

COMMERCIAL SECURITY:
Burglary Patterns and Security Measures

By

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A B S T R A C T

This report is the first to comprehensively analyze commercial security and the effectiveness of burglar and fire alarms. It explains the patterns of burglaries and identifies the decision process of burglars in their choice of a commercial target.

The study reveals why alarm owners buy, and why other similar businesses choose not to buy alarms. The study explains how an installer is chosen, how prices for installation and monitoring are established at the market place, and whether alarms are beneficial to the community and to insurers.

The report demonstrates that alarms are effective in deterring intruders. The chance of burglary is 4.57 times higher for non alarmed properties and that the yard sign serves as a deterrent. The effectiveness of alarms differ for the various types of commercial establishments depending upon their nature, location, and other physical attributes. Other precautions which are used by businesses, short of exterior and interior lights, provide limited additional security. Unlike residences, the alarm is the major source of security to businesses. The report offers directions on how to control false activations and shows that higher fines will have long term limited effect in solving the problem.

The study provides public relations, marketing, and development directions to dealers. It presents challenges to the alarm associations which are aimed at strengthening their influence, improving services to their members, and consequently becoming attractive for non members. The results could provide for improved service by police departments and reduced loss exposure to insurers.

The study is important to end users. It outlines the chances of becoming burglary victims depending upon location, type and age of business, and wealth of the neighborhood. It further discusses choosing dealers, types of sensors and effective security precautions. This advice is based on the experiences and recommendations of other alarmed businesses. Finally, the report shows how alarms benefit individual users and their communities.

COMMERCIAL SECURITY:
BURGLARY PATTERNS AND SECURITY MEASURES

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**COMMERCIAL SECURITY:
BURGLARY PATTERNS AND SECURITY MEASURES**

**Chapter 1
Introduction**

This report addresses the spatial and temporal patterns of commercial burglaries, alarm ownership, and the effectiveness of alarms for commercial establishments by type. It reveals the decision process of burglars, why businesses choose to install alarms and satisfaction levels of alarm owners. Recommendations that alarm owners have for businesses that do not own alarms are also presented. The survey included businesses that do not own alarms. Their views are highlighted as well. This group's perception of alarms is crucial because it is a potential market to alarm installers.

This study is the second major effort by our group. Our first study on residential burglaries and alarm ownership has earned us a strong reputation in the security industry and in the national press. Articles about our findings appeared in all security magazines, in over 200 newspapers and magazines, including leading media outlets, in the United States. We have appeared on numerous TV programs in the U.S., Canada and in several European countries. The first report included comparisons of our findings with other major research projects which dealt with residential burglaries. However, it is important to state that the study's primary objective was to address the various facets of burglar and fire alarm ownership and effectiveness.

This study is innovative in some other respects. A careful review of other studies on commercial burglary and effective commercial security precautions revealed few previous efforts in

the field.¹ A computer search of the National Institute of Justice Reference Service, University libraries, and the Library of Congress revealed less than a handful of comprehensive studies. Thus, this study is a milestone effort in understanding the patterns of commercial burglaries, effective precautions and issues related to alarm ownership and effectiveness.

1.1 The Importance of the Study

Security professionals often ask, "Why is such a study at all necessary, and how can the results of such a study affect the business conduct of security companies?" The significance of this and forthcoming studies to current and future business conduct is crucial to understand.

Marketing strategies-- targets, methods and resources. Security companies often maintain "traditional" targets and marketing methods to promote business. Sometimes, different types of promotion or advertisement are tried and maintained when successful. A "trial and error" method is not efficient and may be quite costly. If one wishes to learn about effective means of promoting alarm sales, then why not learn how and why alarm owners bought their system? Also, questioning non-owners may provide us with information about ineffective measures to sell alarms. Our analysis of 387 commercial establishments in three Philadelphia suburbs, which differ in their attributes and represent many U.S. suburbs, provides statistically reliable results.

The study provides information on the chances of burglary for alarmed and unalarmed properties with respect to proximity to arterial roads, schools, convenience stores, parks and woods. It further provides the chances of burglary with respect to property value, size and other attributes which are relevant to burglars.

¹ Gibbs, John J. and Shelley, Peggy L., Xenon (New Jersey) Commercial Burglary Data, 1979-1981, Inter-University Consortium for Political and Social Research.

Nasar, Jack L., "Environmental Factors and Commercial Burglary," Journal of Environmental Systems, Vol. 11(1), 1981-82.

Pearson, Dennis A., "Evaluation of Multnomah County's Commercial Burglary Prevention Program," U.S. Department of Justice, 1980.

Such information can be used by salespeople in their efforts to sell systems.

Development strategies-- Alarm company executives are usually heavily involved in the day to day operations of the firm. The industry is characterized as highly competitive with a large number of small firms. This level of competition requires the full attention of managers to solve immediate problems and to remain competitive. It leaves no time or resources to cope with long term issues. However, changes in the technological and economic environment may require a reorientation by the firm to face new challenges and opportunities. Only detailed industry studies like this one can provide such information to alarm company managers. This information can help managers foresee trends which may necessitate organizational reorientation or reorganization.

Industry strategies-- Some alarm installers are members of state and national associations. The participation rate in trade associations is higher among manufacturers and central station companies. One of the important missions of the trade associations should be promoting the industry as a whole. Associations should strive to promote the reliability of its members and the value of industry products and services. The association should establish ties with other industries that share similar interests. Our studies suggest that the alarm associations raise public awareness about the benefits of alarms. This, in turn, will increase alarm sales in the long run. The general public and businesses interested in purchasing alarm systems do not consider using industry trade associations for information. Further, our research suggests that insurers benefit from alarms beyond the dollar amount of policy discounts they provide. Thus, cooperation between these two industries could prove to be productive to both.

Police patrol-- Intensity of police patrol in a community is based upon the expected number of incidents in each neighborhood. If, indeed, nonalarmed properties experience four times the burglary rate of alarmed properties, then a neighborhood which has fewer alarmed properties should enjoy a higher frequency of police

patrol. At the same time, if patrol is conducted less frequently in alarm dense areas, then equity considerations suggest that alarm owners should not be charged for responses to false activations. This is true as long as the designated number of responses to alarm trips is less than the number of patrols eliminated in that neighborhood.

False activations-- This is most significant problem facing the alarm industry. Police records show that, on average, each system activates 1.4 times a year. 98 percent of all activations are false; user errors are the leading cause at 75 percent and equipment errors account for another 10 percent. Police department budgets are increasing at a rate of just 4 percent a year while the number of alarm systems is rising at an annual rate of 11 percent. This rate is expected to accelerate due to the introduction of inexpensive standardized systems by several large alarm companies. Several big city police departments have stopped responding to activations other than those by government agencies and special facilities. Thus, if police departments continue to lack adequate funding as the number of alarm systems rises, it is expected that nonresponse policies will spread to other cities and suburbs unless there is a significant decrease in the number of false activations. The alarm industry recognizes the problem and numerous committees were established to suggest solutions. A variety of solutions are offered to deal with the false alarm problem. Very few studies have collected sufficient data to understand the exact causes of false activations. Our studies, which are based upon large surveys of businesses and households, address the issue and may suggest viable solutions.

1.2 Description of the Study's Topics

Three suburban communities in three different counties of Philadelphia's metropolitan area are analyzed in detail using data from a two and a half year time period. These localities display different demographic profiles, locational attributes, and land-use

mixes, making them somewhat representative of many middle class, predominantly white North American suburbs. Thus, our analysis may address some issues that can be extrapolated to North American suburbs in general. However, it is important to note that in order to generalize these findings, it is necessary to analyze more prototype localities across the U.S.

We mailed questionnaires to all commercial burglary victims, a sample of alarm owners and members of a control group, who were neither burglary victims nor alarm owners. We matched the data obtained via the survey with data on these properties from relevant police departments and municipal governments. The result is a very accurate picture of commercial burglaries and alarm ownership in the three localities.

The research questions that motivated the study are:

1. What are the characteristics of commercial properties that make them most susceptible to burglaries?
2. What can commercial property owners do to reduce their chances of burglary?
3. Do burglar alarms deter?
4. Are there target-hardening complements to burglar alarms?
5. What are the locational attributes of commercial burglary victims?
6. What are the characteristics of commercial alarm owners and why do they buy alarms?
7. Why don't other commercial property owners with similar characteristics buy alarms?
8. Do fines for activations imposed on commercial establishments reduce alarm system use?
9. Does the presence of burglar alarms provide a "net benefit" to the community?

The information in the following pages addresses all of these issues. An essential message is that alarms do have deterrent value. Our current study in Greenwich, Connecticut addresses some of these issues and more on the underlying motives for alarm purchase, causes of false activations, and on the incidence of

burglary. State alarm associations or individual companies may be interested in analyzing a particular area for some specific questions. Now that our instruments are validated in four communities and our methods of analysis established, we may conduct similar studies at a relatively low cost.

1.3 Description of the Study Areas

In order to obtain statistically robust results, we selected localities that differ among themselves in many ways, but are similar to the main features of many other North American suburbs. All three localities--Upper Merion Township in Montgomery County, Tredyffrin Township in Chester County, and Springfield Township in Delaware County--are part of the Pennsylvania portion of Philadelphia's metropolitan area.

Of the three, Upper Merion Township has the strongest commuting ties with Philadelphia and the rest of the region. It is served by two major limited access routes, Interstate 76 (the Schuylkill Expressway) and U.S. 202. Upper Merion attracts shoppers to one of the largest indoor malls in the U.S. Many of its residents work in Philadelphia. It also has a sizeable commercial base which attracts transient commuters to the township.

Tredyffrin Township is also located along two major routes, U.S. 30 and U.S. 202. It also has access to the Pennsylvania Turnpike. Unlike Upper Merion, however, Tredyffrin is not a target for non-resident retail shoppers. Most residents don't commute to Center City, but work in the general vicinity instead. Recent growth has made Tredyffrin a center for service and high tech industries.

Springfield Township is located to the south of U.S. 1, a major thoroughfare which extends from Maine to Florida. Although it has some Center City commuters and a rather large shopping district and mall, it is not considered a major attraction for either shoppers or commuters when the entire metropolitan area is factored in. Traditionally, the township has been viewed as having

its antecedents in the working class.

The residents of Tredyffrin Township are the most affluent of the three. It is followed by Upper Merion Township. Springfield Township, which can be best characterized as a blue-collar suburb, is the least affluent of the three. Upper Merion includes many commercial and industrial establishments. King of Prussia, one of the largest volume shopping areas in the world is located there. Of the three, Tredyffrin Township has the most area allocated toward parks and open space. Table 1.3.1 provides more detail about the three localities.

The reason we chose three localities that differ in population, locational attributes, type of housing, and commercial and manufacturing mix is to capture the variety of opportunities for burglars. This large sample allows us to cover the gamut of alarm owners, who differ in their ownership motivations and experiences. We assume that our sample represents a wide population of suburban burglaries and alarm owners, so that we may generalize our findings and conclusions to many areas which are comprised of similar features, but are not included in this study.

Table 1.3.1¹
Description of the Three Study Areas

	Tredyffrin	Upper Merion	Springfield
Population (1990)	28,028	26,138	24,160
Density per sq. mi.	1,415	1,476	4,026
% white	94.0	94.0	98.4
% pop. change 1980-1990	21.8	10.3	- 5.0
Median age	37.7	35.4	38.4
Median Family Income (1989)	\$75,571	55,663	53,302
No. of Housing units (1990)	11,953	9,271	8,604
% owner occupied	70	71	92.2
Median home value	\$231,200	\$64,100	152,400
Ave. home sale price	\$175,000	\$135,000	144,000
	(1987)	(1987)	(1989)
Retail			
Establishments	172	432	301
Sales	\$279 million	\$601 million	\$643 million
Employment	2597	8710	6449
Wholesale			
Establishments	148	216	13
Sales	\$1.8 billion	\$2.8 billion	\$228 million
Employment	2190	4,284	182
Services			
Establishments	407	411	489
Receipts	\$611 million	\$492 million	\$73 million
Employment	6026	11127	1,825
Manufacturing			
Establishments	49	67	15
Sales	\$228 million	\$631 million	unavail
Employment	5,800	9,800	unavail
Area (sq. mi.)	19.8	17.7	6.29
Land Use (%)			
Residential	31.3	31.1	48.4
Commercial	1.4	3.8	3.4
Industrial	1.8	18.1	0.9
Parks & Educational	9.2	17.9	13.8
Streets	13.0	15.6	14.0
Vacant	39.1	9.9	18.0
Other	4.2	3.7	1.5

¹ Sources: 1990 Census of Population and Housing, Townships and Police Departments Annual Reports, Chamber of Commerce Data.

Table 1.3.1
Description of the Three Study Areas (continued)

	Tredyffrin	Upper Merion	Springfield
1989 Total taxes	\$4,603,676	\$7,309,714	\$4,937,359
1989 Total oper.expns.	\$11,168,828	\$13,845,007	\$9,540,180
1989 taxes per ca.	\$199.99	\$279.69	\$194.95
1989 oper.expen.per ca.	\$485.20	\$529.69	\$376.69
Police (1990)			
Officers	47	53	32
Civilians	8	17	2
Budget (1989)	\$2,849,626	\$3,366,520	\$1,853,606
Officers per 1000 pop	2.04	2.03	1.26
Officers per sq. mi.	2.22	2.99	5.09
Police oper.exp. per ca.	\$123.79	\$128.80	\$73.19
police exp.*100/loc.budget	25.51	24.30	19.43

1.4 The Research Methods

We studied four exhaustive and mutually exclusive subgroups of the population in each community: commercial burglary victims with and without alarms, and alarmed and unalarmed commercial establishments that were not burglarized.

The initial phase of the study was built on individual observations of burglaries. The information on each incident was assembled from police data files, surveys of the victims and relevant county real estate data. The database includes all properties burglarized in the localities in the two and a half year period preceding the study's inception. Of course, some burglary victims owned alarms at the time of the incident. Thus, the victimized properties in the database are comprised of two of the subgroups of interest.

The alarm cases were selected randomly from alarm owner files at the police departments. This sample, like the burglary sample, includes a large number of cases. Thus, it is correct to assume that the analyzed sample of alarm owners represents its entire population.

The same survey and real estate information was collected for nonburgled, nonalarmed commercial establishments. Inclusion in this part of the sample was based on two criteria: a matching criteria and a random sample. On the first pass we chose commercial establishments that were adjacent to burglary victims. We then chose an additional group that were adjacent to nonvictimized, alarmed commercial establishments. A group of randomly selected establishments was also chosen.

By including the four subgroups (burgled and alarmed, burgled and not alarmed, not burgled and alarmed, not burgled and not alarmed) we are, in effect, using a quasi-experimental design.¹ For example, in order to analyze whether accessibility to major

¹ A quasi-experimental survey design is one in which non-affected populations are used as a baseline against which alarm ownership and burglary victimization can be compared.

thoroughfares is important in explaining burglaries, we need to compare victimized properties against similarly situated non-victimized properties. In so doing, we can identify the factors which led the former properties to be burgled.

Our thinking behind the matching procedure was that the database would include the same set of choices the burglar confronts. The model of the criminal as an expected income maximizer is received by both economists and criminologists as a reasonable description of average behavior. The burglar is thought to choose that property which will result in the greatest transportable, liquidatable loot and the least chance of apprehension. By including a victimized commercial establishment and an adjacent non-victim, we hope to discover the factors that attracted the burglar's interest in the first property.

Detailed questionnaires were mailed using listings of victims and alarm owners provided by the police departments involved in the study. Table 1.3.1 lists the number of questionnaires mailed to each group in each township and the number of responses. We attribute our high 42.23 percent response rate to the fact that the questionnaires were accompanied by cover letters sent on police department letterhead with the appropriate police chief signature and franked return envelopes addressed to the police departments.

Questionnaires were mailed to both residential and commercial establishments. In Tredyffrin Township, which is primarily residential, the same burglary and alarm questionnaires were mailed to both households and businesses. In Upper Merion and Springfield Townships we differentiated commercial and residential questionnaires. In all three townships, questionnaires were differentiated for non-burgled, non-alarmed businesses and households¹. The commercial questionnaires used in this study are

¹ Tredyffrin was our survey test market. We learned a great deal from the initial survey. Most importantly, the same questions were not meaningful for both households and firms. We also learned that the residents were eager to provide information, but were not necessarily knowledgeable. This necessitated limiting the technical knowledge necessary to answer questions about insurance policies and/or alarm systems.

Table 1.4.1
Structure of Survey Mailing
Mailings

Responses

	(1)	Total (2)	Resid (3)	Comm (4)
Tredyffrin Township Questionnaires				
Burglary Victims	429	195	144	51
Alarm Owners	300	187	108	79
Non-burgled-- non-alarm	300	110	85	25
Upper Merion Township Questionnaires				
Burglary Victims	283	99	47	52
Alarm Owners	460	136	92	44
Non-burgled--non-alarm	300	74	49	25
Springfield Township Questionnaires				
Burglary Victims	128	55	32	23
Alarm Owners	350	187	121	66
Non-burgled--non-alarm	189	110	88	22
TOTAL	2730	1153	766	387
Response Rate	42.23%			

included in Appendix A.

Data on burglaries were not available in computer files for all localities for the same time period. We attempted, however, to collect data on as long a time period as possible and to mail out as many questionnaires as possible to burglary victims. Thus, for Tredyffrin we mailed to all those victimized between June 1986 and June 1989, for Upper Merion the study period turned out to be from January 1988 through February 1990, and for Springfield from January 1988 through June 1990.

Information about the burglaries, including date, time, point of entry, and comments by the investigating officer were gathered from police department files¹. Alarm registration information was also collected from police records. In recent years all three localities have just started to require the registration of alarm systems. Hence, it is unclear whether all installed alarm systems in these townships are registered. For example, mailings to establishments that were presumed to be non-burgled and non-alarmed revealed unregistered alarms in all three localities. Incomplete alarm ownership files would cause us to underestimate the number of alarms in each community. This could have the effect of yielding higher probabilities of burglary among alarm equipped properties (see Chapter 5).

Real estate data on all analyzed properties were extracted from appropriate county assessment boards. These data included assessed value, market value, frontage feet on the street, land and structure size, year the current owner moved to the address, and price at last sale.

1.5 Structure of the Report

In chapter 2 we describe the characteristics of burglary--specifically, where, when, and why they occur. The burglar's

¹ We regard this availability of files and addresses of victims to be a key feature of the study. There was a great deal of trust in the part of everyone. Nothing in our report can be used to identify individual victims or respondents.

process of choosing a target and the physical attributes of the environment which entices burglars are presented.

In chapter 3, we concentrate on alarm owners and non owners. Specifically, why businesses buy alarms, why other businesses with similar attributes do not buy alarms, whether insurance premium discounts promote alarm purchase, whether the fire detection feature plays a role in the purchase decision, how the installer is chosen, the physical attributes of commercial alarms, and alarm owner satisfaction.

Chapter 4 concentrates on the structure of the industry. A detailed analysis is provided on the three segments of the industry--manufacturing, installation, and monitoring. The chapter includes an analysis of prices--how they are established, and whether large companies enjoy market power. It includes a discussion of the role of the trade associations. It further discusses whether and how associations can increase their influence to benefit their members.

In chapter 5 we introduce the major question of this study--are alarms effective in deterring burglaries. A special emphasis is given here to retail establishments, which have distinctly special features. The effectiveness is considered in various dimensions-- satisfaction with the system, burglary rate with and without alarms, effectiveness of other security precautions with and without alarms.

Chapter 6 provides very important information to dealers who need to fight undesired local ordinances, and is a powerful tool to promote public recognition of the benefits alarms grant to local communities. Currently, the problem of false activations is painful to the industry and overshadows the fact that, overall, alarms provide net benefits to the locality. This chapter illustrates a very careful calculation of the costs and benefits for both residential and commercial alarms.

Chapter 7 touches the complex issue of false activations. It shows the causes of activations in commercial establishments, who are responsible for most activations in any community. Development

of effective measures to deal with the problem requires detailed data analysis. A general methodology to investigate false activations in order to reach effective prescriptions is offered.

Chapter 8 concludes the report. It lists the major findings and suggests policy implications to the various segments of the industry, trade associations, and police.

Not all data is available for all localities. Hence, when data is only available for one or two localities we still employ it, even though the database is smaller. Whenever identical data is available on all three localities we report it in aggregate form.

Throughout the text we have relied heavily on graphic presentations. A few notational conventions that we have adopted are that B indicates a burglary victim, A indicates an alarm owner, and n denotes sample size. The sample sizes are sometimes small. In these cases there may be small random errors in the horizontal summation of the probabilities.

Chapter 2

Predicting Commercial Burglaries

The analysis of commercial burglaries over a period of time reveals patterns about where, when and why burglaries occur. These patterns provide us with the characteristics of commercial properties which make them susceptible to burglary. Knowing those patterns and characteristics can help business owners secure their properties more effectively, assist police in designing patrol, aid the alarm industry in targeting commercial customers and guide the insurance industry in developing effective protection requirements and discount policies for commercial properties.

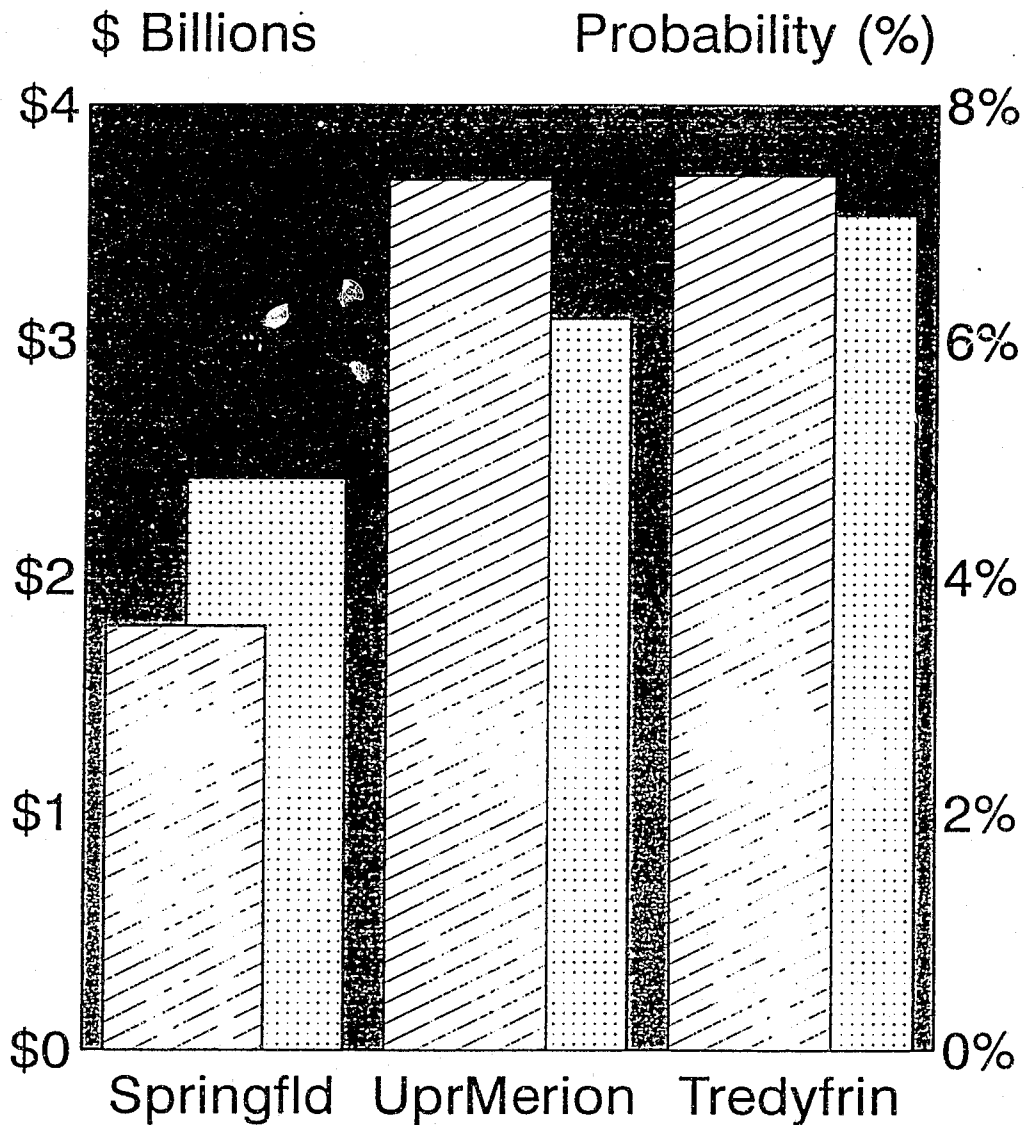
2.1 Where Commercial Burglaries Occur

Criminology literature and experienced police officers tell us much about the locational choice of residential burglaries. The residential study confirmed that locational choices of residential burglaries are made in decision stages in sequentially descending order: the neighborhood, the street in that neighborhood, the property on the street and the point of entry to the property. This chapter shows that the decision process also applies to commercial burglaries. However, the considerations of commercial targets differ from that of residential targets. This chapter shows the target decisions at each stage, tells why such choices are made, and provides statistics about the choices commercial burglars make at each level.

This section also analyzes timing of commercial burglary on two levels. The first looks at a commercial establishment's length of time in business when burgled. The second determines the time of day that commercial burglaries occur. These variables help businesses determine when they are most susceptible to burglary.

Choice of the neighborhood: The burglar's choice of

Commercial Burglary and Market Value



AvgRev(\$M)



\$1.79

\$3.68

\$3.7

Burglary



4.83%

6.18%

7.06%

Figure 2.1.1

17

neighborhood depends primarily on market values although familiarity and concentration of businesses the burglar's choice. The decision process begins with the major thoroughfares the burglar often travels for work or social purposes.¹ Criminals prefer to work in areas with which they are familiar. McIver (1981) found that criminals typically committed crimes at a mean distance of .4 miles from their homes.² However, because locations that are better known to people are perceived to be closer, perceived distance may be more important than actual distance.³ Familiar areas provide a sense of security because the burglar is aware of traffic flows and escape routes. This rule is generally true for all but professional burglars who "hand pick" their targets and plan access and escape routes after picking the target.

The burglar's choice at each level depends on accessibility. Burglars prefer to work where they can approach a property and escape with as little intervention as possible from passersby, neighboring properties and police. Being noticed as not belonging is an obvious concern of the burglar because it may lead to apprehension or conviction. However, in the case of commercial burglary, it is difficult to know who belongs and who doesn't. Therefore, access to commercial properties may be easier than for residential properties.

Perceived market values play an important role in the burglar's decision process for obvious reasons. The perception of wealth leads the burglar to believe that there are valuable goods to be taken. Using revenues and property size, figures 2.1.1 and 2.1.2 show the relationship between perceived market value and risk of burglary. Of the three communities, Tredyffrin has the highest average commercial revenues and, consequentially, the highest probability of burglary. Upper Merion follows in average revenues

1 Rengert, George and Wasilchick, John, Suburban Burglary, Charles C. Thomas, Springfield, IL, 1985.

2 John P. McIver, "Criminal Mobility: A Review of Empirical Studies," Crime Spillover, eds. Simon Hakim and George Rengert (Beverly Hills, CA: Sage, 1981).

3 Brantingham, Paul and Brantingham, Patricia Patterns in Crime, Macmillan Publishing Company, New York, 1984.

Front Feet

Springfield

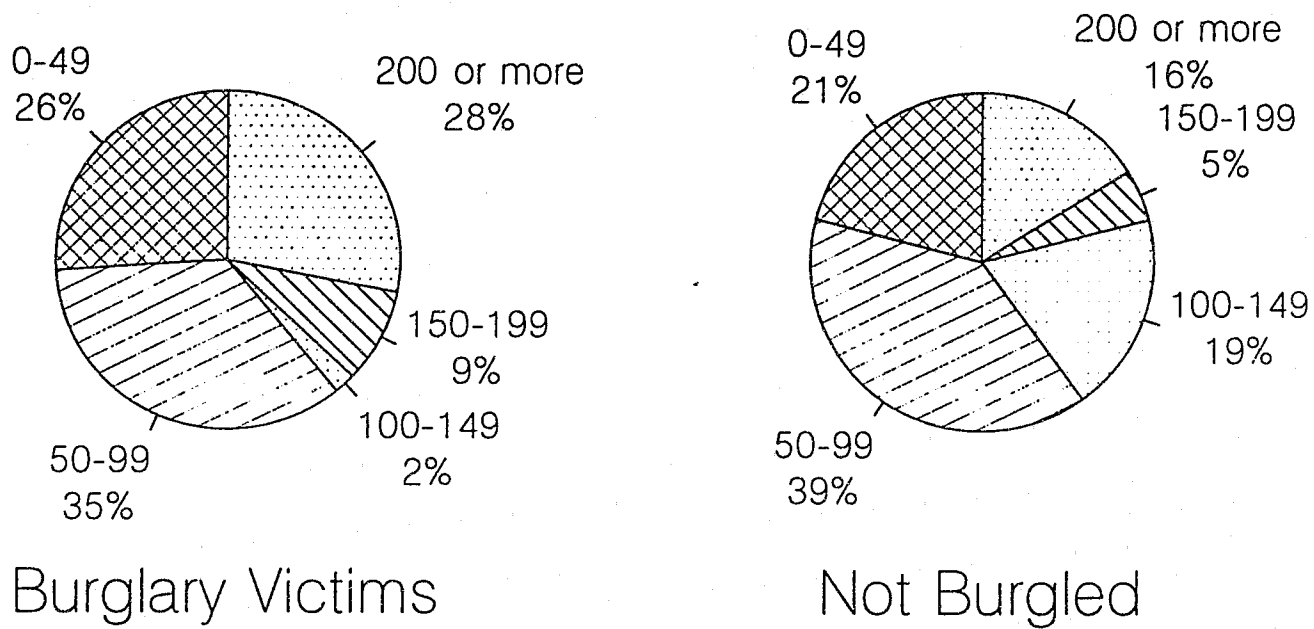


Figure 2.1.2

and burglary risk. Springfield businesses earn the least average revenues and exhibit a significantly lower risk of burglary than the other two townships.

Figure 2.1.2 compares the sizes of burgled and non burgled properties. A large proportion (37 percent) of burgled businesses have more than 150 feet in front of their properties, while only 21 percent of non victimized businesses are this large. The commercial results are consistent with criminology literature on residential and commercial burglaries, which show that the risk of burglary increases with market value.¹

A particular community's chance of burglary is also related to the concentration of businesses. The more commercial establishments there are in a given area, the more targets a burglar has to choose from. A particular community's risk of burglary is calculated by dividing the total number of burglaries by the total number of establishments and, therefore, reflects business concentration. Tredyffrin has 776 businesses, while Upper Merion has 1,126. But, Tredyffrin has a higher rate of commercial burglary; the number of burglaries per establishment is .0706 in Tredyffrin and .0618 in Upper Merion. Tredyffrin has higher revenues per establishment, is a wealthier community, and businesses have more expensive merchandise on their premises. Thus, wealth is a stronger attractor for the burglar.

Choice of the Street: Our first study found proximity to major thoroughfares increases the risk of burglary to households.² However, commercial burglaries generally occur away from major thoroughfares. Figure 2.1.3 shows that a larger proportion of commercial properties located within three blocks of a major thoroughfare were not burgled than were burgled. This is true for both alarmed and unalarmed properties. But particular thoroughfares within the three townships exhibited an opposite

1 Buck, Andrew, Hakim, Simon and Spiegel, Uriel, "Casinos, Crime and Real Estate Values: Do they Relate?" *Journal of Research in Crime and Delinquency*, Vol. 25, No. 3, August 1991, pp. 288-303.
Hakim, Simon, "The Attraction of Property Crime to Suburban Localities: A Revised Economic Model," *Urban Studies*, Vol. 17, No. 3, October, 1980.

2 The Hakim-Buck Study on Residential Security, April, 1991, pp. 15-23.

Accessibility

One or More Thoroughfares
Within 3 Blocks

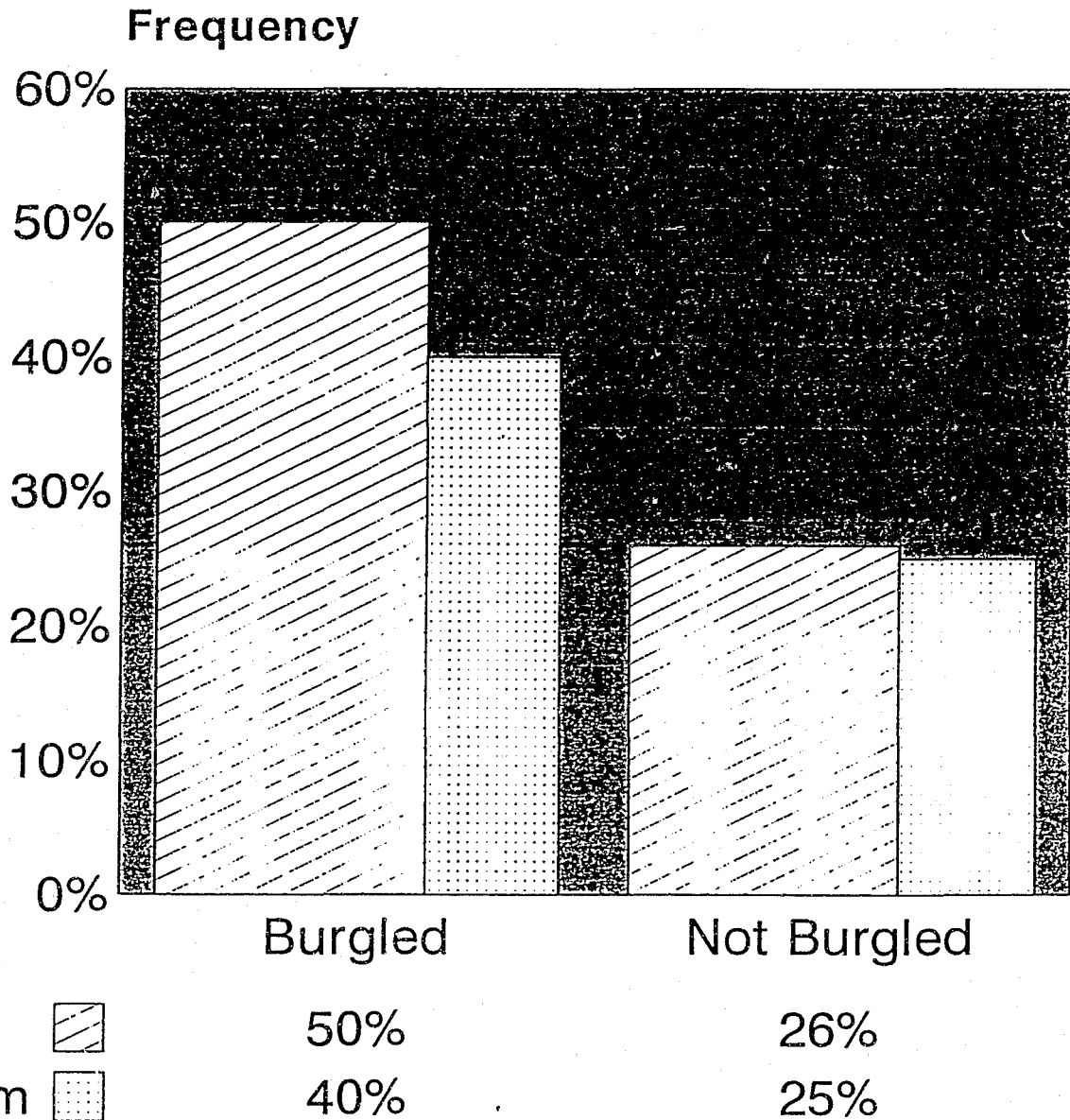


Figure 2.1.3

Sample sizes:

A and B=34, A not B=555

Not A and B=446, Not A Not B=551

trend. By splitting the thoroughfares into two categories, we found some common characteristics which explained the difference in burglary rates for the different types of thoroughfares.

Roads with high pedestrian and auto traffic or limited access are shown in figure 2.1.4. More businesses located within three blocks of these thoroughfares are not burgled than are burgled. Except for the PA Turnpike, all of the roads that appear in this figure have high commercial concentrations. Business concentration offers environmental security precautions. The routes all tend to be well lit and have consistent traffic patterns at all times. Thus, it is difficult for a burglar to go unnoticed near one of these roads.

Figure 2.1.5 shows those thoroughfares near which more businesses are burgled. These roads tend to have a smaller concentration of commercial properties in the general area. Either the firms are spread out or they are not surrounded by other commercial properties. Although Route 202 in Upper Merion has a fairly large concentration of businesses, there are areas in the township with higher business concentrations. It also has very little pedestrian traffic; access to businesses on 202 in Upper Merion requires an automobile. Automobile traffic is not as consistent as it is on the first category of roads. This atmosphere can provide burglars with concealed access and escape routes.

These findings are supported by an earlier study of commercial burglaries Nasar (1981).¹ It found that the risk of burglary on major thoroughfares is related to the concentration of businesses. The more businesses there are on a major thoroughfare, the lower is the risk of burglaries to properties on that road.

Property on the Street: A commercial property's location on the street affects its risk of burglary. Although this study did not analyze the probabilities of burglary by location on the

1 Nasar, Jack L., "Environmental Factors and Commercial Burglary," *Journal of Environmental Systems*, Vol. 11 (1), 1981-82.

Major Thoroughfares

Limited Access Roads and High Auto/Pedestrian Traffic

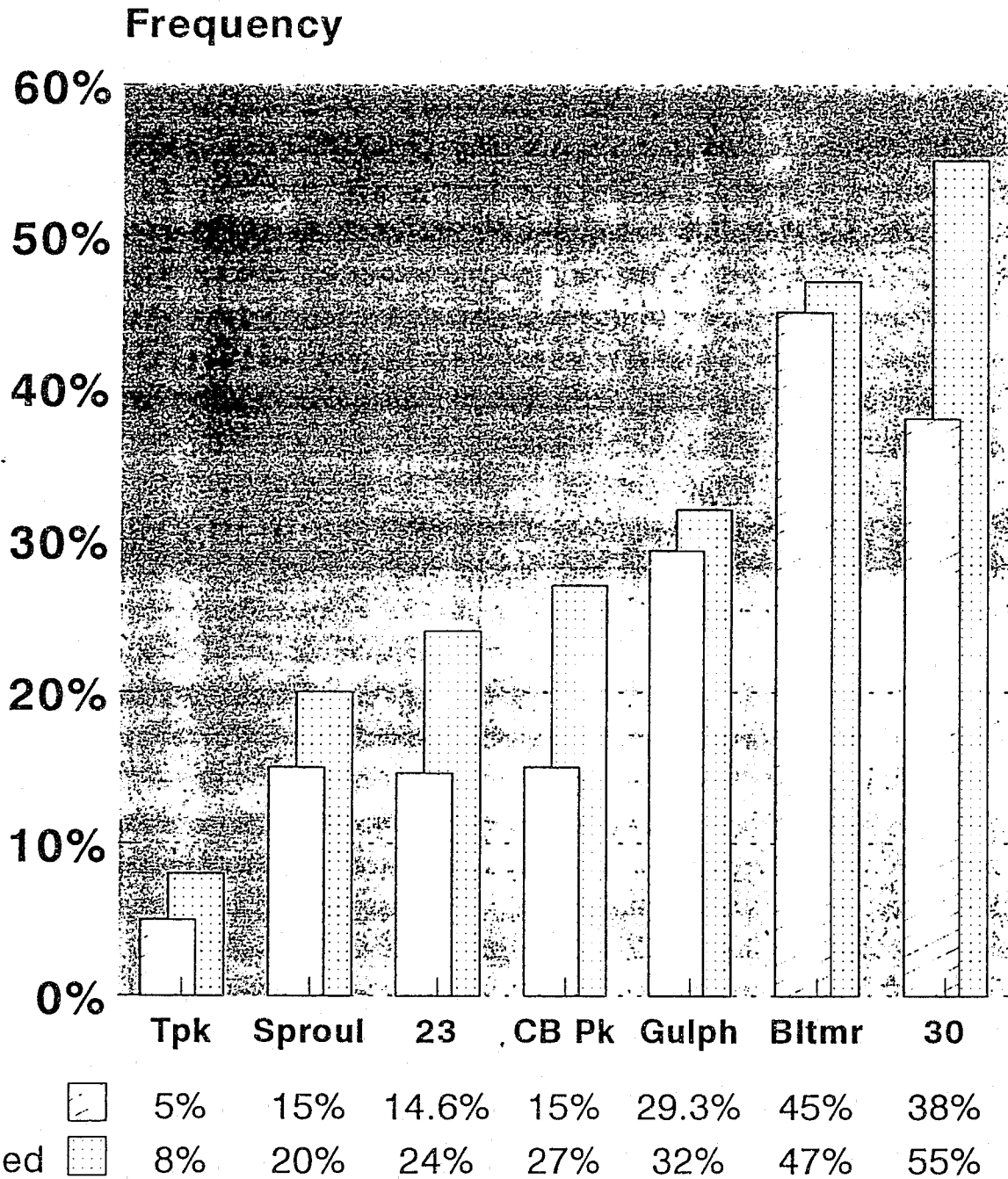


Figure 2.1.4

Major Thoroughfares

Low businesses, pedestrian
and auto traffic

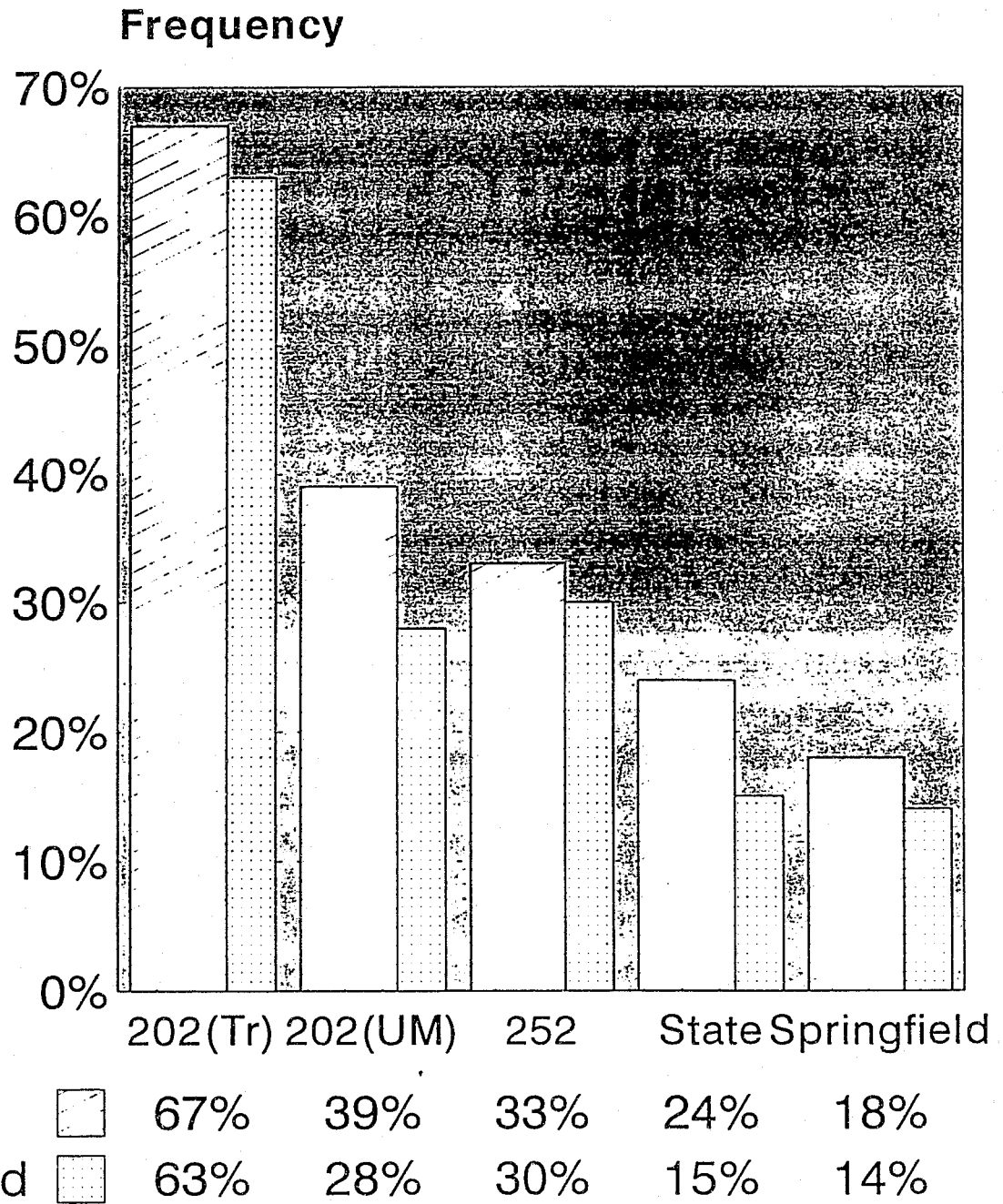


Figure 2.1.5

street, other studies have. Properties on corner lots have a higher risk of burglary than other locations. While only one-third of properties in the study were located on the corner, their share in the burgled population was 74 percent. Thus, corner properties are 1.7 times more likely to be burgled than other locations.¹

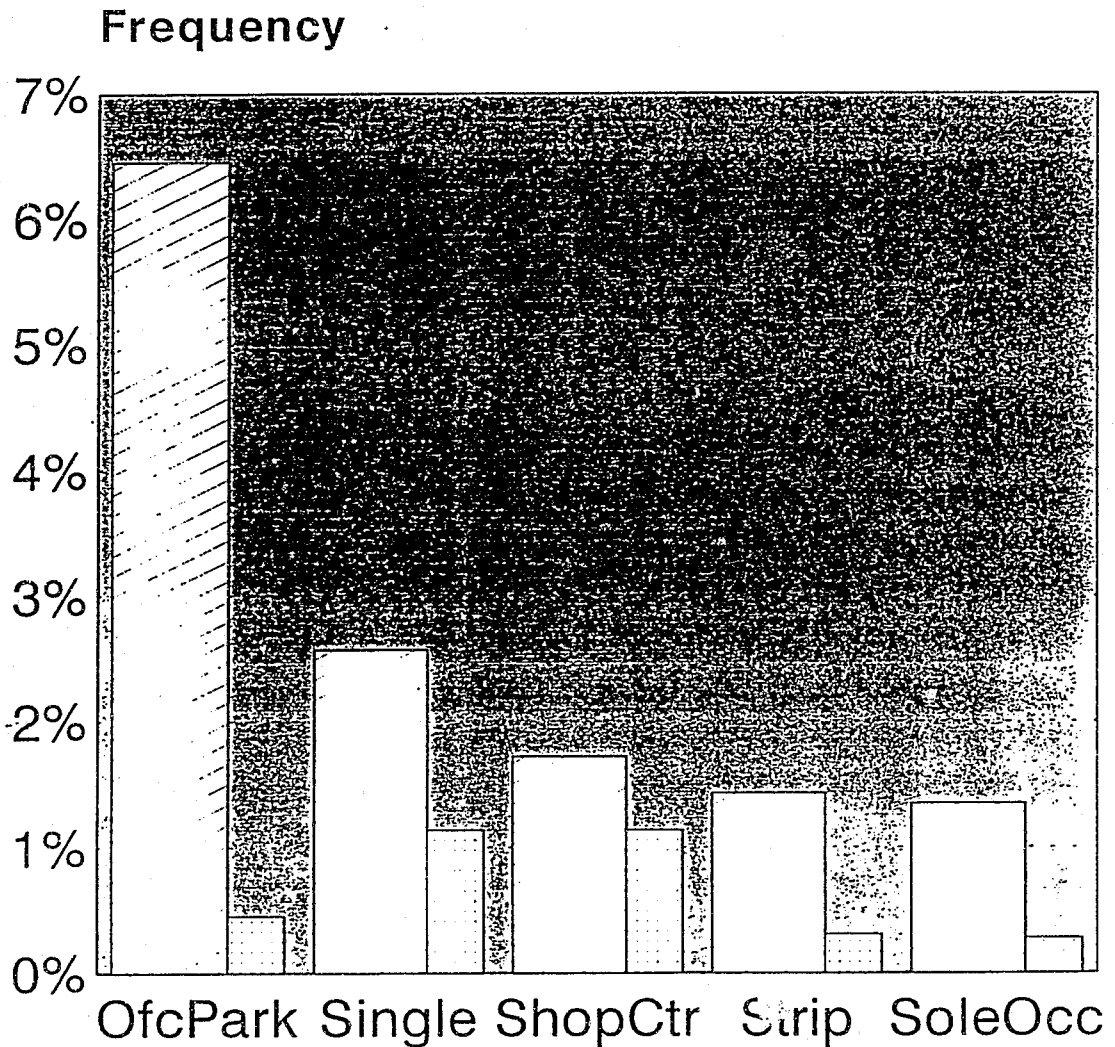
Commercial burglary risk depends also on the type of commercial establishment. Suites in office parks bear the highest proportion of burglary. Accounting for 46.5 percent of commercial burglaries, they are burgled almost two and a half times more often than single office buildings. Figure 2.1.6 depicts burglary rates by type of commercial establishment. The probability of burglary for unalarmed office suites is 6.45. An alarm reduces the probability 14.2 times to .454. Because office parks are new, the office equipment in a suite tends to be newer and more easily fenced. Office suites are vulnerable to burglary because the parks in which they locate are large and secluded and offer concealed access to the burglar. They are attractive and inviting in order to attract customers, so little attention is given to security. Suites are well insured, another reason less attention is given to security measures by owners and lessees. Office parks are also located on roads that are poorly lit and lightly traveled after business hours. The burglar is, therefore, afforded concealed access and ample entry/escape time.

Retail establishments rank second in the proportion of burgled establishments. Twenty-four percent of the burgled establishments were retail stores. Of those, 56 percent were located in shopping centers and the remaining 44 percent were in strip malls. Unalarmed retail stores in shopping centers have a probability of burglary of 1.72. Alarms reduce the risk one and a half times to 1.136. Alarmed and unalarmed retail stores in strip malls have a lower chance of burglary than those in enclosed shopping centers. The probability of burglary for unalarmed stores is 1.43, while it is .305 for their alarmed counterparts. Hence, the chance of

¹ *ibid.*

Burglary by Site

Commercial



	OfcPark	Single	ShopCtr	Strip	SoleOcc
No Alarm	6.45%	2.57%	1.72%	1.43%	1.35%
Alarm	0.454%	1.136%	1.136%	0.305%	0.277%
(NA/A)	14.2	2.26	1.51	4.68	4.87

Figure 2.1.6

burglary is 4.7 times higher for unalarmed than it is for alarmed stores.

Stores typically locate in high traffic areas near major thoroughfares to attract shoppers. These roads are well traveled during the day as well as the night and are very well lit. Thus, the burglar does not have the luxury of concealed access and has a much smaller time frame in which to work before being noticed.

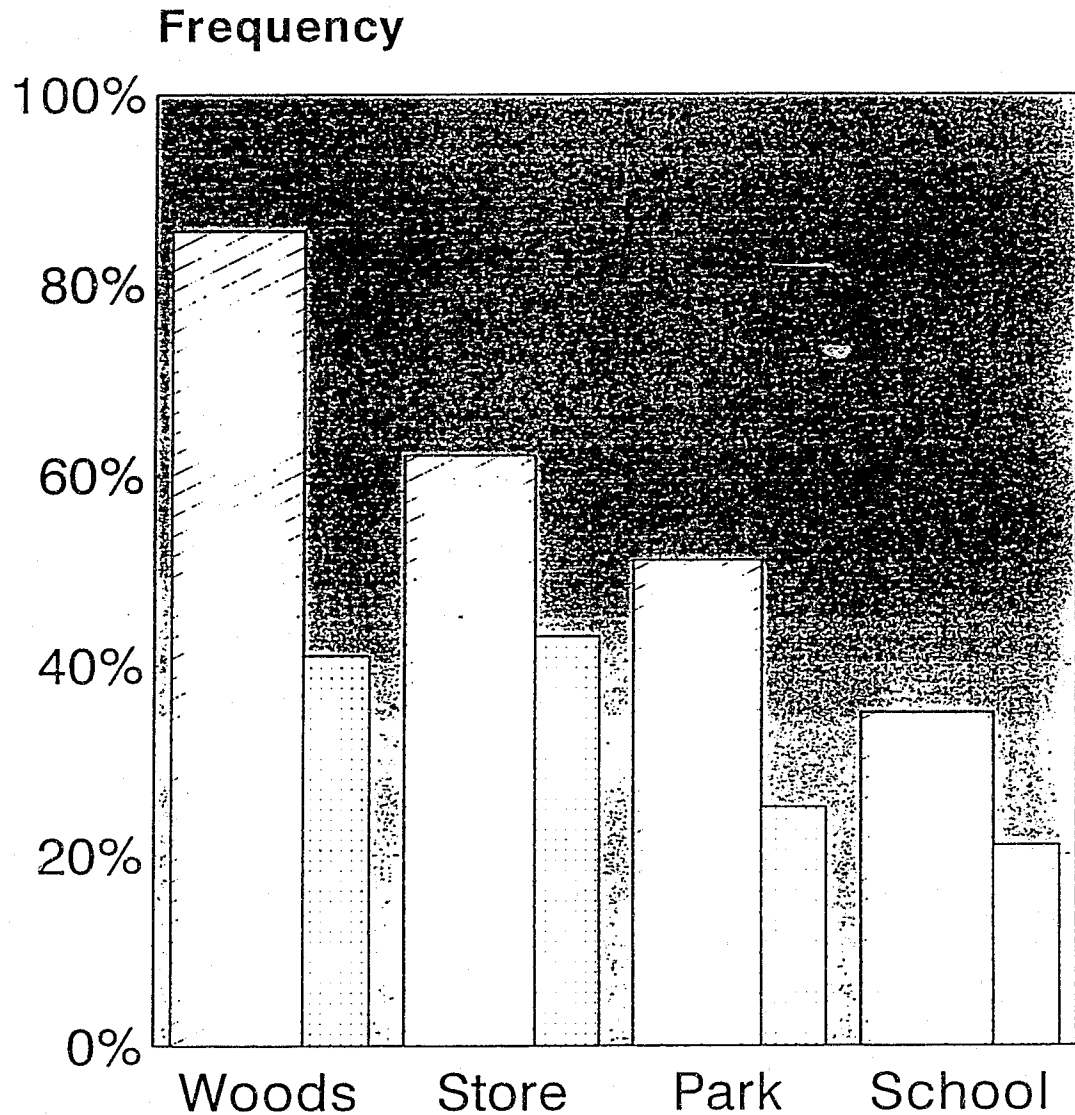
Despite all the factors that should protect stores from burglary, retail establishments represent a substantial proportion of burglaries. But, retail burglaries are similar in nature. Usually, a window or door is broken, and only a few valuable items that are visible from the outside are taken. Since the burglar knows exactly what and where his "take" is, he needs very little time to execute the crime.

Almost 20 percent of all burglaries occur at single office buildings. For unalarmed suites, the probability of burglary at a single office building is 2.57. Alarms reduce the probability by more than two times to 1.136. These structures are often located close to shopping centers so burglars are familiar with them. They offer concealed access, have no one on the premises during off work hours and have no security. The burglar looks for easily fenceable office equipment and petty cash.

Sole occupant manufacturing, wholesale and service buildings are least often burgled. Their share of burglary is just under 10 percent. The rate for unalarmed buildings is 1.35. Alarms reduce the probability to just .277. The type of business and the exterior appearance are unappealing to the burglars. Merchandise available at these locations is usually difficult to fence or has low resale value. Burglars will typically break into fenced storage areas that are not protected by an alarm and are poorly illuminated at these establishments. Electronic protection is expensive relative to the value of the property stored in these areas.

Attractors

Within 3 Blocks





Burgled		85.5%	62%	51%	35%
Not Burgled		41%	43%	25%	21%

Figure 2.1.7

Newman (1972)¹ has written about the higher burglary victimization rates of properties close to schools, gathering spots for juveniles (e.g. convenience stores) or treatment centers for drug addicts based on an urban study in Cleveland, Ohio. It is suspected that these facilities are sources of criminals or that these facilities can provide a backdrop into which the burglar can blend with many varied faces. The study found that proximity to these locations increased the risk of burglary in urban settings.

From figure 2.1.7, it is clear that locating close to any one of these places increases a firm's exposure to burglary. Businesses that locate within three blocks of woods or parks increase their exposure to burglary by a factor of two. Woods and parks can provide concealment and cover for both entry and escape to commercial properties, especially at nighttime. Locating within three blocks of a school or convenience store increases exposure to burglary by 1.66 and 1.44 respectively. These places provide burglars with camouflage. A burglar can blend in with the many varied faces near schools and stores and appear as belonging. Thus, proximity to schools, convenience stores and gathering spots for juveniles increases a business' chance of burglary in both urban and suburban settings. Interestingly, our findings for residential burglaries showed that the burglary rate is low near such places.

In the case of residential burglaries, security precautions other than alarms reduce a property's risk of burglary. However, in the case of commercial burglary, precautions, other than lighting, do little to deter burglars. Deterrence measures serve to give the illusion that someone is on the premises, but burglars know that nighttime and weekends are safe for break in at a commercial property. Lighting deters burglars because it reduces the time frame in which the burglar can break in without being noticed. It also make identification more likely. However, lighting in remote areas with low traffic patterns will be less

1 Newman, O., Defensible Space: Crime Prevention Through Urban Design, MacMillan, New York, 1972.

Point of Entry

Tredyffrin

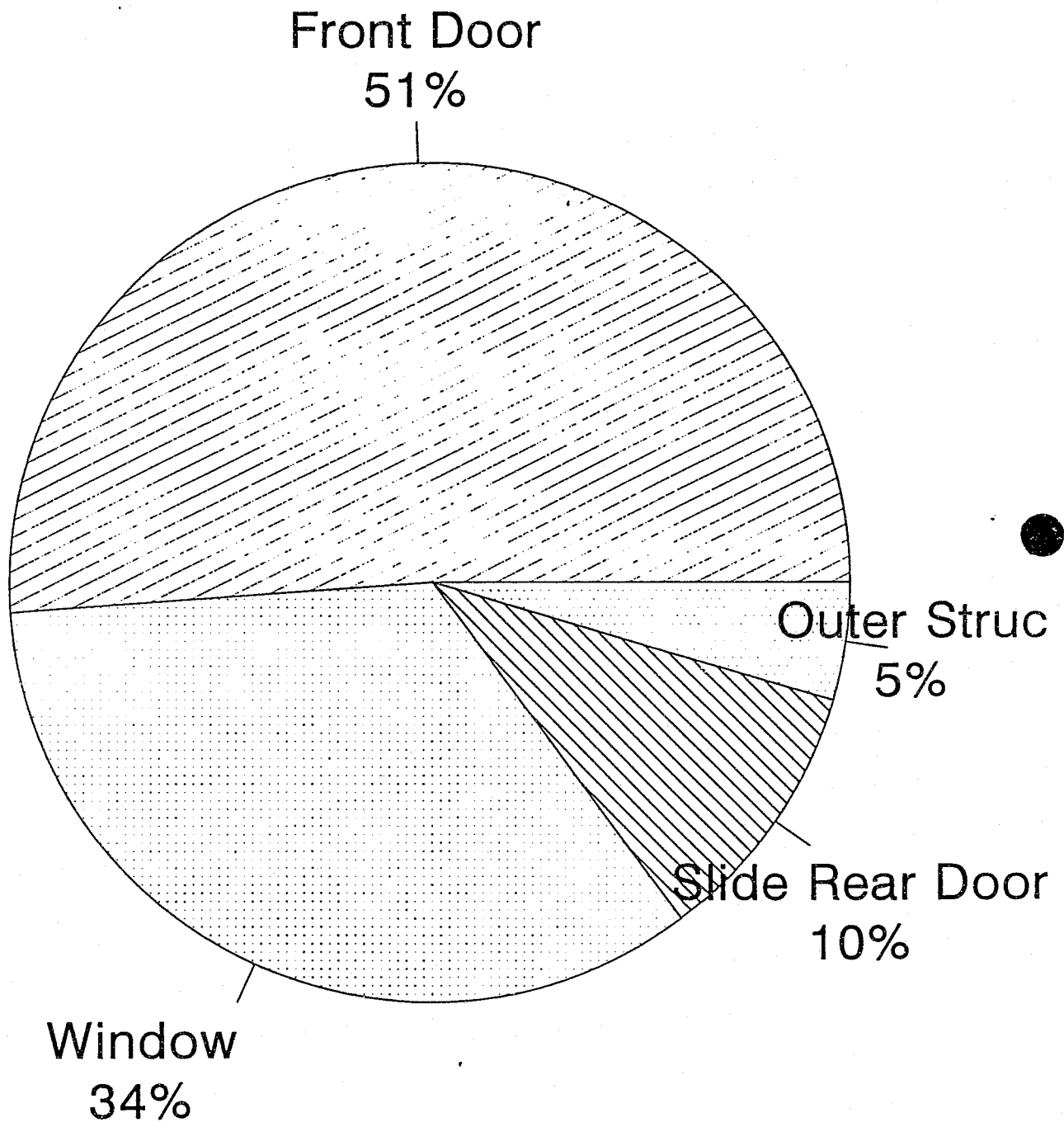


Figure 2.1.8

n=93

effective. Thus, an alarm is the most important security measure for commercial establishments, while exterior and interior lights are marginally effective. For a more complete discussion of security precautions see chapter 5.

Point of Entry: Like residential burglars, commercial burglars typically enter through the front door. Figure 2.1.8 shows that 51 percent of all break ins occurred through the front door of the establishment. Only 10 percent of the properties were entered through a sliding rear door, while 34 percent were entered through a window. The final 5 percent of break ins occurred to outer structures, such as storage facilities. Only 5 percent, a similar rate to residential reporting, stated that no force was used to enter the property.

2.2 Timing of Commercial Burglaries

With respect to commercial burglaries, we examined timing from two perspectives. The first is the length of time the firm has been in business. From this we can determine if businesses become vulnerable to burglary at any point in their course of operation. The study also looked at the time of day that burglaries occur. This will tell business owners when their property most needs to be protected.

Businesses are most susceptible to burglary in their first years of operation. Figure 2.2.1 shows that 53 percent, more than half, were burgled in their first five years. Of those in their first five years, 55 percent were in their first year of business. Each year thereafter, the percentage slowly decreases. Beyond the first five years, the burglary rate decreases for the remaining five year increments. This result is consistent with residential findings. New residents are more likely to be burgled than those that have resided in their homes for a long time.

New businesses are attractive to burglars for several reasons. First, the buildings are aesthetically appealing and well cared for to attract customers. Not only does this attract customers, it

Time in Business

When Burgled

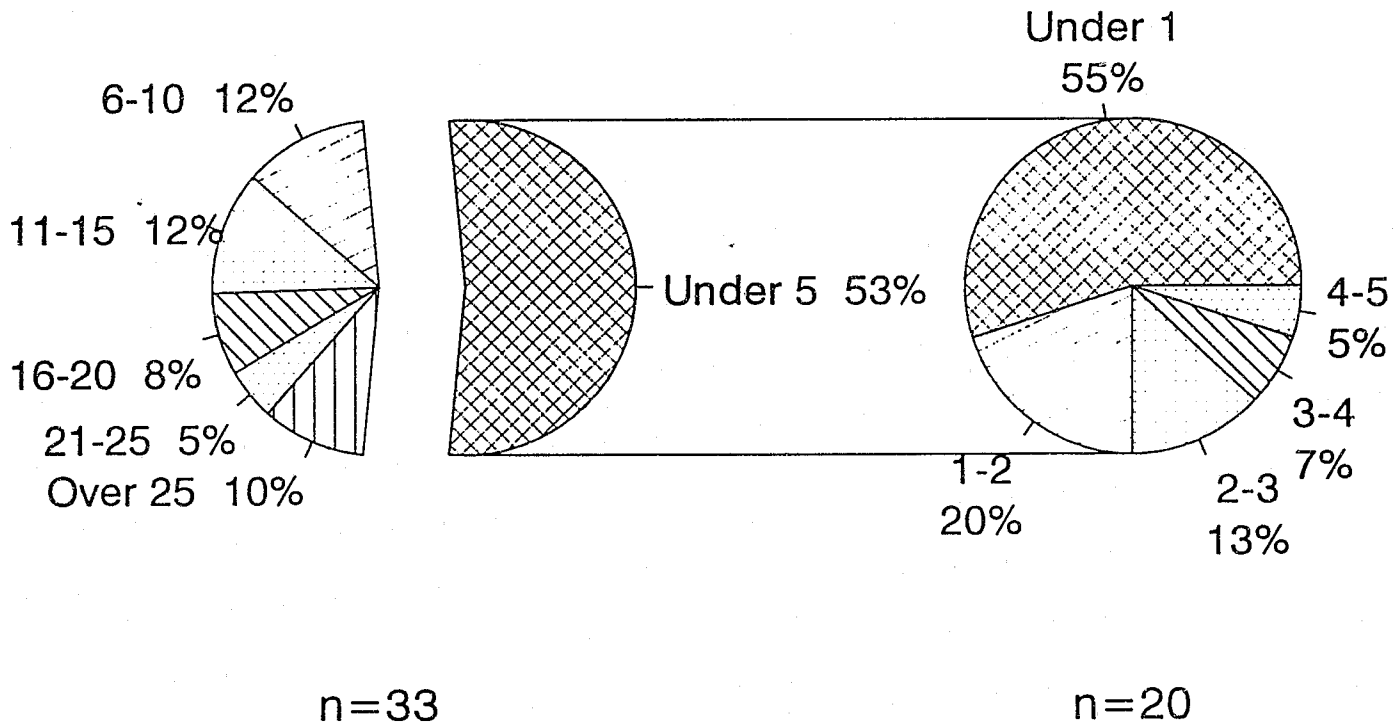
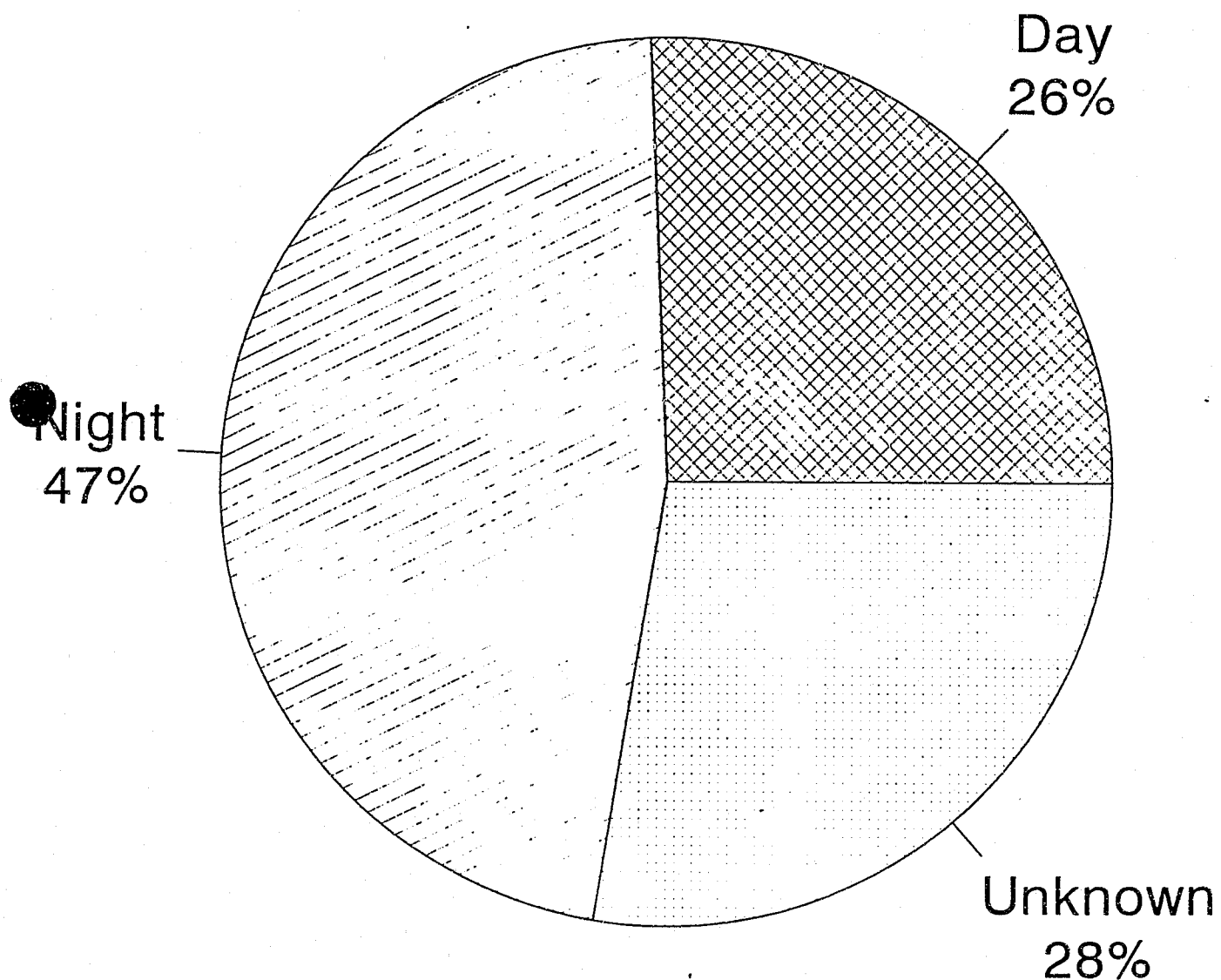


Figure 2.2.1

Time of Burglary

● U.S. Total for Nonresidential Properties



● Figure 2.2.2

also attracts burglars. New retail stores also tend to display new valuable merchandise in their windows, while their more experienced counterparts may display sale and clearance items in their windows. This merchandising philosophy will attract burglars to newer stores. It is much easier for a burglar to take merchandise sitting in a window, then to go inside and look for something of value to take. Finally, many businesses may not think to install an alarm until they've become a victim of burglary.

Common belief is that most commercial burglaries occur at night. National statistics confirm this belief. Figure 2.2.2 shows the time of over one million nonresidential burglaries committed in 1992. For all cases, almost half happened at night, while 28 percent were unknown and the remaining 26 percent occurred during the day. However, removing the unknown cases shows that almost two out of three, or 64 percent of all commercial burglaries occur at night.

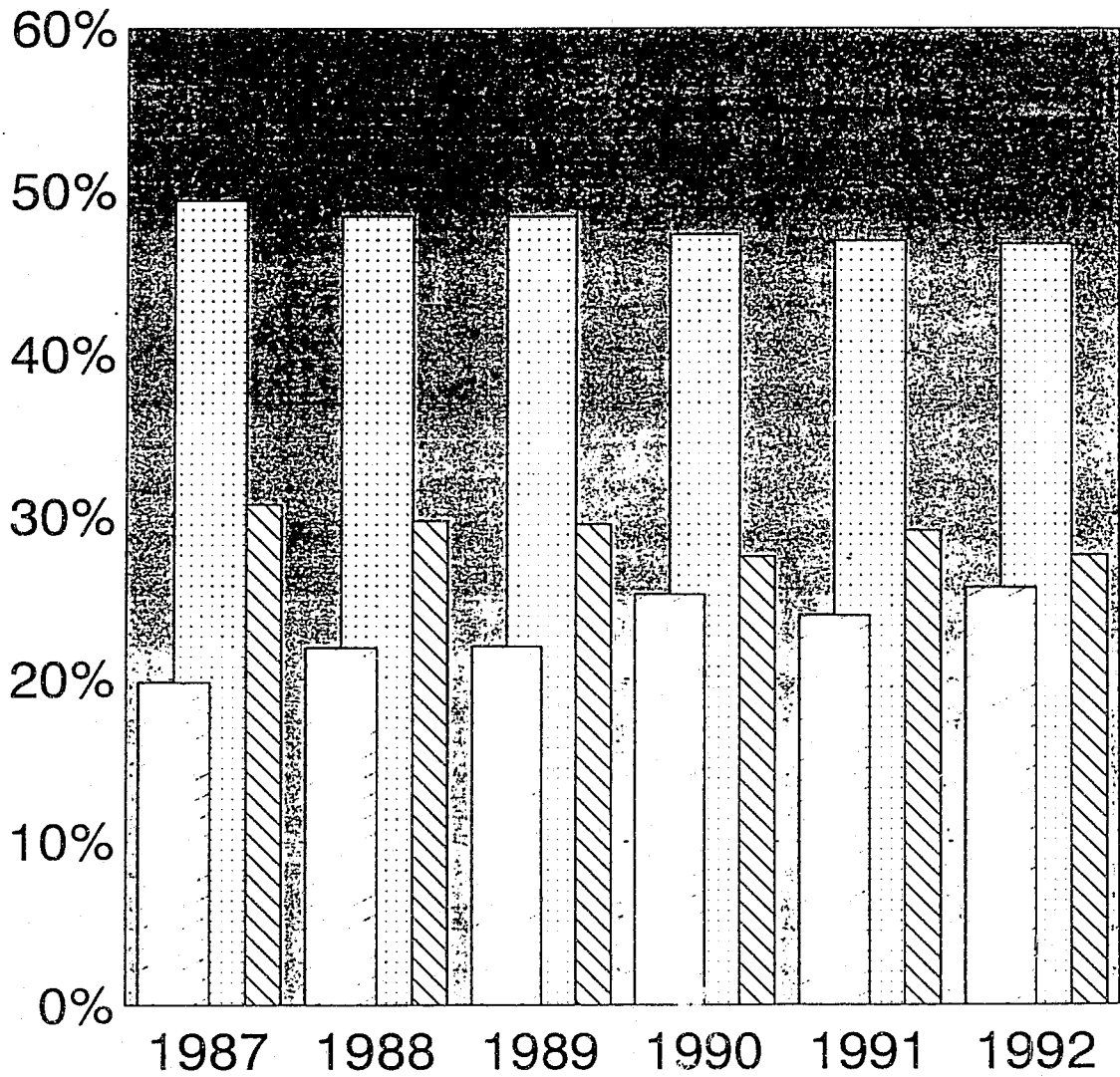
Commercial burglaries happen at night for obvious reasons. More often than not, commercial properties are unoccupied at night. So, the burglar does not have to be concerned with being caught by someone on the premises. Also, since commercial properties are geographically concentrated, the surrounding area is inactive during off work hours. Night hours provide burglars with the cover of darkness. This maximizes the burglar's entry time, while minimizing the risk of being noticed by passers by.

Figure 2.2.3 shows the trend of burglary timing for the past six years. The nighttime burglary rate has remained fairly consistent although it has decreased slightly from 49.4 to 46.7 percent. The unknown cases have also moved in a downward trend during this time period from 30.7 to 27.6 percent. Daytime burglaries, however, have fluctuated during this time period.

Residential burglaries, on the other hand, exhibit an opposite trend. Figure 2.2.4 shows that most residential burglaries occur during the daytime. Percentages of daytime burglaries have increased over time, mainly due to women working as opposed to staying home. Nighttime residential burglaries have remained

Time of Burglary

Nonresidential

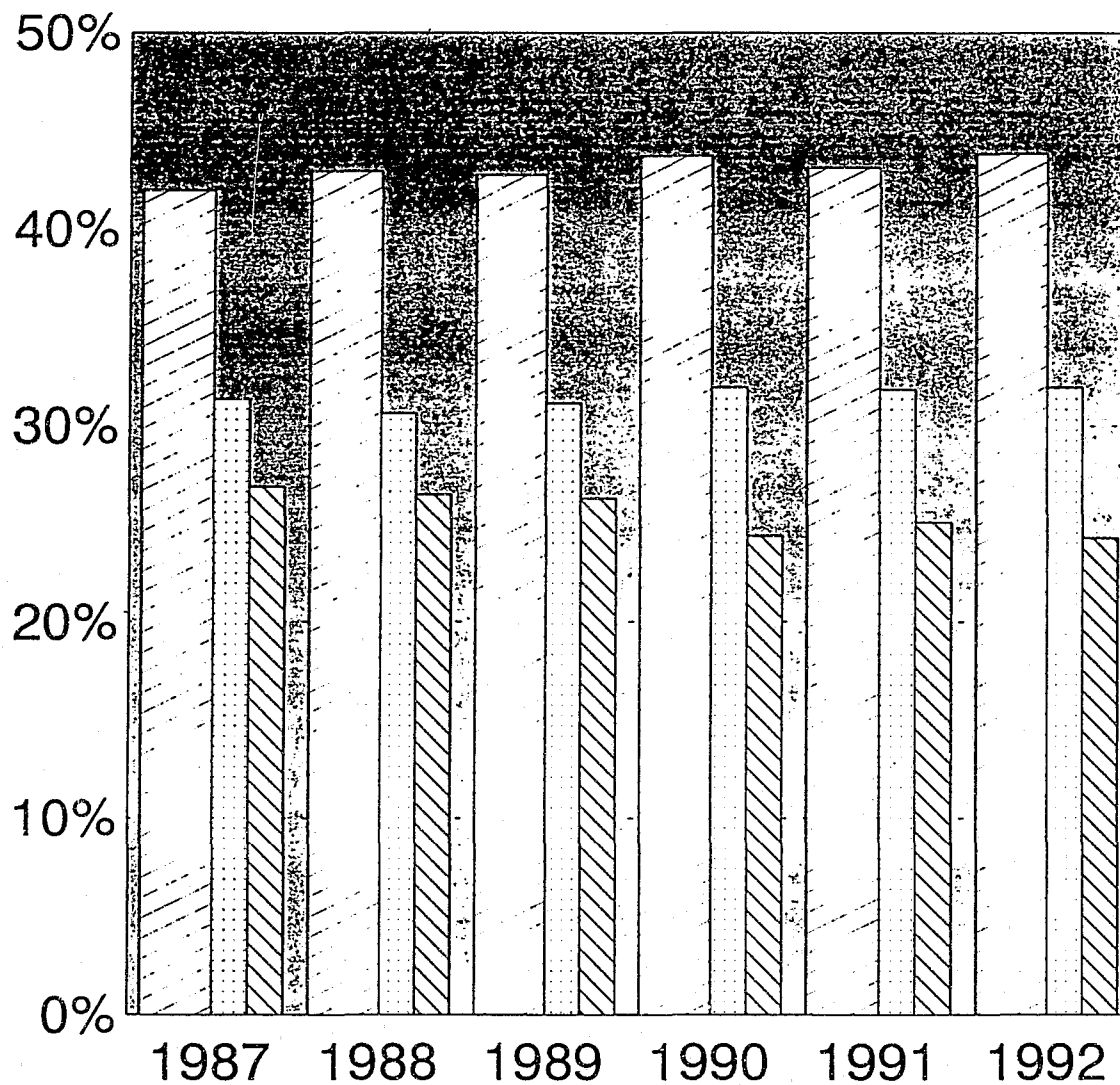


Day		19.8%	21.9%	22%	25.2%	23.9%	25.6%
Night		49.4%	48.4%	48.4%	47.3%	46.9%	46.7%
Unknown		30.7%	29.7%	29.5%	27.5%	29.1%	27.6%

Figure 2.2.3

Time of Burglary

Residential



Day		41.9%	42.9%	42.7%	43.7%	43.1%	43.8%
Night		31.3%	30.6%	31.1%	31.9%	31.8%	31.9%
Unknown		26.9%	26.5%	26.3%	24.4%	25.1%	24.3%

Figure 2.2.4

consistent at around 31 percent during this time period. This is when most family members are home and a burglar is most likely to be caught. Not surprisingly, the residential unknown cases are lower than they are for commercial. People do not always know when an intruder has entered their work premises, especially on weekends when nobody has been there for two days, but they do know when an intruder has entered their homes.

2.3 Summary and Policy Implications

Commercial burglaries occur on the corridor of major thoroughfares. The vicinity of familiarity routes often traveled by burglars is highly exposed to burglaries. The decision process leading to target selection begins here. Burglars prefer neighborhoods with high market values, high business concentrations and areas that are highly familiar. Within these neighborhoods, the chance of burglary increases with distance from major thoroughfares. However, some major arteries exhibit high burglary probabilities. Those roads tend to have lower business concentrations than other major arteries and have less consistent pedestrian and auto traffic patterns. Corner properties are 1.7 times more likely to be burgled than properties in the middle of a block. Proximity to schools, parks, woods and convenience stores also increases a firm's risk of burglary.

Office parks bear the highest proportion of burglaries. Retail stores, single office buildings and sole occupant buildings follow in that order. In all cases, alarms reduce the risk of burglary from one and a half to fourteen times. Burglars entered 85 percent of all commercial properties through the front door or a window.

Younger businesses are the most likely targets of burglary. Fifty three percent of all burgled businesses were in their first five years of operation. The greatest share of those are in their first year of business. As the age of the business increases, the burglary shares decrease. This is consistent with earlier findings

on residential burglaries. The reason is that young businesses offer newer merchandise and/or equipment with high fence value. New businesses are also more attractive and appealing, suggesting that more attractive loot is available.

Finally, the majority of nonresidential burglaries occur during the nighttime. Between 49 and 64 percent of burglaries were committed at night, while in 30, the times are unknown.

The information contained in this chapter is important to industry associations, businesses and police. Statistical data can be used by industry associations to increase visibility and credibility with police and the general public. Associations should be used as a source of information. They should frequently provide the media and consumers with balanced information about burglary patterns and security measures. The evidence is clear that alarms protect. Sharing such information provides a great service to association members.

Industry associations can also use the information in this report to promote alarms through other industries, including the insurance and locksmith industries. The insurance industry, for example, serves as a potential advocate of alarms. Through alliances that will be mutually beneficial to the insurance and security industries, alarms and security measures could further be promoted. Information sharing could help the insurance industry better understand a business' burglary risk factor and, thus, make suggestions that will protect itself as well as its clients.

Tensions between police and alarm associations could also be reduced through information sharing. Police would benefit from the statistics presented within this report. The information may aid in preparing budget and manpower requests or in designing effective patrol patterns. Industry information sharing efforts aimed toward police will lay a foundation for a more cooperative relationship.

The information provided in this chapter could guide installers' and dealers' marketing efforts. We have shown the high risk businesses to be new businesses, suites in office parks, businesses on low traffic thoroughfares and establishments located

near parks, woods, schools and convenience stores. Information provided in chapters 3 and 6 will help to overcome sales objections to these businesses.

Finally, the data provided on points of entry may help manufacturers and installers design simple but effective systems for commercial customers. As most break ins occur through the front door or a first floor window, these are the zones toward which protection should be focused. Simplicity will offer the best mix of protection and satisfaction.

Chapter 3

Commercial Alarm Owners

This chapter intends to aid dealers in their sales efforts. The findings are based upon the questionnaires sent to commercial alarm owners and the control group of non-owners. The chapter will trace the buyer's decision process: the reasons why alarm owners buy a system and why non-owners do not. Once the decision to buy an alarm is made, then the installer must be selected. Related issues include alarm system features and perceptions about alarm prices. Finally, it is important to know whether owners are satisfied with their purchase decision after alarm installation. System satisfaction is an marketing concern since referral is an important source of new business.

Successful marketing depends largely on the nature of the product or service. An alarm system is an electronic device with features with which most consumers are unfamiliar. Consumers are usually aware of household electronic equipment features. But, when they need more help or information, they can refer to the **Consumer Reports Annual Buying Guide**. Burglar alarms differ from these products for two reasons; they are custom designed and have a very strong service component attached. No two installers will design the same system for an individual structure. The number, type and location of sensors, number of zones and key pads will differ from one installer to the next. When a business acquires an alarm system, it also acquires other services including long term monitoring, education on system use, false activation related services and maintenance and repair services.

The nature of alarm systems requires marketing methods that stress the significance of the service aspect and the importance of the company's long term and reliable record. Alarm ownership and installation require more than hardware, so the best price isn't always the best deal. If the installer is unreliable or goes out of business, the system may become non-functional after a short

time. In long term public relations efforts, associations should emphasize the importance of alarm related services to the public. It is better for the industry to educate customers and provide information about reliable service providers than for the state to license alarm companies.

3.1 Why Businesses Purchase Alarms

Alarm owners were questioned about the event(s) which led to the purchase decision. In addition to the five explicit choices provided in the questionnaire, respondents were given space to write in other reasons. Most respondents stated property protection, rather than personal protection, as the motivation for purchase. Figure 3.1.1 shows that 25 percent of respondents stated that the insurance company requirement prompted alarm installation, 24 percent installed after experiencing a burglary, and 23 percent stated that they could afford better security for their property. Two basic comments appeared among the open ended responses; the head office requires alarm installation and the company carries merchandise that is highly valued on the street. Interestingly, many stated that the widespread use of drugs motivated them to install an alarm.

Commercial managers need one reason to install an alarm while homeowners need 1.43 reasons, clearly making the commercial sale easier. Figure 3.1.2 shows that the majority of respondents, 44 percent, installed an alarm for only one reason. Only 17 percent of the respondents needed two or more reasons.

It is important to understand why some businesses choose not to install alarm systems. Such information may aid installers and dealers with efficient marketing. Installers can put many resources and a great deal of effort into marketing methods which may be unproductive. Question 9, asked non-owners to rank the reasons they don't own an alarm. The respondents were offered eight alternatives plus the option to write in answers we may not have considered. The results reveal the many reasons businesses

Motivation for System Purchase

Commercial Properties

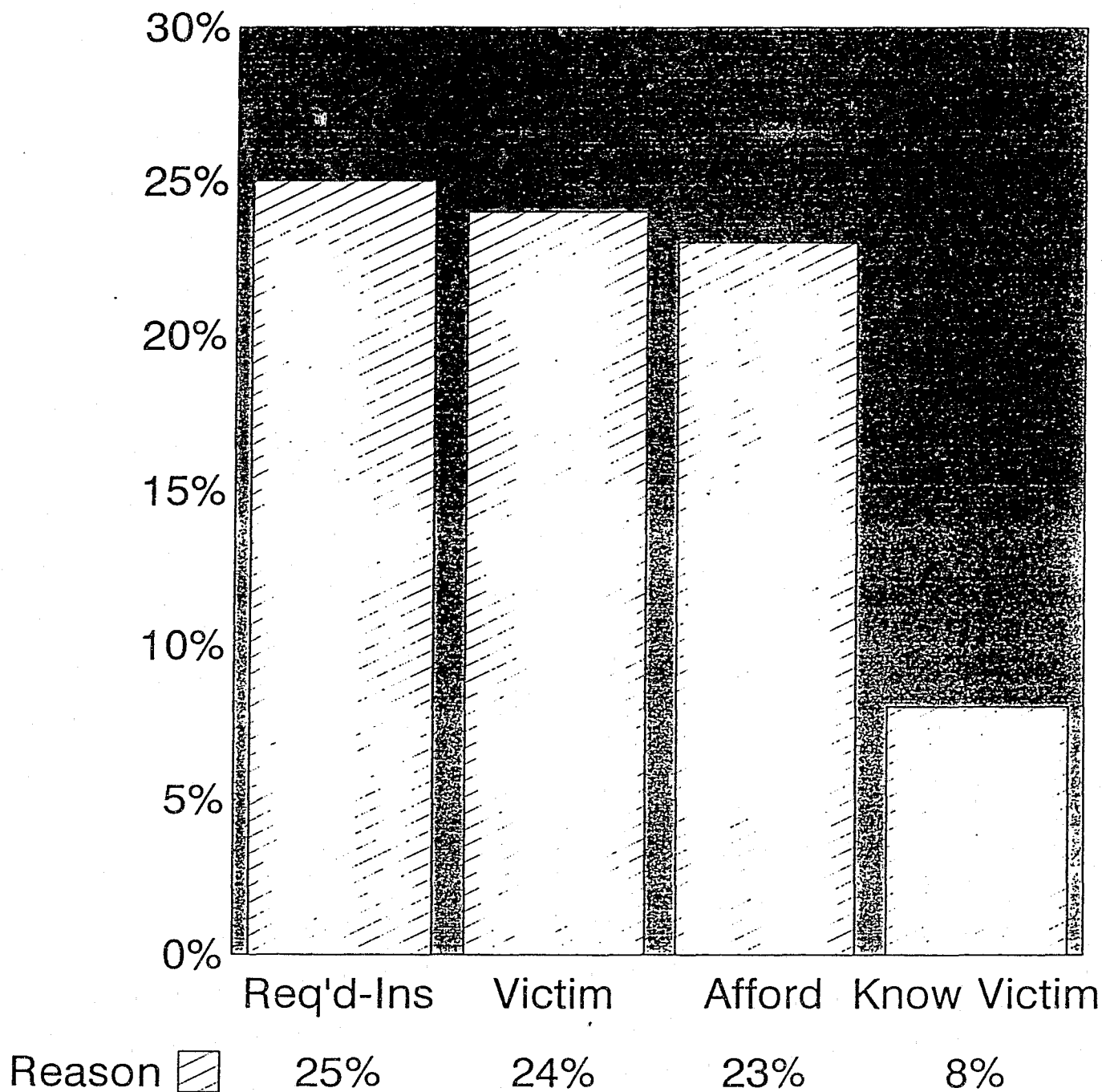


Figure 3.1.1

n=181

Multiplicity of Motives

Commercial Properties

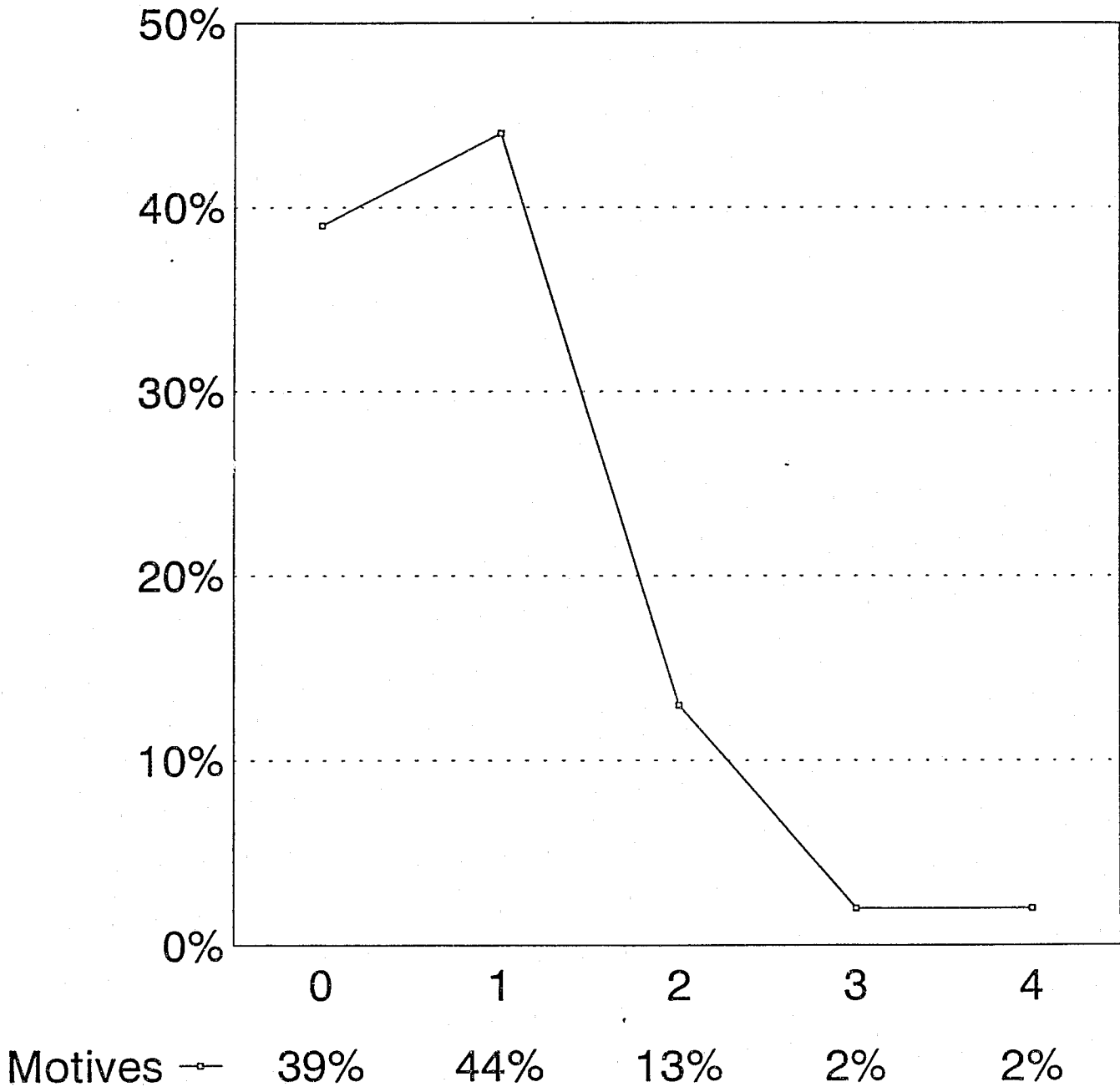


Figure 3.1.2

43

n=181

don't own alarms and their relative importance. Figure 3.1.3 shows that 30 percent of respondents felt that they have adequate security, 22 percent claimed that an alarm would be too expensive, 16 percent never thought about it while another 16 percent felt that false activations would be a nuisance.

Retailers who do not own alarms gave three reasons. The most frequent reason given is that only small amounts of cash are kept at these locations. Another reason was that these stores have nothing worth stealing. Lastly, some retailers feel that because the store is open 24 hours a day, 365 days a year they don't need an alarm. Non-owners perceive the alarm mainly as a deterrent or detector for when a store is closed. They are unaware of or unconcerned with the personal safety which panic alarms may provide their employees. This probably stems from the business owners' basic concern for property, rather than personal, protection. The availability of a panic alarms, which are aimed toward personal protection, is rarely considered in the commercial alarm purchase decision.

Offices use alarms for reasons similar to retailers, i.e. protection of property with little regard for personal safety. Our study area includes many office parks and single standing office buildings. The most common reason stated for alarm installation in offices was the presence of expensive computer equipment. But, more importantly, the alarms are installed to prevent the possible loss of programs and data files, which are difficult and expensive to replace. Insurance payments do not cover the replacement costs of such files.

Comparing the results of figures 3.1.1 and 3.1.3, expense and affordability stand out as important factors in the alarm purchase decision. Even though installation prices have declined in recent years and monthly monitoring fees can be low, the public still perceives alarms as luxury goods. Alarm associations can alter this inaccurate perception through public relations. Such a campaign should focus on alarm affordability and can be complemented by appropriate dealer advertising. Effective public

Why Businesses Don't Own Alarms

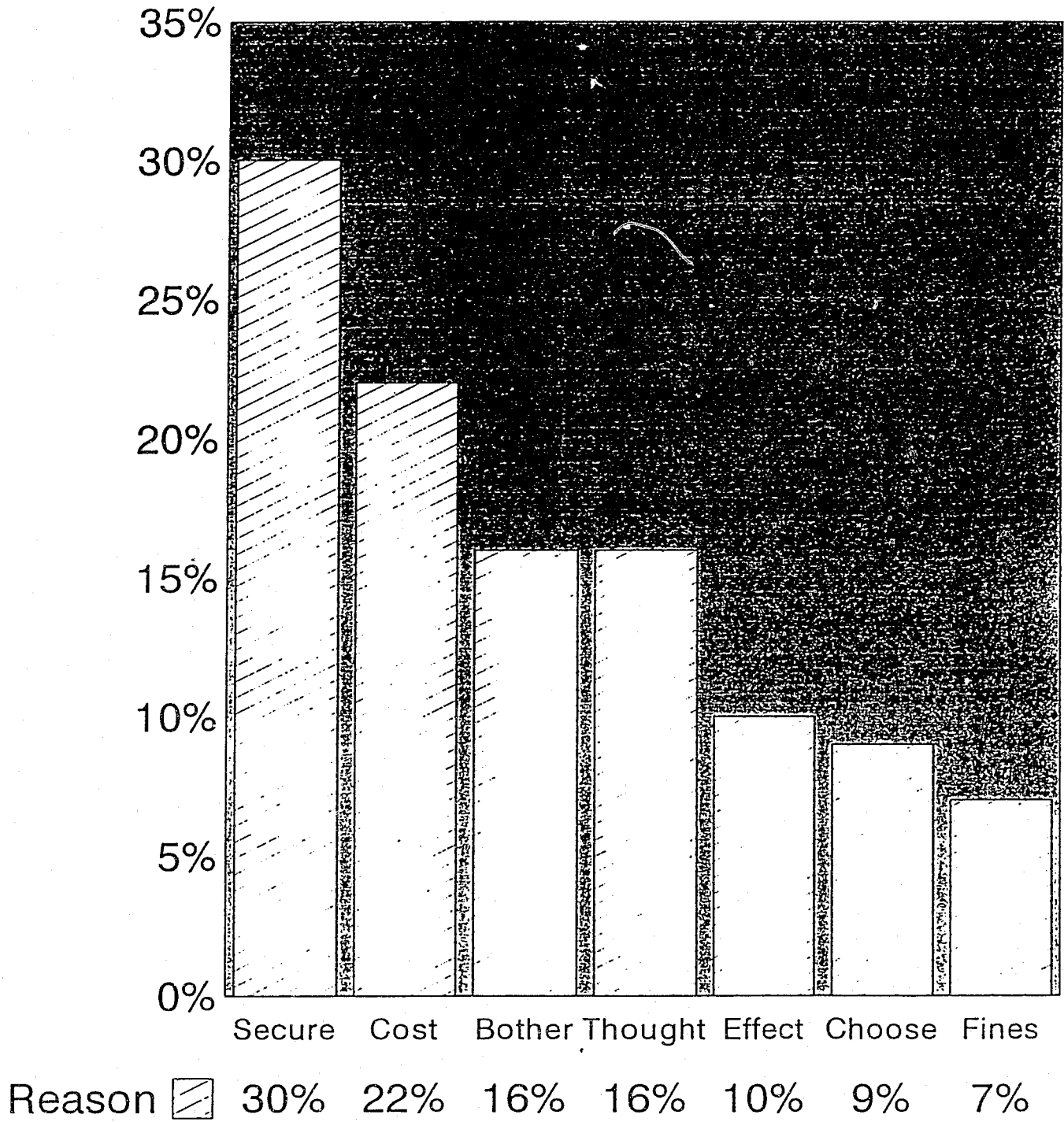


Figure 3.1.3

45

n=69

relations should also discuss insurance discounts and the benefits of alarms.

Alarm owners were requested to elaborate on reasons that prompted the purchase. Over 80 percent of alarm equipped businesses installed alarms solely to protect property, while the majority of households purchased a system for personal protection. Remoteness and proximity to shopping malls, concealed entrances, and vacancy after work hours were the main reasons businesses bought alarms. Indeed, the empirical evidence depicted in sections 2.1 and 6.1 confirm that the higher the concentration of businesses in an area and the further businesses are located from arterial roads, the higher the chance for break ins. Thus, business owners correctly sense their vulnerability to burglary and decide to install an alarm.

Retailers purchase alarms if they carry expensive merchandise or expect to occasionally stock valuables that are not fully recovered by their insurer in case of a break in. Retailers that don't own alarms stated that audible alarms often sound in the mall or in the retail district and nobody pays attention. Many retailers are unfamiliar with connection to a central station and panic buttons, and the benefits that stem from both. Marketing efforts aimed toward retailers should stress the various features of alarms and the benefits each can yield to the protection of the store.

The survey showed that chain stores, corporate subsidiaries, bank branches, and government offices are required by their respective home offices to install an alarm. More often than not, the system specifications and the installers are chosen by the home office.

Turning back to figure 3.1.2, we find that it is easier to sell alarms to businesses than to households. Businesses need only one motive to purchase an alarm, while residences need two. Documented statistical evidence from this report is expected to aid dealers and installers persuade businesses to invest in systems and to overcome sales objections. For example, the main objection to

Victim Acquaintance

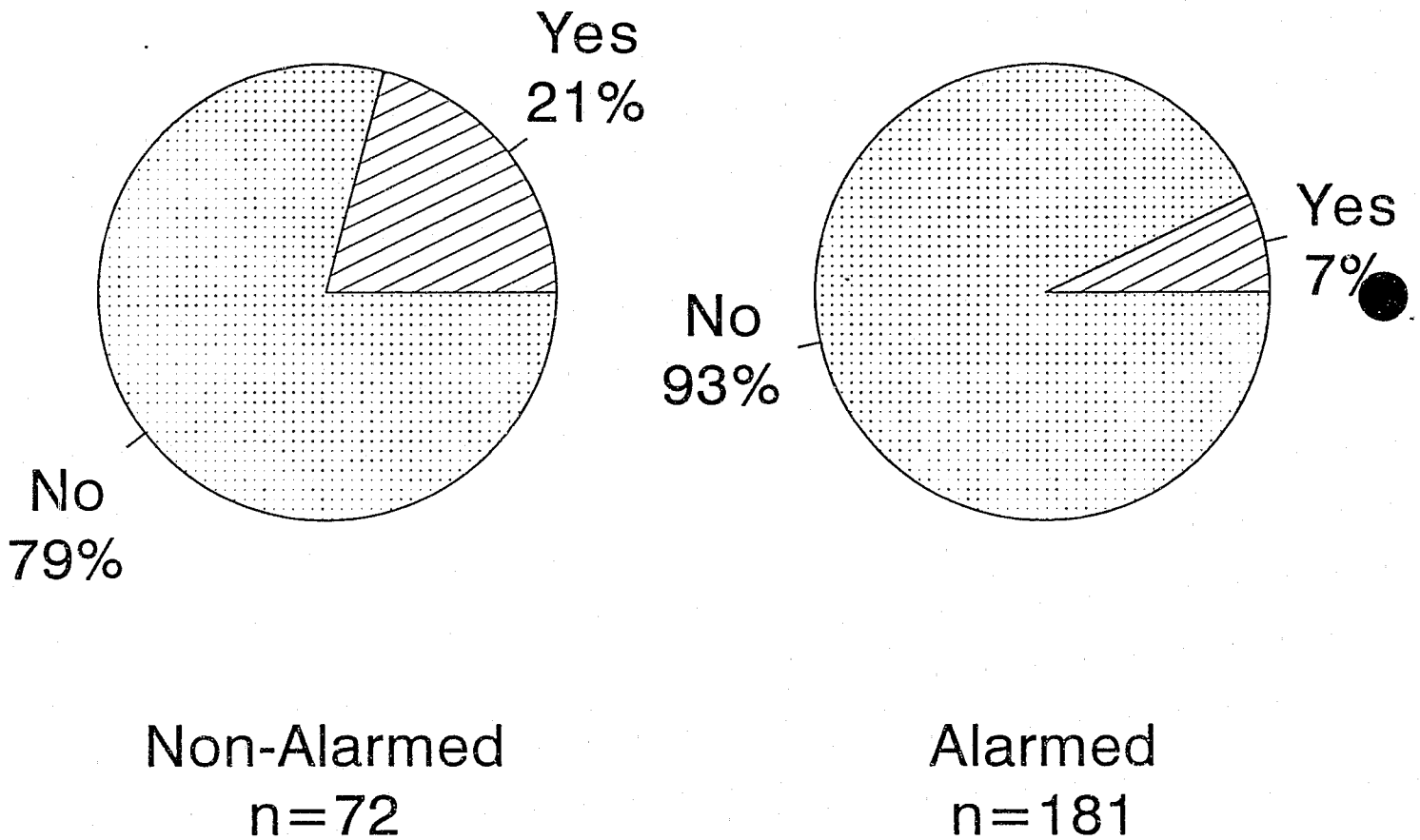


Figure 3.1.4

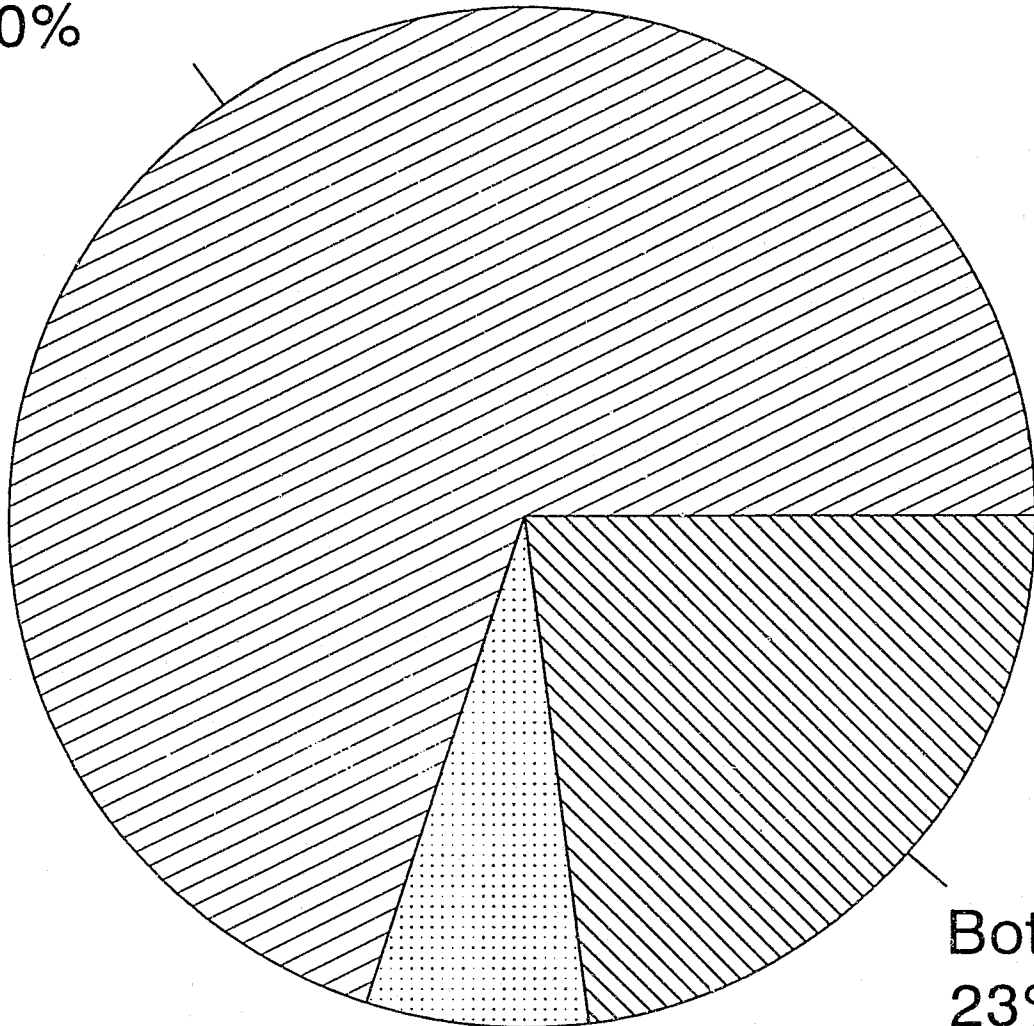
an alarm system purchase is the expense involved (figure 3.1.3). By showing that savings on insurance premiums can cover much of the cost while increasing protection to the property, that objection may be overcome. However, the salesperson must first establish that the insurance discount is applicable as the current discount structure for protective devices is inconsistent from one insurer to the next. Insurance discounts are discussed in more detail in the following section.

When a burglary occurs to a neighboring business it appears that businesses, like households, choose to buy alarms. Figure 3.1.4 demonstrates that when burglary does not occur, businesses do not feel the urgency to purchase alarms. Indeed 79 percent of businesses which do not own alarms are unfamiliar with burglary victims and therefore did not purchase a system. It suggests that businesses which neighbor other victimized businesses are likely to purchase systems.

Understanding business' motives in the alarm purchase decision may provide marketing insight and aid to installers and to the industry as a whole. One finding addresses business owners motives. Figure 3.1.5 shows that 70 percent of businesses install alarms just for the burglar detection attribute. Indeed, public perception is that the role of alarms is to protect against burglars. Our research has shown that homeowners mainly purchase alarms for personal protection while businesses do so for property protection. Protection from fire is considered a byproduct of alarms even though the chance of fire is appreciable. Further, personal injuries and fatalities from fires are devastating and property damage is much larger from fire than from burglary. In 1990, fire departments responded to a fire every 16 seconds and there was a structural fire every 50 seconds. 156,000, or 25 percent of all structural fires were in commercial establishments. The highest fire incidence rate, 10.2 fires per 1,000 people, occurs in the South. Promoting the importance of all alarm features may help to change public perceptions and attitudes about alarms. Changing attitudes through appropriate industry public

Most Important Feature

Burglar Detection
70%



Fire Detection
7%

Both
23%

Figure 3.1.5

relations efforts and individual installers' marketing efforts could increase alarm sales.¹

3.2 Insurance Discounts

The insurance industry, as well as insurance discounts, could be powerful vehicles for alarm sales. Alarms reduce commercial loss exposure to fire and burglary while insurance discounts effectively lower the cost of alarms. However, a lack of communication exists between the two industries. As a result, insurance discount policies are erratic from one company to the next and the insurance industry does little to promote alarm installation.

Table 3.2.1 is a sampling of premium discounts offered by a number of insurance companies. Discounts range from two to 25 percent depending on the company and the level of protection. But the protection requirements also differ from company to company.

The current premium discount structure is not only erratic, but it is also ineffective. In another study we showed that discounts are cost effective to insurers.² The amount sacrificed on discounts is less than the savings on claims that would have been paid for burglaries prevented by alarms and fires which were controlled. But, in order for insurers to decide whether premium discounts are worthwhile, the following questions need to be addressed:

1. Are alarms effective in deterring intruders or preventing break ins and spread of fires?
2. Were alarm owners aware of discounts and take them into account when purchasing their systems? A related question is whether non owners are aware of the discounts.

¹ Source: National Fire Protection Association, Fire Experience Survey, Fire Loss in the United States During 1990.

² See Andrew Buck, Simon Hakim, and Mary Ann Gaffney (1993), "Are Discounts on Homeowners' Premiums for Burglar and Fire Alarms Cost Effective for Insurers?". CPCU Journal, Vol. 46, No. 2, (June): Pp. 107- 111. Also, A. Buck, S. Hakim and M.A. Gaffney (1993), "The Residential Security System / Homeowners' Insurance Discount Connection", Security Dealer, (April): Pp. 28-33.

Table 3.2.1
Insurance Discounts

<u>Company</u>	<u>Discount</u>	<u>Protection Requirements</u>
Aetna	25% Max	Central Station or Direct Fire Central Station or Direct Burglar
Allstate	15% Max	Central Station or Direct Fire Central Station or Direct Burglar
Nationwide	15% Max 5%	Central Station or Direct Fire and/or Burglar Locally Audible and Smoke Detectors
Prudential	20% Max	Central Station Fire and/or Burglar
State Farm	15% 5%	Central Station or Direct Fire and/or Direct Burglar For any of the following: smoke detectors, dead bolt locks, fire extinguisher
Travellers	10% 5% 2%	24 hour private monitoring Alarm connected to police or private guard service Locally audible alarm
Zurich-American	5% 2%	Fire and/or Burglar Central Station Smoke Detectors

3. Do alarms provide net return to insurers? Or, in other words, is the total amount sacrificed on discounts less than the avoided payments on burglaries and fires to victims?

A negative answer to any one of the three questions suggests that it is not worthwhile for insurers to offer discounts. Clearly, the rationale is that net return is the insurers' primary objective when offering discounts.

In response to the first question, chapter 5 demonstrates that the chance of burglary is 4.57 times higher for unalarmed commercial establishments. The answer to the second question is intriguing. In figure 3.1.1 we saw that 25 percent of businesses installed alarms because their insurers' required them to do so. Figure 3.2.1 shows that only 9 percent of businesses took the discount into account when they had free choice in the purchase decision. Of non owners, only two percent know that their insurer offers a discount for alarm ownership. These findings are consistent with the residential findings. Homeowners did not consider insurance discounts in their decision to buy alarms and non owners were unfamiliar with the discount policies of their insurer.

Finally, alarms can deter burglars and prevent the spread of fire. However, if the loss in premiums due to discounts is greater than the claims from burglary and fire, then insurers are better off not providing discounts. The benefits and costs to insurers were calculated for all properties in Tredyffrin Township.¹ There is one structural fire in the U.S. every 50 seconds. Total fire losses to commercial establishments in 1990 was \$2.53 billion. In our survey, 2.5 percent stated that the alarm detected fire. From Table 1.3.1 we learned that the total number of businesses in Tredyffrin was 776 in 1990. The average loss due to fire is \$6,786 which brings total avoided damages to \$131,648. Now let's determine whether alarms are beneficial to insurers. If we subtract the average business participation at a cost of \$250 per

¹ See Andrew Buck, Simon Hakim and Mary Ann Gaffney (1993), "Are Discounts on Homeowners' Premiums for Burglar and Fire Alarms Cost Effective for Insurers?" *CPCU Journal*, Vol. 46, No. 2, June, pp. 107-111.

Insurance Discount

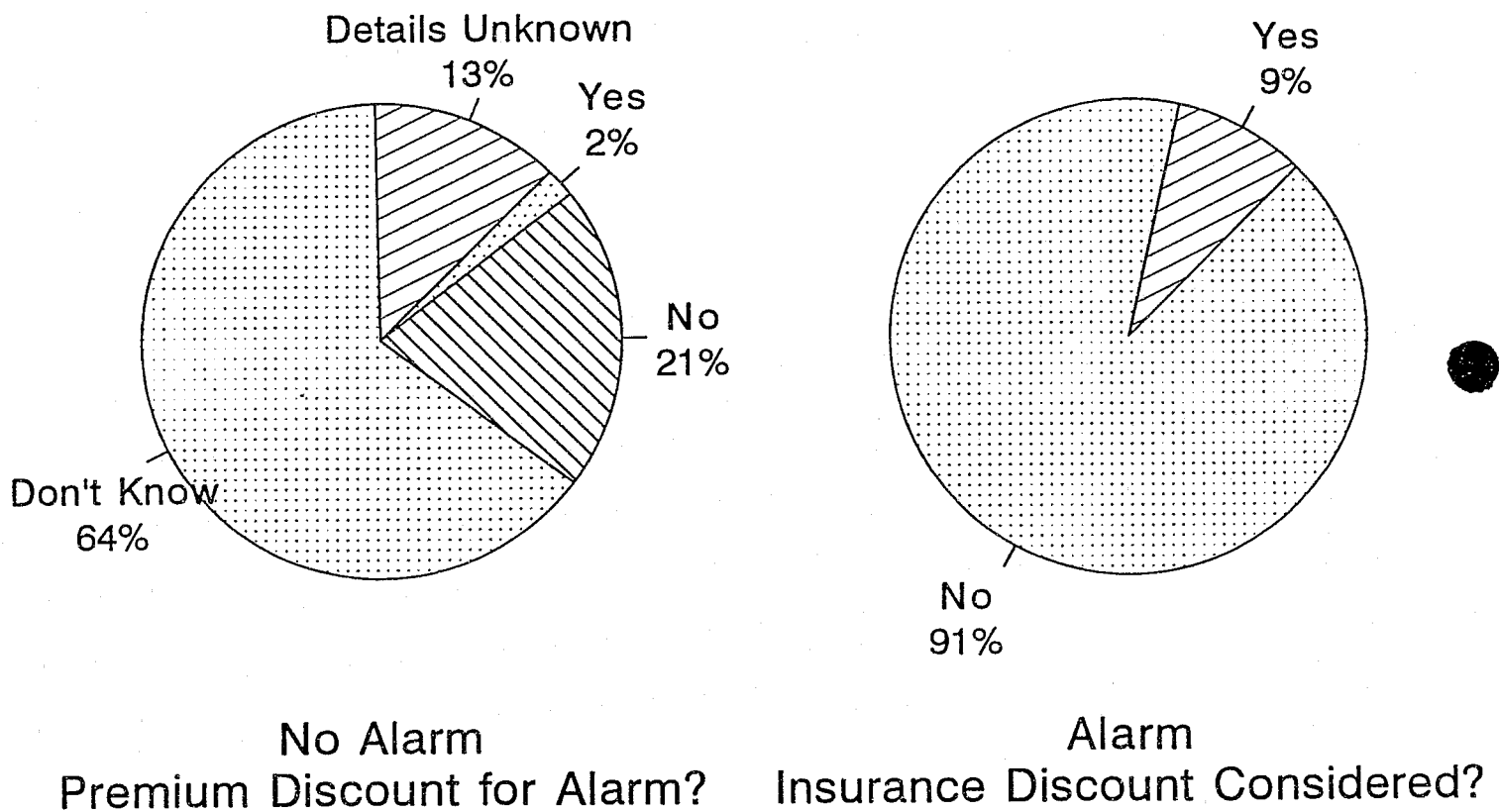


Figure 3.2.1

incident from the total damage, then the cost to insurers is \$126,798. The average discount insurers should offer for the savings on nonmaterialized fires is \$163.40. Since the average business discount for commercial establishments for both fire and burglar alarms is \$80, then insurers definitely save on both burglar and fire alarm ownership.

The results of this study prove that alarms deter intruders and detect fires. Discounts are proven to yield a monetary benefit to insurers. What can we learn from these findings? At present, insurers waste money by offering discounts. Premium discounts are meant to promote alarm ownership to reduce insurance company claims and losses. However, discounts are not considered in alarm purchase decisions. Non owners aren't even aware of the possible savings from alarm ownership. Insurers should encourage alarm purchase because it significantly reduces their loss exposure.

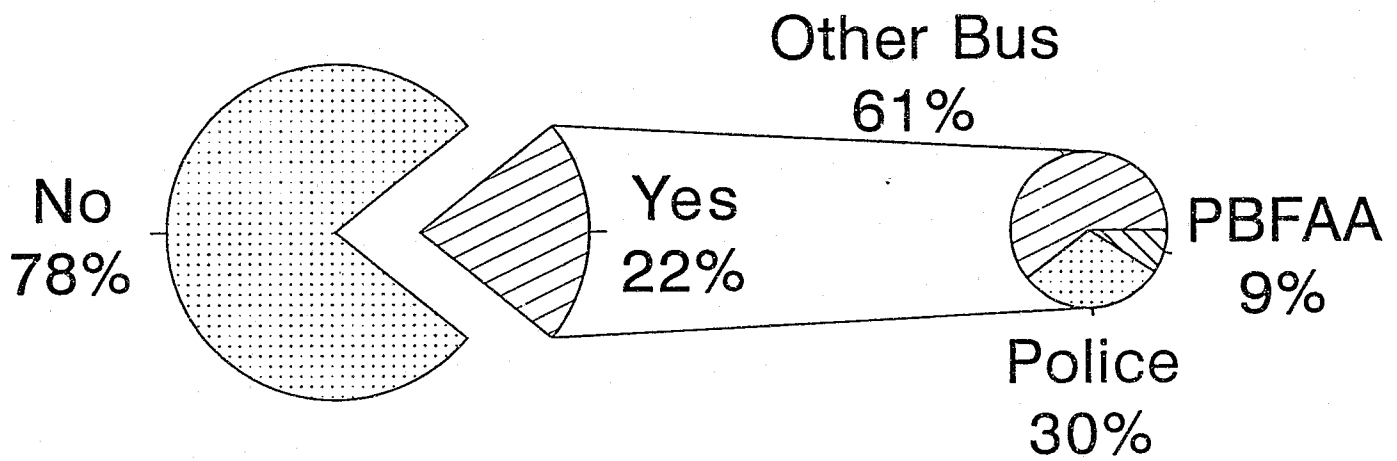
And what are the policy implications drawn from these findings? The alarm industry should join forces with the insurance industry to encourage the purchase of alarms. Joint seminars and brochures should be developed by the two industries. Methods of promoting alarm sales, establishing hardware standards that warrant premium discounts, and listings of installers who provide accepted hardware and adequate service are some of the issues which could be addressed by the industries.

3.3 How Installers are Chosen

The first section of this chapter described what motivates businesses to buy alarms. In this section we concentrate on how installers are chosen. It is important to realize that buying an alarm is not an easy task for consumers. Alarms are complicated electronic devices with which consumers are unfamiliar. Very little unbiased information is available to the public on alarm features and reliable hardware. Thus, potential alarm buyers are forced to rely on partial information available from existing alarm owners.

Advice Sought

Alarm System Purchase



Advice?
n=181

From whom?
n=33

Figure 3.3.1

In the survey, several questions directly and indirectly addressed alarm owners' installer choices. Most of the interesting responses were to the question, "What recommendation would you make to those who are considering alarm installation?" The most common answer was to choose an installer who is reliable, comes well recommended, has been in business for a long time and provides prompt service.

The following question was asked of commercial alarm owners in the three communities: "When buying your alarm system did you seek the advice of: the police department, other businesses, the Pennsylvania Burglar and Fire Alarm Association, other? Explain." Figure 3.3.1 shows that 82 percent sought no advice. Of the 18 percent which did seek advice, 61 percent sought it from other businesses. The alarm association plays a negligible role in providing such crucial information to its public.

Another related question is whether businesses are affected by the same company protecting other firms in the vicinity. This indirect question may indicate that a particular dealer was chosen because of the visibility of its signs in the area. Or, it could be that the business owner consulted with other local businesses about alarm installation and became familiar with a popular dealer. The left chart of Figure 3.3.2 indicates that, indeed, a geographical concentration of alarm companies exists. 49 percent of respondents indicated that the same company has few or many other subscribers in the immediate vicinity.

Businesses which were neither burgled nor alarmed were surveyed as well. They were questioned about how many businesses in their neighborhood are alarm equipped. Figure 3.3.2 illustrates that 82 percent of all respondents didn't know. Thus, the fact that businesses in a restricted geographical area have alarms does not drive unalarmed firms to purchase alarm systems.

Now let's turn to the same two questions addressed to the same two groups of retail establishments. Figure 3.3.3 shows that when retail establishments are concerned then dealers do not acquire new customers just because they have several existing customers in that

Other Systems in Neighborhood

All Commercial Properties

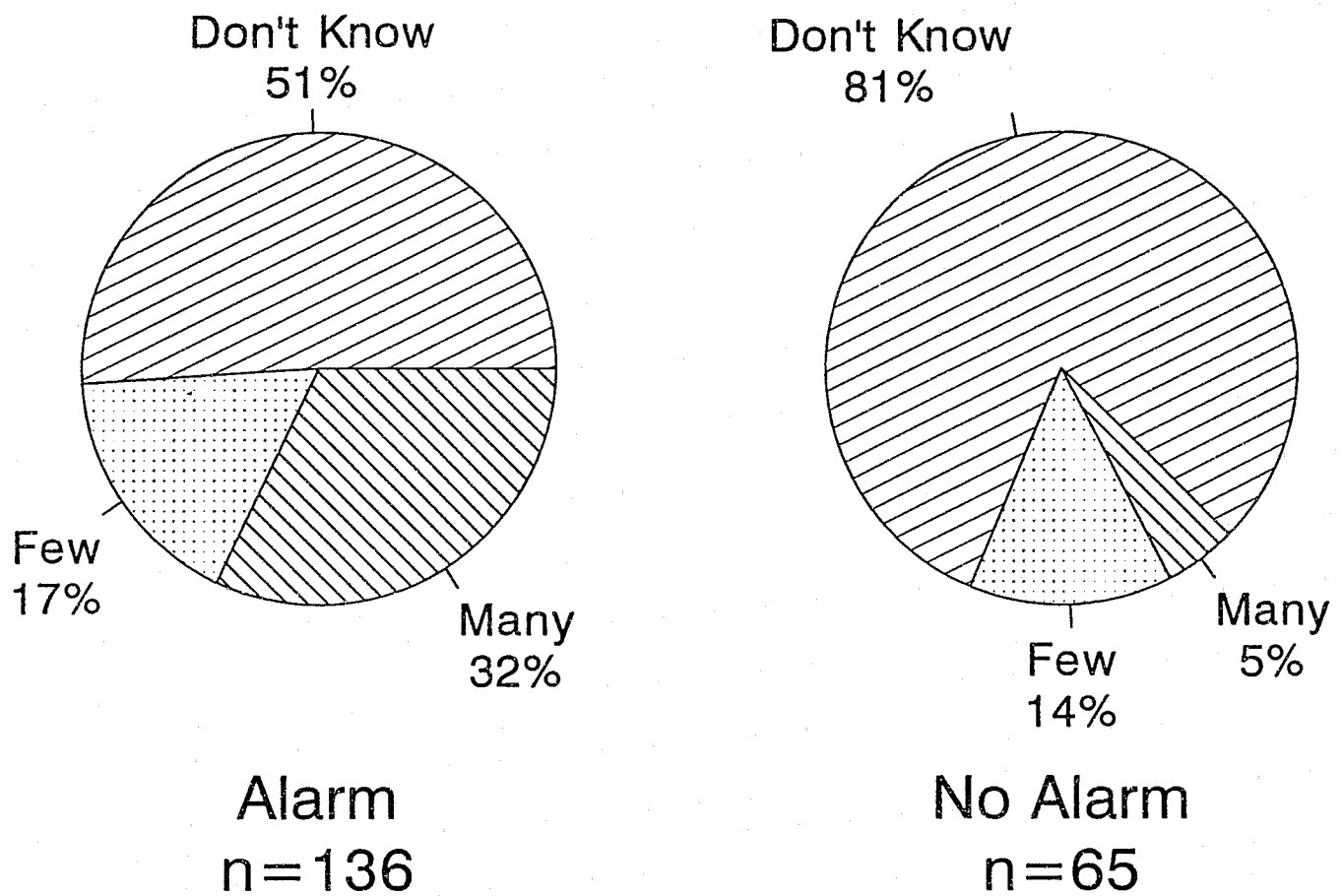


Figure 3.3.2

Other Systems in Neighborhood

Retail Properties

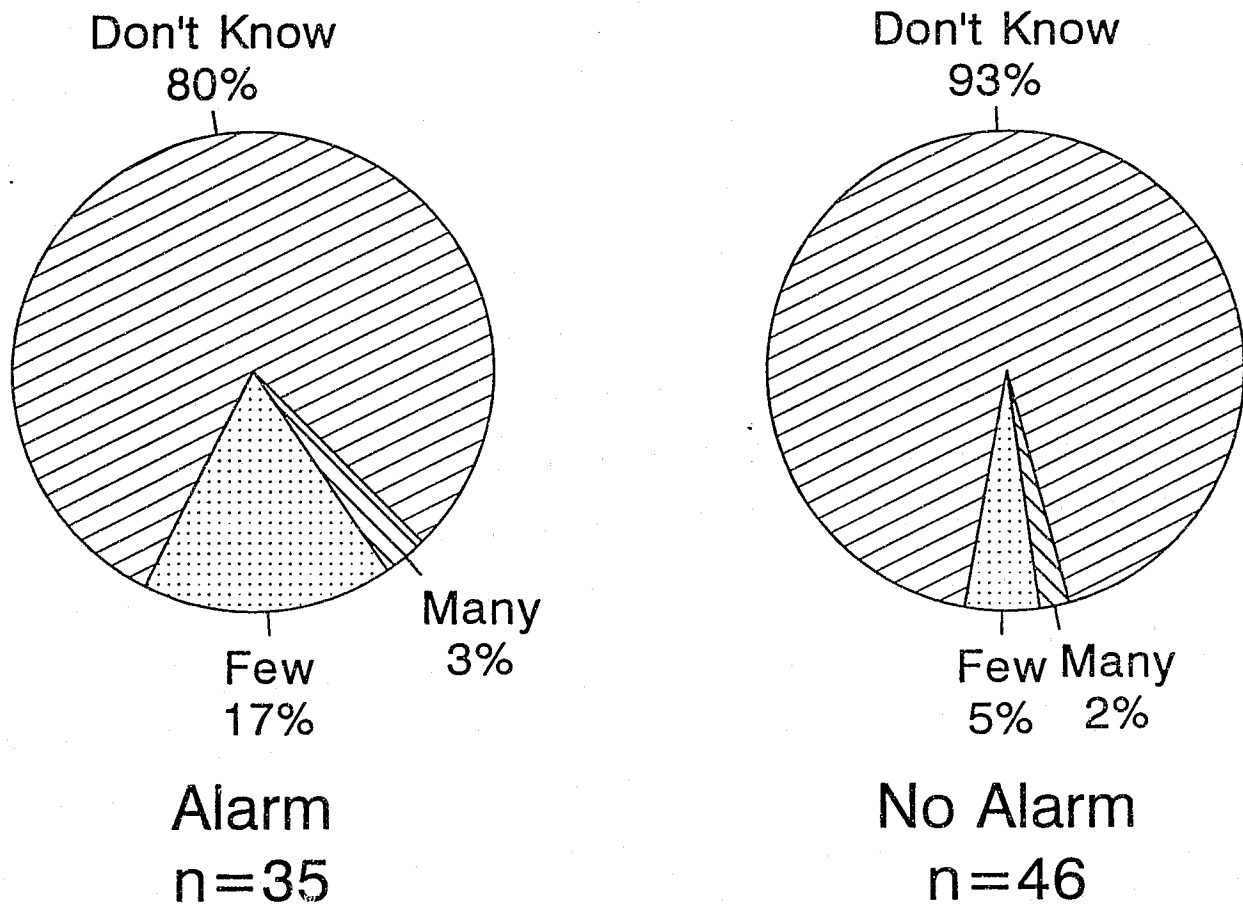


Figure 3.3.3

Alarm-Springfield only
No Alarm-All three townships

limited geographical area.

The findings indicate that businesses understand the importance of service over hardware. A good reputation which results from reliable and persistent service yields more subscribers. Installers should not view their job as complete when a system is installed, but should maintain regular contact with customers especially when false alarms and/or system malfunctions occur.

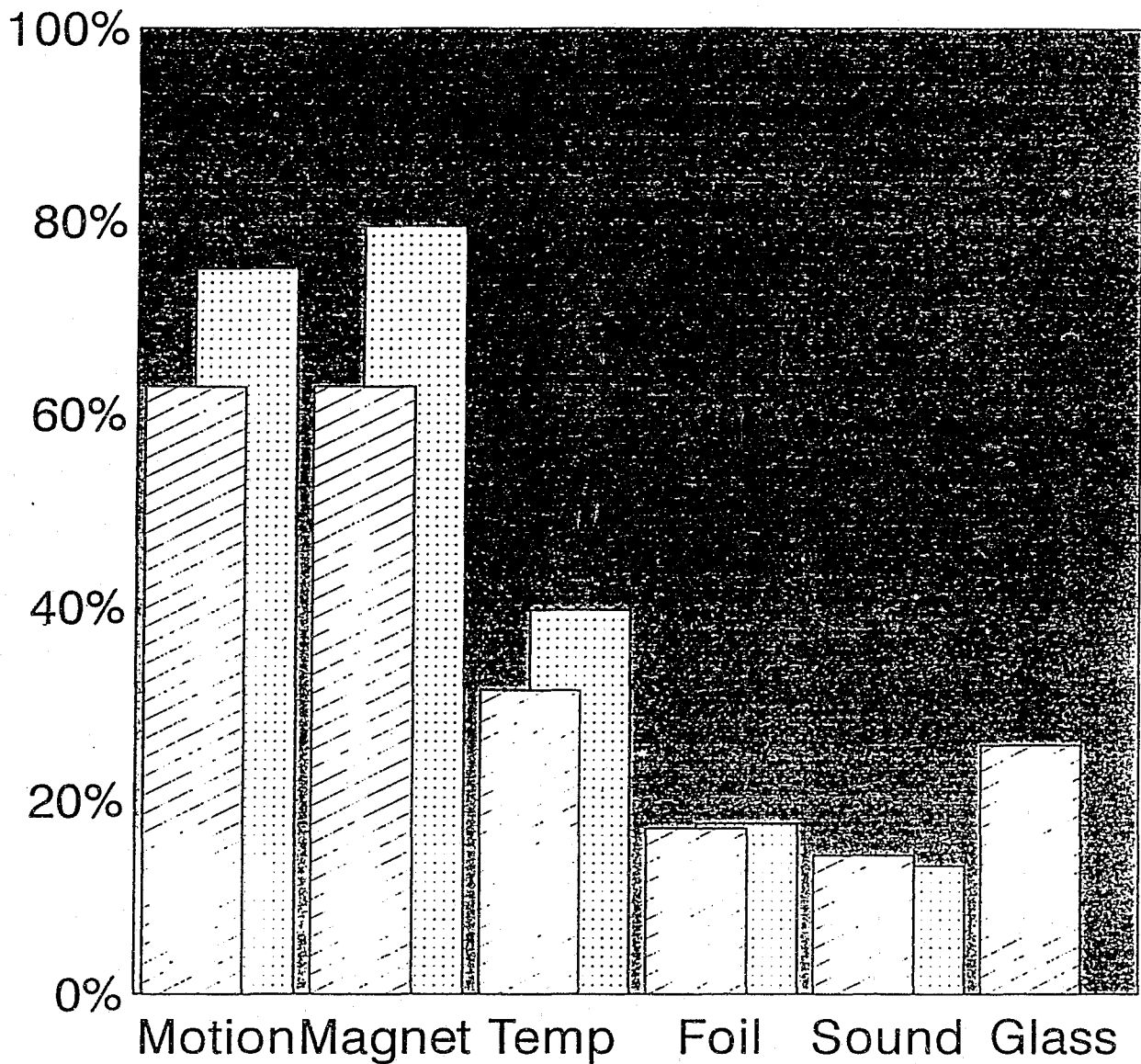
Indeed, dealers are popular geographically and, therefore, are known by businesses interested in installing systems. Businesses appear to consult other businesses in their search for an installer. On the other hand, non owners are not driven to buy systems just because other businesses in the geographical area have alarms.

3.4 Alarm Features

Burgled commercial properties had similar features to their counterparts in residential properties. Figure 3.4.1 shows that the most common sensors in commercial are the same as in residential properties-- magnet and motion sensors. In commercial properties, as in residential, the average is approximately two types of sensors (figure 3.4.2).

An interesting question is whether a yard sign should be posted to indicate the presence of an alarm. One argument says that announcing alarm ownership suggests that valuable merchandise or equipment is available and, therefore, may attract burglars. On the other hand, an advertised alarm may deter burglars who wish to minimize their risks. Considering the fact that over 90 percent of burglaries are drug related indicates that the expected loot is usually small and aimed at satisfying immediate drug needs. Thus, alarms should have a deterring effect on nonprofessional, opportunistic burglars. But what about professional burglars? Conversations with detectives in various police departments suggest that very few burglaries are committed by professional burglars.

System Sensors



T	62.8%	62.8%	31.4%	17.1%	14.3%	25.7%
UM	75%	79.4%	39.7%	17.6%	13.2%	

Figure 3.4.1

Multiplicity of Sensors

Tredyffrin and Upper Merion

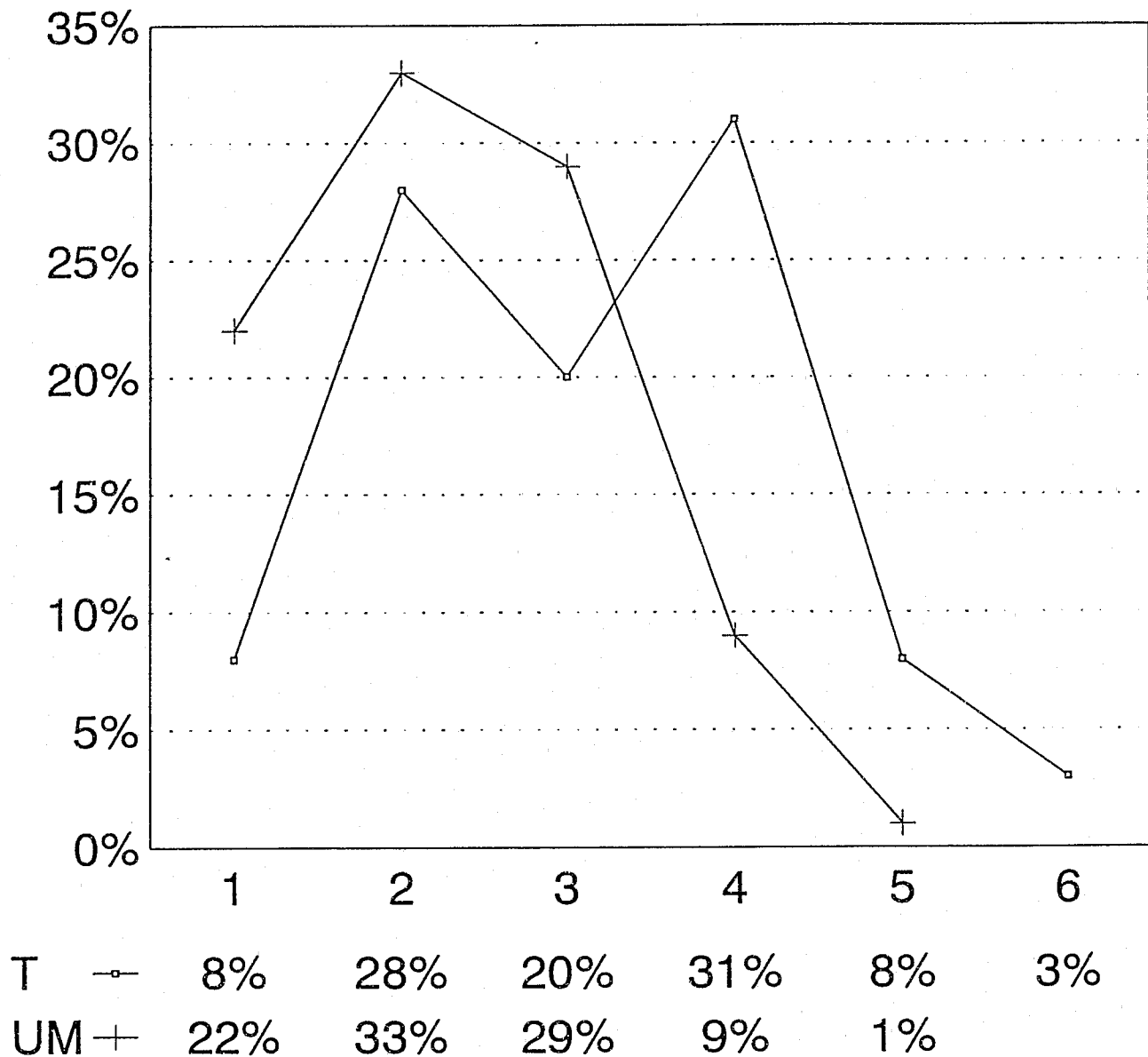


Figure 3.4.2

T=Tredyffrin: n=35; mean=2.11

UM=Upper Merion: n=55; mean=2.6

Glassbreak not an option on Upper Merion Questionnaire

For example, a detective in Greenwich, Connecticut told us that in his fifteen years with the department he came across two (!) professional burglars who operated in the community. Research elsewhere suggests that such burglars choose a target and pursue the burglary regardless of the alarm.

The Figgie Report¹ (1988) surveyed inmates in order to understand crime motives. Burglar alarms connected to central stations, electronic window sensors, closed circuit TV, and private security were rated the most effective security measures by the inmates. The report further revealed that drugs and alcohol were the most often cited reasons for committing crimes. 41.1 percent of the inmates reacted to security measures by shifting to another target in the same area, while another 32.4 percent would shift to another area altogether. Only 26.7 percent would "score" the same target.

Now, let's turn to our survey's findings. Figure 3.4.3 indicates that 51 percent of commercial alarm owners who were not victimized had no alarm sign posted. Of the victimized alarmed properties, 64 percent had no sign. Therefore, it is apparent that the sign indeed deters burglars.

What can we learn from these findings. The power of alarms is in their deterring effect. The burglar has no idea how elaborate the alarm system is at a particular property. For most burglars, the mere existence of an alarm is sufficient to make them choose another target. Audible alarms not connected to a central station are ineffective. In most cases burglars will not travel far to choose another target. Alarms are not effective when professional burglars are concerned. The professional chooses a target, plans the assault, and can overcome the alarm. However, since most burglars are opportunistic myopics, security measures should be directed at them and not toward the infrequent professional burglar. Finally, alarm signs should be visible, and could be

¹ Figgie International (1988), The Figgie Report Part VI: The Business of Crime: The Criminal Perspective, Richmond, Virginia.

Yard Sign Use

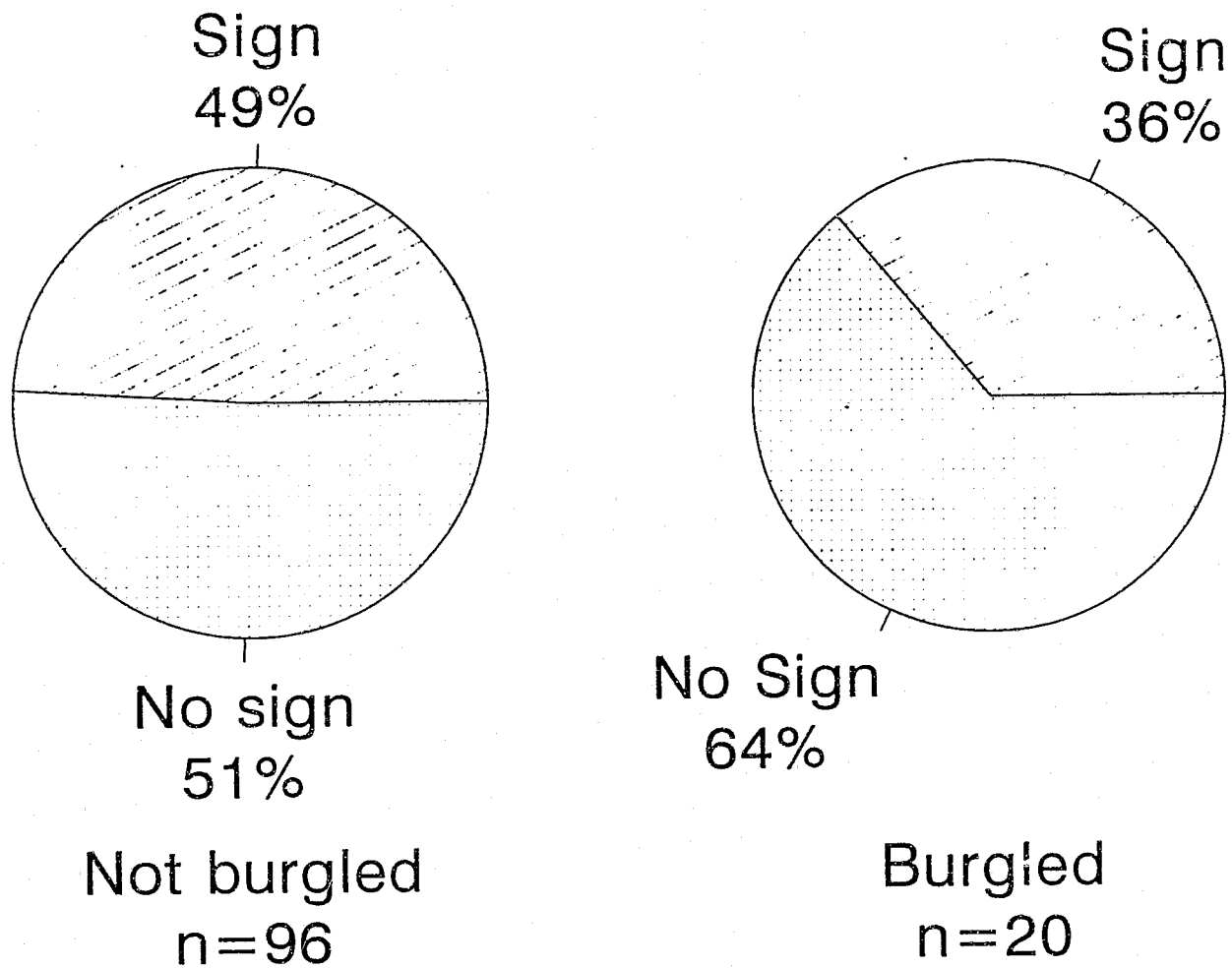


Figure 3.4.3

further modified to show central station connection. Commercial properties, particularly retail stores and warehouses, should also install components that operate flashing lights outside the facility to warn burglars before they actually break in.

The objective of individual businesses differs from that of the police department or the community as a whole. The latter group's objective is to reduce the "inventory" of burglars who operate in the area. Thus, an alarm with silent connection to a central station is desired. Clearly, silent alarms are more likely to yield an arrest than a warning alarm, which in most cases only shifts the burglar's attention to another target. Individual businesses interests are to prevent and/or deter a burglar's entry to the premises or to shorten his stay if entry is successful. Thus, an individual business' interest is to install an audible alarm with central station hookup, flashing lights, visible alarm signs and visible indicators that deter burglars from attempting to break in.

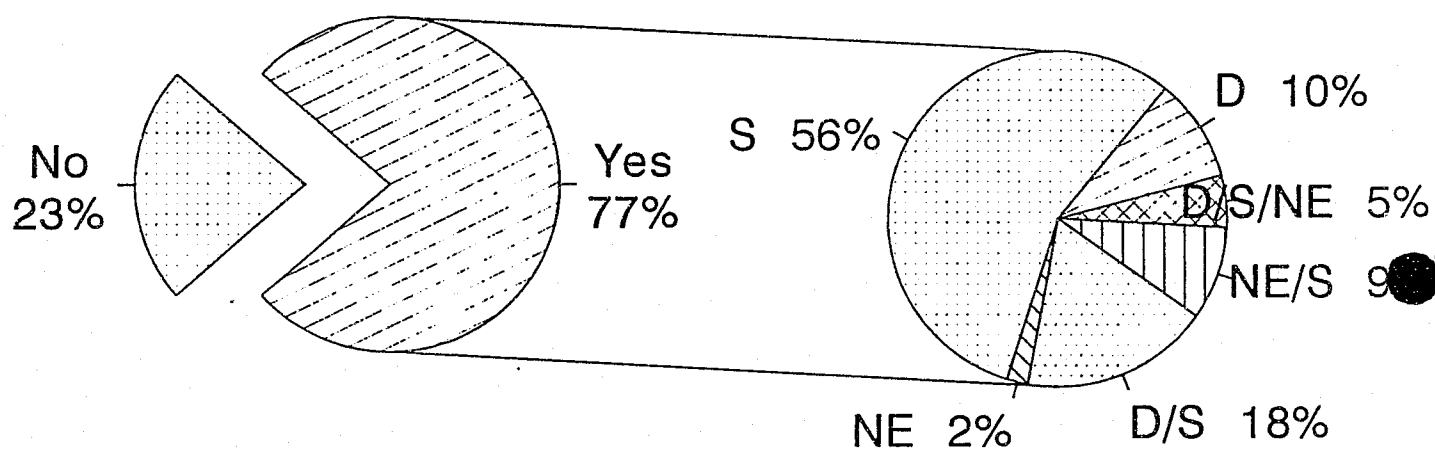
3.5 Satisfaction with Alarms

The major indication of alarm benefits is whether alarm owners are satisfied with their decision to install the system. Satisfied customers are the main source of new referrals in this industry. Further, the most important element is the perceived feeling of security alarms yield for businesses. Figure 3.5.1 depicts that 77 percent of business alarm owners are satisfied with their decision to acquire a system, compared with 94 percent for households. In the verbal responses, many stated that "an ounce of prevention is greater than a pound of cure."

The questionnaire provided the following possible options to businesses that indicated satisfaction with their alarms (see figure 3.5.1): D= It has already prevented break-ins; NE= Other businesses in the vicinity have an alarm so I feel it is important for me to own one; S= Makes me/my employees feel safer.

The main reason for their satisfaction is the feeling of

System Satisfaction



Satisfied?
n=146

Why?

Figure 3.5.1

S=Feel Safer
D=Detected Intrusion
NE=Neighbor Effect

safety the alarm provides. It is important to note that the feeling of safety pertains to property protection unlike homeowners' perception of personal security. 56 percent of respondents stated that safety is the only reason for their satisfaction. Another 27 percent included safety with one other reason.

Alarm owners made other valuable suggestions which will raise satisfaction gained from alarm systems. Technical suggestions include educating the new owner on how to use the alarm, installing simple and flexible systems so that the regular activities of employees are not disrupted, testing the system four times a year, and separately zoning each sensor to be able to identify which one tripped the alarm. Many suggested that if passive motion sensors are used, infrared with microwave should be considered. Some have indicated their dissatisfaction with foil tapes.

Another helpful suggestion is to have the phone line monitored by the local telephone company if the line is accessible to a potential burglar. Such a service adds ten to twenty dollars to the monthly cost of monitoring and is not as yet available in all states. Commercial properties with valuable merchandise, such as jewelry stores, or businesses that have irreplaceable data on their computers should consider this additional service in lieu of private lines.

The suggestion made most often by businesses is similar to the one made by residential alarm owners. That is to choose a reputable, reliable, and well known installer who uses UL approved units and is current on new components. Some commercial alarm owners report that installers mistakenly perceive their business as hardware installers and neglect to follow-up with customers. Those installers seem to believe continuity of the relationship occurs with the central station while they enjoy the recurring revenues. This perception does little to promote business for the firm or for the industry. The installer must view his business as a service, not as a hardware supply. Because personal referral is the major source of new business, the only way to increase sales is to

improve service and satisfaction.

A service orientation includes educating new customers. Education should occur in all phases of the installer-customer relationship. Initially, consumers must be made aware of alarm features that are available and how each feature will benefit them. Once the alarm has been installed, the user must be taught how to properly operate the system and how to get the most protection from it. This may involve second and third visits to the business to make sure that all relevant employees understand the system.

A service oriented company also provides customer support. For example, installers should track users' false activations and contact those users to discuss any problems. Vector, formerly Westec, currently visits all customers whose alarms have been activated in the Philadelphia Metropolitan area to make sure the system is working properly and that the customer is using the hardware properly. Also, because technological advances occur so rapidly in this industry, installers can improve service by offering the option to periodically upgrade the system.

To conclude, this section concentrates on the satisfaction of commercial alarm owners with their systems and provides respondents' suggestions to raise satisfaction. The responses showed that alarm owners are satisfied with their decision to install a system. The main reason for purchasing the alarm is to protect property during hours when the property is not open for business. Little knowledge or interest was expressed in improving employee safety through the installation of panic alarms.

A most effective marketing campaign for the industry and for installers is to improve in the area of personal service. Higher service levels increase customer satisfaction, which produces more referrals and sales. Service should be improved by focusing on communication and education. Customers should receive immediate response to inquiries and alarm activations. Customers should be individually educated on system use. In addition, installers and alarm companies should provide information to customers about additional precautions they can take to minimize their risk of

burglary.

"Have it installed without a doubt! It is the best insurance you have," is a testimony to alarm owner satisfaction. Let's enhance their feeling by providing better and more valuable services with alarms.

Chapter 4

The Structure of the Industry¹

Total 1992 alarm sales in the U.S. are estimated at \$9.50 billion or 1.9 million systems with an annual growth rate of 5 percent. Total stock of alarms is 17 million, of which 42 percent are systems installed in commercial establishments. National statistics show there are a total of 8.84 million residential alarms and 91,947,410 households in the U.S. Thus, ten percent of households own alarms. Penetration of commercial alarms is estimated at 14 percent. In this chapter we will discuss the competitive level in the three segments of the industry, manufacturing, installation, and monitoring. Then we will exhibit how prices are established in the market place

4.1 Industry Segments

The alarm industry is composed of four parts-- manufacturers, distributors, installers, and monitoring companies. Only the largest firms are integrated from manufacturing through to monitoring and response.

Manufacturing: On the national level, substantial competition exists in alarm component manufacturing. In 1987, there were 92 establishments principally engaged in manufacturing alarm systems.² Most manufacturers are relatively small. In 1987, the average number of production workers per establishment was only 72. Forty-nine percent of firms had 25 workers or less, and an additional 29 percent of manufacturers have 26 to 100 workers. For comparison purposes, the average size of a manufacturer in the telephone and telegraph industry is 125.

Concentration by manufacturers, or the share of the market

1 This chapter was co-authored with Erwin A. Blackstone and Andrew J. Buck from the Department of Economics at Temple University.

2 Unless otherwise noted, aggregate industry statistics are from the Census of Manufacturers, U.S. Department of Commerce, Washington, D.C., 1987.

controlled by the largest firms, is not high and market shares are fairly evenly distributed among the various sizes. The largest manufacturer has about 10 to 15 percent of the market, and the top 10 have no more than 80 percent. There are many small, specialized firms that serve to constrain the leading manufacturers. Moreover, concentration declined between 1982 and 1990, suggesting that smaller firms are no less efficient than larger ones¹; the efficient level of production is quite low. Twenty-three percent of manufacturers had less than one million in gross revenues and another 32 percent earned between one and five million in 1992-- quite a modest size business.² Further there is no cost savings if a manufacturer is engaged in providing services in other segments of the alarm industry. Thus, there is no incentive for vertical integration. This also implies that entry into alarm manufacturing is easy since existing manufacturers enjoy no cost advantages in providing other alarm services.

Other conceivable barriers to entry include patents, ownership of key inputs, cost of capital, and product differentiation. As sensor equipment uses essentially "off the shelf" infrared, microwave, and electronics technology, patents do not play an important role in preventing market entry by new firms. Product development expense has been modest in the industry. New products take an average of nine months to develop and require an average investment of \$150,000.³

There are no unique inputs that can be controlled by a single firm. The small scale of incumbent firms limits the extent to which capital requirements could serve as a barrier to entry. The fact that there are very few publicly traded alarm manufacturing companies suggests that the capital needs of the industry are

1 This argument is based on the survivor principle first articulated by George Stigler, "The Economies of Scale", Journal of Law and Economics, Vol. 1, October 1958, pp. 54-71.

2 See Security Sales, Vol. 15, No. 13, page 20.

3 Staff, "Products take Average of Nine Months", Security Sales, Vol. 14, No. 3, March 1992, Pp. 54-58.

in all parts of the electronic security equipment manufacturing market is minimal and is geared toward industry insiders. The majority of advertising occurs through the major trade journals and the major industry conventions.

In addition, knowledgeable buyers can use their substantial purchasing power to ensure competitive behavior of manufacturers. Approximately 40 percent of alarm equipment is sold through wholesalers¹, while another 45 percent is sold directly to installers. The rest is sold abroad. Evidence of the potential to induce competitiveness among manufacturers is offered by the fact that the average installer bought alarm equipment from four suppliers in 1986. Moreover, if prices exceed the competitive level, other electronics firms could easily enter. Vertically integrated manufacturers that install only their own equipment could also expand into sales to wholesalers if prices at that level of the industry became attractive.

Further proof of competitive price in the industry is the elasticity, which shows the change in demand from an incremental change in price. In 1987, price exceeded variable cost by only 60 percent for alarm hardware, implying a high price elasticity of -2.7. This shows that a small change in price yields a large change in the demand for hardware, or that a 1 percent price increase will cause the demand for hardware to decrease by 2.7 percent. Such a value for the industry price elasticity is consistent with highly competitive pricing among manufacturing firms.

Installation: Alarm system installation is also highly competitive. In 1992 it was estimated that there were 12,000 installers nationwide². The top 25 were estimated to account for 40 to 50 percent of the industry's total sales. In local markets,

1 This statistic is from "1987 National Survey of Dealers and Installers of Security and Fire Protection Equipment", SRI Research Center, Inc. for the Security Equipment Industry Association and "National Survey of Dealers and Installers of Security and Fire Protection Equipment", 1983, STAT Resources, Inc. for the Security Equipment Industry Association.

2 The reported number of installers varies from 8000 to 12,000 depending on the source used. See footnote 5 for two examples, and John Keller, "Security Companies Are Alarmed by Baby Bells' Threat", The Wall Street Journal, July 1, 1992, P. B4 for three examples.

the relevant locus of competition, there are also many firms. For example, Lower Bucks County, Pennsylvania had at least 88 firms advertising burglar alarm installation¹ in 1988. Thus a small area like Lower Bucks has a substantial number of firms. Lower Merion Township, with about 19,000 dwelling units, reported that 332 installers were doing business within its borders in 1989. This was an increase of 68 firms over the previous year². In addition, electricians, locksmiths and other contractors install alarm systems, and self-installation is also feasible³. Not only are there many firms, but entry into the market is easy; entry and exit barriers can both be described as negligible. Entry costs include a modest advertising expense and, perhaps, membership in a state or national alarm association to receive training and education. Since alarm installation involves low voltage electrical work there are no significant institutional barriers⁴. The requisite knowledge and skills are also easily acquired. Many start-up owners have their origins in previous employment with an incumbent. Many locksmiths have neglected their original trade and chosen to concentrate in alarm installation. Easy entry and exit has resulted in an industry in which 12 percent of the firms are less than two years old and 32 percent are less than five years old.⁵

Most installers are of moderate size and have been so through the industry's 100 year history, suggesting insignificant economies

1 Lower Bucks borders on Philadelphia. It encompasses ten townships. It had a population of approximately 310,000 in 1984. We obtained our count for the number of firms from the Yellow Pages. Thus, since firms from other areas could operate there, 88 is a lower bound for the number of firms which can do business in Bucks County.

2 The statistics were compiled from police department data and are reported in "The Hakim-Buck Study: Deterrence of Suburban Burglar", 1991, by Metrica, Inc. for the Alarm Industry Research and Education Foundation and the Pennsylvania Burglar and Fire Alarm Association.

3 Expander Technologies in Canada and Quorum in the U.S. are now selling do-it-yourself systems via network marketing. There is virtually no investment capital required to begin as a sales representative. Patricia M. Padilla, "Networking Benefits Everyone with Quality Sales Leads", Security Sales, July 1992, pps. 50-61.

4 Many localities require that installers have a low voltage electricians permit. There usually is no licensing test and the fees are invariably less than \$100. Although many local security company trade associations are lobbying for statewide licensing to replace licensing at the municipal level, such legislation would not pose a significant barrier.

5 Staff, "Dealer Survey", Security Sales, Vol. 14, No. 3, March 1992, P. 10.

of scale. A dealer survey revealed that the average number of burglar alarm installations per dealer was 146 in 1991 and 172 in 1992.¹ Table 4.1.1 provides further information; 33 percent of all installers annual revenues are between \$100,000 and \$249,000. Ninety-eight percent of installers employ less than 10 people and earn revenues of less than one million annually. Small size and low capital requirements for entry explain why new installers enter as demand for alarms rises. Thus, the stiff competition causes moderate profit margins for installation, and small price variations for monitoring.

Now, let's turn to our study area of three suburban communities in the vicinity of Philadelphia, Pennsylvania. Here, we checked the number of systems installed by size of installers on a geographical basis. We analyzed market share of large and small installers by their concentration in each community. The results exhibited in table 4.1.2 were similar to the national figures with respect to market structure. Overall, 8.1 percent of installers installed 68.5 percent of the systems. The large dealers installed, on the average, 123 systems while small firms installed only 5 systems. Such a difference between installers suggests possible price dictation by the large players in the marketplace. Later in this chapter we will discuss how prices are determined for alarm installation and monitoring.

Easy entry and a large number of competitors means that no more than normal economic profits should be earned in the long run. Moreover, easy entry means that if profits exceed normal levels, new firms would quickly enter, eliminating profits. Indicative of the low level of profitability is this statement:

A lot of dealers believe that they have to make a substantial cash investment in a system, so they constantly lose money up front on new business with the intention

¹ Security Sales, Vol. 15, No. 13, page 14.

Table 4.1.1
Market Concentration: Systems and Installers by Township

Township	Tredyffrin (1989)	Lower Merion (1989)	Upper Merion (1989)	Total
Totals				
Number of Systems	930	6508	308	7746
Number of Units	11045	19302	12458	42805
Systems/1000 Units	84.2	337.1	169.5	
Number of Installers	120	332	82	534
Systems per Installer	7.7	19.6	3.7	14.5
Large Companies²				
Number of Systems	606	4512	186	5304
% of all Systems	65.2	69.3	60.4	68
Number of Installers	14	16	13	43
% of large Installers	11.7	4.8	15.8	8.1
Systems Per Installer	43	282	14	123
Small Companies				
Number of Systems	324	1996	122	2442
% of all Systems	34.8	30.7	39.6	32
Number of Installers	106	316	69	491
% of small Installers	88.3	95.2	84.2	91.9
Systems per Installer	3	6	2	5.0

1. The data for Upper Merion is only for the sample included in our survey.

2. In Tredyffrin a large installer is one with 20 or more accounts. A small installer in Tredyffrin is one with fewer than 20 accounts. In Upper Merion a large installer is one with 7 or more accounts, and in Lower Merion with 100 or more.

Source: Alarm Industry Research and Education Foundation, Residential Security: The Hakim-Buck Study, 1991.

of making it up down the road
on the monthly service fee.¹

The notion of recurring revenues is the operative phrase in the industry, but the industry authority quoted above added that the low-initial price strategy was often unsuccessful. The strategy has proven unsuccessful because a large dealer can expect his subscriber list to turn over every five or six years, thus limiting the ability to recapture the loss on installation.²

Monitoring: The final retail level of the industry also has a considerable number of firms in relevant local markets. For example, in 1987 Philadelphia had 17 establishments monitoring alarm systems and Montgomery County, Pennsylvania had 12. The average annual sales in Philadelphia were \$1,359,824 and in Montgomery County \$1,719,000, suggesting the modest size of the operations. In 1987, for the U.S. as a whole, there were 2451 monitoring establishments with an average revenue of \$904,781. Although vendors use geographic proximity to the client as a sales ploy, the monitoring market is actually national by virtue of modern telecommunications and computer software.

Labor costs accounted for a large portion of these firms' expenses. In Montgomery County, labor costs were equal to about 45 percent of the revenues and in Philadelphia they amounted to 38 percent. For the nation, labor costs amount to 35 percent of firm revenues. Moreover, entry barriers are quite low in monitoring.³ Indeed, only about 1000 subscribers are required to cover all costs. Adding to the competitive pressures on local monitoring firms is the existence of national and super-regional firms. These firms can enter a new market through acquisition of a small

¹ Lisa Spooner, "Pricing for Profit Now, Not Later", Security Distributing and Marketing (July 1990), p. 67.

² There is not industry unanimity on this point. For opposing views on the success of mass marketing see Staff, "Mass Marketing: Pros and Cons Arouse Controversy", Security Sales, Vol. 14, No. 1, January 1992, pp. 43-49.

³ Although the Supreme Court used UL certification to define the market in the Grinnell case, we do not believe this to be appropriate. In the years since Grinnell the proportion of certificated central stations has not changed. Such certification plays little role for either entry or success.

installer/dealer. Because of their size they are able to economize on the use of labor for the production of a somewhat reduced level of service to the consumer.

Adding to the competitive pressures exerted by the national and super-regional firms is the potential entry by the RBOCs. A number of them have been offering a derived channel service that surveys the phone subscriber's circuit for integrity. The monitoring central stations are already value added resellers of this service element. US West, NYNEX and Bell Atlantic have not found much of a market for this service since it is typically priced at 50 percent of current residential monitoring fees. More importantly, US West has proposed a rule change to the FCC that would allow it to enter monitoring per se.¹

To conclude, the entire electronic security industry is highly competitive.² Competition exists among manufacturers, distributors and installers, and among firms monitoring alarm systems. National and regional market concentration indicates price control by the few large companies. Small installers can not charge more than the leaders in the industry unless they can offer special products or services. Since most alarm products are available to all installers, it is unlikely that small installers can offer differentiated products that will allow them to charge higher prices. Vertically integrated firms like ADT ensure that prices are competitive at every level and that prices reflect any savings from vertical integration. These companies produce, install and monitor equipment their own equipment. Should any level become more profitable, the vertically integrated firm could then serve other firms, as well as its own downstream unit.

One could argue that even if competition exists, short-run

¹ Staff, "RBOC Asks FCC to Waive Rules to Monitor Alarms", Security Sales, Vol. 14, No. 5, May 1992, p. 13.

² The findings in *U.S. v. Grinnell Corp.* (236 F. Supp. 244, 384 U.S. 563) are at variance with our conclusions. The majority opinion found that all segments of the industry operate nationally. Our evidence suggests the contrary. The majority opinion also defined the product market to be accredited and certificated central stations and security systems. This distinction is really only relevant to commercial users of alarm services, a small part of the total market. Correctly, the court observed that fringe firms had not been adversely affected nor driven from the market by the behavior of Grinnell and the firms in which it owned stock. Our interpretation of ADT's operation of deficit offices was a recognition of the competitive tenacity of local installer/dealers.

profit may be earned because of rapid growth. But growth has not been rapid. For example, between 1982 and 1987, shipments of alarm systems grew by about 52 percent, an annual rate of 8.7 percent, while shipments of telephone equipment grew by about 65 percent, an annual rate of 10.5 percent.

4.2 Price Structure

The fragmented structure of the industry dictates the price of both installation and monitoring. STAT Resources Inc.¹ has reported that the average installation price of commercial systems is \$1500, 20 percent higher than residential, while the monitoring price is \$22.50, 12.5 percent higher than residential establishments. Both prices have been dropping in recent years.

Our survey of commercial establishments is a sample drawn from suburban communities in the Philadelphia area while the previous data is a national sample including urban communities. It is apparent that suburban commercial establishments, like residences, pay more for installation than do establishments in urban areas. Figure 4.2.1 which is based upon our suburban sample shows that the average installation price is \$4,102 and monitoring is \$104.31. The magnitudes are biased upward due to large alarmed department stores in Upper Merion's large shopping malls. However, it is evident that the wealthier is the community, the more expensive are the commercial establishments, and the more sophisticated and more expensive are the alarm systems. When the installation and monitoring costs of large commercial establishments with extensive security requirements are extracted from Upper Merion's sample, its average installation cost decreases to \$1725 and monitoring goes down to \$55.48.

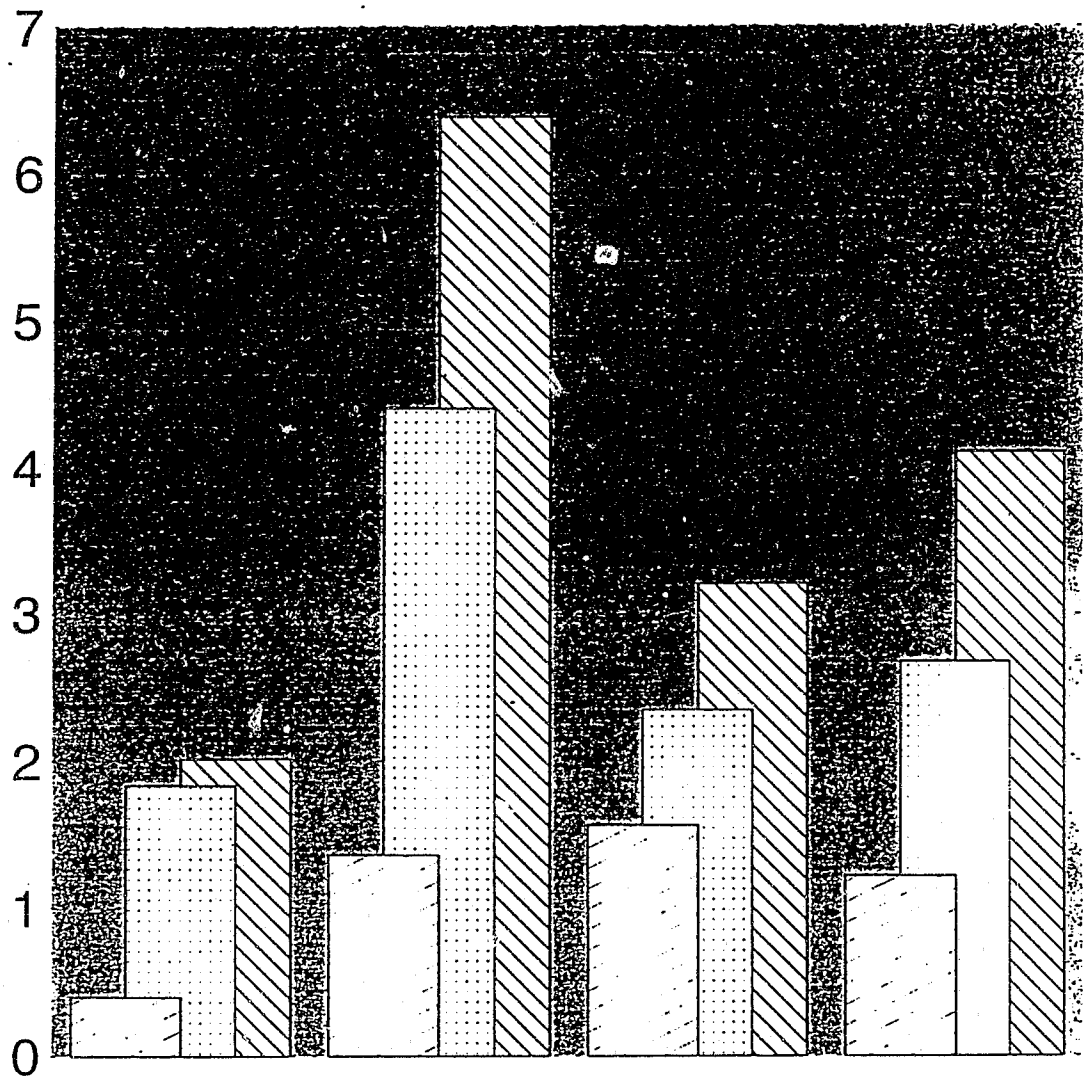
Both figures 4.2.1 and 4.2.2 show how much non-alarmed businesses are willing to pay for a system, their perception of system costs and the amount alarmed businesses actually paid for

¹ Security Sales, Vol. 15, No.13, 1994, Page 14.




Willingness, Perception and Reality

Installation Prices

\$ Thousands



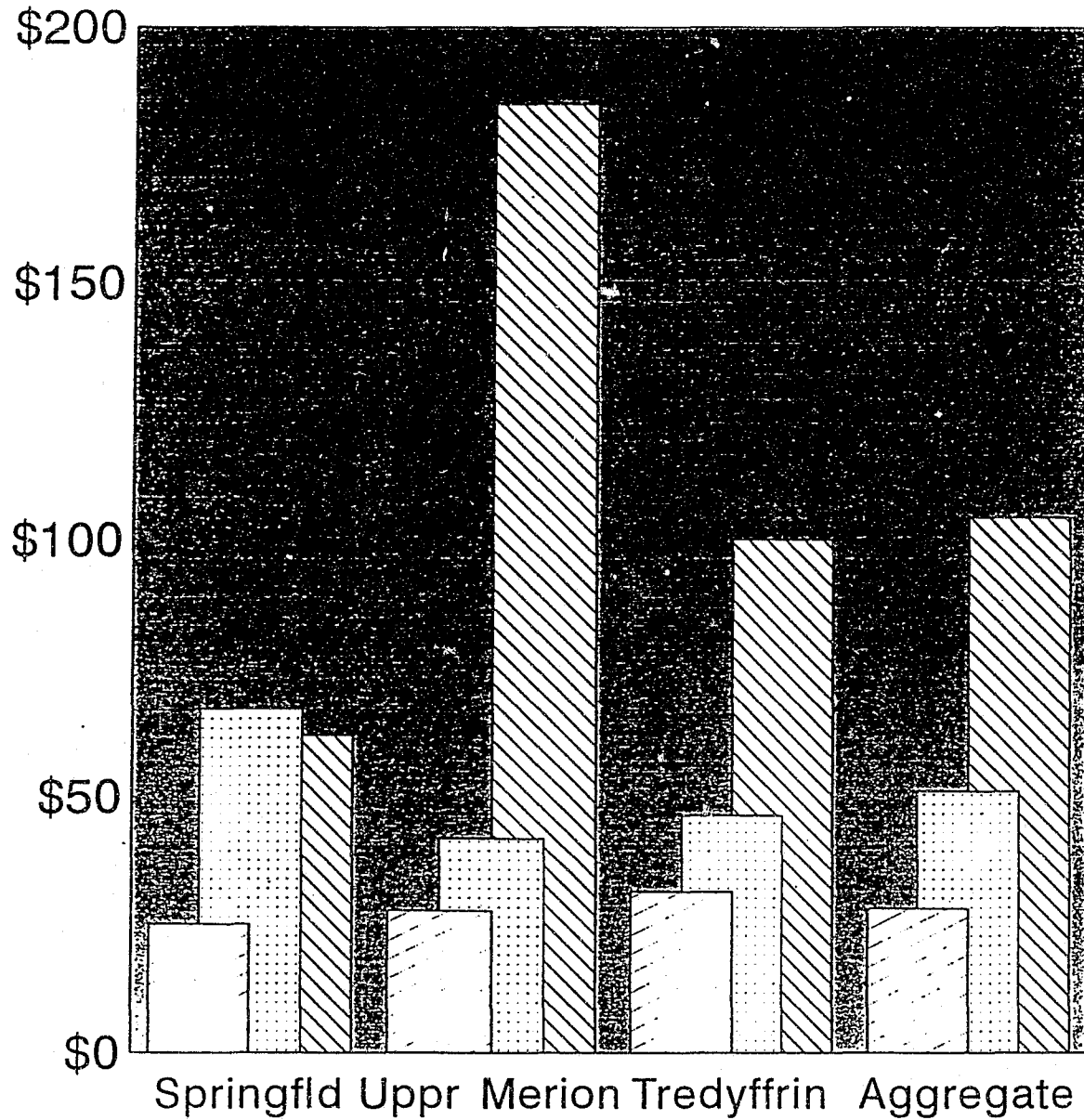
Springfld Uppr Merion Tredyffrin Aggregate

Willing		0.4	1.36	1.56	1.215
Perceive		1.833	4.4	2.345	2.676
Reality		2.012	6.38	3.2	4.102

78
Figure 4.2.1

Willingness, Perception and Reality

Monitoring Prices



	Springfld	Uppr Merion	Tredyffrin	Aggregate
Willing	\$25	\$27.5	\$31.25	\$28
Perceive	\$67	\$41.66	\$46.25	\$50.99
Reality	\$61.89	\$185	\$100	\$104.31

79
Figure 4.2.2

their systems. It shows again that the price of alarms plays a crucial role in the purchase decision. Non-owners are willing to pay only 30-56 percent of the actual cost of installation.

The figures show that the perceptions about alarm system prices are always lower than reality. However, it is important to note that the perceived price and willingness increase with community wealth. Thus, the wealthier a community is the more businesses are willing to pay for an alarm.

Now let's turn to figures 4.2.3 and 4.2.4 which show installation and monitoring fees by size of installer. Size of installer is determined by the number of systems installed in each locality. The results show that larger installers charge, on the average, 28.6 percent more for installation and 19 percent more for monitoring than small installers. Reputation allows dealers with a proven track record to charge up to 30 percent higher prices on installation and still maintain market share. Reputation and reliability play a crucial role in attracting business in this industry, where referrals are the most important source for new business.

4.3 Lessons for alarm industry

The discussion in sections 4.1 and 4.2 provides policy implications for both individual firms and for the alarm industry as a whole. The industry is composed of a large number of firms at the levels of manufacturing, installation and monitoring. There are no apparent economies of scale or scope in the industry, firms are privately owned, initiation costs are low, and entry and exit are easy. Over the long run the share of small firms did not decrease. All this suggests a very competitive industry with merely normal profits.

The structure of the industry suggests no incentive for vertical integration. There are few vertically integrated firms which need to maintain prices at no higher level than smaller firms. The advantage of large companies such as ADT, Brinks, or

Size of Installer and Installation Price

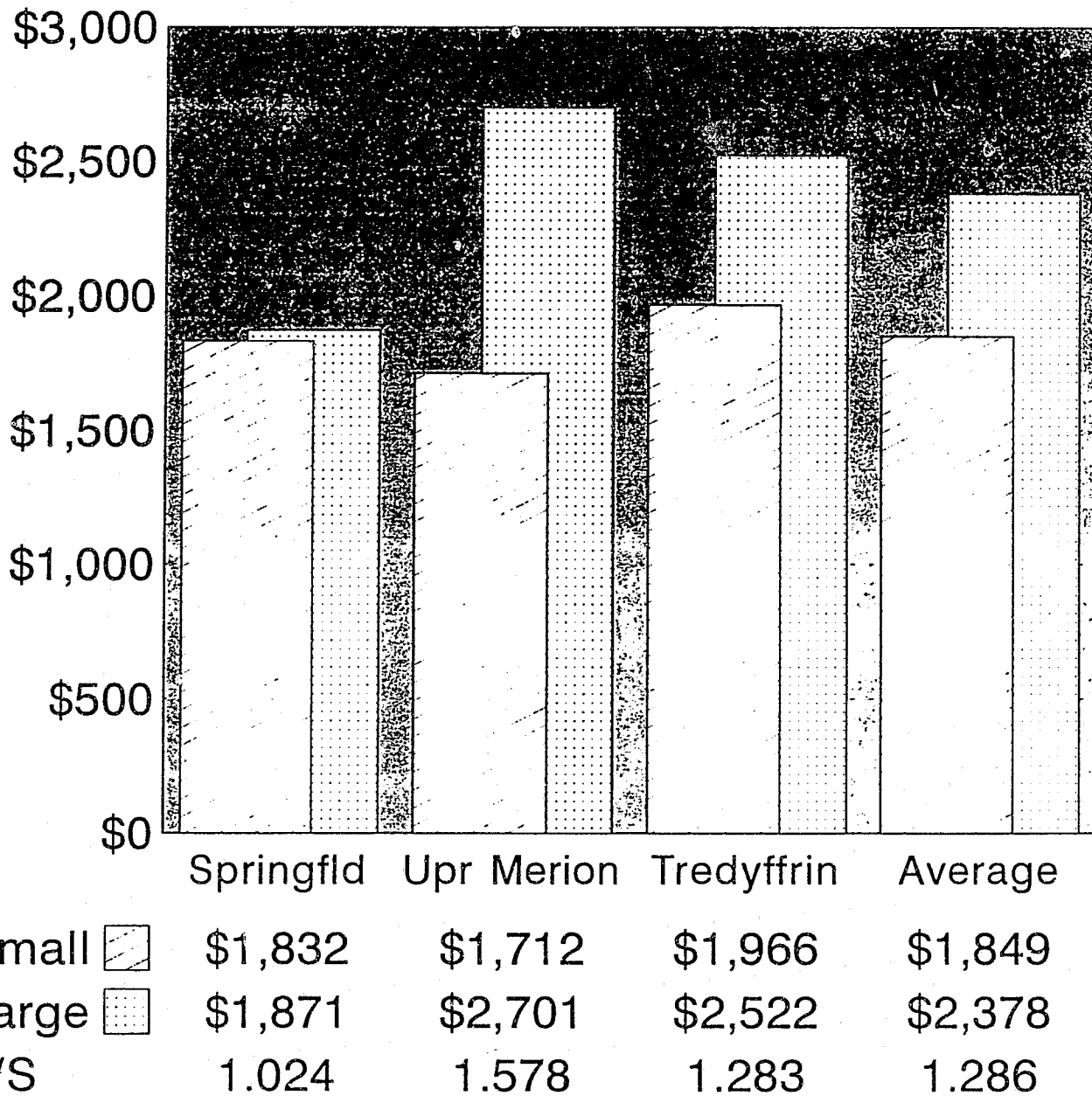
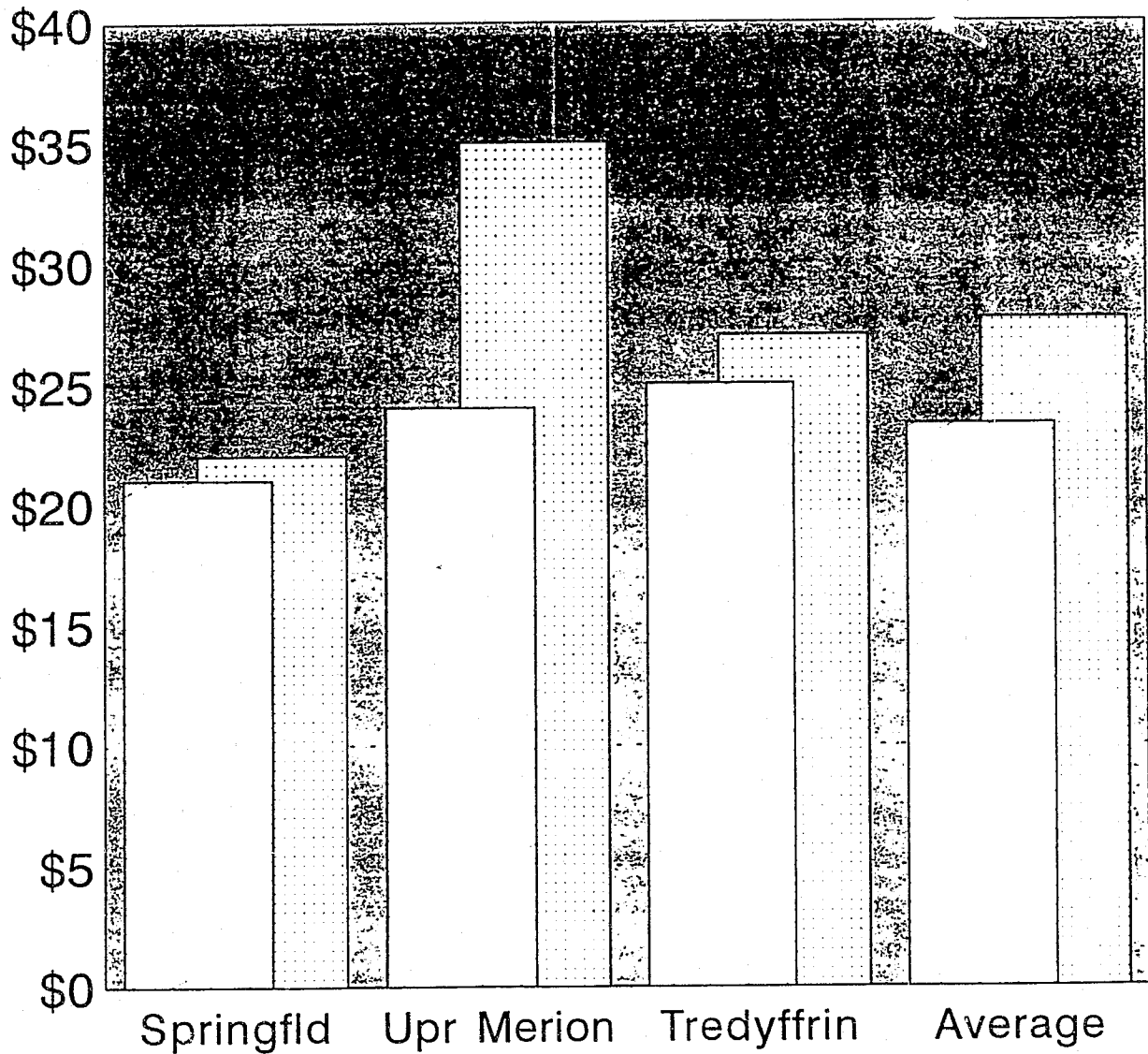


Figure 4.2.3

Prices include residential and commercial
Averages are weighted

Size of Installer and Monitoring Fees



Small	□	\$21	\$24	\$25	\$23.3
Large	▤	\$22	\$35	\$27	\$27.7
L/S		1.05	1.46	1.08	1.19

Figure 4.2.4

Westinghouse is financial power. They can afford to install inexpensive systems at losses of \$300-\$400 for future recurring revenues. Installation losses are recovered in two years.

There is no incentive for large companies like the Bell Operating Companies, the cable TV companies or any other large players to enter the industry. These companies require industries with high entrance thresholds, which is not characteristic of the alarm industry. Stiff competition will deter entry by such large players. This highly labor intensive industry is unattractive to large unionized companies which can not compete on labor costs with small firms. Further, little differentiation can be offered with respect to hardware. Differentiation, which leads to the ability to price higher, can only be achieved through reputation and service. Once regional companies establish a reputation of reliable and durable service, they can charge a premium on that reputation. Installation prices may enjoy premiums of up to 30 percent while the premium on monitoring is about 20 percent.

Chapter 5

Effectiveness of Commercial Alarms

The effectiveness of alarms can be measured on various scales. In the previous section 3.4 we saw that alarm owners are satisfied with their decision to install a system. An effective measure of the benefits of a product or a service is whether its customers are satisfied and whether the product continues to sell. Indeed it has been demonstrated that owners of alarms are satisfied. Revenues from alarm sales have risen 4.8 percent between 1991 and 1992 and 4.7 percent between 1992 and 1993. System sales have risen 5.6 percent and 6.8 percent in the same two years, respectively.¹

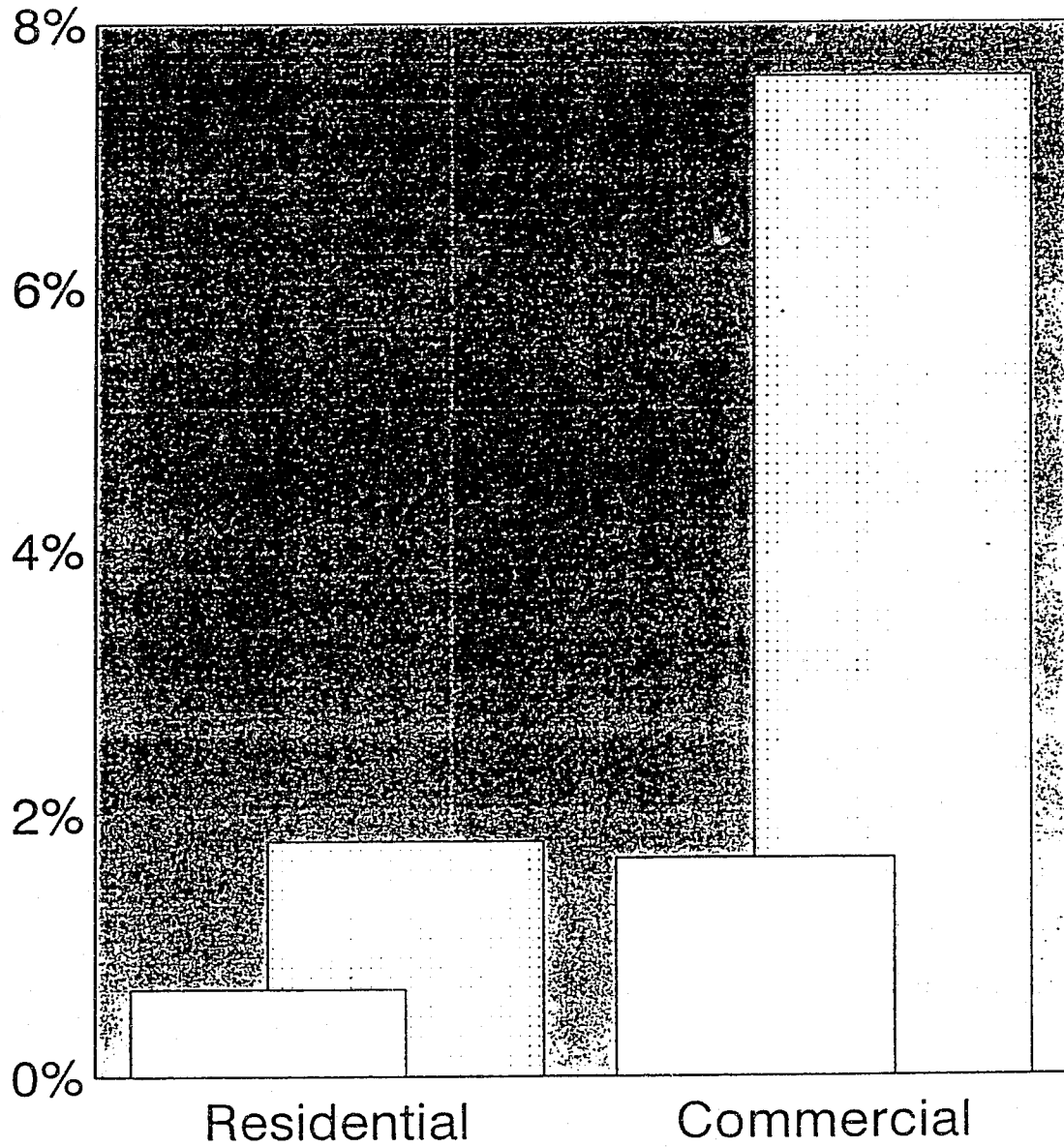
5.1 Overall Alarm Effectiveness

Probability of burglary was computed for alarmed and unalarmed properties. The probability of commercial burglary with an alarm is equal to the number of alarmed properties burgled in the course of a year divided by the total number of alarmed properties in the three communities. This calculation reflects the chances an alarmed commercial property has of being burgled. The probability of a non-alarmed commercial property becoming a burglary victim is the ratio of non alarmed burgled properties to the total number of non alarmed properties in the three communities. Dividing the second number by the first indicates how much greater the chance a non alarmed property has to be burgled than that of an alarmed property.

The information provided here has important uses for the alarm industry. First, it offers a marketing tool for dealers who try to make a convincing sale. Statistical figures which show that alarms are effective speak louder than words. These figures, in conjunction with those provided in our earlier study on residential

¹ Source: STAT Resources, *Security Sales* (1994), Vol. 15, No.13, page 10.

Probability of Burglary



Alarm	<input type="checkbox"/>	0.66%	1.66%
No Alarm	<input type="checkbox"/>	1.79%	7.59%
NA/A		2.71	4.57

Figure 5.1.1

security, are also important to the industry's current public relations campaign, and its lobbying efforts with state and federal legislative and government bodies. These results are important in establishing relations and increasing cooperation with the insurance industry, which has greater financial resources that can help promote mutual interests with the two branches of government. If the industry chooses to pursue installer licensing, then cooperation with the insurance industry's strong lobbies will be important. Once insurers are convinced that alarms reduce their loss exposure they should be interested in increasing alarm use as well as ensuring that technically high standard systems are installed. Dealer licensing will then become in the insurers' interests.

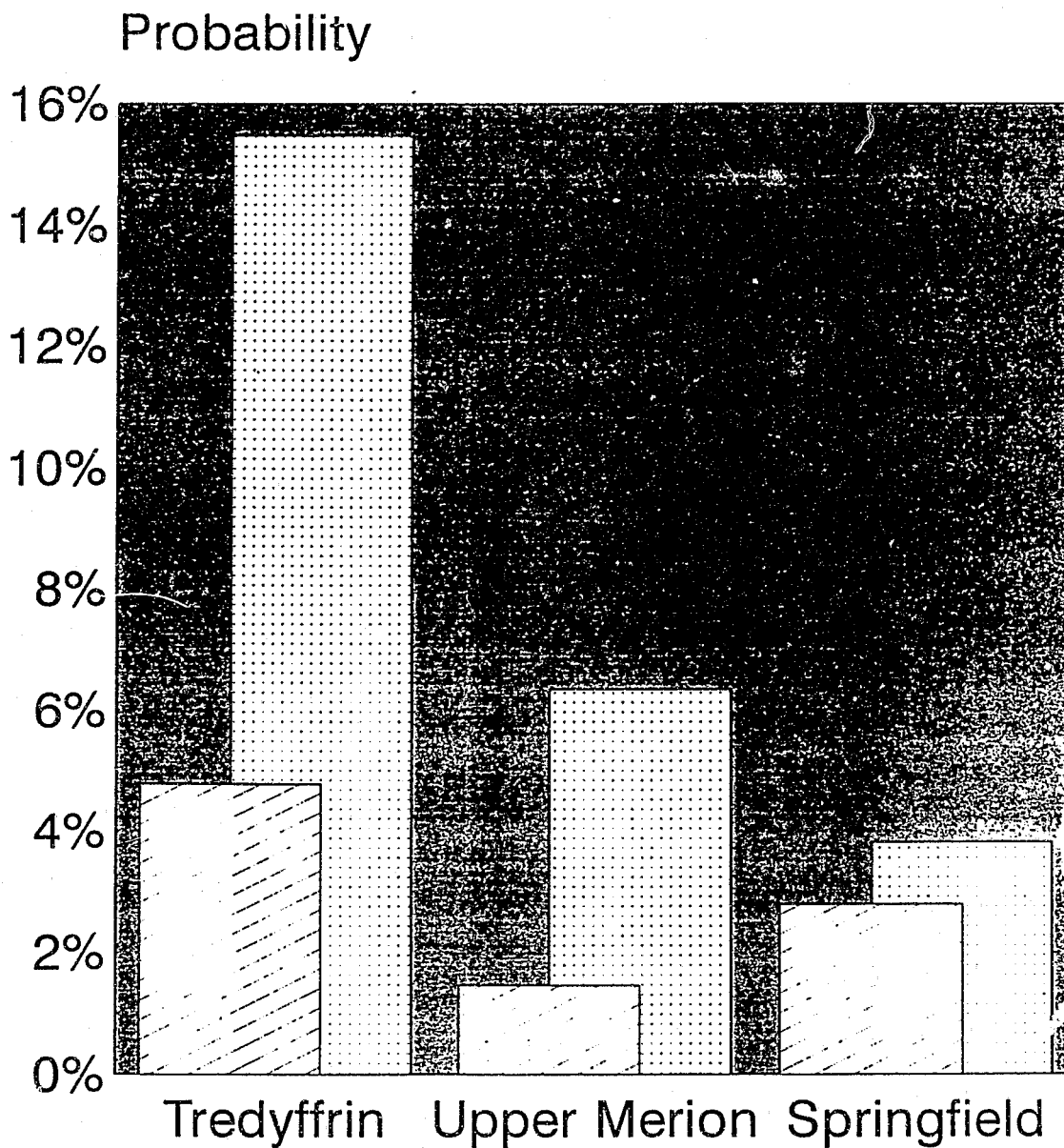
Figure 5.1.1 illustrates the overall deterring factor of both residential and commercial alarms. It shows that non alarmed residential properties are 2.71 times, and non alarmed commercial properties are 4.57 times, more likely to be burgled than their corresponding alarmed properties. Indeed, alarms significantly deter burglars.



Now let's turn to differences in alarm effectiveness for businesses in the three communities. Figure 5.1.2 illustrates that the chances of burglary for non-alarmed businesses is the highest in Tredyffrin, the wealthiest of the three communities and where the value of merchandise at stores and businesses is the greatest. Alarms are most effective in deterring burglars in Upper Merion where the concentration of businesses is the highest. Springfield, a working class suburb where most businesses serve the local population, has the lowest chance of burglary due to low expected loot.

In figure 5.1.3, which shows the aggregate for two communities, we see that over the two and a half year period, 14.6 percent of businesses detected some evidence of a burglary attempt that the alarm prevented. Another 2.6 percent of alarm owners stated that the alarm prevented the spread of fire. Observing the same data separately for the two localities reveals that 13.5

Probability of Commercial Burglary

Burgled Properties



Alarm		4.78%	1.46%	2.79%
No Alarm		15.48%	6.34%	3.81%
(NA/A)		0.0324	0.0434	0.0137

87
Figure 5.1.2

Event Detection

Springfield and Upper Merion

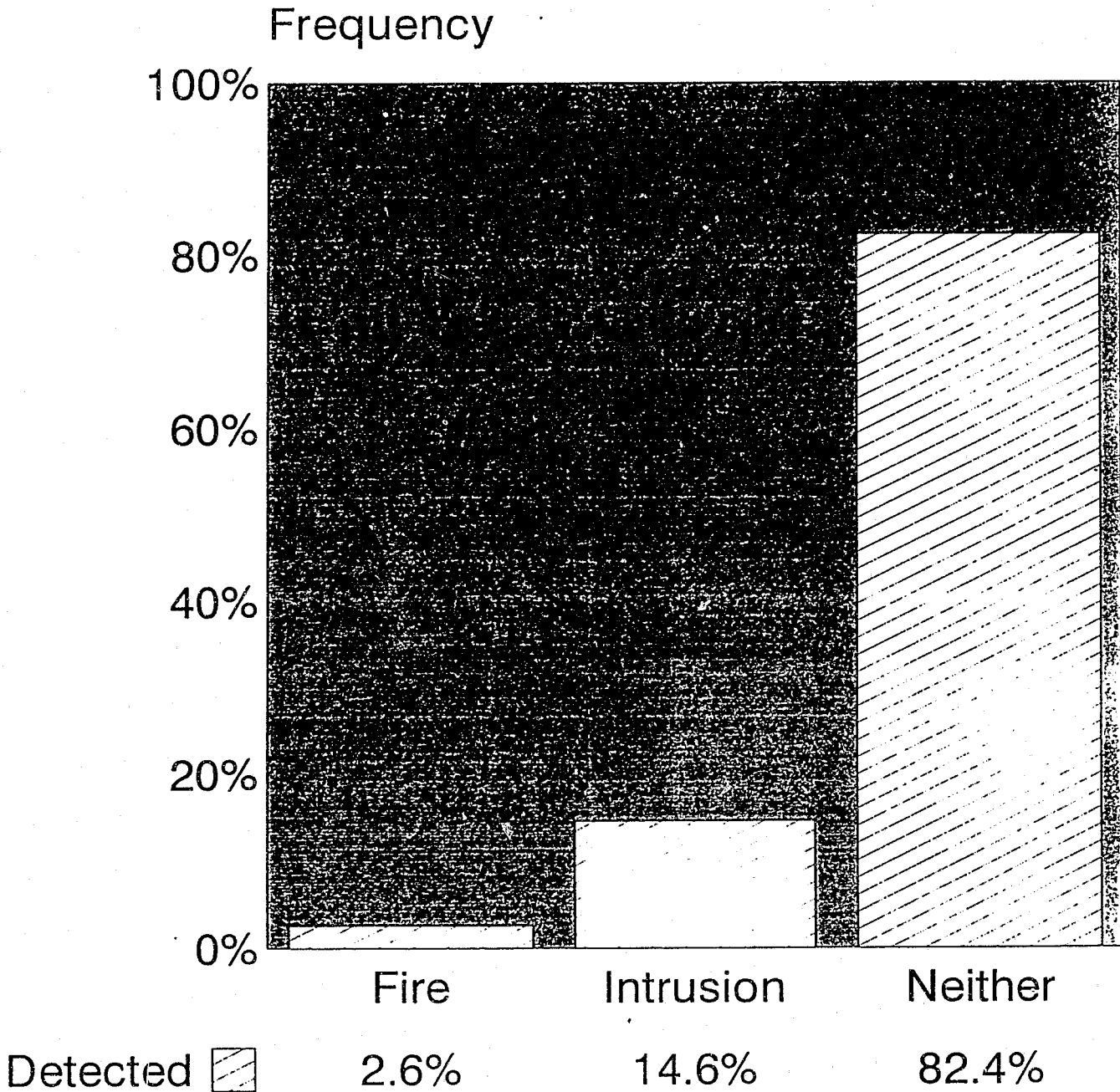


Figure 5.1.3

n=130

Event Detection

Springfield and Upper Merion

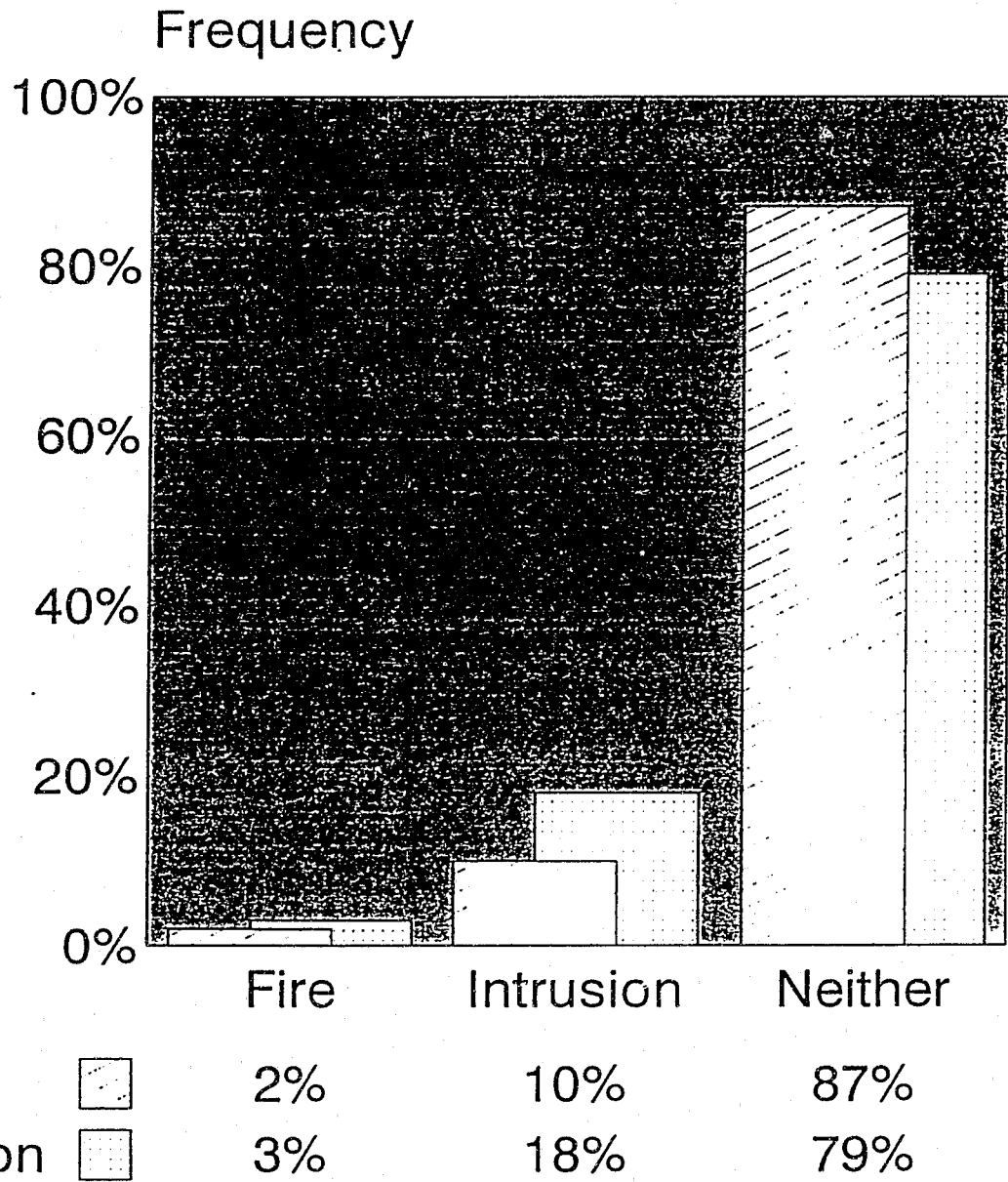


Figure 5.1.4

Springfield n=55
Upper Merion n=75

percent of businesses in Upper Merion and 5.5 percent in Springfield claimed to have witnessed burglary signs. 3 percent and 2 percent claimed that a fire was prevented in the two communities, respectively. To annualize these figures the numbers need to be divided by two and a half. These figures are self reported by businesses and offer higher effectiveness measures than police records. It is attributed to under reporting of incidents by businesses, a very common phenomenon. However, figure 5.1.3 shows that alarms are more effective than they are believed to be. Figure 5.1.4 also shows that alarm effectiveness is higher in Upper Merion than it is in Springfield. The greater the concentration of businesses in an area, the more burglaries and burglary attempts are made and the more effective alarms become. It is also evident that a small percentage of businesses reported the prevention of fire in their facilities. The figure seems unimpressive on the surface. However, one should bear in mind that fires have more devastating effects to both lives and property damage than burglary. Section 5.3 provides monetary measures on fire costs.

The effectiveness of burglar alarms is also measured by the value of property stolen. Figure 5.2.4 demonstrates that the value of property stolen from non alarmed businesses is 35.2 percent higher than that of alarmed establishments. 42.1 percent of break-ins to alarmed properties end with no theft compared with 33.9 percent in non alarmed establishments. This result is consistent with the residential findings. The average loss is \$1,275 in an alarmed home and in \$1,674 in a non alarmed home, again 31.3 percent higher in the latter. The reason is obvious; burglars who unknowingly enter alarmed establishments¹ become aware of the alarm's presence once inside when the audible alarm sounds. Burglars are aware of the fact that a typical police response takes 15 to 20 minutes. Thus, the time that they spend on the premises is limited and so is the loot taken.

¹ In section 3.5, figure 3.5.3 we saw that 64 percent of victimized alarmed establishments had no external sign which warns about the alarm. Thus, most burglars (64%) who break into commercial establishments which are alarmed do not know it before their act.

5.2 Precautions Taken

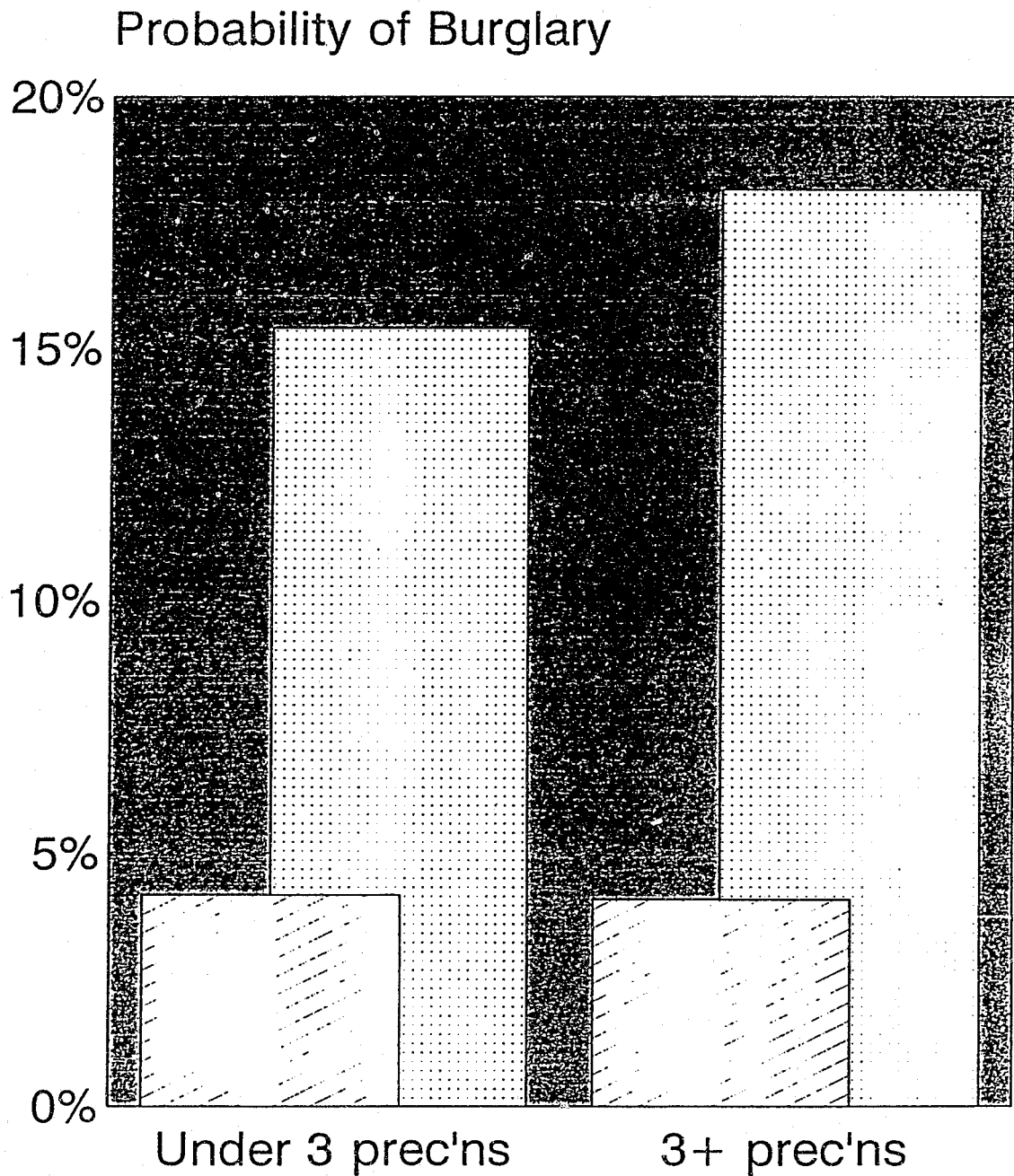
The residential study showed that an effective precaution package includes burglar alarms in conjunction with other less costly precautions. The findings suggested a package that will significantly reduce burglary attempts.

The survey in the three localities included all burgled properties in the two years which preceded the study, a sample of alarmed properties, and a control group of properties which neither owned alarmed nor were burgled. All respondents were questioned about the precautions they took against burglary. The results of the surveys suggested the possible package of precautions which may significantly reduce the chances of becoming a burglary target.

An effective package of precautions should address three criteria: deterrence, prevention, and detection. Deterrence measures include precautions which will make the burglar eliminate the property as a potential target. These precautions produce the impression that somebody is at the property and that a break in will be physically difficult. Another deterring factor is the perception by potential intruders that little can be found in cash or easily fenceable equipment/merchandise. Preventive measures are those that make the actual break-in difficult and time consuming. Detection measures are those which detect intruders and notify the police and/or owners about the burglary in progress.

Preventive measures are less likely to be used at retail establishments. Most retailers maintain attractive entrances that make intrusion easy. Retailers are less apt to install deterrent and preventive measures because they are unattractive and may produce an impression that the place is unsafe. Such measures may adversely affect business. Measures which aid in identifying the thief/intruder replace necessary deterring measures for retail and many wholesale establishments. Deterring measures are irrelevant for retail and wholesale establishments since they are always occupied during business hours and vacant during off hours. Preventive measures are employed only when the retail/wholesale

Alarms and Security Precautions



Alarm

4.17%

4.08%

No Alarm

15.4%

18.15%

⁹²
Figure 5.2.1

establishment is closed. Since customers do not visit these establishments during off business hours, preventive measures can still be employed without adversely affecting business image. It is very easy for burglars to actually observe whether anyone is at the establishment. Where residences are concerned, the burglar can not tell the last name of the occupants from the outside, and therefore, can not call to check whether anyone is home. Many households keep their telephone number unlisted. Thus, deterring factors are crucial in deterring potential residential burglars. For businesses, deterring measures are irrelevant.

During work hours, the most effective feature of a "traditional" alarm is the panic button. Well noticed identification measures like video devices can also be effective. After work hours the detection measures of the alarm take over. It has also been advised that two way voice alarms or the new systems which take snap photos are most suited for commercial establishments. The three most important categories of precautions retailers and wholesalers need to address to adequately protect their premises are prevention, detection and identification.

Now, let's analyze the probability of burglary depending upon the number of precautions taken. Figure 5.2.1 shows that only 4.08 percent of establishments with alarms and three or more other precautions are burglarized. If an alarm is present and less than three other precautions are taken, then the chance of burglary rises just slightly to 4.17 percent. The two right hand side bars show that regardless of the number of precautions, non-alarmed establishments have approximately four times greater the chance of burglary than alarmed establishments. If the establishment is not protected by an alarm, the chance of burglary significantly rise by 15.4 to 18.15 times regardless of whether other security measures are taken. Alarms reduce the chance of burglary by approximately four times.

Figures 5.2.2 and 5.2.3 shed light on the precaution issue. Calculating the percentage of businesses with three or more precautions shows the following:

Table 5.2.1

Percent of businesses with three or more precautions

	Burgled			Non Burgled		
	percent	Mean	# Cases	Percent	Mean	# Cases
Alarmed	49	2.40	35	43	1.88	146
Not Alarmed	21	1.40	39	31	1.70	76

Burgled establishments take significantly fewer precautions than non-burgled establishments. Managers of alarmed properties appear to be more security conscious than non alarmed property managers.

These results differ from those we saw for alarm effectiveness in residential properties. Effective residential security includes both an alarm and other security precautions. In the commercial case, a burglar alarm on its own is the most important measure to deter burglars regardless of the number of other precautions. This finding makes intuitive sense; very seldom is somebody on the premises during off work hours, so deterring measures are senseless. For aesthetic and appeal reasons most businesses refrain from maintaining effective prevention measures. So, actually only an alarm is used as a precaution, and due to the nature of commercial establishments is first and most effective in deterring burglars.

Interesting findings were observed on the preventive measures. Sixty nine percent of burgled, non-alarmed properties had deadbolt locks while only fifty one percent of all alarmed properties had deadbolt locks. Thus, deadbolt locks may be ineffective if not accompanied by an alarm. The same is true for bars on windows; they appear to be effective only when accompanied by an alarm system. Figure 5.2.4 shows that there is no significant difference between burgled and non burgled establishments disregarding alarms. Non burgled properties do not use more of any one of the precautions. Indeed, as seen in figures 5.1.1 and 5.2.1, an alarm is the one precaution that significantly reduces the probability of burglary. Deadbolt locks are the most often used precaution by

Number of Precautions

Burglary Victims

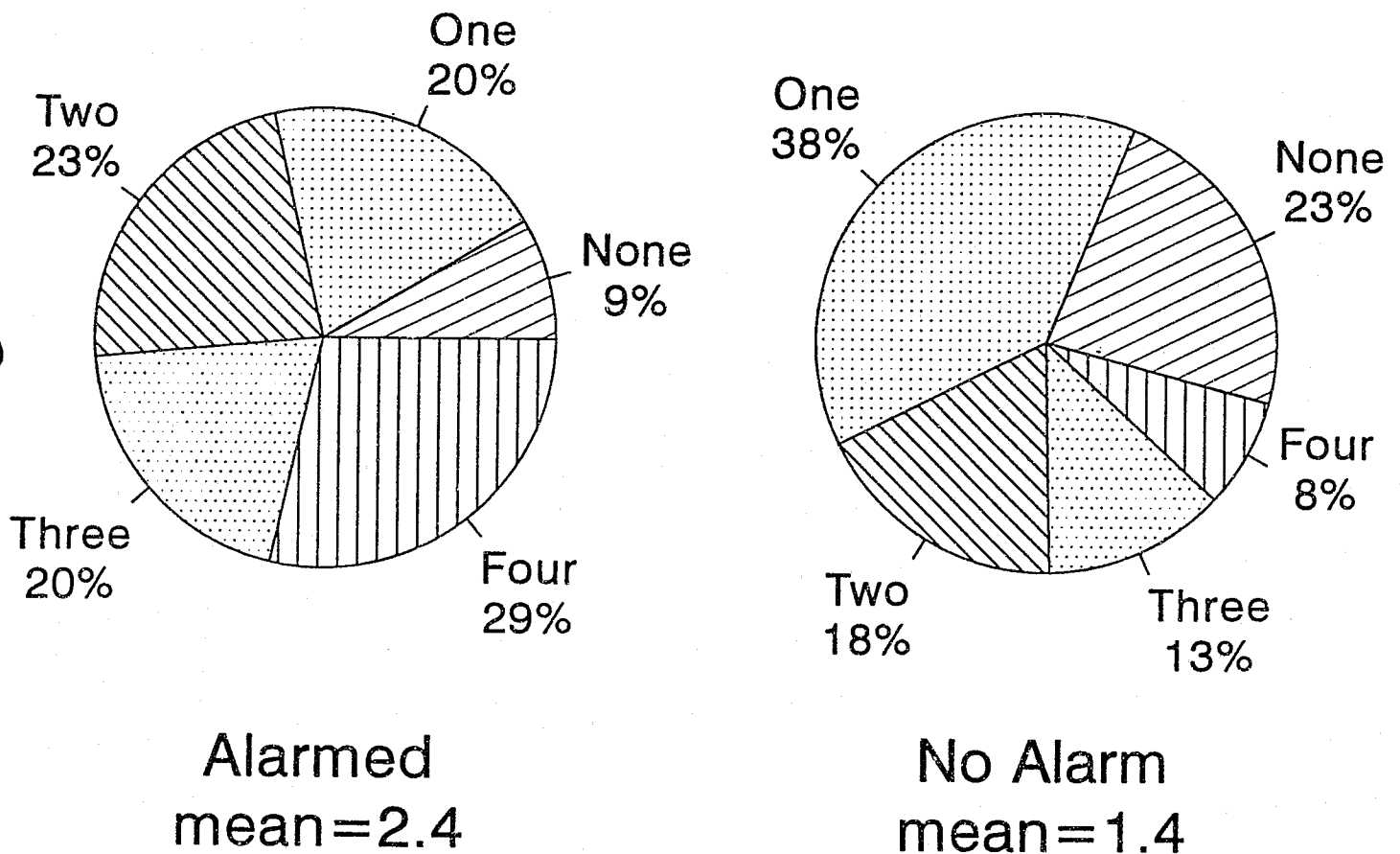


Figure 5.2.2

Alarmed n=35
No Alarm n=39

Number of Precautions

Not Victimized

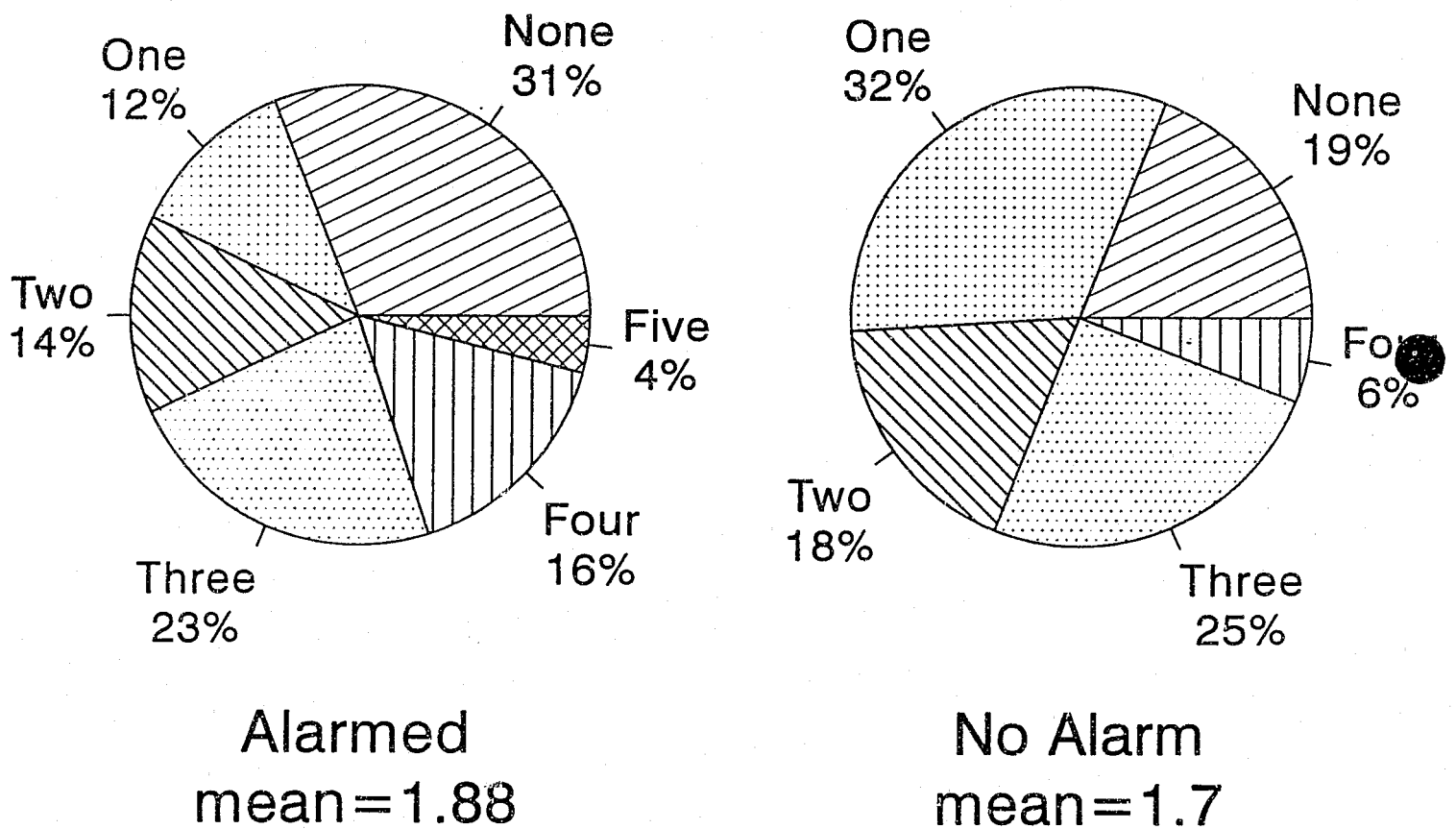


Figure 5.2.3

Alarmed n=146
No Alarm n=76

Precautions Adopted

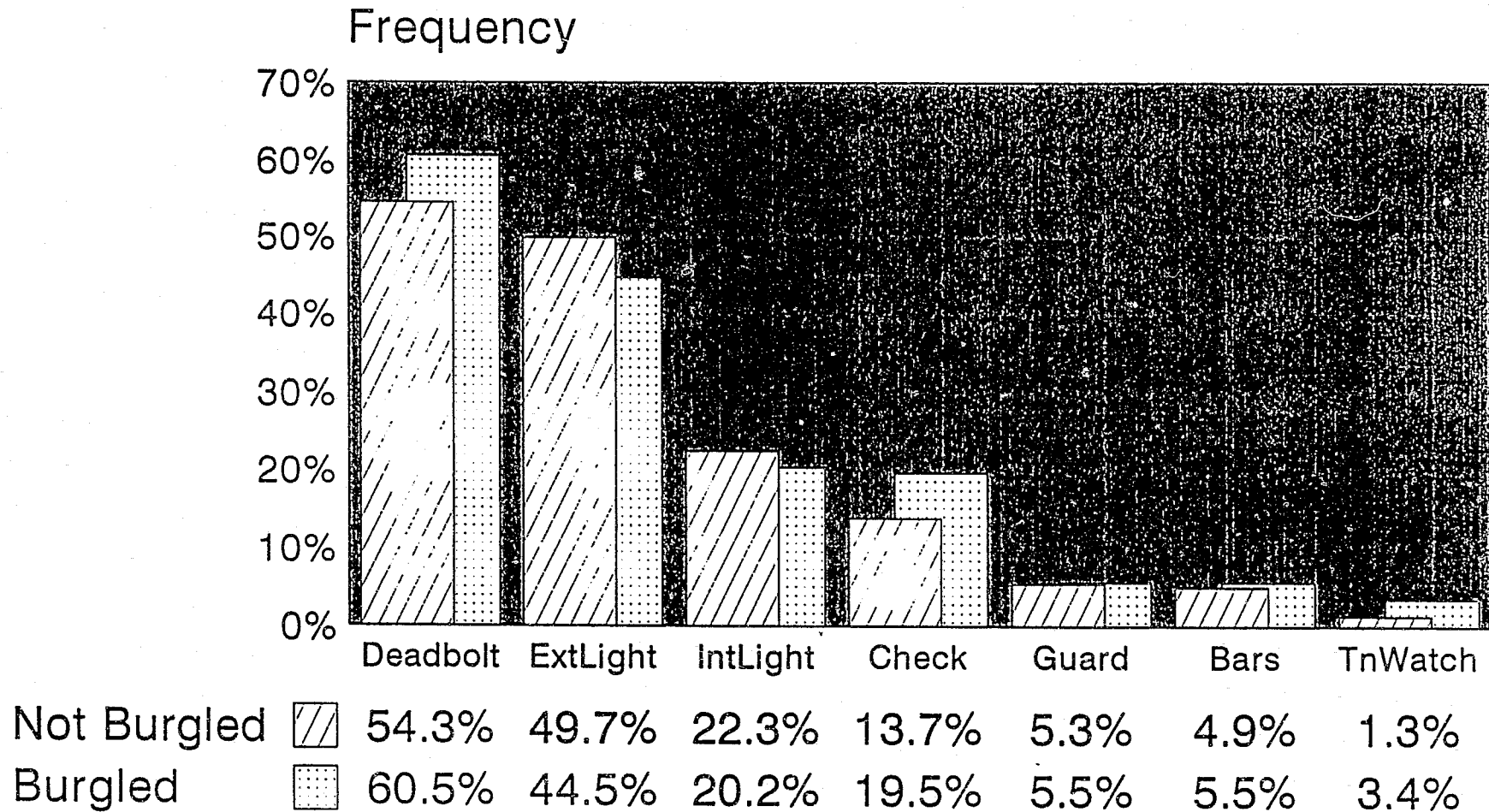


Figure 5.2.4

Burgled n=74
Not Burgled n=218

businesses. However, of all the precautions, short of alarms, the most effective measure is exterior lighting. Interior lights are another modestly effective measure in deterring intruders. Thus, as a package of precautions, alarms play the primary role. Adding exterior and interior lights does marginally enhance business security.

What are the policy implications for individual dealers and for the alarm associations from these findings? First, such findings should be well publicized to enhance alarm sales. The diagrams clearly support the notion that alarms deter commercial burglars and that the role of other precautions is minimal. In the residential report we recommended that installers provide additional security measures to households. Commercial installers should concentrate in alarms and provide the various features of alarms including access control, video, sound sensors, monitoring of telephone lines, etc. Also, advanced technology can be applied to commercial establishments who are more likely to spend more than households on new alarm features. Also, due to differences between commercial and residential customers' needs and price sensitivities, marketing styles should be distinguished between residential and commercial markets.

The effectiveness of alarms and the role other precautions play in securing commercial establishments are important to police departments in their patrol design. Further, many business owners call the police seeking security checks and advice on to better securing their establishments. No other studies so far have dealt with commercial security. It is recommended that the state associations conduct appreciation nights with local police chiefs to outline such findings and suggest measures to better protect commercial establishments. Such meetings will also enhance the relationship between the police and the associations and may establish the association as the information source for businesses that seek to purchase alarms.

Value of Property Stolen

Tredyffrin

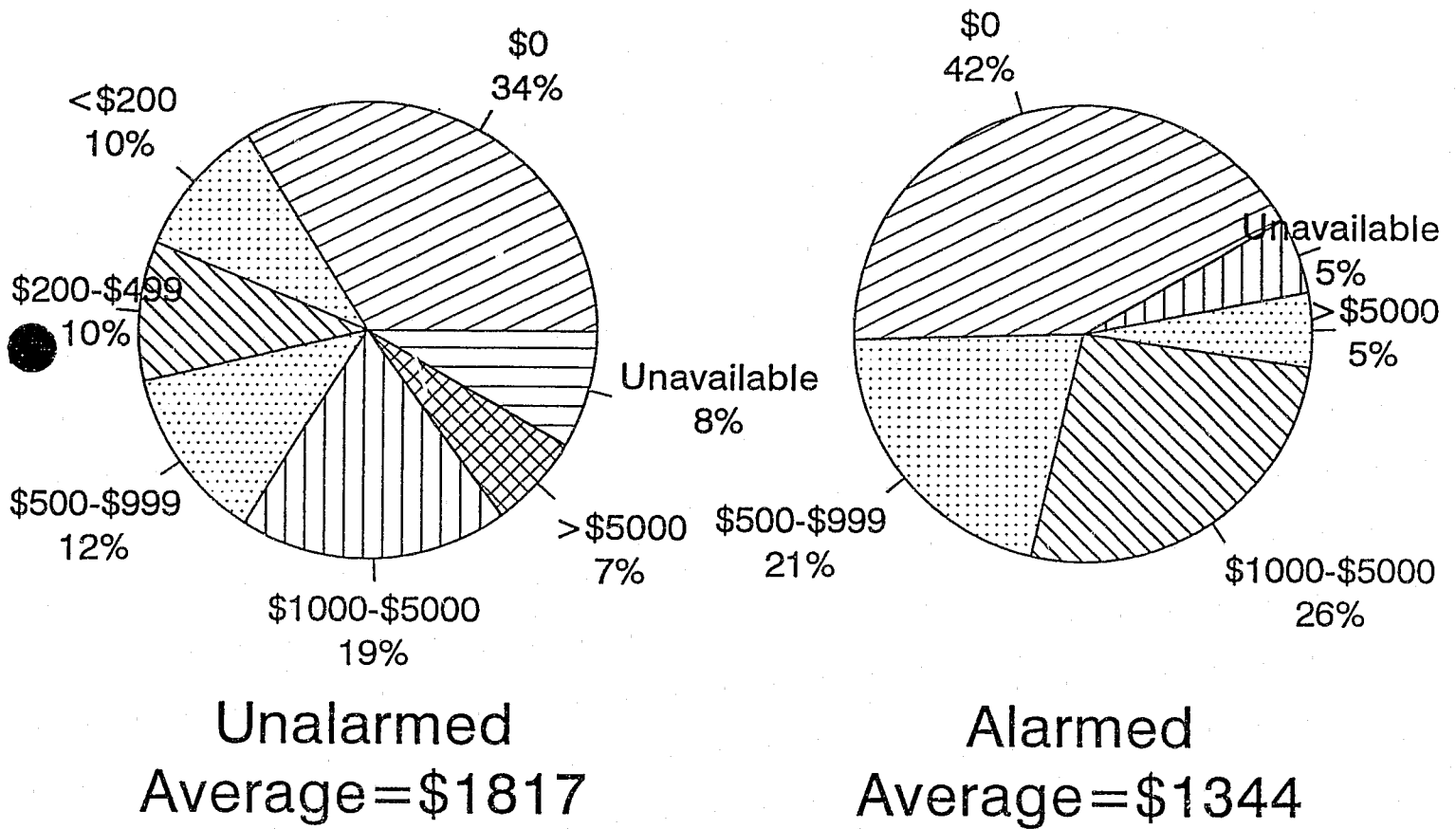


Figure 5.2.5

Chapter 6

Costs and Benefits of Alarms to the Community¹

This chapter is aimed at testing whether alarms provide net benefits to the community, including police departments, given the existing levels of false activations. Obviously, even if alarms do produce net benefits to the locality, it does not preclude current efforts to control and decrease false activations. This analysis will be beneficial to alarm associations and installers who attempt to prevent or alter local ordinances which impose restraints on businesses and residents who own alarms. Revealing the benefits and costs to local communities and to the police provides a comprehensive understanding of the net effects of alarm systems. It redirects the attention of local policy makers from the mere cost considerations of false activations to the overall costs and benefits effects.

Tredyffrin Township in Pennsylvania is a prototype east coast affluent suburban locality. It is plausible to assume that similar results will be obtained for other suburban localities, however at different magnitudes. The analysis is conducted conservatively; in case of uncertainty, costs are overestimated and benefits are underestimated or even assumed away. The effects on the community are often termed social or real costs and benefits². These effects can accrue to alarm users and nonusers, installers, police and fire departments and insurers. We begin with the cost variables, first for the residential units and then for the commercial structures.

6.1 Cost Variables

Residential Costs Variables:

The first cost to be considered is residential installation

¹ This chapter was co-authored by George Rengert from Temple University, Department of Criminal Justice, and Johannan Shachmurove from University of Pennsylvania and Bar Ilan University, Department of Economics.

² National Crime Prevention Institute, 1986, *Understanding Crime Prevention*, Butterworth Publisher, Boston Mass.

outlays. The average cost of a residential system in Tredyffrin Township has been calculated by Hakim and Buck (1991, p. 78) to be \$2244. There were 1818 residential alarm owners in the township. We estimate the life span of a system to be fifteen years and the capital recovery rate at six percent. Thus, the annual cost to all residential alarm owners in Tredyffrin Township is:

cost of one unit: \$2244.00
* residential units: 1818
* capital recovery rate: 0.10296
= \$420,035.

Next, we consider the monthly service charges. The average service charge has been determined to be \$26.00 per month. Eighty percent of all residential alarm owners in the Township are connected to a central station. Thus, the annual cost of the service charges is:

monthly charge: \$26
* months: 12
* residential owners paying the charge: 0.8
* residential alarm owners 1818
= \$453,773.

Now we come to the costs accrued to the police department through response to residential false activations. The police budget for 1990 was \$2,849,626.00. Operating costs include officers' wages, maintenance of facilities and cruisers, fees to the dispatching service, equipment replacement, cost of support personnel, heat and electricity. The number of officers in the department totalled 47. We assume that seven officers and the eight civilians are part of the overhead costs, leaving 40 officers available for direct crime prevention. In addition, we assume that the officers actually work at their basic job only 230 working days annually. This calculation allows for days off, vacation and sick time, holidays, and in-service training. Thus, the cost per hour per officer is:

yearly police budget: \$2,849,626.00
divided by: (40 officers * 230 days * 8 hours)
= \$38.71.

Since we have used the total operating budget to calculate the cost per man per hour, this figure represents the fully loaded cost of one hour of an officer's time. Two officers respond to each activation with two cars, and the average response time is nine tenths of an hour. This is the average time needed to clear an alarm activation from initial call to response and subsequent follow-up. Since an ordinance was enacted to fine owners for false activations, the number of activations were significantly down from previous years. The police in Tredyffrin Township have stated that the officers on regular patrol are diverted from public service and routine patrol to respond to alarm activations. However, in the absence of alarm response, manpower would not have diminished. In order to be conservative on the cost, we assumed that actual cost would have diminished at their average cost. Clearly, the real cost of responding to alarm activations in the community is lower than the average cost we used. Therefore, the cost imposed on the police department for each activation is calculated as:

\$38.71 per hour
* 2 officers
* 9/10 hour = \$69.68.

There were 1996 residential false activations in Tredyffrin Township in 1990 which yield total cost of response for both manpower and automobiles of \$139,081. This figure includes response for both residential burglary and fire. That figure indicates that the alternative benefits accruing to the community from other denied patrol activities when the officers respond to alarms are equal to the real cost.

The total cost to Tredyffrin Township of residential alarms is the sum of residential installation costs, monthly service costs, and the costs of responding to false activations. These figures total to \$1,012,889 per year.

Commercial Cost Variables:

The average cost of an installed alarms in a commercial unit in the township has been calculated by Hakim and Buck (1991, p. 78) to be \$3,200.00. There were 440 commercial alarm owners in the township. As illustrated in the residential part it is estimated that the life span of a system is fifteen years and the capital recovery rate is assumed at six percent. In addition, alarms are considered part of business expenses and are depreciated faster for tax consideration. Continuing with our conservative estimate, we assume that the tax code assumes a fifteen year life span, and as a result we apply the corporate tax rate of 34 percent yearly. The tax benefit means that the firm is really paying only (1 - the corporate tax rate) = 66 percent of the cost of installing the alarm. The fact that the tax code allows faster depreciation means that the benefit to commercial units are higher than we estimate. Taking all the above into consideration it can be estimated that the annual cost to all commercial alarm owners in Tredyffrin Township is:

cost of one unit: \$3,200
* commercial alarm units: 440
* capital recovery rate: 0.10296
* after tax cost: 0.66
= \$95,679.

The average monthly service charge has been found to be \$100.00 per month (Hakim Simon 1991). Only seventy four percent of all commercial alarm owners in the Township are connected to a central station. This low figure reflects the fact that many retailers are not connected to a central station. All the monthly charges are recognized as business expenses. Thus, the annual cost of the service charges is:

monthly charge of \$100.00
* Months: 12
* owners paying charges: 0.74
* commercial alarm owners: 440

* after tax cost: 0.66
= \$257,875.

The costs imposed on the police department through response to false activations was calculated earlier to be \$69.68. In 1990, there were 528 commercial false activations in Tredyffrin Township which yields a total response cost for both manpower and automobiles of \$36,152. This figure includes response for both burglary and fire.

The total cost of commercial alarms to Tredyffrin Township is the sum of commercial installation costs, monthly service costs, and the costs of responding to false activations. These figures total to \$390,345 per year. The total residential and commercial costs is thus estimated to be \$1,403,230. This is a significant cost to the alarm owners and to other members of the community. The issue now turns to whether or not the benefits of alarms outweigh these costs.

6.2 Benefit Variables

Residential Benefit Variables:

The first obvious benefit to the alarm owners is avoided burglaries. Avoided nonmonetary costs of burglary include personal injuries and emotional discomforts to the victimized persons. On the national level, in thirteen percent of all break-ins, burglars encountered someone in the home; in almost one third of these cases, the confrontation ended in assault, ten percent of which were rape¹. Cohen² has calculated the cost of crime to victims based upon national statistics and jury awards in personal injury accident cases. Using these figures, we calculated the avoided violent crime as the difference in probability of burglary with and without an alarm multiplied by the number of homes with alarms.

1 Dingle, Derek, 1991, "Theft Proof Your Home", *Money Magazine*, August: 96-97. National Crime Prevention Institute, 1986, *Understanding Crime Prevention*, Butterworth Publisher, August. Rand Michael, 1991, *Crime and the Nation's Households*, 1990, Bureau of Justice Statistics Bulletin, Washington, DC.

2 Cohen, Mark, 1988, "Some New Evidence on the Seriousness of Crime", *Criminology*, Vol 26, No. 2, pp. 343-353. Cohen, Mark, 1988, "Pain, Suffering and Jury Awards: A Study of the Cost of Crime to Victims", *Law and Society Review*, Vol. 22, No. 3.

Then, this figure was multiplied by the cost of average crime as estimated by Cohen (1988: Table 1). For the total cost of assaults, we multiplied:

the average cost of assault of \$12,028

- * (probability of burglary without an alarm, .0306,
- probability of burglary with an alarm, .0104)
- * alarm owners: 1818
- * proportion of homes where somebody was present at
the time of the break-in: .13
- * proportion of occupied homes that ended in
assault: .333
- = \$19,122.

The average cost of rape is:

\$51,058

- * (probability of burglary without an alarm, .0306 -
probability of burglary with an alarm, .0104)
- * alarm owners 1818
- * proportion of houses occupied: .13
- * proportion of occupied homes that ended in
assault: .333
- * proportion of assaults that ended in rape: .10
- = \$8,117.

The direct monetary losses of burglary to a victimized homeowner, which include the costs of repairs, lost wages from time off work excluding the value of the goods stolen, were estimated at \$939, pain and suffering at \$317, risk of death at \$116, reaching an average cost of burglary of \$1,372. Therefore, the calculation of the nonmonetary costs of burglary is:

nonmonetary costs of burglary: \$1,372

- * (probability of burglary without an alarm, 0.0306
- probability of burglary with an alarm, 0.0104)
- * alarm owners: 1818
- = \$50,385.

To summarize, the avoided costs by existing alarms of pain, suffering, and risk of death in residential units add to \$50,385.

The avoided cost of the same three categories for assaults is \$19,122, and of avoided rapes is \$8,117. Thus, alarmed homes in Tredyffrin Township avoided violent crime for non-monetary benefits of burglary is \$77,624.

Next, we consider the direct costs of residential property stolen that are avoided by alarm owners. Our computations are illustrated in Table 6.1. The first column assumes that there are no residential alarms in the community. Applying the historical burglary rate to all housing units without alarms yields an expected 319 burglaries which would have resulted in the Township in 1990 if no alarms existed. On average, unalarmed residences lose \$1674 per incident, yielding a total loss of \$534,006. If there are alarms in the community, 1,818 homes suffer a successful attack rate of 0.0104, giving us an expected number of burgled, alarmed properties of 19. To these add those expected to occur in the remainder of the population, 236 incidents. Now, applying the average loss to each yields expected losses of \$24,106 in alarmed and \$440,888 in non-alarmed residences. The difference between these two states of the world, alarms versus no alarms $((2) + (3) - (1) = 24,106 + 440,888 - 534,006)$, is a reduction in losses of \$69,012 due to the existence of burglar alarms in Tredyffrin Township.

Not all burglary attempts in Tredyffrin Township were successful. We also must consider the case of incomplete burglary. Two percent of alarmed properties experience unsuccessful burglary attempts. Burglars are presumed to be scared off by the alarm's activation. This means that $.02 * 1,818 = 36$ properties suffered no loss. They would have lost \$1,674 had they not had an alarm. Thus, total loss avoided is \$60,264.

A further well recognized cost of successful burglaries is demoralization. These are emotional costs associated with the trauma of the invasion of privacy, feeling of vulnerability, and loss of items with sentimental value. In this affluent community all residences are insured. The insurance protects against the monetary loss of assets. Alarm installation protects against

future burglaries and its resulting demoralization costs. 90 percent of the burgled population in the township installed alarms after burglary. Therefore, paying for alarms today saves the homeowners from both buying an alarm in the future and from being burglarized in the future. Accordingly, the annualized cost of alarm installation and the monthly charges may be conservative estimates of the nonmonetary costs which are not recovered by insurers. The annualized demoralization costs associated with burglaries avoided by alarm owners are:

Installation costs:

Homes installing alarms after burglary: 0.9
* unit cost: \$2244
* capital recovery rate: 0.10296
* number of alarmed homes expected not to be burglarized: 1799
= \$374,080.

Monthly charges:

Homes installing alarms after burglary: 0.9
* Monthly charges: \$26
* Months: 12
* capital recovery rate: 0.10296
* alarmed homes expected not to be burgled: 1799
= \$52,011.

Thus, total demoralization costs are (\$374,080 + \$52,011) \$426,091.

Additionally, most systems protect against both fire and burglaries. Therefore, one other benefit to the Township is the avoidance of fire. Indeed, fire protection alarms do not get the attention they deserve. About 2.5 percent of the homes in the sample claimed that their alarm systems detected fires (Hakim and Buck, 1991, p. 106). Using our survey responses, we find that 19 percent of expected fires are eliminated due to the use of alarms. The fires at alarm equipped residential properties had minimal damages due to early detection. Thus, we conservatively assume that alarms prevent fires in one percent of all households. Further, we may assume that it includes the upper 50-th percentile

in the seriousness of fires. If those homes had not had an alarm system, an additional 49 homes in Tredyffrin Township would have had a serious fire. Using national figures¹, average loss due to fire in the United States is \$7286. This is a very conservative measure for a high income suburb like Tredyffrin Township. Using these figures, avoided residential losses due to fire total annually to \$357,014.

Demoralization costs also accrue from fire loss. Again, like in the case of burglary, these costs pertain to devastation associated with destruction of a home and loss of personal items with sentimental value. Estimating these losses is very difficult so we chose to maintain our conservative estimate of benefits and provide no monetary value to these benefits.

Finally, we consider the insurance discounts on policy premiums for alarm owners. The nature of the discount and its level vary significantly among companies. Using a conservative estimate of \$500 annual premium and a ten percent discount yields an additional benefit of $\$50 * 1818 \text{ alarmed units} = \$90,900$.

The total benefits of alarm ownership to Tredyffrin Township sum to \$1,080,905. These are conservative estimates of avoided losses due to the existence of alarms in the township.

Commercial Benefit Variables:

Maintaining conservative estimates we assume that the probability of rape in commercial structures resulting from burglary is zero. The benefits of prevented burglaries consist only of avoidance of assault and the indirect non-monetary benefits. The probability of burglary without an alarm is 0.15480 and with an alarm is 0.04776. Following the residential calculation, the total cost of assaults is estimated as:

the average cost of assault: \$12,028

* (probability of burglary in commercial units without alarms, .15480 - probability of burglary in

¹ The National Fire Protection Association, Fire Experience Survey, Fire Loss in the United States During 1990.

commercial units with alarms, .04776)

* commercial alarm owners: 440

* proportion of commercial units somebody was present at the time of the break-in: .13

* proportion of occupied structures ending in assault: .333

= \$24,523.

The total cost of rape is assumed to be null. The direct non-monetary losses of burglary to a business owner, which include the costs of repairs, lost wages from time off work, excluding the value of the goods stolen, were estimated at \$939, pain and suffering at \$317, risk of death at \$116. The average cost of burglary is \$1,372. Therefore, the calculation of the non-monetary costs of burglary is:

non-monetary costs of burglary: \$1,372

* (probability of burglary without an alarm, 0.15480

- probability of burglary with an alarm 0.04776)

* commercial alarm owners: 440

= \$64,618.

To summarize, the avoided costs by existing alarms of pain, suffering, and risk of death in commercial units is \$89,141.

Next, we consider the direct costs avoided by alarm owners of commercial property stolen. Our computations are illustrated in Table 3. The first column assumes that there are no commercial alarms in the community. Applying the historical burglary rate to all commercial units without alarms yields an expected 120 burglaries which would have resulted in the Township in 1990 if no alarms existed. On average, unalarmed commercial units lose \$1817 per incident, giving a total loss of \$218,267. If there are commercial alarms in the community, 440 units suffer a successful break-in rate of 0.04776, giving us an expected number of burgled, alarmed properties of 21.01. Adding the expected number of break-ins to the remainder of the population yields 52.01 incidents. Now, applying the average loss per incident yields expected losses of \$29,078 in alarmed, and \$94,502 in non-alarmed businesses. The

difference between these two states of the world, alarms versus no alarms $((2) + (3) - (1) = 29,078 + 94,502 - 218,267)$, \$94,687 is the amount of prevented losses attributed to commercial alarms.

As noted above, about two percent of alarmed properties are unsuccessful attempts, where intruders have been scared off by the alarm's activation. This means that $.02 * 440 = 8.8$ properties suffered no loss. They would have lost each \$1,817 had they not have alarm. Thus, losses avoided by unsuccessful burglary attempts on commercial establishments is \$15,990.

The demoralization costs reflect emotional costs associated with the trauma of the invasion of privacy, feeling of vulnerability, and loss of items of sentimental value. About sixty two percent of burgled commercial units reacted to burglary by installing alarms. Installing alarms provides valuable protection against future burglaries. Therefore, paying for alarms today prevents the owners from buying an alarm in the future and of being burglarized in the future. Accordingly, the annualized cost of alarm installation, and the monthly charges may be a conservative estimate of the nonmonetary costs which are not recovered by insurers. The annualized demoralization costs associated with burglary avoided by alarm owners are both in installation and in the monthly payments. The installation cost component consists of:

- burglarized businesses that install alarms: 0.62
- * unit cost: \$3,200
- * capital recovery rate: 0.10296
- * number of alarmed firms expected not to be burgled: 437.9
- * after tax cost: 0.66
- = 59,038.

The second component in the calculation of the demoralization costs is the monthly charges which can be estimated as follows:

- Burglarized firms that install alarms: 0.62
- * monthly charges: \$100
- * months: 12
- * capital recovery rate: 0.10296

* number of alarmed businesses expected not to be
burgled: 437.9

* after tax cost: 0.66

= \$22.139.

Thus, the total commercial demoralization costs is equal to \$81,177.

Most alarms provide protection against burglaries and fire. About 0.0238 of the commercial units in the sample claimed that their alarm systems detected fires. Fire at alarmed properties are minimal in damage due to early detection. If those businesses had no alarm system, an additional 18.47 commercial units would have had a fire. Using national figures¹, average loss due to fire in the United States is \$10,199. This is a very conservative measure for the commercial establishments in this affluent community. Thus, avoided fire attributed to commercial alarms totals annually to \$188,376.

Demoralization costs also accrue from fire loss. Again, just as in the case of burglary, these costs pertain to devastation associated with the destruction of the business and loss of business records which have no resale value. Estimation of such losses is difficult, and maintaining our conservative approach we chose not to give them any monetary value.

Finally, we consider the insurance discounts on policy premiums for alarm owners. The nature of the discount and its level vary significantly among companies and among businesses. Using a conservative estimate of \$750 annual premium and a ten percent discount yields an additional benefit of \$75 * 440 for commercial alarmed units = \$33,000.

The total benefits of commercial alarm ownership to Tredyffrin Township sum to \$502,371. These are conservative estimates of avoided losses due to the existence of alarms in the township.

The total residential and commercial benefits to the township

¹ The National Fire Protection Association, Fire Experience Survey, Fire Loss in the United States During 1990.

is estimated conservatively to be:

$$\$1,080,905 + \$502,371 = \$1,583,276.$$

6.3 The Balance of Costs and Benefits

In this section the balance of costs and benefits is presented, first for the residential units and then for the commercial units. Table 6.2 provides the summary estimate of the costs and benefits which resulted from residential alarm systems. It shows that the net benefits of the 1,818 systems are \$68,016. Thus, overall, residential alarms are beneficial to the community. The community includes alarm owners, the police department, township officials and non-alarm owners. It is likely that one group bears costs and another enjoys the benefits. For example, the police department bears the costs of responding to alarms and alarm owners enjoy additional security. Application of real costs and transfer of costs or benefits may raise the efficient use of alarms. For example, the fee charged for false activations should be the average cost to the police department of answering these calls. Currently, the amount collected by the township for false activations enters the township's general fund. Thus, rising costs of alarm response and subsequent increased collection of fees are not channeled to the police department which bears the actual costs. These charges should be transferred to a special fund for the police department to be used solely to cover police costs of responding to false activations.

It is important to note that the one element in Table 6.2 which gets most attention is the cost to the police department of responding to commercial false activations (\$139,081). However, the overall picture is more important to township officials who must reconsider local ordinances restricting alarm installation.

Table 6.4 provides the summary estimates of the costs and benefits resulting from commercial systems alone. It shows that the net benefits of the 440 systems are \$112,026. Thus, overall,

commercial alarms are beneficial to the community. The overall net benefits to the community from residential and commercial burglary and fire alarms is summarized in Table 6.5. The net total benefits are \$180,042.

6.4 Conclusions

In this chapter we calculated whether the benefits from burglar alarms outweigh the costs. On the benefit side is the prevention of break-ins and on the cost side is the cost of responding to false activations. It shows that the total benefits accruing to the community in the form of enhanced security outweigh the costs of installing residential and commercial alarms and responding to false activations. Homeowners and businessmen install alarms because they believe that their private benefits are greater than the associated private costs. The benefit is the perceived greater security and the cost is the fines to be paid for false activations. Individuals can be trusted to make correct decisions provided they bear all associated costs and benefits. What is good for the individuals is not necessarily good for the community as a whole. An overall assessment requires the consideration of external costs and benefits. External costs include police response to alarms while external benefits include arresting burglars and "taking them out of circulation".

Costs and benefits were conservatively calculated. Costs are biased upwards, and benefits downwards. The external benefits associated with an alarm's effect on deactivating burglars was not taken into account. Still alarms appear to be beneficial to the community. Benefits outweigh the costs by \$180,042. 62 percent of it is attributed to commercial and the remaining 38 percent to residential alarms.

This work provides policy proscription for municipal officials. They should consider redistributing fees collected from alarm owners to the police, who bear the costs associated with the

Table 6.1

Direct Costs and Benefits of Residential Alarms in the Community

	No Alarms in the Community	Equipped	Unequipped
	(1)	(2)	(3)
Housing units	10,425	1,818	8,607
x Burglary Rate	<u>.0306</u>	<u>.0104</u>	<u>.0306</u>
Expected Number of Burglaries	319	19	263
x Loss per Burglary	<u>\$1674</u>	<u>\$1275</u>	<u>\$1674</u>
Total Expected Loss	\$534,014	\$24,106	\$440,888

Table 6.2

Total Costs and Benefits of Residential Alarms to the Community

A. The cost variables are:

1. To owners		
Installation outlays		420,035
Monthly Charges		453,773
2. To the Police Department		
Response to false activations		139,081
 Total Costs		 1,012,889

B. The benefit variables are:

1. Avoidance of burglaries		
Cost of violent crimes (assault and rape)		77,624
Cost of property stolen		
Cost to homeowners		69,012
Incomplete burglary		60,264
Demoralization costs		426,091
2. Avoidance of fires		
Cost to homeowners		22,939
Cost to insurers		334,075
Demoralization costs		NA
Insurance Discount		90,900

Total Benefits 1,080,905

Net Benefits \$68,016

Table 6.3

Direct Costs and Benefits of Commercial Alarms in the Community

	No Commercial Alarms in the Community (1)	Equipped (2)	Unequipped (3)
Commercial units	776	440	336
x Burglary Rate	<u>.15480</u>	<u>0.04776</u>	<u>0.15480</u>
Expected Number of Burglaries	120.12	21.01	52.01
x Loss per Burglary	<u>\$1,817</u>	<u>\$1,384</u>	<u>\$1,817</u>
Total Expected Loss	\$218,267	\$29,078	\$94,502

alarms. For example, the total amount of users' fees collected in 1990 was only \$14,796.00. The amount collected did not cover the real costs to the police department. Further, the money was credited to the general fund of the township. Thus, the township is still underpaid for its real costs. Efficient use of alarm related collections can be achieved if the following two conditions are fulfilled. First, the fines should represent the real costs to the department. Hence, each and all false activations will be charged a flat fee of \$70 per false activation. The amount should represent the long-run average costs associated with false alarms. Second, the police department should enjoy all receipts associated with alarms and should use this amount to provide alarm related services. In this case, so much friction would not exist between the police and alarm owners. The police would benefit (or at least break even) and the public would benefit from the increased security allowed by alarm installation.

Chapter 7

False Activations

Much has been written in the professional magazines about false activations. All industry segments are aware of the fact that with the rise of alarm installation, particularly of inexpensive residential systems, many police departments will cease response to alarm activations. Clearly, such an outcome as this, which already occurs in some large cities, may be detrimental to the industry. In order to search for a solution, one needs to identify the magnitude of the problem. Then, comprehensive statistical data on the causes of false activations need to be collected and analyzed before recommendations are made on possible courses of action. Installers, local policemen, and central station operators all experience false activations and many have ideas on how to deal with them. However, these ideas are usually drawn from limited personal experience and do not reflect the general picture. Only comprehensive national data collection of individual activations from central station of all sizes can reveal the cost effective measures to reduce false activations.

Why is it important to base recommendations upon thorough data analysis? After all, there are some actions that make intuitive sense. For example, as part of the study we met many police chiefs to discuss alarm issues. The common belief was that an increase in fines has a significant effect on reducing false activations. It certainly makes sense that both households and businesses will be more cautious with the operation of their alarms systems to avoid high fines. Now, since 78.5 percent of all activations stem from commercial establishments, and 75 percent of these are subscriber errors it is clear that it is reasonable to target efforts in this direction. It is cost-effective for policy makers to aim financial efforts where the impact is the greatest. At the same time, raising the level of fines may not be an effective measure to significantly reduce false activations.

Now, suppose that fines do significantly reduce the number of false activations. Does that mean that indeed fines are to be imposed? Even under that scenario such a policy is not necessarily desirable. In chapter 6 we saw that alarms generate positive net benefits to the locality. The question is how much should fines be raised in order to have a depressing effect on false activations. It may reduce alarm use and the purchase of new systems to a level that is enough to significantly raise the actual number of burglaries. Further, more burglaries which could have been avoided by new systems not purchased as a result of the higher fines will be committed. The costs of these burglaries to the community may be higher than the benefits stemming from the smaller number of false activations. Thus, higher fines would be undesirable even if they yield a significant reduction in subscriber false activations.

A detailed analysis of false activations could reveal effective measures which are, to date, unforeseen. For example, the CSAA survey showed that 75 percent of activations are caused by subscribers. It is possible that by changing physical features of the control panels or changing the procedures used by central stations can reduce false activations without significantly sacrificing security. To that end we suggested a research methodology which incorporates Total Quality Management analysis at central stations to determine possible procedural changes. Currently, alarm manufacturers and central station companies have little contact with actual users. Increased communication and feedback could serve to make systems more user friendly and response procedures more effective. Detailed information drawn from a large number of businesses and households that caused false activations and from a matching control group is necessary to establish cost effective measures. Such measures should be aimed at reducing false activations and/or determine means to physically respond to the expected increased number of activations. Responses to false activations may require a concentrated effort by dealers, either directly or through their local associations.

False Alarm Causes

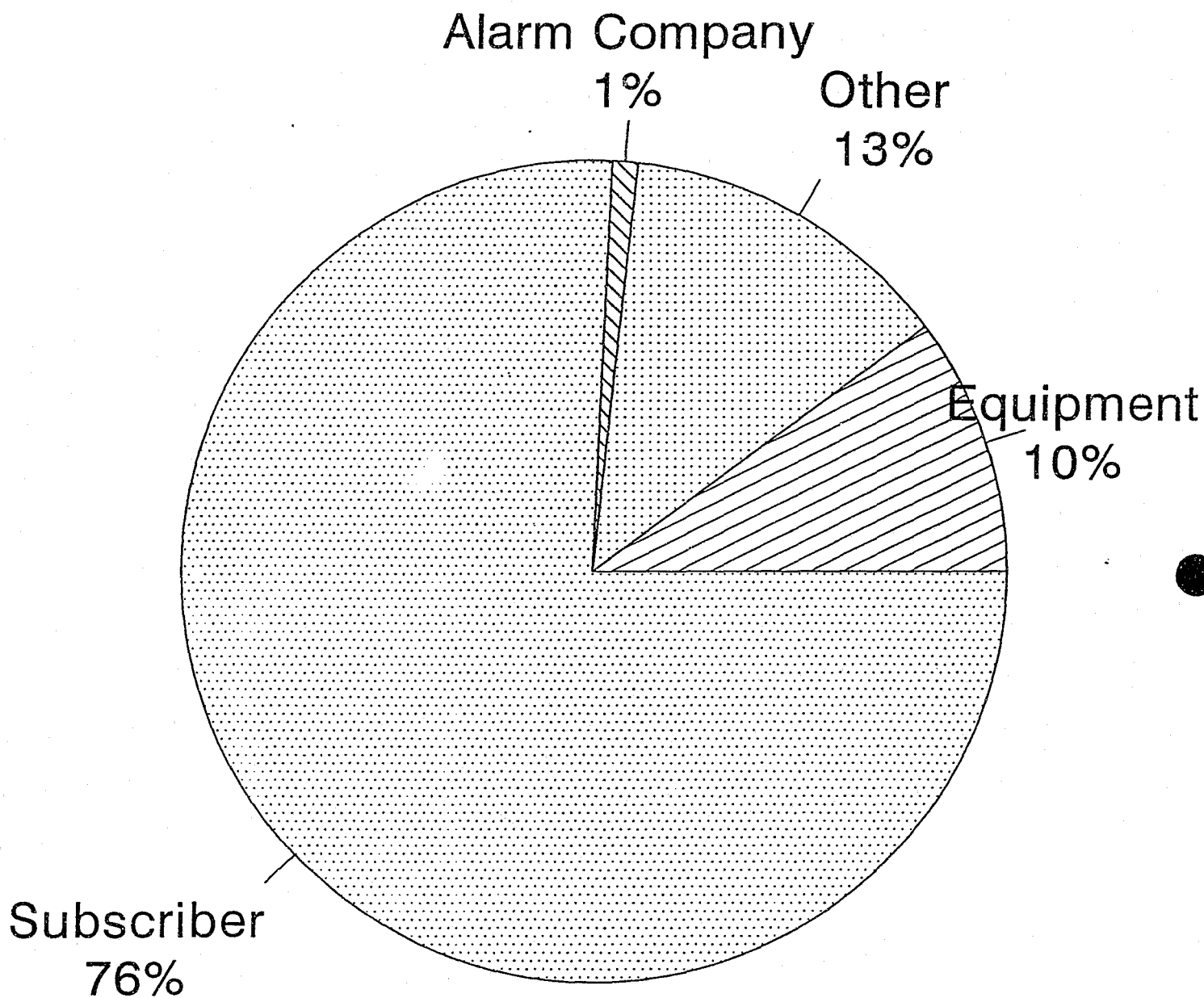


Figure 7.1.1

n=7625

7.1 Data Analysis

The CSAA 1992-1993 False Alarm Committee Report provides some interesting findings. However, a more detailed analysis of the actual cases could reveal further trends. Figure 7.1.1 shows that subscriber errors account for 75 percent of activations. Businesses account for 56 percent of alarms and for 78.5 percent of all activations. Of the 2,221 alarms dispatched to the police, only 2.9 percent were bona fide activations. Central stations were able to abort 58.3 percent of all commercial activations. The majority of the commercial activations were set off by the business or were opening and closing errors. It is important to determine the exact reasons why central station customers set off the alarm. Figure 7.1.2 shows that 19 percent of all the alarmed commercial establishments had three or more activations. It is crucial in any survey to concentrate on the exact causes of activation by these establishments.

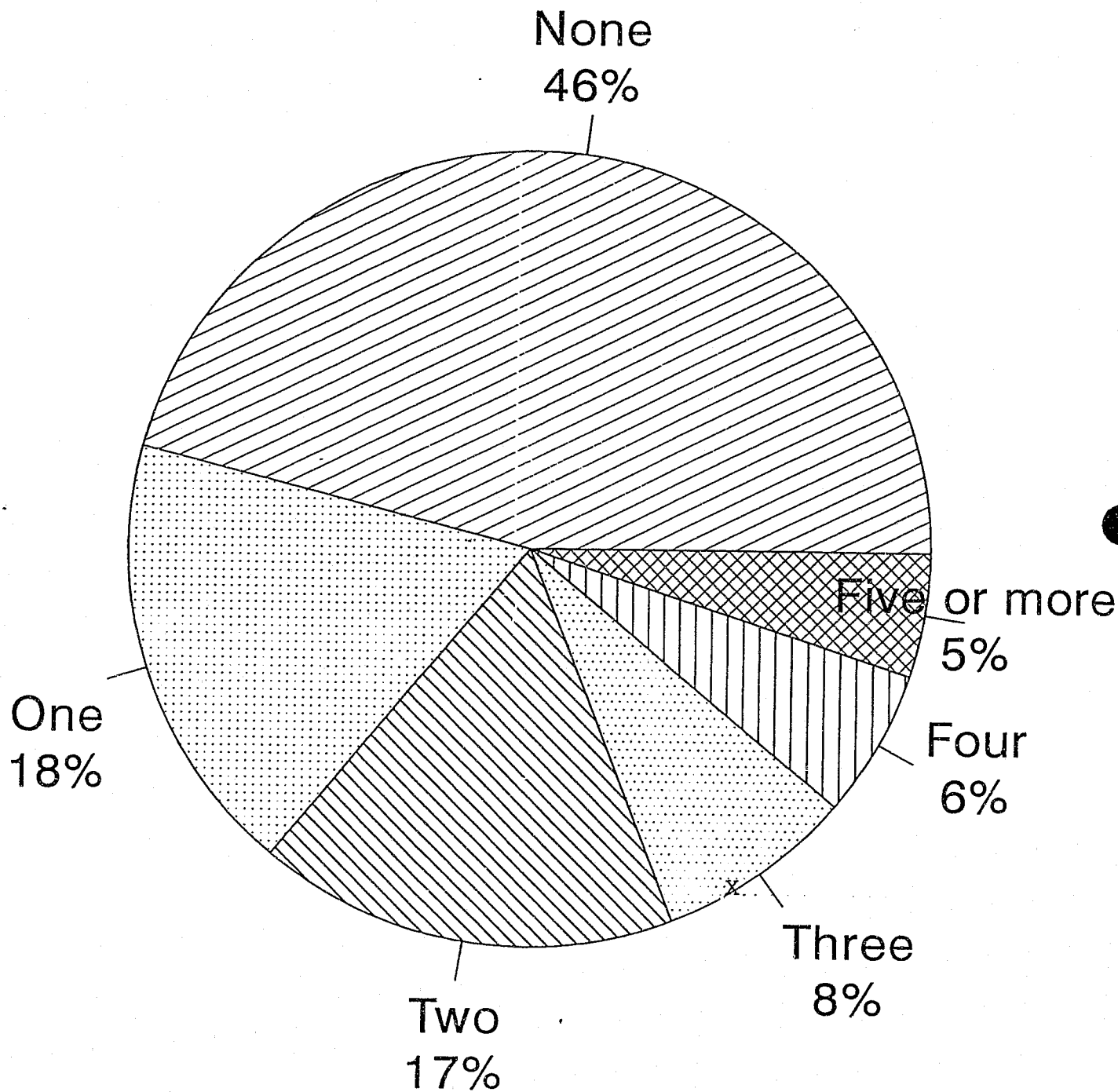
Now let's turn to central station procedures. In our earlier effort, we analyzed differences in activations between large regional or national installers who own their own central stations and small installers that use national central stations. The average number of activations is 1.7 for large and 1.5 for small companies. The reason is that regional central stations are more familiar with their subscribers and use more discretion before dispatching the police.

The fines for false activations vary among localities. In Tredyffrin, the first in the year is free, the second and the third are fined \$25, and thereafter \$100. In Upper Merion, the first is free and all others are fined \$25.

The average cost of each activation to the police was calculated in chapter 6 to be \$70 if police resources are committed exclusively to the response. What will happen if the fines are raised? Economic theory suggests that price should reflect real cost. In the survey we asked businesses to state whether they will

Activations per Year

Springfield and Tredyffrin



n=113
mean=1.3

Figure 7.1.2

Change in Fines and Usage

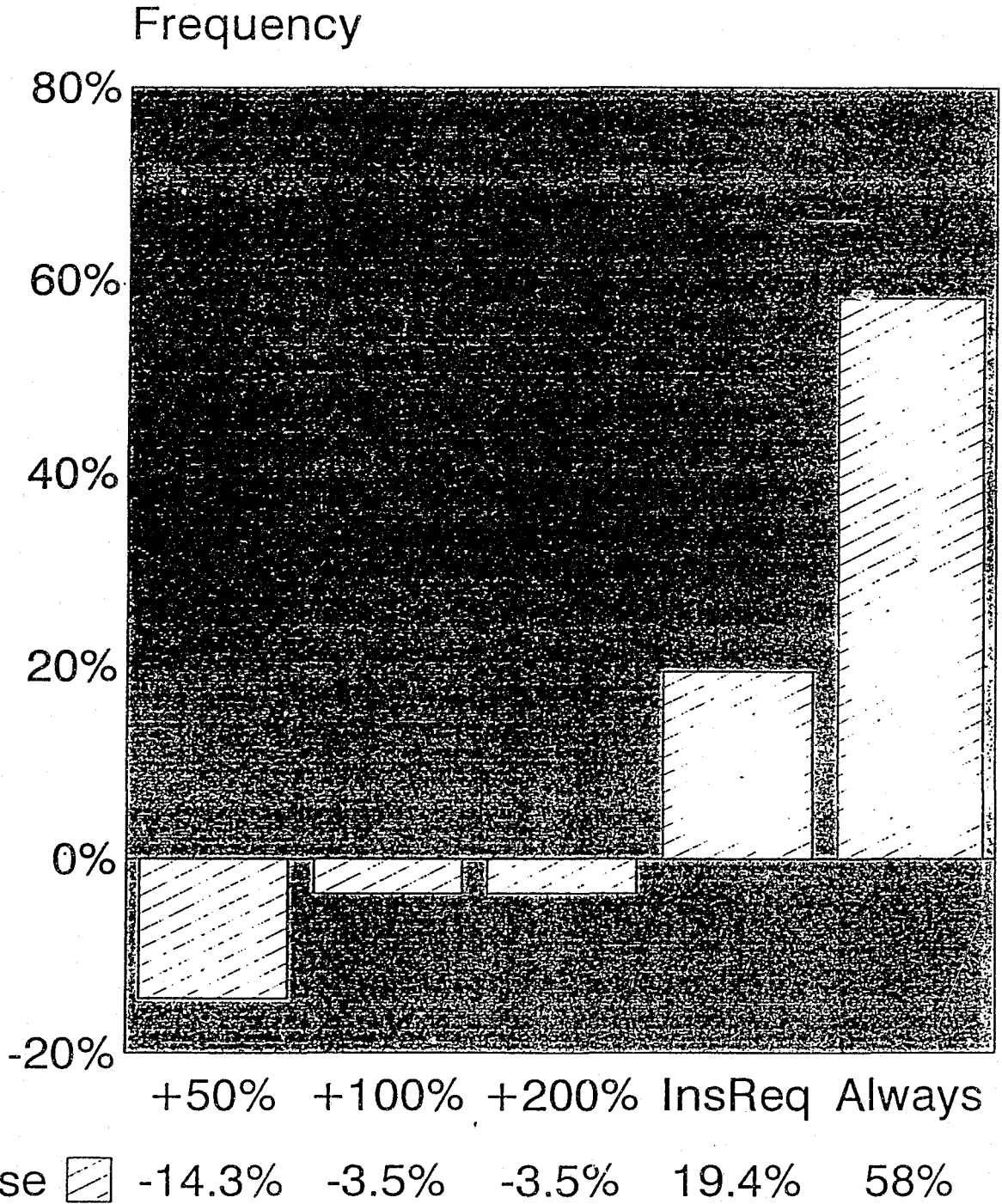


Figure 7.1.3

decrease alarm use if fines are raised by 50, 100, or 200 percent. Figure 7.1.3 illustrates that 58 percent of business respondents indicated that they will use the alarm regardless of the level of the fines, a result consistent with the residential responses.

7.2 Policy Implications

This survey was limited in data collection on false activations. It is obvious that a more detailed survey with geographically cross sectional activation incidents is necessary for sound recommendations. Further, data should be gathered on these incidents from three sources-- the user of the system, the responding police officer, and central station records.

To conclude, efforts to reduce false activations should concentrate on the largest problems-- commercial subscriber errors. Alarms installed by large companies experience less activations than alarms installed by small dealers who often use national central stations. The reasons could be due to differences in both central station procedures and in the follow up with "offenders". It appears that large companies like Vector maintain contact with frequent activators to control the problem. Fines on false activations are less than the actual cost of response to the police department. However, it does not seem that fines are effective in drastically reducing false activations.

What can we learn from these results? It is reasonable to assume that with a ten percent rise in alarm installations per year, no immediate solution can be implemented. Police departments will be more selective in their response. Only highly vulnerable businesses, such as jewelry stores, banks, and government facilities, will enjoy prompt response. Response to "regular" residential and commercial establishments will be either delayed or will entirely cease.

Some preliminary recommendations can be made:

1. Fines should reflect real costs to the police department.
2. The fines collected and the annual fees should enter a

special fund within the police department and should be used to cover the operating costs of response. The current practice of using alarm related proceeds in the general budget and letting police "absorb" response and alarm administration costs yields a distinct burden on police resources.

3. The industry should seriously consider private response to activations. Private security is a rapidly growing industry in the U.S.. Public law enforcement personnel is estimated at 650,000 while private security is at 1.1 million. Between 1980 and 1990 employment in public law enforcement personnel grew 16.3 percent while in the private security sector it grew 31.9 percent in the same time period. The main reasons private response has not as yet spread is the insurance liability and the fragmented structure of the alarm industry. Insurers charge high premiums on private guards who carry weapons. The large number of installers in any geographical district prevents any concentrated effort to establish such forces. It is clear that guard forces can be established only for confined geographical areas. The associations can play a role in establishing an insurance umbrella to cover claims to a certain amount while insurers will provide only secondary coverage. Installers in any given geographical area can form a security force in which their share depends upon the level of systems each has in that district. Such an action can weaken "truck slam" installers whose customers could face difficulties in subscribing to the response service. It is important to note that several private response companies are already operating already on the west coast and appear to be profitable.¹

¹ For example, Golden West K-9 in Pacoima California.

Chapter 8

Summary and Policy Implications

This report dealt with patterns of burglary, security precautions, burglar and fire alarm effectiveness, false activations, and the costs and benefits of alarms for commercial establishments. This report complements our first volume on *Residential Security* which was published in 1991 and is distributed by the National Burglar and Fire Alarm Association in Bethesda, Maryland. These two volumes are the first to analyze alarm effectiveness using a large suburban data base.

Residential burglaries and effective security measures have been widely dealt with in the criminology and security literature. However, very few works have touched upon commercial burglary and security, and this effort is a milestone effort in understanding the patterns and deriving sound policy implications. The main reason for such few commercial works is the lack of commercial burglary and robbery victimization data. The National Criminal Justice Information and Statistics Service renamed the Bureau of Justice Statistics in 1980 decided without explanation to suspend commercial victimization issues from the annual National Crime Survey.¹ However, in order to enhance commercial security it is imperative to collect data on burglary patterns and security precautions. Clearly, this report emphasizes the issues surrounding alarms aimed at improving knowledge in the burglar and fire alarm industry, police departments, security companies, and businesses which are concerned with their security. In this chapter we summarize the major findings. We recommend that a reader who is interested in any particular issue to refer back to the appropriate chapter.

Patterns of commercial burglaries are presented in chapter 2.

¹ Brantingham, Paul, and Brantingham, Patricia, *Patterns in Crime*, Macmillan Publishing Company, New York, 1984, p. 87.

Target choices by burglars are rational and are made in stages. First, commercial burglars prefer to operate along familiar routes. They operate in the corridor of a road they often travel for work or other common purposes. They burgle businesses along a route if the density is low and the properties are not well lit. Otherwise, if the density of commercial activities along the route is high they choose commercial targets which are remote from the major routes. Familiarity with both the area and the access roads is a most important feature for burglars who may need to escape. It is also important to note that police patrol is more likely to exist on major roads than on less active roads.

The second stage of the decision process is the choice of neighborhood. Usually affluent areas include expensive establishments with greater potential loot. Retail establishments in affluent areas are characterized by expensive merchandise that is easily fenced. Further, retail establishments in wealthy neighborhoods need an attractive image, which usually means less burglary preventive measures are taken. Businesses that carry expensive equipment like computers prefer to locate close to their workers' residences and are attractive to burglars, especially if the buildings are isolated.

The third stage in the burglar's choice of target is the street. A quiet street with little pedestrian and auto traffic is attractive to burglars. Targets are likely to be chosen by burglars along roads which have small concentrations of commercial establishments. Such roads and the buildings are usually not well illuminated.

The fourth stage in the decision process of the burglar is the choice of the target. When buildings are remote from the street and from other buildings they provide concealed access. One needs to remember that breaking into commercial establishments needs to be done during off work hours. Thus, most burglaries occur at night and over the weekend to avoid confrontation with bystanders and workers. This again suggests the burglar's desire for concealed access. Indeed, suites in office parks account for 46.5

percent of all commercial burglaries. Almost 20 percent of commercial burglaries occur at single office buildings. A street corner location significantly increases the chance of burglary. A location adjacent to woods or parks which provide concealed access, especially at night, doubles the chance of burglary. Burglar alarms appear to be the most important deterring factor in commercial establishments. Unlike homes, other precautions play a limited role and they appear to be effective only in conjunction with an alarm. The only effective precautions are exterior and interior lights. Actually, lights are the only deterring factor since burglars know that the facility is unoccupied during off work hours.

Interestingly, 53 percent of all commercial burglaries occurred in establishments that were in business less than five years. Within the five year category, 55 percent of burglaries occurred at establishments in business less than a year, 20 percent in the second year with declining shares to the fifth year. The same result was evident in the residential study and the reason is the same. New commercial establishments usually contain expensive merchandise and equipment with high fence values.

Chapter 3 deals with alarm ownership. Commercial owners purchase alarms primarily for property protection, unlike households whose main motivation is personal protection. The fear of fire does not motivate alarm purchase, although fire's effects are more devastating than burglary and occur in one percent of all businesses annually.

Involuntary reasons for system purchase include insurance company requirements and home office requirements in the case of subsidiaries, banks and chain stores. Actually, commercial establishments need only one reason to purchase a system compared with 1.43 reasons for households.

Thirty percent of businesses feel that they have adequate security. Twenty-two percent claim that alarms are too expensive. Sixteen percent never thought about an alarm and another 16 percent are concerned with false activations. Clearly, through an

aggressive public relations campaign stressing the need for protection, and alarm merits affordability price it is possible to penetrate the unclaimed market which is estimated at 68 percent. It is more productive to change the image of alarms through targeted public relations efforts rather than through price motivated advertising by individual companies. The latter approach can only be limited in its prospects for success. Current aggressive advertising by ADT, Brinks and other large companies that stress the alarm affordability has a limited effect upon the 46 percent of businesses that are unaware of the potential benefits of installing a system. It is even possible to coordinate a public relations campaign on the price motive alone. Such a campaign could be conducted in conjunction with insurers who reduce their loss exposure through alarms.

Proximity to shopping centers, remote location, concealed entrances, and vacant facilities after work hours are the major reasons businesses buy alarms. From our discussion in chapter 2 we realize that sometimes businesses are right while other times they are not. An informative campaign by the industry stressing research findings on vulnerability to commercial burglary in conjunction with short information sheets used by alarm sales people can raise sales.

How do businesses choose an installer? This issue has been thoroughly investigated in our survey. Installer choice is made by both residential and commercial owners and managers through referrals. A good reputation, having been around for a long time, prompt service and follow up on false activations are the major reasons installers are chosen. It is further anticipated that the nature of the industry will not change in the near future. A service orientation, rather than a hardware focus, will remain the major guarantee to attract customers.

Insurers offer discounts on premiums for alarm ownership. Alarms are indeed effective in deterring intruders and result in a lower probability of burglary for alarmed properties. Now, in order to justify awarding discounts to alarm owners, the discount

must be considered in the alarm purchase decision process. But, only 9 percent of alarm owners considered the discount when purchasing their systems. Only 2 percent of non alarmed businesses know whether their insurers provide discounts for alarm ownership. Overall, alarms yield net benefits to insurers even after the amount sacrificed on discounts.

The insurance industry should be interested in enhancing alarm sales. Cooperation between the two industries will be beneficial to both. The cooperation of the associations can be in setting standards for adequate systems, referral lists for reliable installers and dissemination of information to businesses on the merits of alarms. The insurance industry could cooperate by working toward standardizing discounts and stressing the merits and effectiveness of alarms to clients. One of the newer insurance industry associations, PASONA, was formed to deal with these types of issues.

Chapter 4 concentrates on the structure and pricing practices of the alarm industry. The industry is composed of three segments - manufacturers, installers and monitoring companies. There are 92 alarm manufacturers in the U.S. with an average of 72 workers per establishment. 49 percent of manufacturers have less than 25 workers and an additional 29 percent employ 26 to 100 workers. The largest manufacturer controls 10 to 15 percent of the market. Concentration in manufacturing has declined between 1982 and 1990, indicating low economies of scale.

STAT Resources has estimated that in 1990 there are between 10 to 12 thousand installers in the U.S.. The top twenty five account for 40 to 50 percent of total industry sales. 12 percent of companies are less than two years old, a much higher rate than other industries. Again, the dealer market is labor intensive, is characterized by easy entry and exit, and has no licensing or other governmental or industry regulations. Most companies are privately owned and corporate acquisition is limited in scope. No economies of scale or scope are evident in the dealers segment of the industry.

2,451 monitoring companies existed in the U.S. in 1987. Average revenues are a modest \$904,781. Labor costs account for 35 percent of total costs. Threshold entry to cover all costs is 1,000 subscribers.

There is little incentive for vertical or horizontal integration. Further, the modest economies of scale and scope in the industry, the ease of entry when profits rise, and exit when profits decline, explain the fragmented structure of the industry at all levels. Hardware and installation quality differs little among dealers. The only possible price differentiation is in service rendered. Dealers can offer long term system upgrades and prompt attention in the case of system malfunction. Indeed, national and some regional dealers respond to false activations by checking with the client and even inspecting the system after the fact for the cause.

The fragmented structure of the industry yields competitive prices. Large and reputable dealers are able to capitalize on their reputation by charging approximately 30 percent more on the installation and 20 percent more on monitoring. The number of activations per system are slightly lower for large national and regional than for small installers.

Chapter 5 exhibits information on the effectiveness of alarms. Effectiveness can be measured along various scales. The first test is whether alarm owners are satisfied with their decision to install a system. Seventy-seven percent of businesses are satisfied compared with 94 percent for households. The main reason for satisfaction is a feeling of safety. Fifty-six percent of the satisfied group stated safety as the only reason and 27 percent more stated it in conjunction with one other reason. It is important to state that for commercial properties that feeling is attributed to property safety while in residential establishments it is personal safety.

We used an objective measure on the effectiveness of alarms using victimization rates of alarmed and non alarmed commercial establishments. The ratio of burgled non alarmed to the number of

all non alarmed commercial properties yields the probability that a non alarmed commercial establishment has to be burgled. The ratio of burgled alarmed to all alarmed establishments in the three communities yields the probability of burglary for alarmed properties. Dividing the first ratio by the second tells how much greater the chance of burglary is for non alarmed properties than it is for alarmed properties. Calculations show that overall, non alarmed properties are 4.57 times more likely to become burglary victims than alarmed establishments. In the residential study we showed that non alarmed homes are 2.71 times more likely to be victimized than alarmed homes. Thus, commercial alarms are effective in deterring intruders and, in fact, are more effective than at residences. Effectiveness is higher as community wealth increases. Also, the greater the concentration or density of commercial establishments the greater the risk of burglary and the more effective an alarm becomes.

The study revealed that 14.6 percent of alarmed establishments detected a burglary attempt that was prevented by the alarm. It further showed that 2.6 of alarmed businesses indicated that the alarm detected a fire. Conservative national estimates of the direct costs of burglary are \$1,110, and \$10,199 for fire. These costs are almost entirely avoided by the presence of an alarm.

Unlike residential properties, other precautions add little to the security of commercial establishments. 4.08 percent of alarmed establishments with three other precautions are subject to burglary while the chance of burglary rises just slightly to 4.17 if the property is protected solely by an alarm. Exterior and interior lights are the most effective precautions and serve to deter burglars.

A controversial issue in the industry is the use of signs to alert others that the property is protected by an alarm. Some claim that alarm signs attract burglars to break in since, presumably, there is something worth protecting. Others claim that the sign deters and burglars search for other unalarmed properties. The results show that the second group is right and that alarm

signs are effective in deterring intruders. In fact, alarmed businesses which do not display a sign are 1.36 times more likely to be victimized than alarmed businesses that do show a sign. The reason is that over 90 percent of burglaries in metropolitan areas are drug related and are committed by non professional burglars who need a small amount of money to pay for drugs. Alarms have a strong deterring effect on them.

Chapter 6 includes a detailed cost/benefit analysis of alarms to the community. The costs include police response to false activations, installation and monitoring costs accruing to businesses and residences. The benefits include the avoided costs of burglary and fire. In these categories we computed avoidance of monetary losses, of possible violence costs and of demoralization costs. Demoralization costs include invasion of privacy and loss of items with sentimental value. The costs and benefits were calculated separately for residential and commercial establishments. Overall, residential benefits net of costs are \$68,016, and commercial \$112,026. Thus, the community as a whole enjoys net benefits from the existing alarms of \$180,042 a year, of which 62 percent result from commercial establishments.

The cost and benefit calculations are important to the industry for its public relations campaign. It is likely to benefit local associations and dealers who need to overcome unfavorable local ordinances pertaining to alarms. These calculations apply to suburban localities. The results are likely to be true, however, at different magnitudes to other localities. Accurate estimates can be computed relatively easily for other localities.

Chapter 7 deals with the false alarm issue. Businesses own 56 percent of alarms connected to central stations and are responsible for 78.5 percent of activations. Only 2.9 percent of activations are classified as bona fide. Overall 75 percent of false activations are caused by subscribers. At commercial establishments the major causes of activations are opening and closing errors and systems being set off by the user.

In order to derive effective solutions it is imperative to first address the major causes of activations. Education of alarm owners has been suggested as an effective measure to control false activations. Aggressive follow up by the crime prevention officer with false activators and their installers appeared to be productive in Tredyffrin Township. However, education per se can not be considered as an effective control measure. Not all police departments are expected to allocate significant resources for that purpose. It appears that more concern with system design that reflects commercial working patterns and user friendliness can significantly reduce false activations. These concerns should be addressed by installers and manufacturers. An early effort in the latter direction was made by SIA, who has established three false alarm immunity standards that address control panels, glassbreak detectors and passive infrared detectors.

Manufacturers need a direct flow of information from alarm users in order to better design systems. At this point in time, the information exists in a very fragmented manner at central stations, police departments, and installer offices. We recommend conducting a detailed study that collects information on the causes of false activations from all three aforementioned sources and from the person who is most familiar with it at the business or residence. The center of data collection must be the central station and information must be collected as close as possible to the time the activation occurred. Only such a study which is based upon a large number of cases throughout the U.S. will provide alarm manufacturers with ideas to change hardware in order to reduce false activations.

Our study makes, however, a few concrete suggestions which will lead to the reduction of false activations. The proceeds of fines and registration fees should be directed to a special fund within the police department and be used for the provision of alarms related services, including response. In the long run, the industry should consider establishing private response forces for confined geographical areas. It is likely that such forces be

formed jointly by the large companies which operate in the area and customers of smaller dealers be allowed to join.

If response to alarms is left to the police then, the real cost of activations should be equal to the amount of the fines. We do not recommend escalating fines as is the case in many localities. It is not easy to calculate that real cost; the main problem is whether foregone benefits exist when two officers divert their activities to responding to the false activation. We calculated the cost of response to be \$70. However, it assumes that the officers forego significant activities for that matter.

Policy recommendations are offered in most sections of the report in direct relation to the empirical findings. Much of the information regarding the patterns of burglary and alarm ownership provide marketing direction to dealers and public relations counsel to the industry. Many suggestions in the report pertain to more aggressive activities by the alarm associations. It suggests increased cooperation with police and the insurance industry to increase the credibility and visibility of the industry and to improve service.

Appendix A:
Burglary Questionnaire

Tredyffrin Township

1. HOW LONG WERE YOU IN RESIDENCE PRIOR TO BEING BURGLARIZED?

2. HOW WOULD YOU DESCRIBE THE LOCATION OF YOUR PROPERTY?

- IN A CUL DE SAC ON A CORNER MIDDLE OF BLOCK
 END UNIT OF TOWNHOUSES MIDDLE OF CONDOS OR
TOWNHOUSES
 OTHER _____

3. HOW WOULD YOU DESCRIBE THE ENVIRONMENT IN WHICH YOUR PROPERTY IS LOCATED?

- (A) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF SCHOOL.
(B) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF PARK.
(C) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF A WOODED AREA.
(D) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF A CONVENIENCE STORE.
(E) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF:
 ROUTE 202 ROUTE 30/LANCASTER AVENUE
 CHESTERBROOK BLVD. TURNPIKE EXIT ROUTE 202
 OTHER ROAD _____ (PLEASE ENTER)

4. DID YOU HAVE A DOG AT THE TIME OF THE BURGLARY?
 YES NO

5. PRIOR TO BEING A VICTIM OF A BURGLARY...

- (A) DID YOU HAVE A TOWNSHIP POLICE DEPARTMENT SECURITY CHECK?
 YES NO
(B) DID YOU PARTICIPATE IN YOUR NEIGHBORHOOD'S TOWNWATCH PROGRAM?
 YES NO

6. DO YOU NOW HAVE A BURGLAR ALARM SYSTEM?

- (A) YES. REFER TO QUESTION 7.
(B) NO

7. CHECK THE BOXES WHICH MOST ACCURATELY DESCRIBE YOUR SYSTEM...

- LOCAL, AUDIBLE SIGNAL ONLY
- LOCAL, AUDIBLE WITH CENTRAL STATION MONITORING
- CENTRAL STATION MONITORING, SILENT LOCAL
- THERE IS AN ALARM COMPANY SIGN ON THE PREMISES
- OTHER. EXPLAIN _____

8. WHEN WAS YOUR SYSTEM INSTALLED? MONTH _____ YEAR _____

- SYSTEM WAS INSTALLED BEFORE THE BURGLARY
- SYSTEM WAS ON AT TIME OF INTRUSION
- SYSTEM WAS INSTALLED AFTER THE BURGLARY

9. WAS YOUR SYSTEM ACTIVATED AT THE TIME OF THE BURGLARY?

- YES NO
- IF NOT, WHY NOT? SYSTEM NOT WORKING POLICE USERS CHARGE OTHER. EXPLAIN _____

10. HOW OFTEN DO YOU TURN ON YOUR SYSTEM SINCE POLICE HAVE INITIATED THE BURGLAR ALARM ORDINANCE? NEVER SOMETIMES ALWAYS

11. PLEASE USE THE SPACE BELOW TO MAKE ANY COMMENTS AND SUGGESTIONS YOU FEEL MAY BE OF USE TO US IN EVALUATING THE EFFECTIVENESS OF BURGLAR ALARMS IN PARTICULAR, AND OUR PROVISION OF POLICE SERVICES GENERALLY.

Upper Merion Township

BC

1. HOW LONG HAD THIS BEEN YOUR PLACE OF BUSINESS PRIOR TO BEING BURGLARIZED?

2. HOW WOULD YOU DESCRIBE THE LOCATION OF YOUR BUSINESS?

- WE HAVE OUR OWN BUILDING/PLANT (SOLE OCCUPANT)
- WE HAVE A SUITE IN A SINGLE OFFICE BUILDING
- WE HAVE A SUITE IN AN OFFICE PARK
- IT IS PART OF AN ENCLOSED MALL/SHOPPING CENTER
- IT IS PART OF A STRIP MALL
- IT IS A STORE IN A COMMERCIAL ZONED BLOCK OF STORES
- OTHER (PLEASE DESCRIBE) _____

3. HOW WOULD YOU DESCRIBE THE ENVIRONMENT IN WHICH YOUR BUSINESS IS LOCATED?

- (A) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF A SCHOOL.
- (B) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF A PARK.
- (C) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF A WOODED AREA.
- (D) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF A CONVENIENCE STORE.
- (E) PROPERTY IS WITHIN 1-3 (), 4-8 (), 8+ () BLOCKS OF:
 - ROUTE 202 ROUTE 23 PA. TURNPIKE
 - SOUTH GULPH ROAD SCHUYKILL EXPRESSWAY
 - OTHER ROAD _____ (PLEASE ENTER)

4. DO YOU FEEL THAT THE PROXIMITY TO ANOTHER PLACE CAUSED THE BURGLARY? SPECIFY NAME AND TYPE.

DISTANCE FROM YOUR PROPERTY _____

5. WERE THERE ANY OTHER BUSINESSES IN THE BUILDING OR IN THE IMMEDIATE AREA BURGLARIZED IN THE SAME YEAR AS YOURS?

YES NO REASON _____

6. HOW MANY TIMES WAS YOUR PROPERTY BURGLARIZED IN THE LAST FIVE YEARS?

BURGLARIES _____ ATTEMPTS _____

7. DO YOU FEEL THAT THERE ARE PARTICULAR REASON(S) WHY YOUR PROPERTY HAS BEEN BURGLARIZED? PLEASE EXPLAIN.

BURGLARIES _____

8. DO YOU HAVE ANY SUSPECTS IN MIND? SPECIFY _____

9. PRIOR TO BEING A BURGLARY VICTIM, WHAT TYPE OF SECURITY MEASURES DID YOU TAKE (CHECK ALL THAT APPLY)

- BURGLAR ALARM DEADBOLT LOCKS
- TIMED EXTERIOR LIGHTS TIMED INTERIOR LIGHTS
- TOWNSHIP, POLICE DEPARTMENT OR OTHER SECURITY CHECK
- A GUARD BARS ON WINDOWS
- OTHER _____

10. DO YOU NOW HAVE A BURGLAR ALARM SYSTEM?

- YES REFER TO QUESTION 11.
- NO REFER TO QUESTION 16.

11. CHECK ALL THE BOXES WHICH MOST ACCURATELY DESCRIBE YOUR SYSTEM.

- LOCAL, AUDIBLE SIGNAL ONLY
- LOCAL, AUDIBLE WITH CENTRAL STATION MONITORING
- CENTRAL STATION MONITORING, SILENT LOCAL
- THERE IS AN ALARM COMPANY YARD SIGN ON THE PREMISES
- U.L. CERTIFIED SYSTEM
- OTHER. EXPLAIN _____

12. WHEN WAS YOUR SYSTEM INSTALLED? MONTH _____ YEAR _____

- SYSTEM WAS INSTALLED BEFORE THE BURGLARY
- SYSTEM WAS INSTALLED AFTER THE BURGLARY

13. WAS YOUR SYSTEM ACTIVATED AT THE TIME OF THE BURGLARY?

- YES NO
- IF NOT, WHY NOT?
- SYSTEM NOT WORKING SYSTEM NOT TURNED ON
- POLICE USERS CHARGE
- OTHER. EXPLAIN _____

14. WHO MADE THE DECISION TO PUT AN ALARM SYSTEM ON THE PREMISES?
- WE, THE BUSINESS OWNERS HAD IT INSTALLED
 - THE BUILDING OWNER INSTALLED IT
 - THE SYSTEM IS PART OF A LARGER SYSTEM PROTECTING THE BUILDING/PLANT/MALL.
 - INSURANCE COMPANY REQUIREMENT
 - OTHER _____
15. UPPER MERION TOWNSHIP HAS A BURGLAR ALARM ORDINANCE. HOW OFTEN DO YOU TURN ON YOUR SYSTEM SINCE THIS ORDINANCE WAS INITIATED?
- NEVER SOMETIMES ALWAYS
16. WAS THE BURGLAR APPREHENDED?
- YES. WE DO NOT HAVE AN ALARM, BUT AS A RESULT OF POLICE INVESTIGATION HE WAS ARRESTED AFTER THE BURGLARY.
 - YES, AS A RESULT OF THE ALARM HE WAS ARRESTED IMMEDIATELY ON OR NEARBY THE PREMISES.
 - YES, HE WAS ARRESTED AFTER SOME TIME.
 - NO, THE BURGLAR WAS NEVER APPREHENDED.
 - I DO NOT KNOW. COMMENT _____
-
17. PLEASE USE THE SPACE BELOW TO MAKE ANY COMMENTS AND SUGGESTIONS YOU FEEL MAY BE OF USE TO US IN EVALUATING THE EFFECTIVENESS OF BURGLAR ALARMS AND OUR PROVISION OF POLICE SERVICES.
-
-
-
-

PLEASE USE THE ENCLOSED PRE-STAMPED ENVELOPE TO RETURN THE COMPLETED QUESTIONNAIRE TO:

UPPER MERION TOWNSHIP POLICE DEPARTMENT
 175 WEST VALLEY FORGE ROAD
 KING OF PRUSSIA, PA. 19046-0139

THANK YOU FOR YOUR EFFORTS TO IMPROVE SECURITY IN OUR TOWNSHIP.

Springfield Township

SBC _____

1. HOW LONG HAD THIS BEEN YOUR PLACE OF BUSINESS PRIOR TO BEING BURGLARIZED?

2. HOW WOULD YOU DESCRIBE THE LOCATION OF YOUR BUSINESS?

WE HAVE OUR OWN BUILDING/PLANT (SOLE OCCUPANT)

WE HAVE A SUITE IN A SINGLE OFFICE BUILDING

WE HAVE A SUITE IN AN OFFICE PARK

IT IS PART OF AN ENCLOSED MALL/SHOPPING CENTER

IT IS PART OF A STRIP MALL

IT IS A STORE IN A COMMERCIAL ZONED BLOCK OF STORES

OTHER _____

3. HOW WOULD YOU DESCRIBE THE ENVIRONMENT IN WHICH YOUR BUSINESS IS LOCATED?

(A) PROPERTY IS WITHIN 1-3 (), 4-8 () BLOCKS OF A SCHOOL.

(B) PROPERTY IS WITHIN 1-3 (), 4-8 () BLOCKS OF A PARK.

(C) PROPERTY IS WITHIN 1-3 (), 4-8 () BLOCKS OF A WOODED AREA.

(D) PROPERTY IS WITHIN 1-3 (), 4-8 () BLOCKS OF A CONVENIENCE STORE.

(E) PROPERTY IS WITHIN 1-3 (), 4-8 () BLOCKS OF:
(PLEASE CHECK ONLY THE CLOSEST THOROUGHFARE)

STATE ROAD SPROUL ROAD WOODLAND AVENUE

BALTIMORE PIKE SPRINGFIELD ROAD

OTHER ROAD _____

4. DO YOU FEEL THAT THE PROXIMITY TO ANOTHER PLACE CAUSED THE BURGLARY? SPECIFY NAME AND TYPE.

DISTANCE FROM YOUR PROPERTY _____

5. WERE THERE ANY OTHER BUSINESSES IN THE BUILDING OR IN THE IMMEDIATE AREA BURGLARIZED IN THE SAME YEAR AS YOURS?

YES NO REASON _____

6. HOW MANY TIMES WAS YOUR PROPERTY BURGLARIZED IN THE LAST FIVE YEARS? BURGLARIES _____ ATTEMPTS _____

7. DO YOU FEEL THAT THERE ARE PARTICULAR REASON(S) WHY YOUR PROPERTY HAS BEEN BURGLARIZED? PLEASE EXPLAIN

15. WHO MADE THE DECISION TO PUT AN ALARM SYSTEM ON THE PREMISES?

- WE, THE BUSINESS OWNERS HAD IT INSTALLED
- THE BUILDING OWNER INSTALLED IT
- THE SYSTEM IS PART OF A LARGER SYSTEM PROTECTING THE BUILDING/PLANT/MALL.
- INSURANCE COMPANY REQUIREMENT
- OTHER _____

—16. SPRINGFIELD TOWNSHIP HAS A BURGLAR ALARM ORDINANCE. HOW OFTEN DO YOU TURN ON YOUR SYSTEM SINCE THIS ORDINANCE WAS INITIATED?

- NEVER
- SOMETIMES
- ALWAYS

17. WAS THE BURGLAR APPREHENDED?

- YES. WE DO NOT HAVE AN ALARM, BUT AS A RESULT OF POLICE INVESTIGATION HE WAS ARRESTED AFTER THE BURGLARY.
- YES, AS A RESULT OF THE ALARM HE WAS ARRESTED IMMEDIATELY ON OR NEARBY THE PREMISES.
- YES, HE WAS ARRESTED AFTER SOME TIME.
- NO, THE BURGLAR WAS NEVER APPREHENDED.
- I DO NOT KNOW. COMMENT _____

18. PLEASE USE THE SPACE BELOW TO MAKE ANY COMMENTS AND SUGGESTIONS YOU FEEL MAY BE OF USE TO US IN EVALUATING THE EFFECTIVENESS OF BURGLAR ALARMS AND OUR PROVISION OF POLICE SERVICES.

PLEASE USE THE ENCLOSED PRE-STAMPED ENVELOPE TO RETURN THE COMPLETED QUESTIONNAIRE TO:

SPRINGFIELD TOWNSHIP POLICE DEPARTMENT
50 POWELL ROAD
SPRINGFIELD, PA. 19064

THANK YOU FOR YOUR EFFORTS TO IMPROVE SECURITY IN OUR TOWNSHIP.

Appendix B:
Alarm Questionnaire

Tredyffrin Township

1. When did you install your alarm system?
month_____ year_____. Was present when we moved in
month_____ year_____

What type of alarm system do you have?

- interior and/or perimeter detection
 silent or audible inside outside
 visible sign warning of system on premises
 window sticker yard sign

My system is monitored Yes No.

Type of sensors (check all that apply):

- motion sound temperature
 magnetic contact foil on window
 glass-break detection

Other. Explain _____

3. a. Who manufactured your alarm system? _____
b. Who installed your alarm system? _____
c. Who is your central station monitor? _____
d. What were the installation and purchase charges for
your system? _____
e. What is the monthly monitoring charge? _____
Does this include a service plan Yes No

4. When buying your alarm system did you seek the advice of -
 the Police Department
 the Pennsylvania Burglar and Fire Alarm Assoc.
 your neighbors
 Other. Explain (For example, relatives, insurance
company, etc.): _____

5. What recommendation would you make to those who are considering alarm installation? _____

6. Does your alarm company protect

a few or many other properties in your neighborhood?

none

7. What personal events made you decide to get an alarm system? Check all that apply.

someone broke into my business/residence

other properties in my neighborhood were burglary victims

I know other people in other places who were victimized

I can afford to have better security

for my property for myself and family

My neighbors have an alarm system

My insurance carrier recommended it.

Other _____

8. Are there environmental characteristics of your property/neighborhood that made you feel the need to install an alarm? Explain. (Examples would be accessibility or proximity to Rte 202 or a convenience store)

9. User charges collected by the police department for false activations are a sensitive issue. Current fees are such that the first false activation is free, the second and third false activations result in a fee of \$25 each, the fee for each activation beyond the third is \$100. If they were raised by

- 50%; I would use my system less frequently
 - 100%; I would use my system less frequently
 - 200% or more; I would use my system less frequently
 - I would use my system regardless of the size of user charges. (Comment)_____
-
-

10. How many times have you been fined for a false activation in the last year?_____

11. When is your alarm system turned on?

- When we are home
- When we are away
- All the time
- Seldom
- Never

12. What is your household income?

- less than \$35,000
- \$36-50,000 per year
- \$51-75,000 per year
- \$76-100,000 per year
- \$101-200,000 per year
- more than \$200,000

13. Without checking your insurance policy, approximately how much is the yearly premium discount for owning an alarm?

() \$ _____ or % _____

() I do not know

() Other _____

14. Was the expected discount a consideration in purchasing the alarm?

() Yes

() No

() Other _____

15. Please make any other comments and suggestions you may have about alarm usage and installation.

PLEASE USE THE ENCLOSED PRE-PAID ENVELOPE TO RETURN THE COMPLETED QUESTIONNAIRE.
THANK YOU FOR YOUR EFFORTS.

Upper Merion Township

AC

1. When did you install your alarm system?

month _____ year _____

Alarm was present when the business moved to this address on

month _____ year _____

What type of alarm system do you have? (check all that apply)

my business is protected as part of a larger system in the building/mall

interior and/or exterior detection

silent or audible inside outside

hard wire wireless

visible yard sign or a decal warning of system on premises

monitored by central station.

U.L. certified system

Type of sensors:

motion sound temperature

magnetic contact foil on window

Other. Explain _____

2. a. Who manufactured your control panel? _____

b. Who installed your alarm system? _____

c. Who is your central station monitor? _____

d. What were the approximate installation and/or purchase charges for your system?

\$ _____

e. What is the monthly charge?

Monitoring \$ _____ Service \$ _____ Lease \$ _____

3. Which feature of the system was most important to you when purchasing?

burglar alarm fire alarm

4. When buying your alarm system did you seek the advice of
- the Police Department other adjacent businesses
 - the Pennsylvania Burglar and Fire Alarm Assoc.
 - Other. Explain _____
-

5. What recommendation would you make to those who are considering alarm installation?

6. Does your alarm company protect

- a few or many other properties in your vicinity?
- I do not know

7. What event(s) made you decide to get an alarm system?

- someone broke into my business/residence
 - other properties in my building/vicinity were burglarized
 - The insurance company required alarm installation
 - I can afford to have better security
 - for my property for myself and the employees
 - Other _____
-

8. Are there environmental characteristics of your property that made you feel the need to install an alarm? Explain.
(Examples: proximity to major roads, deteriorating neighborhood, near a shopping center)

9. User charges collected by the police department for false activations are a sensitive issue. Current fees are \$25 if paid voluntarily, and can be as high as \$300. I would use my system less frequently if they were raised by:

50%; 100% 200% or more

Due to the insurance requirements I must activate the system

I would choose to use my system regardless of the size of user charges. (Comment)

10. We would like you to be aware of other security measures that appear to be effective. If you wish please check those measures you have already taken.

Burglar Alarm Deadbolt Locks

Timed Exterior Lights Timed Interior Lights

Township, Police Department or Other Security Check

Private Guards Bars On Windows

Other _____

11. Do you have evidence that the alarm has already prevented burglary attempts in the last five years? Yes No

If yes, how many ___ comment _____

If you have a fire alarm, has it detected fires? Yes No

If yes, how many ___ comment _____

12. Are you satisfied with the decision to install an alarm system?

Yes No

If yes, please check relevant reasons (you may check more than one):

It has already prevented break-ins

Makes me/my employees feel safer

Other businesses in the vicinity have an alarm so I feel it is important for me to own one.

Other _____

If unsatisfied, please indicate reason: _____

13. Without checking your insurance policy, approximately how much is the yearly premium discount for owning an alarm?

() \$ _____ % _____ () I do not know

() Comment _____

14. Was the expected insurance discount a consideration in purchasing the alarm?

() Yes () No

() Other _____

15. Please make any other comments and suggestions you may have about alarm usage and installation.

Please use the enclosed pre-stamped envelope to return the complete questionnaire to:

Upper Merion Township Police Department
175 West Valley Forge Road
King of Prussia, PA 19406-0139

THANK YOU FOR YOUR EFFORTS TO IMPROVE SECURITY IN OUR TOWNSHIP.

Springfield Township

SAC _____

1. How long has this been your place of business? _____

2. How would you describe the location of your business?
- We have our own building/plant (sole occupant)
 - We have a suite in a single office building
 - We have a suite in an office park
 - It is part of an enclosed mall/shopping center
 - It is part of a strip mall
 - It is a store in a commercially zoned block of stores
 - Other (please describe)
- _____
- _____

3. How would you describe the environment in which your business is located?

- (A) property is within 1-3 (), 4-8 () blocks of a school.
- (B) property is within 1-3 (), 4-8 () blocks of a park.
- (C) property is within 1-3 (), 4-8 () blocks of a wooded area.
- (D) property is within 1-3 (), 4-8 () blocks of a convenience store.
- (E) property is within 1-3 (), 4-8 () blocks of:
(please check only the closest thoroughfare)
 State Road Sproul Road Woodland Avenue
 Baltimore Pike Springfield Road
 other road _____ (please enter)

4.a. When did you install your alarm system?

month _____ year _____

Alarm was present when the business moved to this address on

month _____ year _____

4.b. Who made the decision to put an alarm system on the premises?

- We, the business owners, had it installed
- The building owner installed it
- The system is part of a larger system protecting the building/plant/mall
- Insurance company requirement
- Other _____

5. Check all the boxes which most accurately describe your system.

- Local, audible signal only
 - Local, audible with central station monitoring
 - Central station monitoring, silent local
 - There is an alarm company sign visible on the premises
 - U.L. certified system
 - Other. Explain
- _____
- _____

6. Which feature of the system was most important to you when purchasing?
 burglar alarm fire alarm
7. a. Who manufactured your control panel? _____
b. Who installed your alarm system? _____
c. Who is your central station monitor? _____
d. What were the approximate installation and/or purchase charges for your system?
\$ _____
e. What is the monthly charge?
Monitoring \$ _____ Service \$ _____ Lease \$ _____
8. Without checking your insurance policy, approximately how much is the yearly premium discount for owning an alarm?
 \$ _____ % _____ I do not know
 Comment _____
9. Was the expected insurance discount a consideration in purchasing the alarm?
 Yes No
Comment _____
10. When buying your alarm system did you seek the advice of
 the Police Department other adjacent businesses
 the Pennsylvania Burglar and Fire Alarm Assoc.
 Other. Elaborate _____

11. What recommendation would you make to those who are considering alarm installation?

12. Does your alarm company protect
 a few or many other properties in your vicinity?
 I do not know
13. What event(s) made you decide to get an alarm system?
 someone broke into my business/residence
 other properties in my building/vicinity were burglarized
 The insurance company required alarm installation
 I can afford to have better security
 for my property for myself and the employees
 Other _____

14. Are there environmental characteristics of your property that made you feel the need to install an alarm? Explain. (Examples: proximity to major roads, deteriorating neighborhood, or proximity to a shopping center)

15. User charges collected by the police department for false activations are a sensitive issue. Current fees are \$25 if paid voluntarily, and can be as high as \$300. I would use my system less frequently if they were raised by:

50% 100% 200% or more

Due to the insurance requirements I must activate the system

I would choose to use my system regardless of the size of user charges. (Comment)

16. We would like you to be aware of other security measures that appear to be effective. If you wish please check those measures you have already taken.

- Burglar Alarm Deadbolt Locks
 Timed Exterior Lights Timed Interior Lights
 Private Guards Bars On Windows
 Townwatch Program
 Township, Police Department or Other Security Check
(Please Describe)
-

17. Are you satisfied with the decision to install an alarm system?

Yes No

If yes, please check relevant reasons (you may check more than one. Please rank order, one is highest.):

- It has already prevented break-ins
 Makes me/my employees feel safer
 Other businesses in the vicinity have an alarm so I feel it is important for me to own one.
 Other _____
-
-

If unsatisfied, please indicate reason: _____

18. Do you have evidence that the alarm has already prevented burglary attempts in the last five years? () Yes () No

If yes, how many ___ describe _____

If you have a fire alarm, has it detected fires? () Yes () No

If yes, how many ___ describe _____

19. How many times have police responded to activations of your system within the last twelve months? _____

If the activations were false, indicate the reason:

() fault of someone on premises

() system malfunctioned

() unknown

() other _____

If activations were bona fide, indicate reason

() burglary attempt, but no entry

() burglary

() burglar fled due to alarm

() burglar apprehended

20. Please make any other comments and suggestions you may have about alarm usage and installation.

Please use the enclosed pre-stamped envelope to return the complete questionnaire to:

Springfield Township Police Department
50 Powell Road
Springfield, Delaware County, Pa.
19064

THANK YOU FOR YOUR EFFORTS TO IMPROVE SECURITY IN OUR TOWNSHIP.

Appendix C:
Control Group Questionnaire
(Non Burgled, Non Alarmed)

Tredyffrin Township

SC _____

1. How long has your business been at its current address? _____ Years

2. How would you describe the location of your business?
- We have our own building/plant (sole occupant)
 - we have a suite in a single office building
 - we have a suite in an office park
 - it is part of an enclosed mall/shopping center
 - it is part of a strip mall
 - it is a store in a commercially zoned block of stores
 - other (please describe)
-
-

3. How would you describe the environment in which your property is located? (Check all that apply)

- A. Property is within 1-3 (), 4-8 () blocks of a school.
- B. Property is within 1-3 (), 4-8 () blocks of a park.
- C. Property is within 1-3 (), 4-8 () blocks of a wooded area.
- D. Property is within 1-3 (), 4-8 () blocks of a convenience store.
- E. Property is within 1-3 (), 4-8 () blocks of State Road.
- F. Property is within 1-3 (), 4-8 () blocks of Sproul Road.
- G. Property is within 1-3 (), 4-8 () blocks of Woodland Ave.
- H. Property is within 1-3 (), 4-8 () blocks of Baltimore Pike.
- I. Property is within 1-3 (), 4-8 () blocks of Springfield Road.
- J. Other major road (name) _____ (dist. in blocks) _____

4. Were there any businesses in the building or in the immediate area burglarized in the last year?
 Yes no reason _____

5. Was your property burglarized in the last five years?
Burglaries _____ attempts _____

6. What type of security measures have you taken to combat crime? (check all that apply)
- burglar alarm
 - deadbolt locks
 - timed exterior lights
 - timed interior lights
 - a guard
 - bars on windows
 - townwatch program
 - township, police department or other security check (please describe)
-
-

8. How many businesses in your neighborhood are equipped with burglar/fire alarm systems?
 a few many I don't know
9. Why don't you currently have a burglar/fire alarm system in your business? (If more than one applies, please rank order. One is most important)
 It would be too expensive.
 Alarm systems are ineffective in deterring burglars.
 False activations would be a nuisance for me.
 Fines for false activations are too high.
 My other security precautions are adequate.
 I wouldn't know how to choose a reliable alarm company.
 I never thought seriously about it before.
 Other _____
 I do have a burglar alarm system
10. Some insurers offer discounts on their liability policies if the property is protected by a burglar/fire alarm. If you installed a system would you qualify for reduced policy premiums?
 YES, _____% _____ dollars
 YES, but I don't know how much.
 NO
 I don't know whether a discount applies.
11. How much do you think a reliable burglar/fire alarm system would cost for your business?
 \$ _____ one time installation fee
 \$ _____ monthly maintenance and monitoring fee
 I don't know
12. What is the most that you would be willing to pay to have an alarm system in your business?
 \$ _____ one time installation fee
 \$ _____ monthly maintenance and monitoring fee
 I would never have an alarm system in my residence
13. Please use the space below to make any comments which may help us in the provision of police services.
- _____
- _____

PLEASE USE THE ENCLOSE PRE-ADDRESSED AND STAMPED ENVELOPE TO RETURN THE COMPLETED QUESTIONNAIRE TO:

Upper Merion Police Department
 175 West Valley Forge Road
 King of Prussia, PA 19046-0139

THANK YOU FOR YOUR EFFORTS TO IMPROVE SECURITY IN OUR COMMUNITY.

Upper Merion Township

UMC _____

- 1. How long has your business been at its current address? _____ Years
- 2. How would you describe the location of your property?
 - () We have our own building/plant (sole occupant)
 - () we have a suite in a single office building
 - () we have a suite in an office park
 - () it is part of an enclosed mall/shopping area
 - () it is part of a strip mall
 - () other (please describe _____)

- 3. How would you describe the environment in which your property is located?
 - A. Property is within 1-3 (), 4-8 () blocks of a school.
 - B. Property is within 1-3 (), 4-8 () blocks of a park.
 - C. Property is within 1-3 (), 4-8 () blocks of a wooded area.
 - D. Property is within 1-3 (), 4-8 () blocks of a convenience store.
 - E. Property is within 1-3 (), 4-8 () blocks of Route 202.
 - F. Property is within 1-3 (), 4-8 () blocks of Route 23.
 - G. Property is within 1-3 (), 4-8 () blocks of South Gulph Road.
 - H. Property is within 1-3 (), 4-8 () blocks of Route 363.
 - J. Other major road (name) _____ (dist. in blocks) _____

- 4. Were there any business in the building or in the immediate area burglarized in the last year?
 - () Yes () No Reason _____

- 5. Was your property burglarized in the last five years?
 - Burglaries _____ Attempts _____

- 6. What type of security measures have you taken to combat crime? (Check all that apply)
 - () a dog () deadbolt locks on ___ some ___ all doors
 - () timed exterior lights () timed interior lights
 - () a guard () bars on windows
 - () neighborhood townwatch program
 - () police department or other security check. (Please describe)

- 7. Are you acquainted with anyone who has been burgled in the last year?
 - () YES () NO
 - If yes, was it a () Neighbor () Friend () Relative
 - () Other _____

If your answer was YES, has it affected the precautions you have taken to protect your home? Describe _____

7. Are you acquainted with anyone who has been burgled in the last year?
 YES NO
If yes, was it a Neighbor Friend Relative
 Other _____

If your answer was YES, has it affected the precautions you have taken to protect your business? Describe _____

8. How many businesses in your neighborhood are equipped with burglar alarm systems?
 a few many I don't know

9. Why don't you currently have a burglar alarm system in your business? (If more than one applies, please rank order. One is most important)
 It would be too expensive.
 Alarm systems are ineffective in deterring burglars.
 False activations would be a nuisance for me.
 Fines for false activations are too high.
 My other security precautions are adequate.
 I wouldn't know how to choose a reliable alarm company.
 I never thought seriously about it before
 Other _____
 I do have a burglar alarm system

10. Some insurers offer discounts on their liability policies if the property is protected by a burglar/fire alarm. If you installed a system would you qualify for reduced policy premiums?

- YES, _____% _____ dollars
 YES, but I don't know how much.
 NO
 I don't know whether a discount applies.

Comment _____

11. How much do you think a reliable burglar/fire alarm system would cost for your business?

- \$ _____ one time installation fee
\$ _____ monthly maintenance and monitoring fee
 I don't know

Springfield Township

TC _____

1. How long has your business been at its current address? _____ Years
2. How would you describe the location of your property?
 - () We have our own building/plant (sole occupant)
 - () we have a suite in a single office building
 - () we have a suite in an office park
 - () it is part of an enclosed mall/shopping area
 - () it is part of a strip mall
 - () other (please describe) _____
3. How would you describe the environment in which your property is located?
 - A. Property is within 1-3 (), 4-8 () blocks of a school.
 - B. Property is within 1-3 (), 4-8 () blocks of a park.
 - C. Property is within 1-3 (), 4-8 () blocks of a wooded area.
 - D. Property is within 1-3 (), 4-8 () blocks of a convenience store.
 - E. Property is within 1-3 (), 4-8 () blocks of Route 202.
 - F. Property is within 1-3 (), 4-8 () blocks of Route 30/
Lancaster Ave. _____
 - G. Property is within 1-3 (), 4-8 () blocks of Chesterbrook Blvd.
 - H. Property is within 1-3 (); 4-8 () blocks of Route 252.
 - I. Property is within 1-3 (), 4-8 () blocks of Turnpike exit.
 - J. Other major road (name) _____ (dist. in blocks) _____
4. Were there any business in the building or in the immediate area burglarized in the last year?
 - () Yes () No Reason _____
5. Was your property burglarized in the last five years?
 - Burglaries _____ Attempts _____
6. What type of security measures have you taken to combat crime? (Check all that apply)
 - () a dog () deadbolt locks on some all doors
 - () timed exterior lights () timed interior lights
 - () a guard () bars on windows
 - () neighborhood townwatch program
 - () police department or other security check. (Please describe) _____
7. Are you acquainted with anyone who has been burgled in the last year?
 - () YES () NO
 - If yes, was it a () Neighbor () Friend () Relative () Other _____
8. If your answer was YES, has it affected the precautions you have taken to protect your home? Describe _____

8. How many businesses in your neighborhood are equipped with burglar/fire alarm systems?
 a few many I don't know
9. Why don't you currently have a burglar/fire alarm system in your business? (If more than one applies, please rank order. One is most important)
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 Fines for false activations are too high.
 My other security precautions are adequate.
 I wouldn't know how to choose a reliable alarm company.
 I never thought seriously about it before.
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10. Some insurers offer discounts on their liability policies if the property is protected by a burglar/fire alarm. If you installed a system would you qualify for reduced policy premiums?
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 YES, but I don't know how much.
 NO
 I don't know whether a discount applies.
11. How much do you think a reliable burglar/fire alarm system would cost for your business?
 \$ _____ one time installation fee
 \$ _____ monthly maintenance and monitoring fee
 I don't know
12. What is the most that you would be willing to pay to have an alarm system in your business?
 \$ _____ one time installation fee
 \$ _____ monthly maintenance and monitoring fee
 I would never have an alarm system in my residence
13. Please use the space below to make any comments which may help us in the provision of police services.
- _____
- _____

PLEASE USE THE ENCLOSE PRE-ADDRESSED AND STAMPED ENVELOPE TO RETURN THE COMPLETED QUESTIONNAIRE TO:

Tredyffrin Township Police Department
 973 Old Lancaster Road
 Berwyn, PA 19312

THANK YOU FOR YOUR EFFORTS TO IMPROVE SECURITY IN OUR TOWNSHIP.

12. What is the most that you would be willing to pay to have an alarm system on your premises?

\$ _____ one time installation fee

\$ _____ monthly maintenance and monitoring fee

() I would never have an alarm system in my residence

13. Please use the space below to make any comments which may help us in the provision of police services.

PLEASE USE THE ENCLOSE PRE-ADDRESSED AND STAMPED ENVELOPE TO RETURN THE COMPLETED QUESTIONNAIRE TO:

Township of Springfield
Department of Police
50 Powell Road
Springfield, PA 19064

THANK YOU FOR YOU EFFORTS TO IMPROVE SECURITY IN OUR TOWNSHIP.

About Metrica and the Authors

Metrica Inc. is a research group which specializes in the security industry. The company has conducted studies for the industry in the last seven years for ADT Security Systems, Coca Cola USA, Expander Technologies, investment banks, law firms, the Alarm Industry Research and Education Foundation, the Pennsylvania Burglar and Fire Alarm Association.

Dr. Simon Hakim earned an M.Sc. degree in City and Regional Planning from the Technion, Israel Institute of Technology in 1971. He received his A.M. degree in 1971, and Ph.D in 1976 in Regional Science from the University of Pennsylvania. Dr. Hakim has been with Temple University since 1975, and is currently a Professor of Economics. Dr. Hakim is the President of Metrica, Inc. a research group which includes economists and criminal justice experts specializing in the security industry. He published over fifty scientific and professional articles in leading economic and criminology journals and has edited five books. His two books, **Privatizing the U.S. Justice System** and **Privatizing Correctional Institutions** have earned national and international reputations. He is often interviewed by TV, newspapers, and radio stations on his findings and opinions of security issues. Dr. Hakim specializes in the analysis of crime and security. He has conducted funded research projects for numerous governmental agencies and private companies including the National Institute of Justice, U.S. Department of Labor, U.S. Corp of Engineers, Israeli Ministries of Transportation and Tourism, Booz, Allen and Hamilton Consultants, Betz, Converse and Murdoch, Environmental Engineers, and various security bodies. His work centers on analysis of criminal behavior, police operations, and privatization of justice institutions.

Mary Ann Gaffney earned her MBA with honors at Temple University. She has been with Metrica for four years and holds the position of Executive Vice President. Ms. Gaffney has been

involved with all Metrica's projects. She has published several articles in insurance and security professional magazines which have enjoyed wide publicity. Her work centers on Total Quality Management applied to corporate and governmental performance, security industry issues and corporate labor relations.

Commercial Security is the first report to analyze commercial burglary. The report provides a thorough analysis of the market, burglary risk factors, alarm effectiveness, alarm owner profiles, alarm benefits and false activations. The report tells why

- 46% of all burgled commercial properties are suites in office parks; alarms reduce their risk 14 times,
- Large companies can charge 29% more for alarm installation than smaller competitors,
- False alarms cost one community \$70 per activation; 56% of false activations are from commercial properties; 76% are user errors,
- The primary motivator for alarm purchase is insurance company requirement; 30% of non owners feel the property is secure; only 2% of alarm owners sought advice from PBFAA,
- Overall, alarms reduce the risk of burglary by a factor of 4.5; alarms provide a financial benefit; one community benefitted by \$180,000.
- Alarm signs reduce the risk of burglary by 36%.

The report provides important information for all business owners, manufacturers, dealers, central stations, police departments, industry associations, and property insurers.

Acknowledgements

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