization of police service quality, including attentiveness, reliability, responsiveness, competence, manners, and fairness (24). The last three questions of the survey were designed to indirectly measure the police force's overall competence, reliability, and attentiveness by asking the respondents about their general "feeling of safety" in the community. We also compared participants' opinions to the FBI reported crime rates to understand the relationship between perception and reality.

The survey was approved by the Andover Public School superintendent and administration panel. The appropriate Scientific Review Committee form was acquired and approved. The survey was distributed randomly in public places such as the Senior Center, the Youth Center, public library, local shops and businesses, private houses, and streets. The participants were approached on a volunteer basis. Participants' consent was obtained, and their identity was kept anonymous.

The responses were recorded and analyzed using PSPP software, which is a free, open source statistical software application used widely for statistical analyses of various complexity. LibreOffice Calc was also used.

There were 142 surveys that were analyzed. To determine whether the results of the survey matched the population of Andover, the margin of error was calculated for different confidence levels. This calculation allowed us to understand if the amount of people surveyed was enough to obtain confidence about the accuracy of the data collected. The highest percentage margin of error was calculated based on Andover's population size of 35,937, the sample size of

142 respondents, and several different confidence levels. Instead of calculating a margin of error for responses to each question, a proportion of 50% ($p = 0.5$) was used as the highest possible predicted margin of error for any given question. The margin of error (MOE) is calculated according to the formula:

$$\text{MOE} = z * \sqrt{\frac{p * (p - 1)}{(N - 1)} * \frac{n}{N - n}}$$

where z is 1.645, 1.96, or 2.576 for confidence levels of 90%, 95%, and 99%, respectively; p is proportion; N is population size; and n is sample size. For a confidence level of 90%, the highest margin of error is 6.9%. For a confidence level of 95%, the highest margin of error is 8.2%. And for a 99% confidence level, the highest margin of error is 10.8%.

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