Developing a Residential Smoke Alarm Program and Tracking System to Determine Effectiveness for the Las Vegas Fire & Rescue

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Certification Statement

I hereby certify that this paper constitutes my own project, that where the language of others is set forth, quotations marks so indicate and that appropriate credit is given where I have used the language, ideas, expressions, or writing of others.

Signed:_____

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Abstract

During 2012, the Las Vegas Fire & Rescue responded to over 97,000 calls, which included over 88,000 emergency medical response calls. A large percent of the calls that the department responded to were in situations where smoke alarm systems were either disconnected or the resident neglected to maintain the system. Due to this problem, it has become apparent that the Las Vegas Fire & Rescue needs a standard operating procedure to provide guidance for fire department personnel and to address needed training for residential smoke alarms installation, maintenance, and inspection as well as a documentation system for tracking purposes.

The purpose of this research is to define the framework to establish a standard operating procedure to install, maintain, and inspect residential smoke alarms and a documentation system to track the effectiveness of training program.

The following research questions were examined:

a) What are the requirements of a standard operating procedure to install residential smoke alarms for the Las Vegas Fire and Rescue?

b) What are the requirements of a standard operating procedure to maintain residential smoke alarms for the Las Vegas Fire and Rescue?

c) What are the requirements of a standard operating procedure to inspect residential smoke alarms for the Las Vegas Fire and Rescue?

d) What data needs to be gathered to document and ensure the effectiveness of the residential smoke alarm program for the Las Vegas Fire and Rescue?

The data for this research was obtained primarily through the use of the Internet search tool. A review of the policies and procedures relating to residential smoke alarm programs was conducted with fire departments in the local commuting area. The results of this research will provide the necessary framework for the Las Vegas Fire & Rescue to develop, implement, and track the effectiveness of a residential smoke alarm program, which educates residents on installation, maintenance, and inspection of smoke alarms in the home.

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Introduction

The Las Vegas Fire & Rescue handled approximately 97,000 calls with approximately 88,000 emergency medical response calls. A high percentage of the residential calls had smoke alarm systems that were either disconnected or the maintenance of the system was neglected in residential homes. Currently, the problem is that the Las Vegas Fire & Rescue does not a formal process to address this type of problem while in the field that would serve to guide fire personnel to inform and educate residents of the city on how to properly install, maintain, and inspect smoke alarm systems. Without an effective procedure and action plan to help guide Las Vegas Fire & Rescue to address needed training for residential smoke alarm system installation, maintenance, and inspection as well as a tracking system, the problem of disconnected smoke alarm systems and neglected maintenance of the systems will continue to escalate in residential homes.

The purpose of this research is to define the framework to establish a standard operating procedure and action plan to install, maintain, and inspect residential smoke alarms as well as, a tracking system based on national standards. Additionally, this research will determine the type of data needed to track the effectiveness of the training program and standard operating procedure to inspect residential smoke alarm systems for the Las Vegas Fire and Rescue.

For purpose of this study, action research methodology was selected to determine what works best for the fire department to educate residents by increasing awareness and understanding of the importance of functioning smoke alarm systems in residential homes. The following research questions were used to guide the research to gather data:

a) What are the requirements of a standard operating procedure to install residential smoke alarms for the Las Vegas Fire and Rescue?

b) What are the requirements of a standard operating procedure to maintain residential smoke alarms for the Las Vegas Fire and Rescue?

c) What are the requirements of a standard operating procedure to inspect residential smoke alarms for the Las Vegas Fire and Rescue?

d) What data needs to be gathered to document and ensure the effectiveness of the residential smoke alarm program for the Las Vegas Fire and Rescue?

Background and Significance

The city of Las Vegas was founded on May 15, 1905 and was incorporated as a city on June 1, 1911. It is one of the most populous cities founded in the 20th century due to its warm climate, gambling, nightlife, and transient culture. According to the 2010 census, the population of Las Vegas was 583,756 making it the 31st most populous city in the United States. The Las Vegas metropolitan area, which includes Las Vegas, North Las Vegas, Henderson, Boulder City, and Clark County is said to contain 1,951,269 residents according to the 2010 census. Las Vegas is also considered to be one of the world's largest tourist destinations. Some consider the city as the entertainment capital of the world. Nearly 40 millions people visit the city each year for various reasons creating many unique problems and challenges for city servants such the members of the Las Vegas Fire & Rescue. The population of Las Vegas has grown from 125,787 in 1970 to 586,356 in 2011. Currently, the city of Las Vegas operates as a council–manager form of government, which changed from a commission form of government in 1944.

The primary driver of the Las Vegas economy is tourism, gaming, and conventions, which provides patronage for restaurants, hotels, transportation and other industries. Many of the newer theme hotels and casinos located on the Las Vegas Strip are not actually located within the city limits of Las Vegas, they are located and regulated by Clark County.

The Las Vegas Fire Department began June 6, 1905 as a volunteer fire department. Due to the city's growth and demand, services increased and The Las Vegas Fire Department added its first full time employees on August 1, 1942. In 1999, the Las Vegas Fire Department

changed its name to the Las Vegas Fire & Rescue, which provides fire protection, fire prevention, emergency medical services and specialty services for the residents and visitors of the city of Las Vegas and metropolitan area. The department is currently made up of over 660 uniform personnel that respond out of 19 fire stations located strategically throughout the city under the command of 3 battalion chiefs on 3 different shifts. The Las Vegas Fire Department also operates a fire apparatus fleet of 20 paramedic engine companies, 6 truck companies, 23 paramedic rescue ambulances, 1 technical rescue unit, 1 hazardous materials response team, 1 C.B.R.N.E. Unit, 1 Water Tender, and 1 mobile command unit. Being that it is the third largest fire department in the state of Nevada after Clark County Fire Department and the Reno Fire Department, Las Vegas Fire & Rescue is responsible for preserving life and property for an area totaling 133.25 square miles. In 2011, the Las Vegas Fire & Rescue responded to 92,199 emergency calls, 85,117 of which were emergency medical responses.

Since 2009, the department is 1 of only 9 cities in the United States that is accredited by the Commission on Fire Accreditation International (CFAI) and maintains a Insurance Services Office (ISO) Class 1 Rating.

Las Vegas Fire & Rescue provides services to a city with a unique set of challenges and concerns. Its residents, transient population, climate and homeland security risks make for a constantly changing landscape for the department and its executive staff.

Due to an increasing population, there has been a growing problem with disconnected smoke alarm systems and neglected maintenance of the systems in residential homes. Occasionally, there have been situations where the Las Vegas Fire & Rescue has inspected and changed batteries in smoke alarm systems in residential homes while in the field.

Currently, the Las Vegas Fire & Rescue provides smoke alarm systems with batteries free of charge to qualified residents, which is funded with donations from the Firemen's Fund. An Acceptance of Smoke Detector from Las Vegas Fire & Rescue form is completed and

signed by the resident, which is entered into a database for tracking purposes (see Appendix A). Also, informational pamphlets are provided for the resident to install and maintain the smoke alarm system. Nevertheless, established processes to educate city residents on how to properly install, maintain, and inspect smoke alarm systems do not currently exist. Statistically, it has been shown that the probability "of dying in a reported home structure fires is cut in half in homes with working smoke alarm systems" (Ahrens, 2014). Therefore, it is critical for smoke alarm systems to be installed properly for effectiveness in helping to reduce residential fires and injuries from these fires. There is concern with the process of Las Vegas Fire & Rescue providing free smoke alarm systems and batteries without installing them. It has been proven that residential smoke alarm programs, such as education only (i.e. pamphlets) or distribution only (i.e. smoke alarm unit, batteries), were not effective unless the installation component was added (Public/Private Fire Safety Council, 2006).

Since this problem directly affects the safely of city residents, it is imperative to develop and implement an effective procedure and action plan to help resolve this problem and provide needed informational training for residential smoke alarm system installation, maintenance, and inspection as well as developing a tracking system to ensure effectiveness of the program. The researcher will collect data to assist with determining the best option for the fire department to educate residents about the importance of functioning smoke alarm systems in residential homes. Upon conclusion of the data collection phase, the relevant information will compiled to determine the best approach to develop a standard operating procedure and tracking system to measure the effectiveness of the program to be utilized by fire personnel to conduct informational training sessions to teach residents the importance of proper installation, maintenance and inspection of residential smoke alarm systems.

The newly developed smoke alarm standard operating procedure for the Las Vegas Fire & Rescue will guide the proper installation, maintenance, and inspection of residential smoke

alarm systems and will make an immediate impact for the City of Las Vegas to help "reduce risk at the local level through prevention and mitigation" (USFA, 2014). Also, the research meets the objectives established by the National Fire Academy for the Executive Analysis of Community Risk Reduction course (EACRR Student Manual, 2011).

Literature Review

Today, smoke alarms are very common in both residential and commercial settings. For commercial structures, there are federal and state fire codes that regulate and dictate the requirements that are necessary to ensure life safety, property conservation, and incident stabilization. On the other hand, residential homes may or may not have smoke alarm systems installed, especially if it is an older home built pre-1970s. The main reason for residents to have a properly functioning smoke alarm installed in their homes is because "smoke alarms warn occupants of the presence of a life threatening fire and the need to escape to a place of safety before the escape is not possible due to untenable conditions" (NFPA, 2010).

The purpose of this literature review is to examine the background and history of smoke alarm systems, to illustrate the importance of a properly functioning smoke alarm system in residential homes, to develop a standard method to install, maintain, and inspect residential smoke alarm systems, as well as a tracking system that is based on national fire standards to determine the effectiveness of the program for the Las Vegas Fire & Rescue. This review will use scholarly journals, scholarly books, authoritative databases, and primary sources as the method to gather data related to the research questions. Also, it will include a review of secondary sources from newspapers, the National Fire Academy Learning Resource Center (NFALRC), magazines, and other sources. This data will be compiled to identify critical information for the following research questions:

a) What are the requirements of a standard operating procedure to install residential smoke alarms for the Las Vegas Fire and Rescue?

b) What are the requirements of a standard operating procedure to maintain residential smoke alarms for the Las Vegas Fire and Rescue?

c) What are the requirements of a standard operating procedure to inspect residential smoke alarms for the Las Vegas Fire and Rescue?

d) What data needs to be gathered to document and ensure the effectiveness of the residential smoke alarm program for the Las Vegas Fire and Rescue?

There has been some confusion surrounding smoke alarms, which is often referred to as smoke detectors. To clarify the term and eliminate any misinterpretation, let's review the differences between smoke alarms from smoke detectors. A smoke alarm can be described as a self-contained device that detects smoke and activates a built-in audible alarm within the device to alert the occupants. Additionally, "smoke alarms" detect fires through the detection of smoke with heat or distinctive gases and include an alarm horn in a single unit. In comparison, a smoke detector typically sends notification to a fire alarm control panel that may or may not trigger an audible alert and are normally part of a larger system that have separate detectors and alarm horns connected and coordinated by a central panel (Public/Private Fire Safety Council, 2006).

Although for decades the general population has commonly used the term "smoke detector", "smoke alarm" is the most applicable term to use in residential settings. The smoke alarm industry and fire service organizations are pushing to ingrain the term smoke alarm into the general public mindset (Public/Private Fire Safety Council, 2006).

The history of smoke alarms dates back to the 1950s when the first residential fire alarm used heat/temperature as the fire alert method. Between the 1960s and 1970s, studies proved that smoke detectors (photoelectric or ionization) could offer dependable early warning alerts while heat detectors were unreliable.

In 1965, the invention of the first self-contained smoke alarm (i.e., with power source, detection sensor, and audible alert horn in single unit; not connected to a central panel) was introduced for residential homes, which used AC power and photoelectric detection standards. This self- contained unit was termed “smoke alarms” which was distinguished from the “smoke detectors” and “fire detectors” (Public/Private Fire Safety Council, 2006).

A couple years later in 1967, the first standard was established to regulate residential smoke alarms. In 1970, the single-station smoke alarm was improved as a portable, battery-powered unit for residential homes, which used 9-volt batteries and the ionization detection principle. During the mid 70s, the Council of American Building Officials, the U.S. model-building codes, and National Fire Protection Agency (NFPA) made significant modifications in the standard fire codes to start requiring smoke alarm systems in all residential homes (Durso, 2013).

According to the National Fire Protection Association, almost two-thirds of home fire deaths resulted from fires in properties without working smoke alarms. A working smoke alarm significantly increases your chances of surviving a deadly home fire (USFA, 2014).

The single most important reason to have a properly functioning smoke alarm in residential homes is to reduce both the impact of a fire and the fire death rate, which is the role of the fire service. This approach would better serve the community through leadership from the fire service instead of the enduring costs to hire additional staff and purchase more equipment. It imperative for the fire service and other safety organizations to take the lead in educating residents concerning fire safety and their role as citizens in ensuring smoke alarm systems are installed, maintained, and inspected to

function. By taking the leading role to provide on-going education for residents to address fire safety that includes the purpose and importance of a properly functioning smoke alarm system, which would be a more economically feasible option that would reduce the operation costs for the city and the taxpayers who are residents that are served by the fire service (O'Brian, 2013).

According to the NFPA standard published for smoke alarm training, it illustrates where and how to install smoke alarm systems in residential homes. Based on the NFPA smoke alarm training module, a smoke alarm unit should be installed in the basement, inside each bedroom, and outside the sleeping area of the residence to ensure the resident hears the audible alert warning. Nevertheless, it does not recommend installing smoke alarm units in kitchens, garages, bathrooms and most attics since steam in these areas may cause a false alarm and other non-threating conditions. The training module recommends educating residents on how to properly install, maintain, and inspect the smoke alarm unit on a monthly basis (NFPA, 2014).

Additionally, the NFPA offers a complete guide for fire safety to assist fire personnel with establishing and maintaining an effective smoke alarm program. The fire safety guide provides detailed information for installing, maintaining, and inspecting the smoke alarm system program. It includes a sample liability waiver form that releases the fire department and any of its agents from liability if the smoke alarm malfunctions and requires the resident to sign prior to installation (NFPA, 2014).

The smoke alarm training guide would be instrumental in answering the research questions in this study and successfully implementing the plan to establish standard operating procedures and a tracking system to ensure effectiveness of the smoke alarm system training for residents.

The NFPA 72 Standard, National Fire Alarm and Signaling Code, was the most commonly used reference throughout this research for smoke alarm installation, maintenance,

and inspection and can be used as the foundational framework for establishing a standard operating procedure. Chapter 29 establishes standards for both single and multiple residential smoke alarms and provides detailed guidance for properly installing a battery operated smoke alarm system and creating a label that is placed on the outside of the smoke alarm to verify the unit meets acceptable standards (NFPA, 2009).

The researcher contacted other fire departments within the local commuting area to determine the process used for smoke alarm systems in residential homes. The following is a brief synopsis of the information gathered from the City of North Las Vegas, Henderson, and Clark County fire departments.

The City of North Las Vegas fire department has been experiencing fire trends in older homes that were not required to have smoke alarms by code and are located in one of its fastest growing bi-lingual populations in the city. Approximately 7 years ago, the city implemented a smoke alarm program to help education residents by partnering with the Boy Scouts of America, a non-profit organization in the local community. The program is funded through various grants and the fireman's fund. The boy scouts were recruited to walk around the neighbor to place door hangers on the doors of each resident in this growing community of older homes and in turn, the boy scouts would earn credit for community service towards achieving an eagle badge. The door hangers provide information about the smoke alarms program, which includes cleaning, changing batteries, and installation. Also, the door hanger gives the resident an option to schedule a smoke alarm inspection. The inspection includes fire safety, cleaning the smoke alarm and changing the batteries. If the resident doesn't schedule an inspection, follow-up door hangers is placed on the door and confirm receipt of the hanger with the smoke alarm information by knocking on the door resident.

The City of North Las Vegas fire department tracks the smoke alarm inspections by resident address and document any actions taken during the inspection (i.e. cleaning, changing

batteries, installation). This process is repeated 4 times per year on one weekend per quarter. It is estimated that approximately 5,600 smoke alarms have been given out to city residents since the inception of the program. Additionally, there have not been any reported fires in the homes where smoke alarms were installed and/or inspected as a result of this program. The City of North Las Vegas fire department's residential smoke alarm program closely resembles the guidelines outline in Planning and Implementing a Successful Smoke Alarm Installation Program (see Appendix B) and the NFPA 72, National Fire Alarm and Signaling Code. This is has been a win-win situation for the city and its residents.

The city of Henderson, NV and Clark County fire departments do not have a formal smoke alarm program. However, both fire departments will assist senior citizens living in the local area with inspecting and changing smoke alarm batteries. It is the intend of the researcher to share the results of this study with other fire departments in the local commuting area that do not have a formal residential smoke alarm program to improve services provided to local residents.

In summary, although the research revealed very little information regarding evaluating the effectiveness of a smoke alarm system (the missing gap), there was sufficient data obtained from NFPA 72, National Fire Alarm and Signaling Code that could be used to provide essential information to answer research questions. However, NFPA 72 lacked specific examples relating to measuring the effectiveness of a residential smoke alarm program.

Procedures

This research study reviewed the policies and procedures of other fire departments within the local commuting area to determine the process used for smoke alarm systems in residential homes. The City of North Las Vegas was the only municipality that has a formal process for a residential smoke alarm program.

Additional data related to the research questions was gathered through the literature review process. The Internet was the primary source for accessing and gathering data. An Internet search for smoke alarm installation, maintenance, inspection, and evaluation was conducted, which revealed numerous fire departments around the country with residential smoke alarm programs but very little information on effectiveness of smoke alarm systems. Primarily, an extensive search of the NFPA website was conducted to examine standards that related to residential smoke alarm installation, maintenance, inspection and evaluation.

A major limitation was encountered during the research process due to limited access to the NFPA website. It required a membership to gain access to the codes and standards related to the research questions. Therefore, alternative methods had to be employed through various personal contacts that had access to the information (NFPA, 2011).

Results

The data gathered during the research process provided enough information to determine what is needed to develop a residential smoke alarm program, which includes installation, maintenance, and inspection of a residential smoke alarm program, as well as, an evaluation process to determine the effectiveness program.

The research revealed several strategies for basic installation, maintenance, and inspection of residential smoke alarm units, as well as, a tracking system to evaluate the effectiveness of the program. The specific guidelines are outlined in the NFPA: *Planning and Implementing a Successful Smoke Alarm Installation Program* to develop, implement, and evaluation a residential smoke alarm program (see Appendix B). The following is a synopsis to answer the following research questions:

a) What are the requirements of a standard operating procedure to *install* residential smoke alarms for the Las Vegas Fire and Rescue?

b) What are the requirements of a standard operating procedure to *maintain* residential smoke alarms for the Las Vegas Fire and Rescue?

To answer research questions 1 and 2, a recent article published by the NFPA entitled *Installing and Maintaining Smoke Alarms* provides step-by-step instructions for the installation and maintenance of residential smoke alarm units and can be used by the Las Vegas Fire & Rescue to establish the process and standard operating procedures for a residential smoke alarms program (NFPA, n.d.). These instructions should not need to be modified since they are based on national fire standards. However, it may be necessary to obtain permission from the source to use the information to This guideline will ensure smoke alarms are installed properly and functioning correctly, which is very important to ensure residential homes are safer from potential fires. The NFPA 72, National Fire Alarm and Signaling Code, will be used to ensure the smoke alarm meets national standards, which must be verified during the installation process.

c) What are the requirements of a standard operating procedure to *inspect* residential smoke alarms for the Las Vegas Fire and Rescue?

Due to the structural difference, it is recommended to follow the manufacturer's instructions for inspecting a residential smoke alarm unit. At minimal, the NFPA recommends that the smoke alarm be tested at least once a month, follow manufacturer's instructions for cleaning the unit, changing the batteries annually, and replacing the unit every 10 years.

d) What data needs to be gathered to document and *evaluate* the effectiveness of the residential smoke alarm program for the Las Vegas Fire and Rescue?

Although there was little information available in the research, it is imperative to evaluate the residential smoke alarm program to determine the effectiveness of the program. During the installation process, information is collected from the resident on the installation form that can be used to track the effectiveness of the program. Also, surveys can be used to periodically communicate with local residents after the installing of smoke alarm units to stay

abreast of any changes and improvements that may be necessary to ensure the effectiveness of the program.

Discussion

The results of the research reveal the need to use NFPA as the foundational standard to develop, implement, and maintain a residential smoke alarm program. Research articles reviewed during the literature review referenced the NFPA standards regularly. It is the only source found that contains the necessary information to successfully establish a residential smoke alarm program.

In the past, smoke alarm were commonly called smoke detectors. Based on the NFPA standards, the terms are not interchangeable and there is ongoing effort from the fire service to education the public concerning this matter. Out of the three fire departments in the local commuting area, the City of North Las Vegas had the most comprehensive formal residential smoke alarm program.

The outcome of this research will produce a residential smoke alarm program that will have a positive impact on the Las Vegas Fire & Rescue and the City of Las Vegas by reducing residential fires and the injuries and deaths from these fires, which will help keep residents safe. However, to achieve this goal, the program must be developed, implemented, and maintained to be effective. All fire personnel must understand the importance of installing smoke alarm systems in residential homes to reduce fires and the injuries and deaths from these fires. Also, all fire personnel must be trained to properly install, maintain, and inspect smoke alarms in residential homes.

The data from the tracking system will be used to determine the effectiveness of the residential smoke alarm program.

Recommendations

After gathering data for this research project coupled with the importance of fire prevention, it is recommended that the Las Vegas Fire & Rescue adopt a residential smoke alarm program, which includes installation, maintenance, and inspection as well as, tracking to evaluate the effectiveness of the program.

The framework should be designed around the NFPA 72 standard to provide the needed guidance to develop, implement, and maintain the program based on national standards. The current tracking system is can be used during the inspection phase to evaluate the effectiveness of the program.

Due to legal concerns, the researcher recommends adopting the necessary components to draft a standard operating procedure for a residential smoke alarm program, which includes the following resources: NFPA: *Planning and Implementing a Successful Smoke Alarm Installation Program* (see Appendix B), *Installing and Maintaining Smoke Alarms* (NFPA, n.d.), and the NFPA 72, *National Fire Alarm and Signaling Code*. Adopting these resources will provide the guidance to ensure the residential smoke alarm program is setup to meet national standards. Also, all of the required components such as installation, maintenance, inspection, and evaluation to determine effectiveness of the program are implemented in a systematic process. The standard operating procedure will emphasis the importance of properly functioning smoke alarm systems in residential homes and provide a step-by-step process for installing, maintaining, inspecting, and evaluating the residential smoke alarm program.

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Appendix A: Acceptance of Smoke Detector from Las Vegas Fire & Rescue

ACCEPTANCE OF SMOKE DETECTOR
FROM LAS VEGAS FIRE & RESCUE

DATE:_____

NAME: _____

ADDRESS where smoke alarm will be installed:_____

_____

PHONE: _____

I am the homeowner ☐

I am the renter and I understand that the landlord is responsible for providing and maintaining smoke alarms at this address ☐

This address is a house ☐ mobile home ☐ apartment ☐

Approximate age of home:_____

There are currently _____ working smoke detectors installed at this address.

I am in receipt of _____smoke detector(s) provided free of charge by Las Vegas Fire & Rescue. I agree to immediately install the smoke detector(s) at the above listed address.

SIGNATURE:_____

_____

FOR OFFICE USE ONLY

SMOKE DETECTOR PROVIDED FROM:

FIREMAN'S FUND DONATION: _____

Style 1 ☐ Style 2 ☐

LAS VEGAS FIRE & RESCUE: _____

OTHER (specify): _____

EMPLOYEE SIGNATURE: _____

Appendix B: Planning & Implementing a Successful Smoke Alarm Installation Program Guide



Planning & Implementing a Successful Smoke Alarm Installation Program

NFPA®

Smoke Alarm Facts

- Smoke alarms are the residential fire safety success story of the past 30 years.
- Each year, three out of five home fire deaths result from fires in homes with no smoke alarms or no working smoke alarms.
- The risk of dying in a reported home fire is cut in half in homes with working smoke alarms.
- Smoke alarms fail most of the time because of missing, disconnected, or dead batteries.
- Ninety six percent of all homes have at least one smoke alarm.
- Almost five million households still do not have any smoke alarms.
- Overall, three-quarters of all U.S. homes have at least one working smoke alarm.

For more on smoke alarms, go to nfpa.org/smokealarms.

A Safer Community—For Everyone

A tragic fire happens. Communities come together to address fire safety. But what if there was a way for communities to work together before a fire broke out, to help save property and lives before they were lost?

A smoke alarm installation program in your community can make a big difference in reducing deaths and injuries in a fire. Smoke alarms are the life-saving success story of the past 30 years. Each year, three out of five home fire deaths in the United States result from fires in homes with no smoke alarms or no working smoke alarms.

Installing Safety

The approach to an installation program is simple. Fire safety advocates in your community team up to install smoke alarms. These advocates can be firefighters, safety educators, business leaders, representatives of older adult or health groups, and others. Your installation program can be broad. It can target an entire community. Or it can be very focused, reaching out to a core group of vulnerable citizens.

By installing smoke alarms in homes, you'll be doing your part to make residents and your entire community much safer.

From Start to Finish

To help you plan and implement your own smoke alarm installation program, the National Fire Protection Association (NFPA) has developed this nine-step comprehensive guide. In it, you'll find what you need to get started. You'll find everything, from tips on how to select and train volunteers, to pointers on soliciting donations and publicizing your program.

In putting together this guide, we've relied on the experts. These are safety advocates from across the country who've conducted their own successful smoke alarm installation programs. From urban areas, to suburbs, to rural areas, our experts have helped to get smoke alarms installed just about everywhere.

So what are you waiting for? Let's get started!

Note: Smoke alarm installation programs, in which firefighters and trained volunteers install smoke alarms and batteries, are not the same as smoke alarm giveaway projects. Experts warn that simply giving residents alarms does not ensure that they will be installed correctly, if at all.

Step One:

Organize a Planning Committee



A successful smoke alarm installation requires more than just installing smoke alarms. The key to a well-run program is planning ahead and forming a committee of community leaders.

Start by identifying organizations that should be part of your team. You'll probably want to start with the local fire department, including the local fire chief, head of the firefighters union, or the leader of the volunteer firefighter's association. You'll also want to involve local safety advocates, community organizations and businesses. Remember, the more diverse the group of institutions you include in the planning process, the better chance you'll have of reaching local residents and conducting a successful installation project.

Here's who you should think about involving – and how they can make your program a success:

Local fire department or firefighters union

They are the first link to fire safety in the community.

Businesses, including retail outlets

From big home improvement stores to small local outfits, businesses are often willing to donate supplies, including smoke alarms, batteries, ladders, and drills.

Local chapters of service clubs

Service clubs such as Rotary International, The Lions Clubs International, The Elks Club and Kiwanis International, can be a key source of volunteers and often have connections with local businesses.

Older adult organizations

Older residents are among the most vulnerable to fire death. Organizations that service them can help you reach them.

Health and safety agencies and organizations

Fire prevention is a key issue for organizations and agencies that work on health and safety issues.

Faith-based institutions

Local houses of worship can help you get the word out about your smoke alarm installation project.

Electricians or members of an electricians' union

Their labor can be key, and they may be willing to donate it, especially if you are installing alarms that must be hardwired.

Citizen Emergency Response Teams

They've been trained in fire safety and responding to emergencies.

Step Two:

Identify Your Target Population

You've decided that you want to conduct a smoke alarm installation program. You've even begun to assemble your planning committee. But who are you going to target?

Some organizers of smoke alarm programs set an ambitious goal. They plan to install alarms in every home. Other communities have successfully conducted installation campaigns that take a far more limited approach. Some choose homes within a single census tract. Others identify a particularly vulnerable population, then try to reach out block by block.

The scope of your installation program will be determined by the resources available to you and the nature of the community in which you live. Answer the following questions. They will help you to take the next steps toward planning and implementing a successful campaign.

How would you describe the size and population of your community?

Are there neighborhoods in your area that have had many fire deaths or have the most fire runs? (Note: the local fire department will know the answer to this question.)

What are the high-risk populations in your area?

What kinds of resources are available to you to conduct an installation campaign?

NFPA's Community Toolkit on smoke alarms provides public educators with handouts, fact sheets, and public service announcements that can be used for your program. Visit nfpa.org/toolkits.



Keys to Success

Spotlight: Building a relationship

The people behind a successful smoke alarm installation program will tell you that having the trust of the community is essential. Columbus Fire Department in Ohio is challenged by neighborhood youth gangs, violent crime, and drug activity. The department builds coalitions to establish the trust needed to get smoke alarms installed in the homes of residents who need them.

Lt. David Sawyer says he's attended neighborhood civic association, block watch, and faith-based institution meetings in uniform to assure residents that the fire department is invested in the community.

"Not just calling them but actually appearing with them at some of their neighborhood functions makes a difference," he says.

"We had a smoke alarm installation drive in one of our vulnerable neighborhoods," he continues. "The community believed that city government and political leaders were not concerned with what was happening there. I started showing up at some of their grassroots efforts to lower youth violence with other representatives from city government and police. The grassroots leaders joined us when we walked the neighborhood, which helped us secure the willingness from the community to let us in their homes to install the smoke alarms."

Keys to Success

Spotlight: Canvassing High-Risk Multicultural Communities

Many fire departments find that door-to-door canvassing is one of the best ways to reach residents who need smoke alarms. That's the case for the Seattle Fire Department.

"Smoke alarm canvassing allows community members to see and interact with firefighters in a non-emergency situation," says William Mace, Seattle Fire Department Education and Outreach Coordinator. "This builds trust in the community and allows firefighters to hear directly from residents how the work they do is valued and appreciated."

Smoke alarm canvasses there have targeted low-income neighborhoods where fire incidents have been the highest. Before the canvass, the department posts flyers announcing the event. To make sure that the canvassing is effective, the department uses language interpreters where there is a large concentration of people with limited-English skills. For example, at one mobile home park where 60 percent of the homes had Spanish-speaking residents, the department enlisted the services of Spanish-speaking translators and interpreters from the Seattle Chapter of the American Red Cross Language Bank. They went door-to-door with firefighters and educators. The Language Bank has more than 300 volunteers who collectively speak more than 60 different languages and dialects.

"It is essential to have someone who can communicate to the population being reached out to in order to remove language and cultural barriers," says Mace. He said the department was able to install 44 alarms at the mobile home park event. "It would not have been successful without Spanish-speaking interpreters and staff."

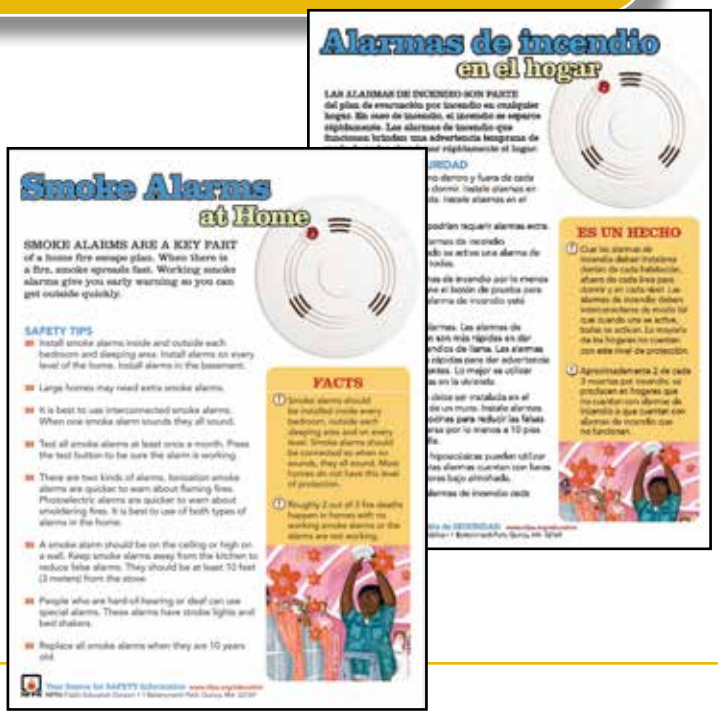
Step Three:
Identify High-Risk Residents in Your Community

NFPA research shows that certain populations are particularly vulnerable to fire-related deaths and injuries. By targeting these populations in your smoke alarm installation efforts, you'll be striking a significant blow against the risk of death and harm from fire. These at-risk groups include:

- **Young children**
- **Older adults**
- **People with disabilities**
- **Low-income communities, communities with many recent immigrants from non-English speaking countries**
- **Residents of homes with security bars**

But the home of a vulnerable individual, or even an entire at risk neighborhood, never exists in isolation. A community is at risk if it has vulnerable homes and those tend to be the homes of older adults. If a neighbor is elderly and can't get up on a ladder to test the smoke alarm, then you're at risk too. When you have vulnerable residents, you have a vulnerable community.

NFPA's smoke alarm tip sheets are available in multiple languages and have illustrations representing various cultures. Visit nfpa.org/safetytips.



Step Four:
Solicit Financial Support and Donations

You've got your plan. You've assembled a group of experts to help. But you're still missing an essential component: supplies, including smoke alarms, batteries, ladders, drills, and other equipment.

Some fire departments and safety organizations pursue grants to fund their smoke alarm installation programs. Other communities conduct their campaign using equipment and labor that's donated locally. Donations from area businesses can pay for much of your installation program.

But how to begin? You should start by identifying businesses. These could be national corporations with an outlet in your area, or home-grown companies or institutions that might have an interest in fire prevention. Even businesses that would seem to have little to do with safety often share an interest in supporting plans that work to make their community safer. These could include:

Stores that sell smoke alarms or batteries
Including Wal-Mart, The Home Depot, Lowe's, True Value, and other hardware, home improvement, and retail outlets.

Insurance companies with offices in your area
Ask them to consider making a donation to support the program.

Hospitals or other healthcare organizations
Supporting a smoke alarm installation program complements their community health mission.

Printing presses or copy shops
Approach them about donating the printing of promotional materials.

Restaurants or grocery stores
They may be interested in donating food to feed hungry volunteers.



Keys to Success

Spotlight: Life-Saving Grant Funding

Because of Mississippi's high fire death rate, the state fire marshal's office set out to conduct a smoke alarm installation program statewide. The program would provide in-home fire prevention education during the installation for people at high risk of fire. These are people with low incomes, families with children under age 14, older adults, and people with disabilities.

The fire marshal's office applied for and was awarded approximately $2 million in FEMA Fire Prevention and Safety Grants to purchase 88,366 10-year ionization smoke alarms, about 3,100 alert devices for people who are deaf or hard of hearing, and 1,000 photoelectric smoke alarms with strobe lights. The program was launched in early 2009. Smoke alarms and alert devices were installed by firefighters, church members, sheriff's departments, state agencies that already make home visits, and others.

More than 52,000 smoke alarms and 250 alert devices–including bed shakers and alarms with strobes–have been installed in more than 26,000 homes across the state. All of the alarms and alert devices have been distributed to installers. The program continues. The fire marshal's office has documented 35 lives saved in eight fires and has received anecdotal reports of other lives saved.

"Without grant funding, this project would not have been possible and annual fire fatalities would have been unchanged," says Mississippi State Fire Marshal's Office Fire Safety Education Officer Tammy Peavy.

Fire deaths are down from an average 81 per year to 65 in 2013. Officials believe the smoke alarm installation program has played a role.

Sample Letter to Area Businesses

Send this letter to area businesses months before you plan to conduct your smoke alarm installation.

Dear (Name of Store Manager):

The commitment of (NAME OF STORE) to public safety is well known. Because of this, the (Town/City) Fire Department and (Name of Organization) would like to invite you to support our smoke alarm installation project. Smoke alarms are the most effective tool we have to prevent deaths from fire, but many (Town/City) residents don't have working alarms in their homes. With the support of (Name of Store), we'll be able to reach more local residents than ever.

There are many ways that you can support this life-saving program, including donating smoke alarms and batteries, making a financial contribution, or by letting your customers know about the installation campaign. I hope that you'll consider partnering with us to make this essential safety program a success.

In return. We will recognize your support by (Clearly explain how you plan to promote the business's involvement in your campaign).

I will follow up with you (WHEN) and look forward to speaking with you about ways that we can work together to increase fire safety in (Town/City). I can be reached at (phone number) or by email (EMAIL ADDRESS) if you have any questions. Thank you for your consideration.

Sincerely,

(Your Name)

(Title)

(Town/City) Fire Department or Organization



To learn about NFPA's grant and award programs for fire departments and fire safety educators, visit nfpa.org/jensen and nfpa.org/educator.

Step Five: Get the Word Out About Your Program

An effective smoke alarm installation program depends on a successful publicity plan. Getting the word out about your campaign will let people know that you're going to be in their neighborhood, and get people talking about smoke alarms and fire safety.

Contacting the local media is one way to generate publicity for your installation program. We've included a sample press release that you can customize and send out to newspapers, television–including public access television, which often emphasizes community news–radio stations, and community newsletters in your area.

But here are other ways to spread the word:

Social Media

Utilize your fire department's blog, Facebook, and Twitter accounts. These will help you to spread the word about the smoke alarm installation program. Create a calendar event on Facebook. Take and post photos of installer training sessions with permission. Post links to media coverage of installations as they occur. Guest tweet and blog on partner organization's sites.

Let them know you're coming

If you plan to be in a certain neighborhood on a scheduled day, let residents know in advance. Leave door hangers or post flyers on community bulletin boards–libraries, casual dining restaurants, and some grocery stores have them.

Work through the schools

One way to contact parents in a targeted area is to get materials into the hands of their children through schools.

Reach people where they are

If you plan to target a particular population–say, older adults–identify places that cater to them and ask about handing out your materials there.

Leave a calling card

If you miss residents in a targeted area, don't give up. Leave a door hanger to let them know that you've stopped by. Give residents the option of calling the fire department to have an alarm installed at a later date.



Keys to Success

Spotlight: Rural Installation Programs

Organizing a smoke alarm installation program in a rural area can present unique challenges. Many rural communities rely on small, volunteer fire departments. Often they don't have a full-time public educator or the resources to conduct smoke alarm canvassing and installation programs.

The North Carolina Department of Insurance, Office of the State Fire Marshal Injury Prevention Division addressed this challenge by forming a partnership with the North Carolina Baptist Aging Ministry (BAM). Installation trainings were conducted across the state for BAM and provided volunteer installers with 10-year lithium battery alarms for people in high-risk areas.

"This is a wonderful partnership," says Kelly Ransdell, deputy director, North Carolina Department of Insurance. The churches are in close contact with the local people and can identify the homes in greatest need." Her office secured funding to purchase the smoke alarms through a FEMA Fire Safety and Prevention Grant and other resources.

Ransdell says the program has been a "tremendous success." Between July 10, 2013 and April 11, 2014, more than 3,743 homes had been visited across the state and 10,006 alarms installed.

Angie Gregg and Jan Parker, with the North Carolina Department of Insurance work on the community outreach for smoke alarms. They recall the response one evening when conducting a smoke alarm installation training for a Native American community in a remote area with limited resources. More than 175 people showed up in bad weather.

Many of them didn't know about the 10-year lithium option. "They were going home to make changes. Each team left with smoke alarms. They were so appreciative. You would have thought we were Santa Claus," said the trainers.

Through a Smoke Alarm Canvassing Grant, Ransdell's office was able to provide smoke alarms to fire departments that submit an application, outlining their plans. More than 90 departments around the state are participating, including a number of rural volunteer departments.

Training Tips

Here is a sample smoke alarm installation training agenda.

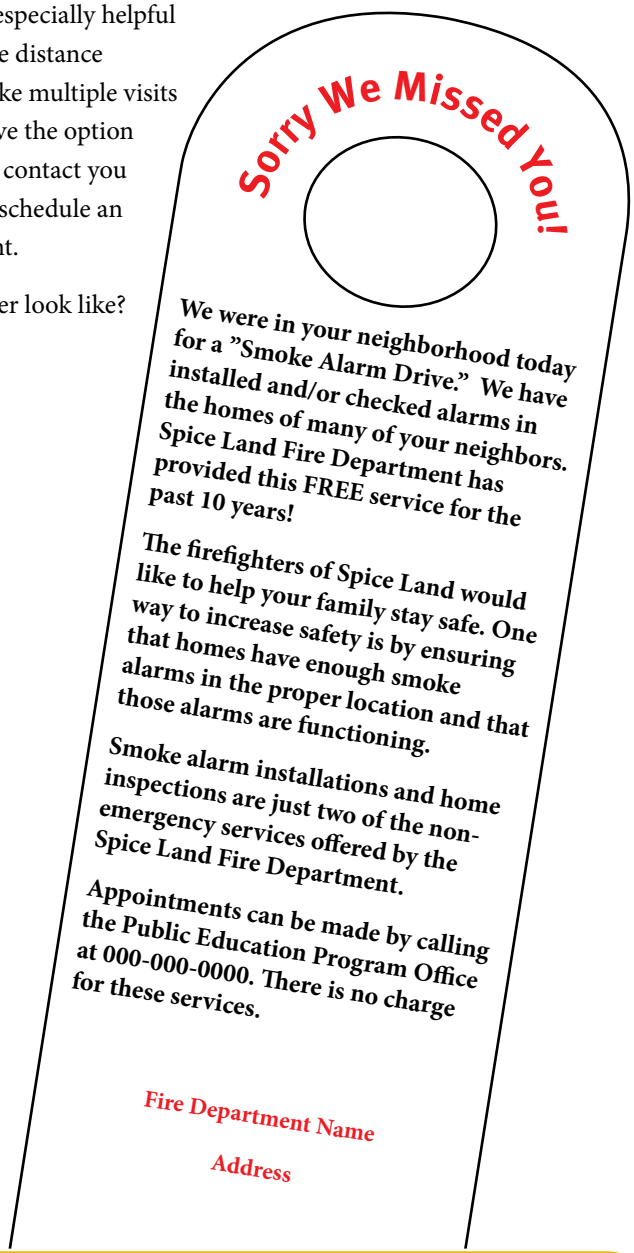
This sample agenda will help make sure that you cover the basics when training volunteers.

1. **Welcome and introductions**
2. **Objectives of the project**
3. **Local smoke alarm requirements and placement of smoke alarms**
4. **Features of the smoke alarm you will be using for your project**
5. **Demonstration and practice of smoke alarm installation and testing**
6. **Respectful interaction with residents**
7. **Using the smoke alarm survey form**
8. **Using the smoke alarm waiver form**
9. **Fire safety and fire escape information**
10. **Review of all handouts**
11. **Program plan and coordination**
12. **Other issues**

Sample Door Hanger

Door hangers are a great way to let residents know that you're planning to be in the area to install smoke alarms. And if you miss a resident, door hangers are a convenient reminder that a smoke alarm installation program is underway. This can be especially helpful in a rural area where the distance between homes can make multiple visits unrealistic. You also have the option of allowing residents to contact you at their convenience to schedule an installation appointment.

What does a door hanger look like?



Need the most recent statistics on smoke alarm usage and effectiveness for your training session? Go to nfpa.org/smokealarms

Sample Press Release

Send this release out at least two weeks before you plan to conduct your smoke alarm installation.

For release on: (Month/Date/Year)
For more information, contact: (Your Name)
(Your telephone number)
(Your Town/City)
(Your email address)

(Your Town/City/) and Community Organizations to Install Smoke Alarms

(Your Town/City) – Firefighters from (Your Fire Department) and members of (Participating Organizations) will visit local residents on (Month, Date) to perform free smoke alarm inspections, replacing batteries and installing smoke alarms as needed. It's part of a community-wide fire prevention effort.

The (Town/City) campaign is part of an effort to reach out to local residents, including older adults, young people and residents of neighborhoods, who are vulnerable to fire deaths. Installing smoke alarms in the homes of (Town/City) residents who don't have them will increase their odds of surviving a home fire.

According to the National Fire Protection Association (NFPA), the international nonprofit leader in fire, electrical, building, and life safety and official sponsor of Fire Prevention Week, working smoke alarms are the key to saving lives from fire.

"Smoke alarms are the most effective early warning device there is," says Judy Comoletti, NFPA's division manager for public education. "Just having a smoke alarm in your home cuts your chance of dying in a reported fire in half."

"Our goal is to make sure residents have the protection of a smoke alarm," says (Your Name, Title, Organization), "because smoke alarms alone won't prevent every fire death. Our project includes educating residents to have a home fire escape plan so they know what to do if the smoke alarm sounds."

During the smoke alarm installation program, local firefighters and community volunteers will fan out through the area, visiting residents in (List towns or neighborhoods). Residents who wish to schedule a home visit should call (Name) at (Number). Local funding for the installation program was provided by (List local funders).

"Fire can grow and spread through a home in a matter of minutes," says Comoletti. "That's why the advance warning provided by smoke alarms can be essential to saving lives. By participating in this community smoke alarm installation, (Your Fire Department) is helping to ensure that local residents are safer in their homes."



Keys to Success

Spotlight: On-the-Go Installations

A number of fire departments find that an effective way to reach residents in need of smoke alarms is to keep alarms on the truck. This way smoke alarms are with firefighters when they answer a call.

The Milwaukee Fire Department's multifaceted approach to installing smoke alarms includes a first responder installation program. The department responds to more than 70,000 calls for service each year. Milwaukee firefighters will check for working smoke alarms when appropriate, and install a new one or replace batteries as needed while at the scene.

Each company carries a kit with smoke alarms, batteries, installation tools and supplies, and fire safety education materials to share with the public so that they can make an immediate impact on the safety of those in greatest need.

When members of the Austin Fire Department in Texas conduct smoke alarm canvassing campaigns, they take along canvassing maps and backpacks that have smoke alarms, and drills. They also bring small utility ladders. This way they can do on-the-spot smoke alarm installations. In addition, the fire department makes sure all units carry smoke alarms for on-the-spot installations when units are making emergency responses.

"It is important to always be prepared for "on-the-spot" installations because the greatest challenges with outfitting every home in our community with a working smoke alarm are identifying the homes that need them, and orchestrating the opportunity to install them," says Austin Fire Department Battalion Chief David Girouard . "These challenges are overcome when we're already in a residence for whatever reason, identifying the need, and making the installation."



Keys to Success

Operation Save-A-Life

When Cleveland experienced a rise in deaths due to home fires in the early 1990s, a local businessman decided to do something about it. He spearheaded a free smoke alarm installation program for older adults and residents who had low incomes. The program continues today.

Operation Save-A-Life is sponsored by the Greater Cleveland Chapter of the American Red Cross. The Cleveland Fire Department is a key participant. Residents who need alarms call a hotline, which is screened by Red Cross volunteers. The fire department picks up the applications, along with smoke alarms and batteries, and distributes them among the station houses. Then the fire department makes the appointments to install the alarms. Eligible residents can request up to three alarms.

"We install alarms to ensure proper placement," says Lt. Larry Gray, public information officer, Cleveland Fire Department. "While we are in the house, if we see any safety issues we inform the resident and suggest changes."

Gray says the department leaves information on cooking safety, escape planning, and other safety topics with the residents.

Since the launch of Operation Save-A-Life, the Greater Cleveland area has experienced a dramatic decrease in home fire deaths. Cleveland reached a century low of three fire deaths in 2011. Work continues to reduce the number to zero. More than 130,000 smoke alarms have been installed.

To order sets of fire safety brochures, visit nfpa.org/catalog

Step 6:

Recruit Volunteers

Your ability to recruit and provide training to volunteers is important. It will play a big part in determining just how successful your smoke alarm installation project is. The more volunteers you have, the more homes your team members will be able to visit. Numbers are important, but quality is too. You'll be visiting the homes of some of the more vulnerable members of your community. You'll want to make absolutely sure that the volunteers you recruit are both trustworthy and accountable.

First of all, you'll need to develop a plan for recruiting volunteers. **Here are some tips.**

Fire department first

As mentioned earlier, fire department participation is essential. The fire chief may be willing to assign on-duty firefighters to the task (Of course, be prepared for them to leave quickly in the event of an emergency). Off-duty firefighters can also be called on to help.

Target the community

Very likely, there are groups in your community that share your mission of fire safety and prevention, but aren't involved in the actual planning of the event. Supplying volunteers to help with the installation of smoke alarms is a relatively easy way for these groups to support your efforts.

Start with your planning committee

Groups involved in planning your smoke alarm installation project are a good source of volunteers. These may include, staff members of health and safety organizations, and members of local chapters of service organizations such as The Lions Clubs International and Rotary International.

Branch out – with care

With the proper training, all sorts of people can serve as volunteers on your installation team. Installation campaigns across the country have circulated their appeals for volunteers via radio, television, blog posts, social networking sites, and web sites that list volunteer opportunities.

Step 7:

Provide Your Volunteers with the Necessary Training, Tools and Materials

You've assembled your volunteers. They are ready to fan out across the area where you've chosen to check smoke alarms, install new ones, and replace batteries as needed. So how do you make sure that your volunteer force is up to the task? Simple: train them. You'll want to ensure that your helpers understand how to install smoke alarms correctly and can speak about the purpose of the program and about fire safety in general.

Installation 101

The most successful campaigns include a thorough training session before the big day. The top lesson on the agenda: how to install a smoke alarm. To make sure your training covers the basics, follow the suggested Installation Training Agenda on page 8.

Firefighters lead the way

Ask firefighters to help you conduct the training. Have them break down the installation process into simple steps that can be easily remembered.

Training volunteers to lead

If you are relying on on-duty firefighters to lead the installation teams, be sure you're prepared in the event of an emergency (one that requires them to leave the installation project to respond to an emergency). You'll want to make sure that your volunteers can step up to the challenge if there are no firefighters present.

Role-play the day

Your volunteers' people skills are important. Do role-playing activities to make sure that they can explain the program in a friendly and knowledgeable way.

Have materials ready

Chances are, you'll want to have some materials to give to the people you're visiting. Many of these are available online at.nfpa.org/safetytips . You will find safety tip sheets on smoke alarms, home escape planning, and many other topics. Make sure you print out enough materials before the big day.

Tools for success

Divide your alarms and batteries among your volunteers when installation day finally arrives. In addition, you may also want to consider supplying your volunteers with the following:

Cordless drills and screwdrivers

Safety goggles

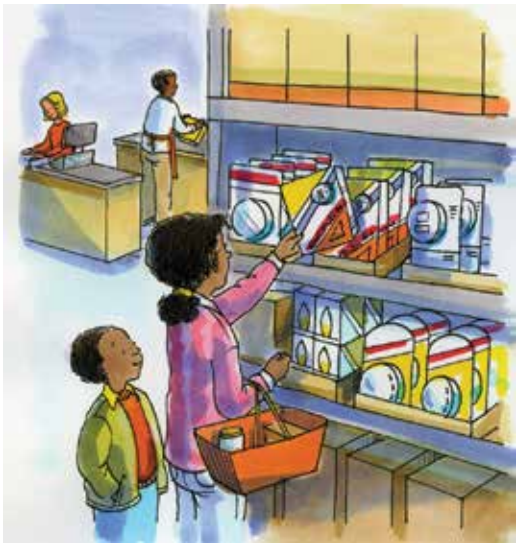
Safety step stools

Liability release forms (see page 15)

Installation survey forms (see page 16)

Training Tips

Tools for Volunteers



Be sure to use smoke alarms that have the label of a recognized testing laboratory. When handing out alarms to the installers, be sure to keep track of the number of alarms given to each volunteer. The installer must complete surveys to account for every alarm. Additional alarms should not be given to the installer until all alarms are accounted for.

Survey and Waiver Forms: Provide forms for volunteers to complete when they visit a home. Give installers pens and a clipboard to make it easier to complete the forms.

Identification: All volunteers should be able to identify themselves. Consider using badges, T-shirts, jackets, or hats to identify your volunteers. Inform residents requesting an installation/inspection that they should ask to see the credentials of the installer.

Drill: If possible, have cordless drills and screwdrivers available on a loan basis for volunteers. Teach installers how to operate the drill. Be sure to recharge the drills according to manufacturer's instructions.

Drill Bits: Extra drill bits should be provided with the drill.

Safety Ladder: If possible, loan a lightweight safety ladder for the installer to use.

Dry Wall Screws: Use screws designed to be used with dry wall. They may be easier to use than the screws and dry wall anchors provided with the alarms.

Batteries: If an installer discovers and alarm with missing or dead batteries, fresh batteries can be installed and the alarm tested.

Goggles: Installers can protect their eyes from injury by wearing goggles.

Smoke Alarm Types and Features

Smoke alarms are available in a variety of types and features. These types and features are summarized below along with considerations for their application.

Power Systems

Many jurisdictions require new homes and multifamily dwellings to have smoke alarms hardwired into their electrical systems.

Conventional batteries: Models using replaceable batteries (only) should have their batteries replaced in accordance with the manufacturer's instructions or whenever the low battery indicator sounds. Replace the batteries with the ones that are specifically listed for replacement by the smoke alarm manufacturer. The batteries specified are required to last at least one year. It is a good idea to replace standard alkaline batteries proactively once a year. (If lithium batteries are included in the list of batteries specified by the manufacturer, they will typically last much longer than a year.) These models – as with all smoke alarms – are required to have regular maintenance, including testing at least once a month.

Non-Replaceable Long-life batteries: Manufacturers have introduced smoke alarms with long-life non-replaceable batteries that last up to 10 years. Smoke alarms with non-replaceable long-life batteries offer an advantage for older people or people with disabilities who may have difficulty replacing batteries. (These alarms usually do not have the ability to be interconnected.) Alarms powered by long-life power cells still require regular testing and maintenance. The smoke alarms themselves need to be replaced after 10 years.

Hardwired smoke alarms: Hardwired alarm systems are powered by the home's AC electrical system, which also allows the alarms to be interconnected—when one goes off, they all sound. Most hardwired alarms are required to have a battery back-up. Hardwired alarm systems should be tested at least monthly, but replacement should be done by a qualified contractor. The back-up battery should be replaced in accordance with the manufacturer's instructions or whenever the low battery indicator sounds. There are now wireless interconnected smoke alarms available that are easier to install.

Low-Battery Warning Feature

All battery-powered alarms have a low-battery warning that "chirps" when battery power is low. Since the warning signal itself will stop after a few days, residents are encouraged to test their alarms after they've been away from home for several days. If the smoke alarm "chirps" signaling a low battery, replace the battery right away.

Sensing Systems

Most smoke alarms use one of two common sensing systems for detecting a fire. Ionization-type smoke alarms pass an electric current through a "sensing chamber." When smoke enters the chamber, it reduces the flow of current and activates the alarms. An ionization smoke alarm is generally more responsive to flaming fires. Photoelectric-type smoke alarms aim a light source into a sensing chamber. Smoke enters the chamber and reflects light onto the light sensor, triggering the alarm. A photoelectric smoke alarm is generally more responsive to smoldering fires. For the best protection, both types of alarms or combination ionization-photoelectric alarms, also known as dual-sensor smoke alarms, should be installed.

Other Smoke Alarm Features

Manufacturers are offering smoke alarms with new consumer features, some of which are especially appropriate for older adults. Take these options into account when buying alarms for your community installation project, but be sure that any alarm you purchase bears the label of a recognized testing laboratory.

Hush buttons: Nuisance alarms resulting from a smoky oven, burned toast, or other non-threatening circumstance are a common complaint. If cooking fumes or steam sets off nuisance alarms, replace the alarm with an alarm that has a "hush" button. A hush button will reduce the alarm's sensitivity for a short period of time. An ionization alarm with a hush button or a photoelectric alarm should be used if the alarm is within 20 feet of a cooking appliance. Pressing the hush button deactivates the alarm for roughly 7 minutes, after which it reactivates automatically. If a real fire occurs, the unit will override the pause feature and sound the alarm. Missing or disconnected batteries are the leading cause of smoke alarm failure. The hush feature discourages the dangerous (and too common) practice of disconnecting or removing alarm batteries in response to nuisance alarms and is recommended for use in all locations.

Voice capability: Some smoke alarms may also be designed with either a pre-recorded voice message or the ability to record voice messages during certain portions of the alarm signal. This feature helps to reinforce the alarm's urgency and, where capable, can be used by parents to record a message in a voice more recognizable to their children.

Escape Light: Some smoke alarms are available with a built-in safety or escape light. When the smoke alarm sounds, the light is also activated, helping you to exit the area.

Easy-to-install battery mounts: Standard 9-volt batteries used in many smoke alarms require the consumer to snap the battery's terminals into tight-fitting connectors, which may be difficult for some older adults.

Alarms with spring-metal terminal contacts reduce the difficulty of installing batteries but increase the potential for installing a battery backwards (switching positive and negative terminals). Residents should be cautioned to properly align the battery terminals with the polarity symbols (+ and -) on the alarm's battery mount.

Convenient test buttons: Some smoke alarms are equipped with a large, rectangular, easy-to-push test button. These may be attractive to consumers who are unable to or reluctant to stand on ladders.



Life Span

Smoke alarms should be replaced when they are 10 years old. Immediately replace a smoke alarm that does not respond when tested, even after you have replaced the battery.

Adequate Protection

Since the majority of fatal home fires happen when people are asleep, a smoke alarm should be installed outside each sleeping area, inside all bedrooms and on every level of the home (including the basement). People sometimes sleep in rooms other than bedrooms, such as living rooms, dens, dining rooms, and home offices where a fire may start. The closer an alarm is to a fire's origin, the sooner the alarm will sound. For the best protection, install interconnected smoke alarms so when one sounds, they all sound.

Alarms for people who are deaf or hard of hearing: Smoke alarms and alert devices, called accessories, are available for people who are deaf or hard of hearing. Strobe lights throughout the home are activated by smoke alarms and alert people who are deaf and hard of hearing to fire conditions. When people who are deaf are asleep, a high-intensity strobe light along with a pillow or bed shaker can wake them up and alert them to fire conditions so they can escape. When people who are hard of hearing are asleep, accessories that produce a loud, mixed low-pitched sound can effectively wake them up and alert them to fire conditions. This equipment is activated by the sound of a standard smoke alarm. Recent research shows that a loud, mixed low-pitched sound is more effective for waking people of all ages than the loud high-pitched sound of a traditional smoke alarm. Again, choose products that have the label of a recognized testing laboratory.



Installation Waiver

Before your team members actually install a smoke alarm in a particular household, they'll need to get the resident's signature on a waiver. (See sample on next page.) By signing the waiver, the resident agrees not to sue the fire department, the city or town, or other organizations involved in the smoke alarm installation program in the event that the smoke alarm fails to work properly.

NFPA's Remembering When™: A Fire and Fall Prevention Program for Older Adults, centered around 16 key safety messages. Eight fire prevention and eight fall prevention. To learn more, visit nfpa.org/rememberingwhen.

Sample Waiver Form

Waiver Form for (name of organization) Program

At my request, (name of organization) established to install smoke alarms in residences in (your community), has voluntarily installed one or more smoke alarms in my home located at _____.

In consideration for voluntarily providing and installing those battery-powered smoke alarm(s) in my home, I, for myself, my heirs, executors, administrators or successors, hereby waive any actions or claims of any nature that I have or might in the future have against any and all individual or organizational participants in the above referenced program, including but not limited to the fire department, the municipality and the officers, agents or employees growing out of or resulting from the installation and/or failure of the smoke alarms and/or batteries, and I further agree to hold harmless any and all organizational and individual participants in the above referenced program from and against all damages of any kind, to persons or property, growing out of or resulting from the installation and failure of such smoke alarms and/or batteries in my referenced home.

By signing this document, I certify that the smoke alarms were tested in my presence and are in good working order. Furthermore, I acknowledge that I have received information from the installer regarding proper smoke alarm maintenance, and understand that the maintenance is my responsibility.

I acknowledge having read, understood, and agreed to the above waiver, release, and indemnity.

_____ _____ _____

Print name Signature Date

_____ _____ _____

Witness (print name) Signature Date

*This form generally indicates that the occupant agrees to waive his or her rights to sue the individual or municipality and any other organizations or individuals involved in the installation of the smoke alarms, if a fire occurs after the alarm has been installed or tested. The purpose of the waiver is to protect the individual or any of the organizations involved against liability arising from the installation or operation of the smoke alarm. This statement is intended for information only, the terms of the waiver themselves shall prevail if there are any questions. You should seek advice if you do not understand this waiver.

Keys to Success

Spotlight: Strategic Volunteering

In Charlotte, North Carolina, workers at The Friendship Trays–the Meals on Wheels program–stay busy preparing and packaging meals for older adults, people with disabilities, and those financially unable to prepare their own food. They deliver more than 600 meals daily. Once or twice a month, Charlotte firefighters join in the effort.

The department provides two-person teams. These include fire safety educators, inspectors, investigators or other support staff. Each team is equipped with smoke alarms, carbon monoxide alarms, batteries, flashlights, goggles, drills, ladders, and fire safety educational materials. The teams pick up meals from The Friendship Trays kitchen and make deliveries, choosing a different route in the coverage area each time.

As meals are delivered, fire department personnel ask to check the smoke alarms to replace batteries or provide an installation. If residents don't want a safety check, fire safety materials and the phone number to the smoke alarm hotline are provided.

"We've been conducting this program since 2007 after multiple fire injuries and deaths to senior citizens in our community," said Senior Fire and Life Safety Educator Amy Krise. "This program is successful in that the fire department's partnership with this organization allows a fire prevention outreach to a group at high-risk of fire injury or death. We continue the program as a benefit to the participants, strengthening community partnerships and providing fire prevention to a variety of residents."

Survey Form for Smoke Alarm Installation Program

Your volunteers will need some means of keeping track of the work they've done. This installation survey from NFPA will allow them to record important information about the residences they've visited, as well as the number of alarms they've installed or batteries they've replaced.

www.nfpa.org/fireservice

Smoke Alarm Installation Survey Form

1. Date:	**11. Was there a smoke alarm inside each bedroom?** ❑ Yes ❑ No
2. Installer's Name:	**Was there a smoke alarm outside each sleeping area?** ❑ Yes ❑ No
3. Head of Household Name: Total number of people living in the home: ____	**12. How many smoke alarms did you test?** ❑ zero ❑ one ❑ two ❑ three or more - How many ___
4. Street Address:	**13. How many alarms did not work?** ❑ zero ❑ one ❑ two ❑ three or more - How many ___
5. Town/City: **State:**	**14. If smoke alarms did not work, please indicate how many alarms had the following problem(s):** ❑ battery was disconnected_____ ❑ battery was dead_____ ❑ battery was missing_____ ❑ other (specify)_____
6. Type of Residence: ❑ one family ❑ 2-family (duplex) ❑ apartment ❑ manufactured home (mobile home)	**16. How many batteries did you replace?** ❑ zero ❑ one ❑ two ❑ three or more - How many ___
7. Number of levels in the home: ❑ zero ❑ one ❑ two ❑ three or more - How many ___	**17. How many new smoke alarms did you install?** ❑ zero ❑ one ❑ two ❑ three or more - How many ___
8.How many smoke alarms were in the home before you installed new alarms? (If zero, please skip to #16.) ❑ zero ❑ one ❑ two ❑ three or more - How many ___	**18. Did you discuss the following?** Test smoke alarms once a month. ❑ Yes ❑ No Practice a home fire drill twice a year. ❑ Yes ❑ No
9. Was there at least one smoke alarm on every level of the home? ❑ Yes ❑ No	**19. Did you help occupant find two ways out of every room?** ❑ Yes ❑ No
10. If "no", which level(s) did not have a smoke alarm? ❑ basement ❑ first floor ❑ second floor ❑ other (specify)_____	**20. Did you help occupant select an outside meeting place?** ❑ Yes ❑ No

Training Tips

Installing smoke alarms

A successful installation program involves making sure that alarms are installed correctly and in the right locations.

- Install smoke alarms in every bedroom, outside each separate sleeping area, and on every level of the home, including the basement. Larger homes may require additional smoke alarms to provide a minimum level of protection.
- For the best protection, interconnect all smoke alarms, so when one sounds, they all sound.
- If someone in the home has profound hearing loss, install alarms with high intensity strobe lights. Vibration equipment is required and is activated by the sound of the alarm.
- If someone in the home is hard of hearing, a complex, low-frequency audible signal works best. A separate device that is activated by the sound of the alarm is available.
- Mount smoke alarms high on walls or ceilings (remember, smoke rises).
- If you have ceilings that are pitched, install the alarm near the ceiling's highest point.
- Don't install smoke alarms near windows, doors, or ducts where drafts might interfere with their operation.
- Smoke alarms should not be installed in attics, bathrooms, or garages.
- Install smoke alarms away from the kitchen to prevent false alarms. Generally, they should be at least 10 feet from a cooking appliance.

It is important to have enough smoke alarms in the home. Fire research has shown that with today's modern furnishings, fire can spread more rapidly than ever. Residents and authorities should take steps to make sure that enough smoke alarms are in the home.





Install smoke alarms in every bedroom, outside each separate sleeping area.

Step 8:

Be Prepared for Challenges—and Know How to Overcome Them

From recruiting volunteers to reaching out to the residents you want to serve, you may encounter difficulties along the way. To help you overcome these bumps in the road, we have a few stories to share.

Problem: Too Few Volunteers

The coordinators of a smoke alarm installation program had an ambitious plan to recruit more than 100 volunteers. The program was well publicized. However, there was difficulty getting people to commit. Then, on the big day: disaster. Many volunteers who'd signed up to participate didn't show at all. The coordinators went to Plan B: They brought fire trucks into designated areas of the city and had volunteers and firefighters canvas the neighborhoods. The original plan would have been better, but in a pinch, Plan B worked.

Problem: Trouble Reaching Designated Recipients

With the help of a grant, a nonprofit organization identified 145 children from low-income environments who had moderate to profound hearing loss. Each family was offered specially designed smoke alarms for people with a hearing impairment and installation free of charge. The committee had trouble reaching the people they hoped to help. The population was not responsive. The committee went through the school, got no response or the families would not agree. The solution: Organizers ultimately relaxed their guidelines in order to boost the number of participants in the program. They allowed anyone who met the hearing impairment part to participate.

Problem: Residents Live in Apartments

An organizer wanted to target homes of older adults. However, many of the older adults lived in apartment complexes. Installing smoke alarms was the responsibility of the landlord or building supervisor. The solution: the organizer worked with building maintenance and supervisors, making sure they understood the importance of having working smoke alarms. A print media campaign for residents of apartments was also launched to help reach the identified audience.



Step 9:
Evaluate Your Program

Once the big day has come and gone, you'll want to evaluate your program's success. Having completed survey forms from volunteers will help this process. As you answer the following questions and others, try to focus on ways that you might improve the installation project the next time around.

How many smoke alarms did you install?

Were you able to gain access to the community or communities you were targeting?

Did you meet the installation goals you set? If not, what were the problems?

Was your effort to recruit volunteers successful?

Did you receive coverage in the local media?

What kinds of financial support did your campaign receive?

How might you conduct the project differently next time?



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Keys to Success

Spotlight:
Measuring Outcomes

The St. Louis Fire Department conducts an extensive evaluation of its program's effectiveness. The department tracks installations by household and ZIP code. It gathers information on the number of people living in the home to identify a baseline. The collected information is cross-referenced with fire incidents where smoke alarms have been installed every six months. This is done to determine the number of lives saved. Follow-up home surveys and questionnaires are used to determine the extent of behavior changes.

"The overall goal of any successful smoke alarm program is to save lives. Evaluating the program's effectiveness is key," says St. Louis Fire Department Battalion Chief Derrick Phillips. "Fire departments will need to be able to provide figures on lives saved to show the impact. The information can be used to write or rewrite letters asking for support and to request support from the mayor, city manager, or city council."

To learn more about NFPA's Learn Not to Burn® programs for classroom outreach, visit nfpa.org/lntb.

Safety Tips

Share these life-saving tips with residents as you install new alarms for them or change the batteries in existing alarms.

- Once the alarm sounds, you may have as little as two minutes to escape.
- Test your smoke alarms once a month by pushing the test button.
- Smoke alarms with nonreplaceable (long-life) batteries are designed to remain effective for up to 10 years. If the alarm chirps, warning that the battery is low, replace the entire smoke alarm right away.
- For smoke alarms with any other type of battery, replace batteries at least once a year. If that alarm chirps, replace only the battery. Hint: schedule battery replacements for the same day you change your clocks from daylight saving time to standard time in the fall.
- Never "borrow" a battery from a smoke alarm. Smoke alarms can't warn you of fire if the batteries are missing or have been disconnected.
- Don't disable smoke alarms even temporarily. If your smoke alarm is sounding "nuisance alarms," try relocating it further from the kitchen, where cooking fumes or steam can cause the alarm to sound. Or, replace the alarm with a photoelectric type alarm which is not as sensitive to cooking fumes.
- Follow the manufacturer's instructions for cleaning to keep smoke alarms working well.
- Practice your home fire escape drill twice a year with everyone in your home. Practice at night and during the daytime. Practice your drill with overnight guests.





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