



Twin Falls City Council Agenda

Monday, July 27, 2020, 5:00 PM

City Council Chambers
203 Main Avenue East- Twin Falls, Idaho

****AMENDED****

Members: Suzanne Hawkins, Craig Hawkins, Nikki Boyd, Shawn Barigar, Gregory Lanting, Christopher Reid, Ruth Pierce

- 1) CALL MEETING TO ORDER/CONFIRMATION OF QUORUM
- 2) PLEDGE OF ALLEGIANCE
- 3) PROCLAMATIONS:
 - a) Recommitment to Full Implementation of the Americans with Disabilities Act (ADA)
- 4) CONSENT CALENDAR
 - a) **ACTION ITEM:** Request to approve the July 20, 2020, City Council Minutes.
By: Amy Luna, Finance Administrative Assistant
 - b) **ACTION ITEM:** Request to approve the Alcohol License Application for Rock-A-Billy Barber & Tattoo Company.
By: Amy Luna, Finance Administrative Assistant
 - c) **ACTION ITEM:** Request to hold the Twin Falls Chamber Mini Masters event.
By: Ryan Howe, Police Department
 - d) **ACTION ITEM:** Request to approve the annual Joshua Way Block Party.
By: Ryan Howe, Police Department
- 5) ITEMS OF CONSIDERATION
 - a) **PRESENTATION:** Presentation by Joshua W. Kern M.D., Vice President of Medical Affairs, St. Luke's Health System.
By: Travis Rothweiler, City Manager
 - b) **PRESENTATION:** A presentation of the City Manager's Recommended Budget for FY 2021 followed by citizen input.
By: Travis Rothweiler, City Manager
 - c) **PRESENTATION:** A presentation of the Twin Falls Police Department's 2019 Annual Report.
By: Craig Kingsbury, Police Chief
 - d) **PRESENTATION:** A presentation of the Twin Falls Fire Department's 2019 Annual Report.
By: Les Kenworthy, Fire Chief, Tim Lauda, Fire Marshal

- e) **PRESENTATION:** Fire Protection Systems Inspection Third Party Reporting Discussion.
By: Tim Lauda, Fire Marshal
- f) **ACTION ITEM:** Request to allocate \$80,000.00 funds from contingency reserves to replace the roof at Fire Station One.
By: Les Kenworthy, Fire Chief
- 6) **GENERAL PUBLIC INPUT:** To provide public input to the City Council please send to:
Citizeninput@tfid.org
- 7) **ADVISORY BOARD REPORT/ANNOUNCEMENTS**
- 8) **PUBLIC HEARINGS:** None
- 9) **ADJOURNMENT**
 - a) **ACTION ITEM:** REQUEST TO ADJOURN TO EXECUTIVE SESSION:

§ 74-206(1)(f) To communicate with legal counsel for the public agency to discuss the legal ramifications of and legal options for pending litigation, or controversies not yet being litigated but imminently likely to be litigated. The mere presence of legal counsel at an executive session does not satisfy this requirement.

Any person(s) needing special accommodations to participate in the above-noticed meeting could contact Leila Sanchez (208) 735-7287 at least two working days before the meeting. Si desea esta información en español, llame Leila Sanchez (208) 735-7287.

Public Input Procedures

1. Individuals wishing to provide public input regarding matters relevant to the City of Twin Falls shall:
 - Wait to be recognized by the Mayor or Chairman
 - Approach the microphone/podium
 - State their name, and whether they are a resident or property owner in the City of Twin Falls, and proceed with their input.
2. The Mayor or Chairman may limit input to no less than two (2) minutes. Individuals are not permitted to give their time to other speakers.

Public Hearing Procedures for Zoning Requests

1. Prior to opening the first Public Hearing of the session, the Mayor or Chairman shall review the public hearing procedures.
2. Individuals wishing to testify or speak before the City Council or Planning & Zoning Commission shall wait to be recognized by the Mayor or Chairman, approach the microphone/podium, state their name, and then proceed with their comments. Following their statements, they shall write their name and address on the record sheet(s) provided by the staff. The staff shall make an audio recording of the Public Hearing.
3. A City Staff Report shall summarize the application and history of the request.
4. The Applicant, or the spokesperson for the Applicant, will make a presentation on the application/request (request). No changes to the request may be made by the applicant after the publication of the Notice of Public Hearing. The presentation should include the following:
 - A complete explanation and description of the request.
 - Why the request is being made.
 - Location of the Property.
 - Impacts on the surrounding properties and efforts to mitigate those impacts.
5. Applicant is limited to 15 minutes, unless a written request for additional time is received, at least 72 hours prior to the hearing, and granted by the Mayor or Chairman.
6. The City Council or Planning & Zoning Commission may ask questions of staff or the applicant pertaining to the request.
7. The general public will then be given the opportunity to provide their testimony regarding the request. The Mayor or Chairman may limit public testimony to no less than two (2) minutes per person.
 - Individuals are not permitted to give their time to other speakers.
 - However, five (5) or more individuals that received written notice of the public hearing may appoint, by written petition, a spokesperson. The written petition must be received at least 72 hours prior to the hearing and must be granted by the Mayor or Chairman. The spokesperson shall be limited to 15 minutes.
 - Written comments, including e-mail, received by 12:00 p.m. on the date of the hearing shall be either read into the record or displayed to the public on the overhead projector.
8. Following the Public Testimony, the applicant is permitted five (5) minutes to respond to Public Testimony.
9. Following the Public Testimony and Applicant's response, Council or Commission members, as recognized by the Mayor or Chairman, shall be allowed to question the Applicant, Staff or anyone who has testified. Responses shall be limited to answering the questions asked. The Mayor or Chairman may limit the time permitted for the answer.
10. The Mayor or Chairman shall close the Public Hearing. The City Council or Planning & Zoning Commission shall deliberate on the request. Deliberations and decisions shall be based upon the information and testimony provided during the Public Hearing. Once the Public Hearing is closed, additional testimony from the staff, applicant or public is not allowed. Legal or procedural questions may be directed to the City Attorney.

* Any person not conforming to the above rules may be prohibited from speaking. Persons refusing to comply with such prohibitions may be asked to leave the hearing and, thereafter removed from the room by order of the Mayor or Chairman.

Office of the Mayor
City of Twin Falls, Idaho

Proclamation

Recommitment to Full Implementation of the Americans with Disabilities Act (ADA)

WHEREAS, some 57 million Americans have disabilities which have caused many to undergo the indignities of discrimination; and

WHEREAS, some 304,000 Idahoans have disabilities which have also caused many to undergo indignities of discrimination; and

WHEREAS, on July 1, 1988, the Idaho Human Rights Act was amended to prohibit employment discrimination against individuals with disabilities; and on July 26, 1990, President George H. Bush signed into law the Americans with Disabilities Act (ADA) to ensure the civil rights of people with disabilities; and

WHEREAS, it is the purpose of this Act to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities in the areas of education, employment, government services, places of public accommodation, commercial facilities, and other vital areas of society; and

WHEREAS it is also the purpose of this Act to provide clear, strong, consistent, enforceable standards addressing discrimination against individuals with disabilities, and

WHEREAS, the ADA has expanded opportunities for Americans with disabilities by reducing barriers and changing perceptions, and promoted full participation in community life; and

WHEREAS, despite progress over the past 30 years, people with disabilities still have higher poverty rates and lower employment and educational outcomes than those without disabilities; and

WHEREAS, the City of Twin Falls is committed to providing the most integrated, least restrictive environments for people with disabilities and their families to live in freedom and enjoy the promise of education, employment, effective communication, participation in their communities, culture, way of life, and to have an equal opportunity to participate as active, productive and independent citizens in the City of Twin Falls; and

WHEREAS, it is fitting and appropriate to recognize this date and to heighten public awareness of the 30th anniversary of the Americans with Disabilities Act;

NOW, THEREFORE, I, Suzanne Hawkins, Mayor of the City of Twin Falls, Idaho, do hereby proclaim July 26, 2020, to be

AMERICANS WITH Disabilities ACT AWARENESS DAY

and do hereby reaffirm that the full promise of the ADA will only be reached if the City of Twin Falls remain committed in our efforts to fully implement the ADA, and celebrates and recognizes the progress that has been made to fulfill the promise of the ADA.

IN WITNESS WHEREOF, I do hereby set my hand and cause the Seal of the City of Twin Falls to be affixed.

Suzanne Hawkins
Mayor

Attest: Leila A. Sanchez
Deputy City Clerk

Dated this 27th day of July



Twin Falls City Council Minutes

Monday, July 20, 2020, 5:00 PM

City Council Chambers
203 Main Avenue East- Twin Falls, Idaho

1) CALL MEETING TO ORDER/CONFIRMATION OF QUORUM

Present: Mayor Suzanne Hawkins, Vice Mayor Ruth Pierce, Council Member Shawn Barigar, Craig Hawkins, Greg Lanting, Christopher Reid & Nikki Boyd.

Absent:

Staff Present: City Manager Travis Rothweiler, Deputy City Manager Mitch Humble, City Attorney Shayne Nope, Captain Matt Hicks, Fire Chief Les Kenworthy, City Manager Assistant Mandi Thompson, Staff Engineer Lee Glaesemann, Planning & Zoning Director Jonathan Spendlove, Budget Coordinator Mat Farnes, Parks & Recreation Director Wendy Davis, City Engineer Mark Holtzen, Public Works Director Jon Caton, CFO Breanna Howard, Airport Director Bill Carberry, Human Resources Director Gretchen Scott, Help Desk Technician Kim Hafer, Finance Administrative Assistant Amy Luna.

Mayor Hawkins called the meeting to order at 5:00 PM. A quorum was present.

2) PLEDGE OF ALLEGIANCE

Mayor Hawkins invited all present, who wished, to recite the Pledge of Allegiance to the Flag.

3) PROCLAMATIONS: None

4) CONSENT CALENDAR

MOTION: Council Member Boyd moved to approve the Consent Calendar as presented. **Vice Mayor Pierce** seconded the motion. Roll call vote showed all members present voted in favor of the motion. 7 to 0

- a) **ACTION ITEM:** Request to approve the Accounts Payable for July 9-15, 2020.
- b) **ACTION ITEM:** Request to approve the Wells Fargo Credit Commercial Card for June 2020.
- c) **ACTION ITEM:** Request to approve the Monday, June 20, 2020, City Council Minutes.
- d) **ACTION ITEM:** Request to approve the Findings of Fact and Conclusions of Law for Annexation for 400-600 blocks of Hankins Rd.
- e) **ACTION ITEM:** Request from the Twin Fall School District to waive building permit fees for the remodel of the School District's residential construction classroom on South Washington.
- f) **ACTION ITEM:** Request to consider a recommendation from the Parks and Recreation Commission to accept a donation by Jakob and Pam Hartley of two benches along the newest section of trail.

5) ITEMS OF CONSIDERATION

- a) **PRESENTATION:** Presentation by Joshua W. Kern M.D., Vice President of Medical Affairs, St. Luke's Health System.

Mayor Hawkins introduced Dr. Kern, Vice President of Medical Affairs, St. Luke's Health System.

Discussion ensued on the following:

Vice Mayor Pierce: Thanked Dr. Kern. Asked about the delays in testing results.

Council Member Lanting: Will you be limiting any elective surgeries? How many ICU beds do we have available and what do you think will look like?

Council Member Barigar: How many health care providers are COVID positive? What can we do to limit the spread?

Mayor Hawkins: Asked about pool testing. Is that something we are doing or just in other states?

Mayor Hawkins thanked Dr. Kern for his update.

- b) **ACTION ITEM:** Request to confirm the appointment of seven members to the newly formed Public Art Commission.

City Manager Assistant Thompson made a request to confirm the appointment of seven members to the newly formed Public Art Commission.

Laura Stewart
Janeale Dean

Drew Nash
Melissa Crane

Camille Barigar
Amy Westover

Olivia Barrett

Discussion ensued on the following:

Council Member Barigar: Explained that one of the candidates is his wife, but has been advised by City Attorney Nope, that there is not a conflict of interest in this matter.

Mayor Hawkins: Spoke about the process and thanked all the members.

MOTION: **Council Member Reid** moved to confirm the appointment of the seven members to the newly formed Public Art Commission and wave the residency requirement for Amy Westover.

Council Member Barigar seconded the motion. Roll call vote showed all members present voted in favor of the motion. 7 to 0.

- c) **ACTION ITEM:** Request to award the 2020 Locust Street Paving Project.

Staff Engineer Glaesemann requested to award the 2020 Locust Street Paving Project.

Discussion ensued on the following:

Council Member Lanting: Is this a build all the way across or just the lanes?

Council Member Reid: How much of the road will be closed?

MOTION: **Council Member Reid** moved to award the 2020 Locust Street Paving Project to Idaho Materials & Construction, in the amount of \$819,499.00 and authorize the use of \$250,000 in reserves for the project and contingencies. **Council Member Boyd** seconded the motion. Roll call vote showed all members present voted in favor of the motion. 7 to 0.

- d) **PRESENTATION:** A presentation of the City Manager's Recommended Budget for FY 2021 followed by citizen input.

Deputy City Manager Humble made a presentation of the City Manager's Recommended Budget for FY 2021.

Discussion ensued on the following:

Council Member Barigar: Reiterated that the numbers related to the tax rate will change as the budget process goes forward.

City Manager Rothweiler: Explained where this number comes from and why it could change. Talked about the CARES Act Funds.

Council Member Lanting: Do you know how many Cities & Counties have not opted in? Asked about the legalities of the CARES Act Funds.

Focus Area 1: Healthy Community

Parks & Recreation Director Davis presented the following:

Parking lot repair/Maintenance	250,000
Frontier Park Restroom	150,000
Trail Maintenance	20,000
Misc Facility Enhancement 10,000 Tree Sprayer	5,500
Replace rusted restroom doors	5,000

Preserve Trail Head improvements	600,000 (Impact Fees)
Replace program equipment	25,000
Demolish old slaughterhouse	10,000
Nothing for Pool	
Nothing for Shoshone Falls & Dierkes Lake	

Listed out projects to consider in the future.

Council Member Lanting: Spoke about the Golf Course needing a new sprayer.

Council Member Barigar: Are these items to be considered Category B items? Shoshone Falls Entrance Fees, do they go to reserves, or are they an Enterprise Fund?

City Member Rothweiler: Explained the forgone balance that is being referred to.

Council Member Barigar: What do the Shoshone Falls fees look like this year?

Mayor Hawkins: Asked about the Commons Splash Pad and why it has not been turned on. First Federal Park, what is the issue with the zip line?

Focus Area 4: Accessible Community

Airport Construction (FAA Grant Funded Capital Projects)	3,120,170
--	-----------

Public Works Director Caton presented the requests for Streets

Overlays & Misc Maintenance	350,000
New Construction	250,000
Sidewalk Grant Match Program	150,000

6) GENERAL PUBLIC INPUT: To provide public input to the City Council please send to:

Citizeninput@tfid.org

Scott Rickert: Spoke on the *Local Disaster Emergency Declaration* that the City enacted about four months ago.

City Manager Rothweiler: Explained the "State of Emergency" process.

7) ADVISORY BOARD REPORT/ANNOUNCEMENTS

Council Member Hawkins reported on the Historic Preservation Committee meeting.

Council Member Lanting reported on the Friends of Muni Tournament.

Mayor Hawkins reported on the Parade of Homes and thanked the builders for their efforts.

8) PUBLIC HEARINGS: To make written comment please email: JSpendlove@tfid.org. Comments submitted after 12:00 PM, will not be included in the public hearing record. To call in to the meeting please telephone 1-208-939-6718, Conference ID: 968 427 88#. Calls must be received between 6:00 pm – 6:10 pm on July 20, 2020, and will be put into a queue to speak during the Public Hearing portion of the meeting.

- a) **ACTION ITEM:** Request for a Zoning District Change and Zoning Map Amendment from R-2, R-4, R-4 PRO, C-1 PUD to C-1 ZDA for property located at the northwest corner of Addison Avenue East and Carriage Lane North c/o EHM Engineers, Inc. on behalf of Gary N. Nelson. (PZ20-0062)

P&Z Director Spendlove presented a request for a Zoning District Change and Zoning Map Amendment from R-2, R-4 PRO, C-1 PUD to C-1 ZDA for property located at the northwest corner of Addison Avenue East and Carriage Lane North c/o EHM Engineers, Inc. on behalf of Gary N. Nelson. (PZ20-0062)

Discussion ensued on the following: None

The Applicant presented their request.

Discussion ensued on the following: None

Public Hearing Opened: 7:02 p.m.

Public Hearing Closed: 7:03 p.m.

Discussion ensued on the following:

Council Member Barigar: Would this widen Addison Ave E?

MOTION: **Council Member Barigar** moved to approve the request for a Zoning District Change and Zoning Map Amendment from R-2, R-4, R-4 PRO, C-1 PUD to C-1 ZDA for property located at the northwest corner of Addison Avenue East and Carriage Lane North c/o EHM Engineers, Inc. on behalf of Gary N. Nelson. (PZ20-0062). **Council Member Reid** seconded the motion. Roll call vote showed all members present voted in favor of the motion. 7 to 0.

9) **ADJOURNMENT**

The meeting adjourned at 07:04 PM

Amy Luna, Finance Administrative Assistant



City of Twin Falls
103 Main Avenue East
P.O. Box 1907
Twin Falls, Idaho 83303

Print Form

Alcohol License

Please attach a copy of your state license

Business Name: Rock-A-Billy Barber & Tattoo LLC State License # 3086
Doing Business As: Rock-A-Billy Barber & Tattoo Company
Physical Address: 110 Main Ave North City, State, Zip Twin Falls, ID 83301
Legal Description of Place of Business Lot _____ Block _____ Subdivision _____
Mailing Address: 110 Main Ave North City, State, Zip: Twin Falls, ID 83301
Contact Person: Jody Lapp Phone # [REDACTED]

Beer:	Bottled for consumption off the premises only	(\$ 50.00)	☐
	Bottled for consumption on premises	(\$150.00)	☒
	Bottled for Draught for consumption on premises	(\$200.00)	☐
Wine:	Retailed Sales for consumption off premises only	(\$200.00)	☐
	Wine by the Drink for consumption on premises only	(\$200.00)	☐
Liquor:	Liquor license & fees cover wine license and fees	(\$562.50)	☒

License expires June 30th

Total Fee \$ 712.50

LLC

Applicant is an: Individual ☐ Partnership ☒ Corporation ☐

If a partnership, name all partners:

Name: Toby Lapp

Name: Jody Lapp

Name: _____

If a corporation or association, name all officers:

Name: _____

Title: _____

Name: _____

Title: _____

Name: _____
Title: _____
Name: _____
Title: _____

Date of incorporation or organization: 07/15/2019 Place of incorporation or organization: Idaho

Principal place of business in Idaho: 3543 N 2700 E, Twin Falls, ID 83301

Owner of premises: Bernice Howa

Name of person who will manage business of selling beer at retail: Jody Lapp

(If a partnership, all partners must sign)

Signature of applicant _____

Name: Jody Lapp

Birth date: _____

Signature of applicant _____

Name: Toby Lapp

Birth date: _____

Signature of applicant _____

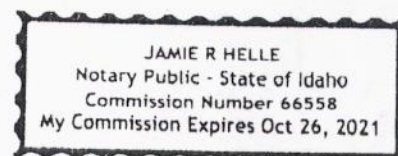
Name: _____

Birth date: _____

Signature of applicant _____

Name: _____

Birth date: _____



Subscribed and sworn to before me this 10th day of July, 2020

Jamie R Helle

Notary Public for Idaho

Residing at: US Bank filer ID 8332

Notary Expiration Date: Oct 26 2021

For Questions call 208-735-7245 [Click here for the City Code \(Title 3 then Chapter 7,8, & 9\)](#)

Return completed form to: Deputy City Clerk, City of Twin Falls, 103 Main Ave. East, Twin Falls, ID 83301

CITY STAFF USE ONLY:

Approvals:

Planning and Zoning:

Yes

☒

see attached

No

Comments:

Police Department:

Yes

☒

No

Comments:

Max Hill

City Clerk:

Yes

☒

No

Comments:

Angie Luna

State of Idaho

Idaho State Police

Cycle Tracking Number: 119536
ISLD ID: 8659

Premises Number: 2T-64
Incorporated City

Retail Alcohol Beverage License

License Year: 2021
License Number: 3086

This is to certify, that Rock-A-Billy Barber & Tattoo LLC
doing business as: Rock-A-Billy Barber & Tattoo Company

is licensed to sell alcoholic beverages as stated below at:
110 Main Ave North, Twin Falls, Twin Falls County

Acceptance of a license by a retailer shall constitute knowledge of and agreement to operate by and in accordance to the Alcohol Beverage Code, Title 23. Only the licensee herein specified shall use this license.

County and city licenses are also required in order to operate.

Liquor	Yes	<u>\$750.00</u>
Beer	Yes	<u>\$50.00</u>
On-premises consumption	Yes	<u>\$0.00</u>
Kegs to go	No	
Restaurant	No	
Wine by the bottle	Yes	<u>\$0.00</u>
Wine by the glass	Yes	<u>\$0.00</u>
Multipurpose arena	No	
Growlers	No	
Plaza	No	

Signature of Licensee, Corporate Officer, LLC Member or Partner

ROCK-A-BILLY BARBER & TATTOO LLC
ROCK-A-BILLY BARBER & TATTOO
110 MAIN AVE NORTH

TWIN FALLS, ID 83301

Mailing Address

TOTAL FEE: \$800.00

License Valid: 07/01/2020 - 06/30/2021

Expires: 06/30/2021

Director of Idaho State Police



License No. 2021-181

License Year 2021



State of Idaho

This License is Valid:

July 10, 2020 - June 30, 2021

Retail Alcoholic Beverage License

This is to certify that Rock-A-Billy Barber & Tattoo LLC
doing business as Rock-A-Billy Barber & Tattoo Company
at 110 Main Ave North, Twin Falls, ID 83301
a(n) Corporation, is licensed to sell Alcoholic Beverages, as stated below, subject to applicable provisions of the law
of the State of Idaho, along with the rules and regulations promulgated there under, and Twin Falls County Ordinances and Resolutions
approved by the Twin Falls County Board of Commissioners, which are on file in the Twin Falls County Clerk's Office.

This License Allows:

Draft, bottled or canned beer

on premises.....

Bottled or canned beer

on premises.....

75.00

Bottled or canned beer

off premises.....

County Wine by the bottle.....

County Wine by the glass.....

Retail Liquor.....

187.50

\$ 262.50

Signature of Licensee or Officer of Corporation

Witness my hand and seal this July 10, 2020

Board of Twin Falls County Commissioners

Chairman

Vice Chairman

Commissioner

Clerk of the Board
Kristina Glascock



Amy Luna

From: Jonathan Spendlove
Sent: Wednesday, July 15, 2020 8:15 AM
To: City Clerk; Lisa Strickland; Candy Reynolds
Subject: RE: New Alcohol License Application

There are no PZ issues with this alcohol license application.



Jonathan Spendlove, AICP
Planning and Zoning Director
Planning & Zoning Department
203 Main Ave. E., Twin Falls, ID 83301
208.735.7276
jspendlove@tfid.org



Date: Monday, July 27, 2020
To: Honorable Mayor and City Council
From: Ryan Howe, Police Department

ACTION ITEM

Request:

ACTION ITEM: Request to hold the Twin Falls Chamber Mini Masters event.

Time Estimate:

Staff requests this item be placed on the Consent Calendar.

Background:

The Twin Falls Chamber of Commerce has submitted a Special Event Application requesting to hold the Twin Falls Chamber Mini Masters event on Friday, August 14, 2020.

The Mini Masters will feature two person mini golf teams competing to be the mini golf champions of Twin Falls. There will be different start times for different flights of competitors. The event will start at 12:00 p.m. and end at 7:00 p.m.

This event will have mobile food vendors set up in the parking lot of Putters and a no host catered bar. Busters Restaurant will be catering this event and they have agreed to secure the proper catering permit.

The event will have a live DJ for announcements and the playing of pre-recorded music.

As with other events, this event will be subject to cancellation, postponement or additional safety precautions based on state and local governmental restrictions and regulations at the time of the event.

Approval Process:

Consent of the City Council.

Budget Impact:

Alcohol will be served at this event, however, there were no calls for service to the police department in 2018 or 2019. Twin Falls Police Department staff does not feel security will be necessary. Therefore, there is no budgetary impact.

Regulatory Impact:

N/A

History:

N/A

Analysis:

N/A

Conclusion:

The Twin Falls Police Department Staff and several relevant City Staff Members have approved this Special Event Application. Based on this request, and the information provided, Staff recommends this event be approved as presented

Attachments:

None



Date: Monday, July 27, 2020
To: Honorable Mayor and City Council
From: Ryan Howe, Police Department

ACTION ITEM

Request:

ACTION ITEM: Request to approve the annual Joshua Way Block Party.

Time Estimate:

Staff requests this item be placed on the Consent Calendar.

Background:

Frank Robles of 2594 Joshua Way, Twin Falls, has submitted a special event application to hold the Joshua Way Block Party in the 2500 block of Joshua Way. This event is scheduled for Saturday, August 22, 2020 from 3:00 p.m. to 10:00 p.m.

The Joshua Way Block Party is for the residents of the 2500 block of Joshua Way and the surrounding neighborhood. The block party is an opportunity for residents of Joshua Way to get to know each other and share in entertainment. This will be the seventh consecutive year this event has taken place and the fourth year the organizers have requested the closure of Joshua Way to accommodate the party and offer more safety for attendees.

There will be a community potluck and entertainment in the form of amplified music. In addition, there will be bounce houses and games for children.

There will be no alcohol served by the event organizers, but residents will be allowed to bring their own beverages.

The organizers of this event have requested the temporary closure of the 2500 block of Joshua Way between Carriage Lane and Longbow Drive to help ensure the safety of those attending. The Twin Falls Fire Department has reviewed this request and arrangements have been made to allow access to emergency vehicles if necessary.

As with other events, this event will be subject to cancellation, postponement or additional safety precautions based on state and local governmental restrictions and regulations at the time of the event.

Approval Process:

Consent of the Council

Budget Impact:

There have been no police calls for service on Joshua Way in years past. Since no alcohol will be served at this event, Twin Falls Police Department Staff does not feel there is a need for the Twin Falls Police Department to provide security.

Regulatory Impact:

N/A

History:

N/A

Analysis:

N/A

Conclusion:

Twin Falls Police Department Staff and several relevant City Staff members have approved this application request. Staff recommends that the City Council approve the Special Event Application based on the information provided.

The Twin Falls Police Department Staff recommends that the on-duty Patrol Supervisor be given the authority to order the event organizers to mitigate the sound of amplified music if necessary. If there are continued noise complaints, disturbances by those participating in the event, and non-compliance, the on-duty Patrol Supervisor shall have the authority to terminate the event.

Attachments:

None



Date: Monday, July 27, 2020
To: Mayor and City Council
From: Travis Rothweiler, City Manager

Request

A presentation of the City Manager's Recommended Budget for FY 2021 followed by citizen input.

Time Estimate

The estimated amount of time this item will take is one hour plus time to answer questions.

Background

The State of Idaho defines city government as a municipal corporation. It is with that mindset this budget has been developed. We are pleased to present to you the recommended Budget for Fiscal Year 2020-2021 (FY2021). This budget represents hundreds of hours of thoughtful work by dozens of people in developing the spending plan for our organization for the coming fiscal year.

We found ourselves dealing with a tremendous amount of uncertainty as we developed the budget for the upcoming fiscal year. We do not know what a "new normal" will look like when, and if, it arrives. To this day, we remain concerned about the long-term economic, health, psychological and societal effects of the novel coronavirus disease (COVID-19) will have on our community and our ability to provide public services. Equally, we are concerned about the societal unrest occurring in many communities across the nation. Lives tragically lost in other states and communities impacted members of our community, just as it did in many hometowns across the United States and the world. The events of the spring of 2020 were further proof our world is shrinking.

The City of Twin Falls is a municipal corporation with over 50,000 shareholders, 313.25 full-time employees and a taxable value of nearly \$3.4 billion. The City's taxable value excludes the taxable value of the properties located in the Twin Falls Urban Renewal Agency revenue allocation areas, which have a total value of \$622,600,619, which is an increase of \$61,047,371. Collectively, the taxable values for both the City of Twin Falls and Twin Falls Urban Renewal Agency totals \$4,032,586,340. To put these values into perspective, the City of Twin Falls' taxable value in FY 2012 was \$2.152 billion.

The FY 2021 budget has been created with following philosophies in mind:

- Create a nimble, agile, adaptable budget that allows the City of react in this dynamic, uncertain and ever-changing local economy;
- Develop a budget that is sensitive to our operating environment and local economic conditions;
- Connect all expenditures directly to the City's 2030 Strategic Plan;
- Limit tax collections by considering not taking 3% and preserve the entirety of the \$1,416,284 foregone balance;
- Minimize all utility rate increases;
- Place a high level of value on our employees.

PUBLIC INPUT AND TRANSPARENCY

The City of Twin Falls strives to communicate, operate, function, and conduct the business of the people in an open and transparent manner. Equally, we recognize the value and importance of honoring and upholding our fiduciary duties and responsibilities. Because openness and transparency are part of our organizational culture and values, we have taken several steps designed to afford our citizens and stakeholders several opportunities to actively participate and contribute to the budgeting process.

The City of Twin Falls has taken additional steps designed to illustrate our commitment to effective community involvement in the annual budget process. The Council provided an opportunity for our citizens and stakeholders to communicate their thoughts about specific programs, strategic initiatives and priorities for the upcoming fiscal year prior to the more customary, internal staff conversations.

A summary presentation of the proposed budget has been placed on the City's website. On August 10, 2020, the City Council will adopt the preliminary budget for FY 2021, with a public hearing and final adoption scheduled to occur on August 24, 2020.

CONNECTION TO THE CITY'S 2030 STRATEGIC PLAN

Twin Falls is a vital, growing, and changing city. We have constructed processes and policies that help us in shaping growth while taking advantage of opportunities as they are presented. We continue to focus on the focus areas contained in the City's 2030 Strategic Plan, just as we have for the past seven budget cycles. The current Strategic Plan was updated in March 2018 after an extensive open, citizen-driven process. The City's FY2021 budget allocates funds for needed projects and critical services collectively designed to help the City take the "next step" in realizing the community's 2030 vision of Twin Falls.

SIGNIFICANT ISSUES DRIVING BUDGETARY CONSIDERATIONS

The four main drivers that influenced the development of the City Manager's Recommended Budget for FY 2020-2021 were:

- **Novel coronavirus (COVID-19)**

Like many cities across the country, the sudden onset of the novel coronavirus (COVID-19) and the resulting disruption to local economies interrupted a period of growth and prosperity that had not been seen since before the Great Recession. What remains to be seen is how the economy, on both a national and local scale, will respond to the disruption and what the trajectory of that recovery will look like.

- **Health Insurance and Compensation**

Health insurance continues to be a difficult subject to navigate in our budgeting efforts. We recognize that offering quality and affordable health insurance is critical in our efforts to be an employer of choice. However, health care cost inflation continues to outpace the Consumer Price Index and the Municipal Cost Index. In addition, some members of our employee family have also had to deal with serious and costly health challenges. These factors have caused dramatic increases in health insurance costs year over year. The cost of our insurance monthly premium to cover an employee and his/her family has almost doubled in the last ten years.

With no changes to the current plan, the proposed increase in cost of health insurance in FY 2021 is 10%. When considering options to reduce this increase, we compared our offering to what other public employers are offering their employees. We feel that our health care benefit is still market competitive, but further changes to our plan could affect that competitive position. An increase in insurance premiums when the compensation adjustment is 2% and/or with a 2% table move will prevent our employees from seeing a net decrease in their take-home pay in the coming fiscal year.

- **Becoming a CDBG (Community Development Block Grant) Entitlement Community**

The City of Twin Falls accepted the status of an Entitlement Community through the U.S. Department of Housing and Urban Development (HUD) in September 2019. With its population estimated to be in excess of 50,000 residents, Twin Falls is now considered small urban and is subject to additional federal requirements. The CDBG program provides annual formula grants based on population to states, cities and counties to develop programs to provide decent housing and suitable living environments and expanding economic opportunities for low and low-

moderate income persons. The City's allocation will be approximately \$342,000 annually. In response to COVID-19, an additional allocation of \$200,000 was made to the city. Staff is working with a consulting firm to develop the planning documents required in order to expend the funds.

- **Property Tax Reform by the State Legislature**

In Idaho, property taxes are the primary source of revenue for local governments. The method for calculating property taxes applies individual tax rates for each taxing entity against the assessed value of the property. When home values are increasing at a faster rate than income levels, the result is a significant increase in property tax burden to homeowners. Prior to COVID-19, housing prices in Idaho were increasing between 8% and 10% each year. Even with a reduced tax rate, an increase in assessed value equates to an increase in property taxes. In addition, in 2016 the Idaho Legislature replaced the index that drove the homeowners' exemption with a cap of \$100,000. As home values increase, the exemption provides less and less relief to homeowners.

Multiple bills were introduced during the 2020 legislative session meant to address property tax reform. These bills varied in method, but all would have resulted in a reduction in our ability to capture property tax revenue: eliminating the statutory 3% increase local governments can take over the previous year's budget, eliminating new construction, and eliminating foregone balances. Due to the sudden onset of COVID-19, the session recessed without any significant changes to property tax collection, but there remains considerable interest in pursuing reform in the upcoming session.

The City will continue to bring forward a balanced budget regardless of the actions at the State level, with the understanding that if our revenues from property taxes are significantly decreased, there will be a resulting decrease in services the City can provide.

ECONOMIC INDICATORS CONSIDERED IN THE RECOMMENDED BUDGET

To produce a conservative and sustainable budget, the FY 2021 budget reflects a decline in some revenue categories as the overall strength of the state and national economies remain uncertain. Our robust and growing economy, overall real estate market stability and desirability, long-term growth management strategy, and dedication to superior services will make it possible for the City to remain on strong financial footing. While we know we will recover, we remain uncertain as to "when."

The swift and destabilizing effects of COVID-19, however, have created a level of economic uncertainty not seen since the Great Depression. It is this uncertainty that will influence budgetary decisions for the foreseeable future.

National

- U.S. house prices rose 1.7% in the first quarter of 2020 according to the Federal Housing Finance Agency (FHFA) House Price Index (HPI). House prices rose 5.7% from the first quarter of 2019 to the first quarter of 2020. The impact of COVID-19 has yet be reported in the housing market.
- Nationwide, unemployment rates remained low throughout 2019. According to the Bureau of Labor Statistics, the national unemployment rate was less than 3.7% every month of 2019, getting as low as 3.5% in February 2020. With the sudden shutdown of the U.S. economy due to COVID-19, the unemployment rate rose to 4.4% in March and 14.7% in April, then falling slightly to 13.3% for May 2020.
- The Dow Jones Industrial Average hit an all-time high of 29,551 on February 12, 2020 as a result of the longest bull market in history. On March 20, 2020, the market closed at 19,173 point, a loss of 10,378 point in a two-month period.
- Prior to COVID-19, consumer confidence was up from last year. The University of Michigan compiles a consumer sentiment rating. The rating for May 2019 was 100 and grew to a 12-month high of 105.8 in early March 2020, before beginning a steady and rapid decline. The April

2020 rating was 69, which shows a 36% decrease in consumer confidence as a result of COVID-19. The decline illustrates a major collapse in economic optimism across all population subgroups defined by income, age, education, and region of residence. Half of all consumers surveyed mentioned they were postponing purchases of household durables due to uncertainty about future job and income prospects.

State of Idaho

- Home prices rose in all 50 states and the District of Columbia between the first quarter of 2019 and the first quarter of 2020. Boise, Idaho realized one of the highest levels of annual appreciation in the nation at 9.3%.
- Home prices rose in 97 of the 100 largest metropolitan areas in the U.S over that four quarters. Annual price increases were the greatest in Boise, Idaho at 12.7%.
- The median home value in Idaho is \$298,257 and increase of 9.5% over the past year. The median list price per square foot in Idaho is \$173. The median price of homes currently listed in Idaho is \$334,895. The median rent price in Idaho is \$1,400. Prior to COVID-19, Idaho home values were predicted to rise 10-15% within the next year. However, the impact of the virus has created a softening of the real estate market and values are expected to decrease by .2% within the next year.
- Statewide unemployment was 2.6% in March 2020. Following the shutdown of the economy as a result of the stay-at-home order to combat COVID-19, the rate rapidly rose to 11.5% for the month of April 2020 but fell to 8.9% in May 2020.
- Per capita personal income (PCPI) continues to grow, but at a slower pace than in previous years. PCPI in Idaho grew by 3.6% from 2018 to 2019. At \$45,642, Idaho is ranked 44th in the United States and was 80 percent of the national average of \$56,623. Idaho was sixth in the nation for real personal income growth, which takes into account the cost of living, measured by regional price parity (the average price paid by consumers for the mix of goods and services in each region). Idaho's real personal income growth was 4.1% for 2018-19.
- The May 2020 revenue projections for the State of Idaho were 59.8% lower than anticipated, due large in part to the extension of the income tax filing deadline from April 15 to June 15. Idaho General Fund tax collections were coming in above the forecasted levels prior to April 2020. Receipts were \$77.7 million more than expected for February and \$30.6 million more for March. Even with receipts coming in higher than predicted for the first 9 months of the fiscal year, to-date revenues (through May 2020) show a \$312.7 million shortfall, which is 8.7% under projections.
- Sales tax receipts for May 2020 were 9.9% lower than projected (\$13.5 million), but of all revenue streams, sales tax is closest to projections through May 2020 (1% lower).

City of Twin Falls

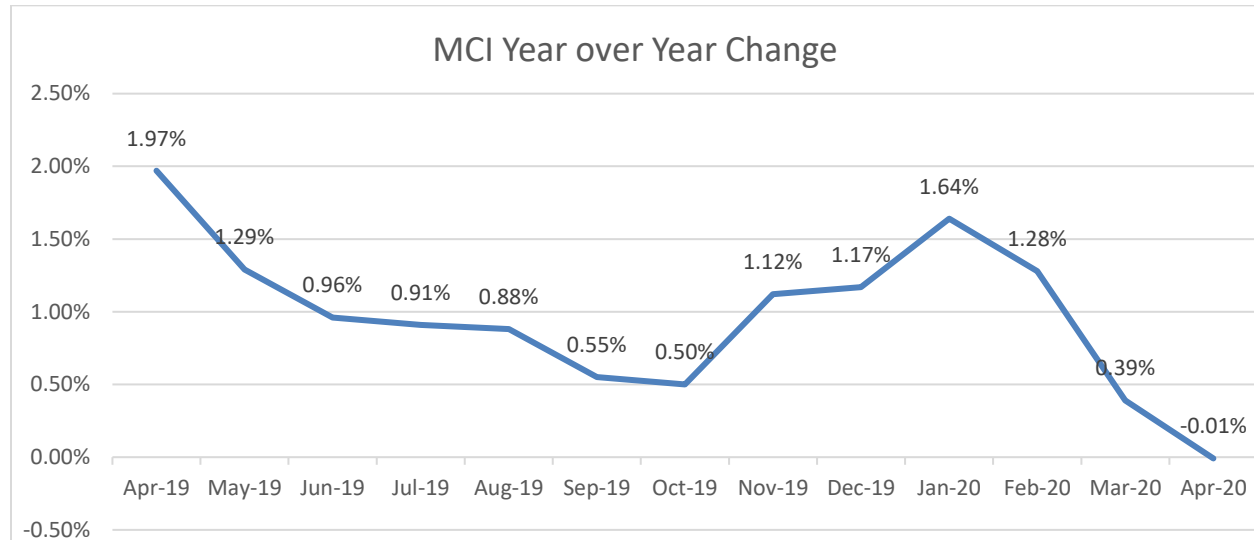
- According to the Idaho Department of Labor's Twin Falls County Workforce Trends report, Twin Falls County had an unemployment rate of 2.6% in March 2020. This compares to the State of Idaho unemployment rate of 2.5% and a national unemployment rate of 3.5%. The unemployment rate for Twin Falls County has dropped continuously for several years, from 5.6% in 2013 to 2.4% in 2019. The impact of COVID-19 on the local economy mirrors that of the State and national economies – unemployment in Twin Falls was 11.2% in April 2020, and this figure was based on March data when social distancing had only been in place for a few weeks. May unemployment dropped to 8.2%, which is better than anticipated but similar to the statewide effects to the economy.
- Construction activity for Twin Falls continued on a similar pace in 2019 in terms of single-family building permits issued. There were 326 single family permits issued in 2019, which was the highest level since 2006. There have been 313 permits issued to- date in FY 2020, which exceeds the same period in 2019 by 102 permits and is 96% of total FY2019 permits with four months left in the fiscal year. It remains to be seen what, if any, long term impacts COVID-19 will have on the housing market and if the pace of construction will be affected.

- There were 78 new commercial building permits issued in FY2019, far surpassing the high of 61 in 2008. To-date there have been 37 new commercial building permits issued in the first eight months of FY2020.

COST OF DOING BUSIENSS – MUNICIPAL COST INDEX

The economy has been improving on many fronts, the cost of offering public services and programs has also increased. The Municipal Cost Index (MCI) is designed to show the effects of inflation on the cost of providing municipal services.

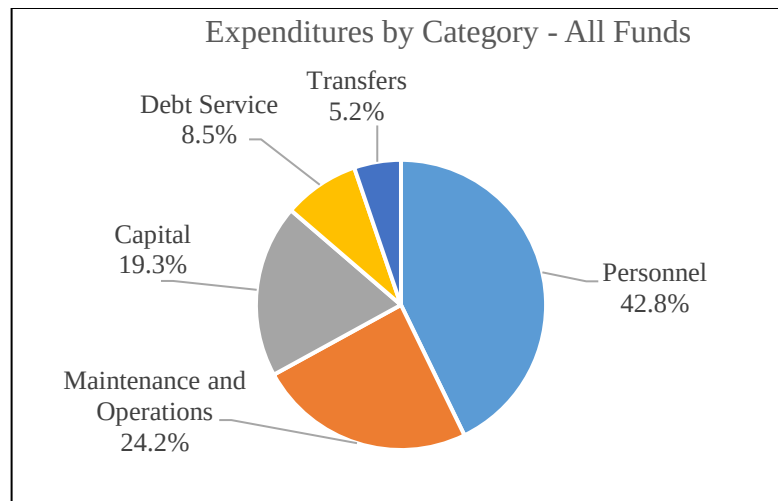
The MCI draws on the monthly statistical data collected by the U.S. Departments of Commerce and Labor as well as independently compiled data to project a composite cost picture. From April 2019 to April 2020, the most recent data available, the MCI decreased 2.19 points or -.86% to 251.13. The Consumer Price Index fell -0.4 in March 2020 and -0.8 in April 2020.



2021 FISCAL YEAR BUDGET SUMMARY

The combined expenditures and transfers total \$73,651,704, which is \$1,581,416 (2.19%) more than the FY 2020 budget of \$72,070,288. Governmental Fund-Type expenditures, or expenditures from funds that receive property tax or shared revenue, total \$42,407,832 (decrease of \$2,301,311, or 5.15%). Of this amount, \$583,219 is for one-time capital initiatives funded with cash reserves. Enterprise and Other Major and Non-Major Non-Tax Supported Fund expenditures total \$31,243,872 (increase of \$3,882,727, or 14.19%), which includes \$2,444,000 for capital projects funded with cash reserves. The “net budget,” or total budget less transfers is \$69,801,197 for FY 2021. This is \$2,055,823 (3.03%) more than the FY 2020 total of \$67,745,374. It is important to note that net overall spending (total less transfers) in the tax supported funds is \$1,742,010 (4%) less than the budget adopted for FY 2020.

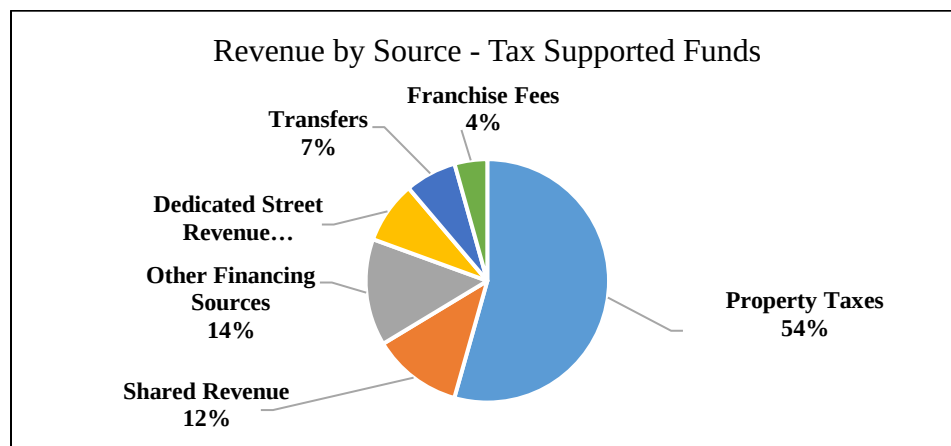
Expenditures in this budget are classified under one of five major categories – Personnel, Maintenance and Operations, Capital, Debt Service and Transfers. The graph below shows the relative percentage of FY 2021 budget expenditures for the five major categories in all funds combined.



In most government agencies, personnel costs (salaries, wages and benefits) normally represent the largest of the expenditure categories. While municipal governments also devote a large amount of their resources to personnel, the significant investment in infrastructure drives the percentage of the budget devoted to operating and capital costs higher than most other government agencies.

REVENUES

Most commonly recognized government activities are conducted through Government Funds. The Government Fund umbrella includes the following funds: General, Street, Street Light, Airport, Library, Capital Improvement, Pool, Golf, Insurance, and Fireworks. Revenues in these funds are derived from property taxes, licenses and permits, intergovernmental grants, shared revenues from the state of Idaho (sales tax, gas tax, etc.), and federal entitlements. The government funds include funding to support personnel, maintenance and operations, contractual services, equipment acquisitions, and capital construction projects.



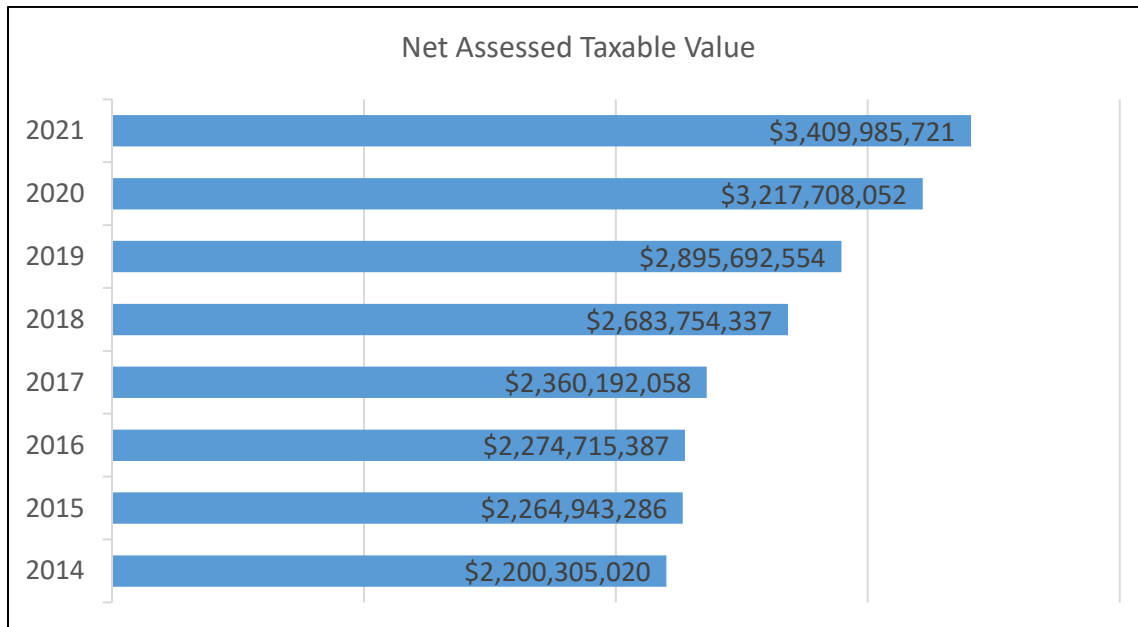
Enterprise Funds account for services financed through the assessment of user-fees. The main goal or purpose of these business-like funds is to provide services to customers at a price that will cover both the current cost of operations and the purchase and maintenance of necessary capital assets. Net income/loss (revenues less expenditures) at the end of each fiscal year either adds to or reduces the fund's residual equity, which is commonly referred to as the net assets of the fund. The residual earnings captured by a particular Enterprise Fund may not be co-mingled with any other fund or spent for any purpose other than the one it has been collected or reserved for without direct and specific action by the City Council.

The City has five separate and distinct Enterprise Funds, which include the City's Water (supply, distribution, irrigation and utility services), Wastewater (collections and treatment), Sanitation, Dierkes/Shoshone Falls, and Common Area Maintenance Funds. This section of the budget message focuses on the City's three largest enterprise funds: Water, Wastewater, and Sanitation. The other funds constitute a small portion of the Enterprise Fund picture and are not specifically addressed in this message; the specific budgeted amounts can be viewed within the budget document.

TOTAL ASSESSED VALUATION

According to the Twin Falls County Assessor's Office, from FY 2020 to FY 2021, the City of Twin Falls' total taxable valuation increased by \$192,277,669, or 6%, from \$3,217,708,052 to \$3,409,985,721. This growth is on top of the \$322,015,498 that was realized in the prior fiscal year.

As illustrated in the table below, the taxable value used to calculate the FY 2021 tax rate for the City of Twin Falls is the largest in its history

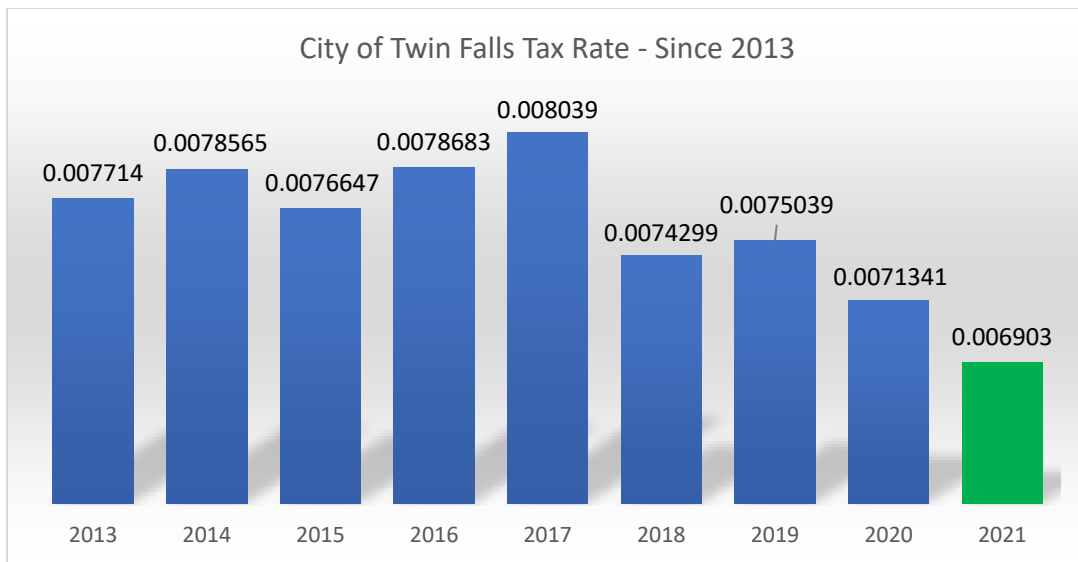


It is important to note the City's taxable value excludes the taxable value of the properties located in the Twin Falls Urban Renewal Agency revenue allocation areas. The entirety of the URA's properties are located in the City and have a value of \$622,600,619. Collectively, the taxable values for both the City of Twin Falls and Twin Falls Urban Renewal Agency total \$4,032,586,340. There are many factors that influence the City's total taxable value. Some of the larger factors include an increase in the base value from reappraisals performed by the Twin Falls County Assessor's Office, growth from new construction, and property incorporated into the City through annexation.

PROPERTY TAXES

Cities in Idaho have control over their annual expenditures in all funds, as well as the rates they assess in the enterprise funds. Statutorily under Idaho Code, cities and counties are permitted to collect 3% more property tax revenue than the previous fiscal year. The FY2021 budget does not include the statutory allowed 3% increase in property tax revenue.

Cities in Idaho do not have control of and cannot determine their community taxable value. That responsibility is assigned to the County Assessor's Office. Based on the taxable value presented above, the City's tax rate for FY 2021 will be \$6.90 per \$1,000 (0.0069038) in taxable value. The tax rate for FY 2020 was \$7.13/\$1,000 (0.0071341) of taxable value. As illustrated in the graph below, the FY 2021 tax rate is the lowest issued by the City over the last eight years.

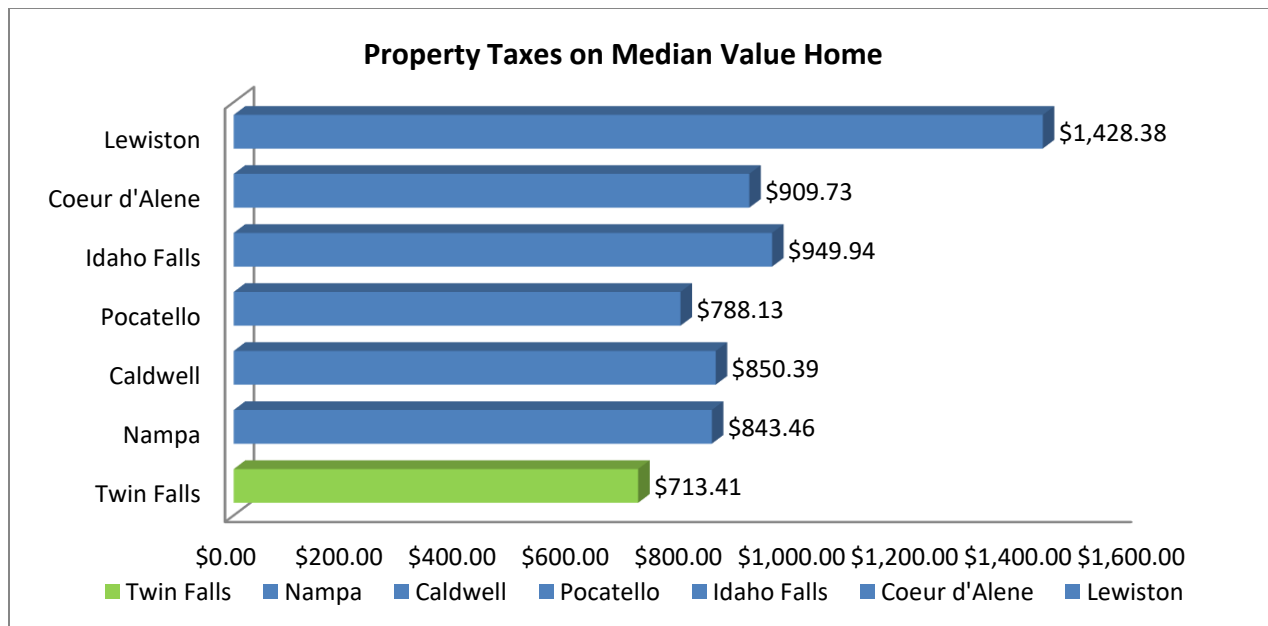


How does our Tax Rate compare to the other, large full-service Idaho cities?

We are often asked the question, “how does our tax rate compare?” The table and graph provided below are intended to provide an approximate answer to that question. Although only intended to be a rough illustration, the table and graph represent the amount of property tax paid on a median-valued, owner occupied home in each of the larger, full-service cities in Idaho. The information used in the table was collected from the Associated Taxpayers of Idaho’s 2018 Levy Book (tax rate) and Zillow.

	Total Taxes	2019 Median Property Value	FY 2020 TR
<i>Lewiston</i>	\$1,428.38	\$245,000	0.0098509
<i>Coeur d'Alene</i>	\$909.73	\$311,000	0.0043115
<i>Idaho Falls</i>	\$949.94	\$208,000	0.0087957
<i>Pocatello</i>	\$788.13	\$166,000	0.0094956
<i>Caldwell</i>	\$850.39	\$215,000	0.0073947
<i>Nampa</i>	\$843.46	\$227,000	0.0066414
<i>Twin Falls</i>	\$713.41	\$200,000	0.0071341

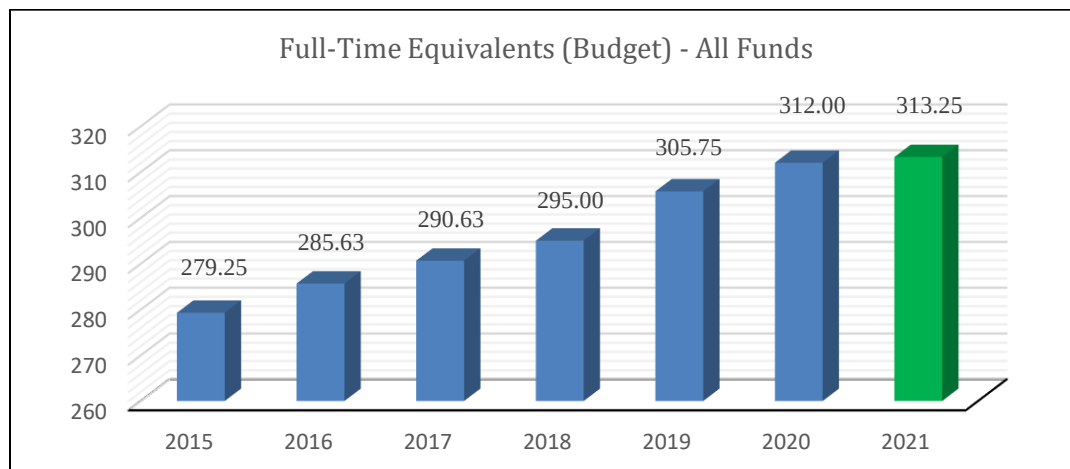
Note: Idaho’s median value of an owner-occupied home for this same period of time was \$267,000.



For the purposes of this analysis, the cities of Boise and Meridian were intentionally excluded because they are not directly responsible for the transportation systems in their communities; that responsibility lies primarily with the Ada County Highway District (ACHD). ACHD is an independent taxing authority specifically created for the purpose of maintaining the transportation system in these communities. For FY 2021, the Street Fund budget for the City of Twin Falls is \$5,108,540, or approximately 12% of the total for tax supported funds.

PERSONNEL

The City of Twin Falls has a philosophy of adding full-time employees only when “need” and “sustainability” can be demonstrated. The City of Twin Falls has an estimated population of 50,529. Based on that estimate, the City of Twin Falls has six employees per 1,000 of population. However, as the regional and urban center for a geographic area having a population of approximately 250,000, the City’s daily census population grows to an estimated population of 85,000. This causes the number of City employees per 1,000 of population to drop to less four.



The City of Twin Falls currently has a total of 312.00 full-time professionals working to deliver services to the citizens of Twin Falls For FY 2021, a net total of 1.25 FTEs were added to the budget, a majority of

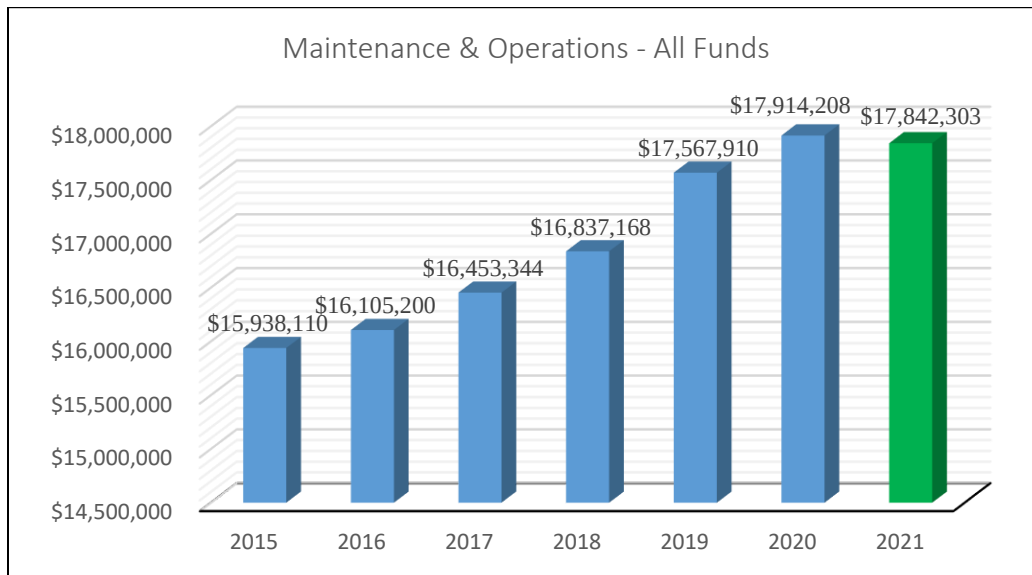
which are offset by existing revenue. The new positions bring the City of Twin Falls total FTE count to 313.25.

The other expenditures associated with personnel in the FY 2021 budget:

- Provides for performance-based adjustment for all employees (2%) and/or Table Movement (2%)
- Increased funding for health care insurance (10%)

MAINTENANCE AND OPERATIONS EXPENDITURES IN ALL FUNDS

This category includes funding for a wide-range of typical activities, including: office supplies, fuels, electricity, travel, training, uniforms, routine repairs to equipment and expenditures for durable goods. The City makes allocations in these areas that are based on actual expenditures from previous fiscal years, economic trends, and the municipal cost index. The FY 2021 budget allocates a total of \$17,842,303 to cover expenses associated with maintenance and operations. In comparison, the allocation for FY 2020 was \$17,914,208. This is a decrease of \$71,905 (.40%) across all funds.



CAPITAL FUND AND TOTAL CAPITAL INVESTMENT

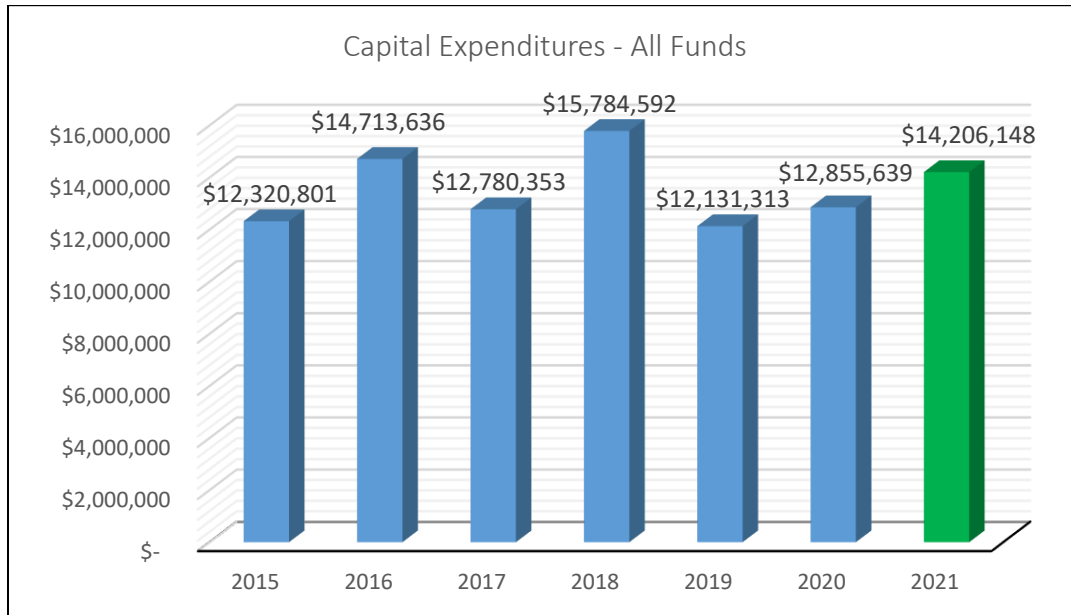
The City of Twin Falls owns and maintains a diverse collection of assets and facilities, which include:

- 103 buildings and structures throughout Twin Falls, ranging from the Magic Valley Regional Airport to administrative buildings; from police and fire stations to water delivery and treatment structures;
- 1,476 acres of open spaces and developed park lands, including world-class amenities such as Auger Falls, Shoshone Falls and Dierkes Lake;
- 640 lane miles to maintain.

A small sampling of the capital initiatives that have been funded in this budget include: making improvements to our water, wastewater and transportation systems; improving our trail systems; making miscellaneous park improvements; rotating our fleet, vehicles, machinery and equipment; improvements to the city's golf course; and repair and replacement of sidewalks.

As demonstrated by the partial list above, the ongoing development, expansion, maintenance, and repair of these capital assets is necessary, recognizing the critical value of civil infrastructure to the economic, aesthetic, and functional viability of the City. For accounting purposes and based on best practices recommendations of the Government Finance Officers Association (GFOA), the City of Twin Falls capitalizes acquisitions and improvements that are durable and in excess of \$5,000. In total, the FY 2021 budget allocates \$14,206,148 to fund needed, critical and desired capital improvements and community

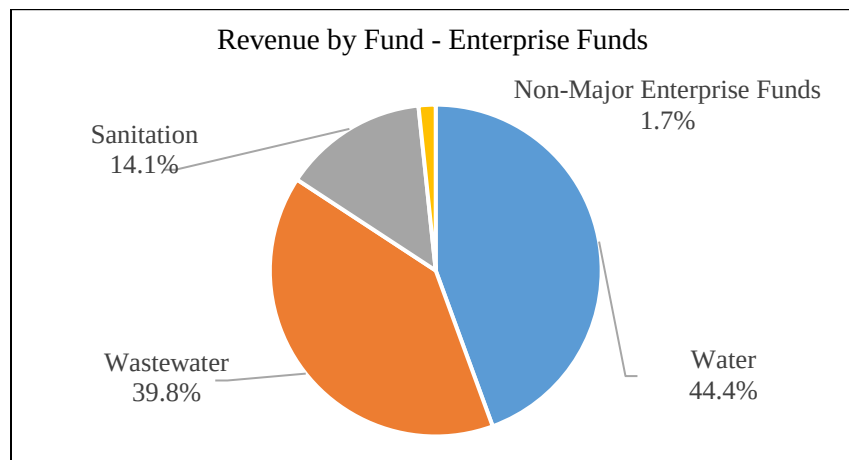
amenities. In FY 2020, the City of Twin Falls budgeted a total of \$12,855,639 for capital improvements. The FY 2021 allocation is an increase of \$1,350,509, or 10.51%.



As illustrated in the graph above, the City of Twin Falls has budgeted \$94,792,482 for capital improvements since 2015. In addition (not included in graph), since 2012, \$57,328,257 has been spent on the Wastewater Treatment Plant Improvement (\$45,570,000), City Hall (\$7,594,150), and Public Safety Complex (\$4,164,107) projects.

MAJOR ENTERPRISE FUND REVENUES

Enterprise and Other Major and Non-Major Non-Tax Supported Fund expenditures total \$31,243,872 (increase of \$3,882,727, or 14.19%), which includes \$2,444,000 for capital projects funded with cash reserves.



Water Fund

The Water Fund supports the following water-related activities: water supply, water distribution, pressurized irrigation, and utility billing. For FY2021, water user rates remain the same as they were in FY 2020. Revenue projections estimate \$11,101,938 in the Water Fund, which combined with reserves of \$1,800,000 equals \$12,901,938 in total funding. This is an increase of \$1,168,200 (10%) compared to the FY 2020 total of \$11,733,738.

Wastewater Fund

The Wastewater Fund is used to support all wastewater services provided by the City of Twin Falls, namely wastewater collection and wastewater treatment. For FY 2021, wastewater user rates remain the same as they were in FY 2020. Revenue projections estimate \$9,951,795 in the Wastewater fund, which compared to FY 2020 funding of \$9,904,742, is a decrease of \$47,053 (.48%).

Sanitation

The City's Sanitation Fund supports the City's sanitation and recycling programs. For FY 2021, sanitation user rates also remain the same as FY 2020. Revenue projections estimate \$3,522,406 in the Sanitation Fund, which compared to FY 2020 funding of \$3,428,969, is an increase of \$93,437 (2.7%).

DISCUSSION ON THE CITY'S FOREGONE BALANCE

Over the past several years, considerable time has been spent illustrating the cost-benefit analysis of using the City's foregone balance. Section 63-802 (e) of the Idaho Code states, "...In the case of a non-school district for which less than the maximum allowable increase in the dollar amount of property taxes is certified for annual budget purposes in any one (1) year, such a district may, in any following year, recover the foregone increase by certifying, in addition to any increase otherwise allowed, an amount not to exceed one hundred percent (100%) of the increase originally foregone." Each year the City has elected not to take the statutory maximum increase has impacted the amount of revenue available in the following fiscal year. Simply, the base by which the three percent is calculated is smaller.

The City's forgone balance is only permitted for as long as the laws on this topic remain unchanged. State legislators have discussed the need to change foregone balance laws in each of the last several legislative sessions. For now, recovering past foregone increases is still an option for cities in Idaho. The decision to incorporate all, or a portion, of the City's forgone balance remains with the City Council.

The table below illustrates the changes to the City's forgone balance since FY2010.

	Amount by Year	Cumulative Amount
FY 2010	\$539,902.00	\$539,902.00
FY 2011	\$476,376.00	\$1,016,278.00
FY 2012	\$463,422.00	\$1,479,700.00
FY 2013	-\$1,123.00	\$1,478,577.00
FY 2014	\$8,630.00	\$1,487,207.00
FY 2015	\$395,464.00	\$1,882,671.00
FY 2016	\$266,548.00	\$2,149,219.00
FY 2017	\$37,034.00	\$2,186,253.00
FY 2018	\$0.00	\$2,186,253.00

FY 2019	-\$770,000.00	\$1,416,284.00
FY 2020	\$0.00	\$1,416,284.00
FY 2020	\$0.00	\$1,416,284.00
FY 2021	\$697,681.00	\$2,113,965.00

The FY 2021 budget does not include the recovery of any additional forgone balance. However, the \$770,000 that was recovered in FY 2019 has been set aside in the FY 2021 budget to fund additional Council priority capital projects. During the creation of the FY 2021 budget, the Council will discuss various capital projects and provide direction regarding their priorities for the \$770,000.

HOW MUCH MORE WILL CITY SERVICES COST?

Over the last ten fiscal years, the City's tax rate fluctuated significantly, ranging from a high of \$7.86 per \$1,000 (FY 2014 and 2016) of taxable value to a low of \$6.59/\$1,000 (FY 2010) of taxable value. The average of the tax rate assessed over the course of the last seven fiscal years (2013-2019) is \$7.72/\$1,000 in taxable value. It is important to recognize the tax rate does not necessarily indicate an individual's tax burdens. The tax rate is simply a multiplier used to determine a property owner's proportionate share of property tax liability. It is a fraction of a local government's total property tax collections divided by the total taxable value of that local government unit.

In May 2020, the City Council and the City Manager made the decision not to assess the statutorily allowed three percent (3%) property tax increase as provided for in Idaho Code §63-802. More than a month later, the Governor created a tax relief program that diverts \$200 million on Federal CARES funding directly to Idaho property taxpayers if cities and counties elect to not take the three percent (3%) property tax increase. For those that elect to participate, the CARES funding will be proportionately divided among those Idaho cities and counties using a formula based on the actual cost of public safety personnel salaries (police, fire, animal control, dispatch, etc.).

	FY 2020 Adopted Budget	FY 2021 Recommended Budget	Variance	Additional Variance for Potential CRF Tax Relief	Total with Potential CRF Tax Relief
Property Tax	Tax Rate: \$7.13/\$1,000 of taxable value	Tax Rate: \$6.90/\$1,000 of taxable value	Tax Rate: -\$.23/\$1,000 of taxable value	Tax Rate: -\$1.03/\$1,000 of taxable value	Tax Rate: \$5.87/\$1,000 of taxable value
Median Valued Home of an owner- occupied home:					
FY 2020 - \$200,000 (as of January 2019)	\$713.00 <i>(annual)</i>	\$745.55 <i>(annual)</i>	\$32.55 <i>(annual)</i>	-\$111.29 <i>(annual)</i>	\$634.25 <i>(annual)</i>
FY 2021 - \$208,050 (as of January 2020)	\$59.42 <i>(monthly)</i>	\$62.13 <i>(monthly)</i>	\$2.71 <i>(monthly)</i>	-\$9.27 <i>(monthly)</i>	\$52.85 <i>(monthly)</i>
Utility Bills					
Average Residential Customer Consumption of:					
Water - 18,000 gallons	\$49.89	\$49.89	\$0.00	\$0.00	\$49.89
Sewer - 12,000 gallons	\$27.27	\$27.27	\$0.00	\$0.00	\$27.27
Sanitation & Recycling	\$17.79	\$17.79	\$0.00	\$0.00	\$17.79
Total Utility Bills	\$94.95	\$94.95	\$0.00	\$0.00	\$94.95
Monthly Total of Property Tax and Utility Bills	\$154.37	\$157.08	\$2.71	-\$9.27	\$147.80

The exact amount of tax credit received will not be known until October 2020 when all cities and county budgets are certified, and all public safety salaries are calculated. Based on the initial guidance supplied by the Governor's Office, we are estimating that our citizens will receive \$3,529,398 in total property tax relief from the CARES funds equal to the three percent property tax, or \$697,681. This will cause the City's functional tax rate to decrease to approximately \$5.87/\$1,000. This will save an estimated \$111.29 in city property tax savings for our taxpayers who own and live in a home valued at \$208,050, which is the median home value per Zillow.

Approval

There is no approval process at this point in the process. The City Council will be holding a series of public hearings prior to adopting the Appropriations Ordinance for the 2020-2021 Fiscal Year. The public hearings are scheduled for August 10, 2020 (rate and fees) and August 24th (preservation for forgone balance and appropriations ordinance). Final adoption of Appropriations Ordinance is also scheduled for the evening of August 24, 2020.

Budget Impact:

There are no current budgetary or financial impacts from the conversation. From this process, we will establish the budget for FY 2021.

Regulatory Impact:

- Idaho Code Section 50-811 states the City Manager shall "...keep the council fully advised of the financial condition of the city and its future needs..." and "...prepare and submit to the council a tentative budget for the next fiscal year."
- Idaho Code §50-235 empowers each city council of each city to levy taxes for general revenue purposes
- Idaho Code §50-1002 requires the city council of each city in the State of Idaho to pass a budget, referred to as an annual appropriation ordinance
- Idaho Code §63-802 sets limitations on all taxing district budget requests on the amount of property tax revenues that can be used to fund programs and services. This section also states that taxing entities can only increase property tax collections by a maximum of three percent (3%) annually, plus value of new construction and annexation added during the previous calendar year, and forgone taxes that have been accumulated and reserved in prior fiscal years

Attachments

Recommended Budget for FY 2021 can be found online.

Citizen Input can be made after the presentation in person or by calling: 1-208-939-6718, Conference ID: 683 122 778#. In addition, by email to Citizeninput@tfid.org.



CHIEF CRAIG KINGSBURY



One Team, One Mission, One City.

Chief Craig Kingsbury



Office of Professional Standards - O.P.S.

Of the **54,427** calls for service in 2019, the OPS received 18 complaints. After thorough investigations, 13 complaints were sustained, 5 complaints were exonerated.

Use of Force: 112	Total Number of TFPD Arrests: 2191	Vehicle Pursuits: 8
Electronic Control Weapons: 21	K-9 Deployments: 2	PR24 Baton Deployment: 1
Personal Strike: 2	Take Down Technique: 39	Personal Control Hold: 14
Leg Restraint Application: 3	Spit Hood Application: 4	Weapons Point: 26

YEAR 2019

COMMUNITY CONNECTION

During this past year, the Twin Falls Police Department has expanded our Liaison Officer and Community Connection Officer Program.

The Community Connection Officers were established to maintain a positive rapport between cultural diverse communities, marginalized groups and to promote trust and understanding.

One of the main roles of our Community Connection Officer is to interact and collaborate with the community they police.

Community Connection Officers work with local organizations, leaders and citizens to create and maintain comfortable and safe living conditions.

The Twin Falls Police Department launched Community Connection patrol vehicles to show support for special causes around our community. The Community Connection patrol vehicles include support for such causes as Breast Cancer awareness, Domestic Violence awareness, Salute to Service and the College of Southern Idaho.

Twin Falls Police Department
321 2nd Avenue East
Twin Falls, ID 83301

Non-Emergency: 311 Emergency: 911



Twin Falls Police Department

2019 Annual Report to Our Citizens



Twin Falls, Idaho



The Twin Falls Police Department has established a set of values that are foundational to the operation of the organization. These values represent the shared, fundamental principles from which every policy and procedure is derived and they permeate every facet of the Department's operation.

The ability therefore to articulate these values, as well as each member's personal commitment to them, contributes to the overall success of the organization and of the individual employee. Because we are proud of our chosen profession, Department, City and work, the values to which we subscribe can be articulated as **PRIDE:**

Professionalism Respect Integrity Dignity Excellence

PROFESSIONALISM

- Honesty: We hold ourselves accountable for our words and our actions
- Attitude: We are knowledgeable, confident, positive, and optimistic
- Appearance: We maintain a professional demeanor
- Conduct: We value a strong work ethic to fulfill all of our responsibilities

RESPECT

- Teamwork: We strive for unity and understanding
- Authority: We recognize and value the public's trust to uphold constitutional rights and never abuse our authority
- Golden Rule: We will remain unbiased in our approach to providing public safety services
- Interaction: We will maintain a courteous comportment with everyone we encounter

INTEGRITY

- Integrity: We take pride in our actions
- Courage: We always strive to do the right thing
- Considerate: We are genuine with everyone we interact with
- Standards: We hold ourselves to the highest standards
- Honor: We always uphold our Oath of Office and the Law Enforcement Code of Ethics
- Trust: We will be trustworthy and lead by example

DIGNITY

- Commitment: We will foster a supportive culture
- Perseverance: We will remain reliable, loyal, and optimistic
- Judgment: We acknowledge the individual worth of everyone
- Dedication: We are committed and dedicated to the mission and principles of the Twin Falls Police Department and the Law Enforcement profession

EXCELLENCE

- Connection: We strive to make positive connections with others through active listening and positive engagement
- Collaborate: We strive for positive engagement to promote, encourage, and cultivate meaningful relationships
- Stewardship: We are good and faithful stewards in all aspects of the public's trust
- Development: We always strive for personal improvement through education and training



JOIN OUR TEAM
ourteam@tfid.org



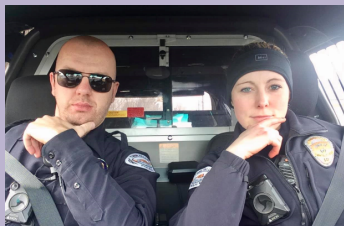
TWIN FALLS
People Serving People

Mission

To provide excellent customer service, professional law enforcement and effective crime prevention for a safe community.



November 21, 2019 - Executive Assistant Alice DeLeon retires after seventeen years of dedicated service.



Agency 2019 Crime Report

TWIN FALLS Police Department

Offense Overview

• Offense Total	3,595
• % change from 2018	-4.24%
• # of cleared offenses	1,748
• Percent Cleared	48.62%
• Group "A" Crime Rate per 100,000 population	7,124.03
• Summary based reporting crime rate per 100,000 populated is calculated for other state crime comparisons only.	2,510.75

Arrest Overview

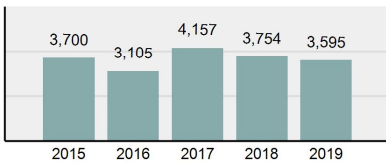
• Arrest Total	2,252
• % change from 2018	2.6%
• Adult Arrest total	1,999
• Juvenile Arrest total	253
• Arrest Rate per 100,000 population	4,462.68

Population: 50,463
County: Twin Falls

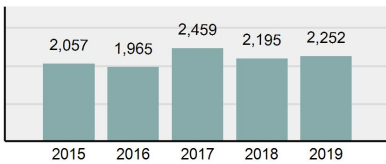
Group "A" Offenses	Offenses		Arrests	
	# Reported	# Cleared	Adult	Juvenile
Murder	1	1	1	2
Negligent Manslaughter	0	0	0	0
Rape	23	9	0	0
Sodomy	1	0	0	0
Sexual Assault w/Obj	3	0	0	0
Fondling	48	13	5	1
Aggravated Assault	166	115	66	7
Simple Assault	720	466	131	26
Intimidation	83	37	11	2
Kidnapping	10	5	1	0
Incest	0	0	0	0
Statutory Rape	9	5	4	0
Human Trafficking, Commercial Sex Acts	0	0	0	0
Human Trafficking, Involuntary Servitude	0	0	0	0
Robbery	12	7	10	0
Burglary/Breaking and Entering	156	29	22	1
Larceny/Theft Offenses	843	292	253	38
Motor Vehicle Theft	58	7	1	1
Arson	8	2	0	2
Destruction Of Property	380	76	21	8
Counterfeiting/Forgery	22	4	2	0
Fraud Offenses	264	39	8	1
Embezzlement	2	1	0	0
Extortion/Blackmail	0	0	0	0
Bribery	0	0	0	0
Stolen Property Offenses	13	9	3	0
Drug/Narcotic Violations	559	473	469	51
Drug Equipment Violations	149	122	14	1
Gambling Offenses	0	0	0	0
Pornography/Obscene Material	3	1	0	0
Prostitution Offenses	2	1	0	0
Weapons Law Violations	60	34	13	12
Animal Cruelty	0	0	0	0
Total Group "A"	3,595	1,748	1,035	153

Group "B" Arrests	Arrests	
	Adult	Juvenile
Bad Checks	10	0
Curfew/Loitering/Vagrancy Violations	2	0
Disorderly Conduct	22	0
DUI	203	1
Drunkenness	6	0
Family Offenses, Nonviolent	31	4
Liquor Law Violations	15	5
Peeping Tom	0	0
Trespass of Real Property	14	0
All Other Offenses	661	90
Total Group "B"	964	100

Total Offenses - 5 year trend



Total Arrests - 5 year trend



Agency/County Information

233

2019 Crime In Idaho

In 2019, the Twin Falls Police Department was staffed by 77 sworn law enforcement officers and 20 support services personnel for a total of 97 employees. During 2019, the Twin Falls City Communication Center managed approximately 54,427 calls for service. Of those events, the Twin Falls Police Department filed 7,495 police reports, affected 2,191 arrests, conducted 9,368 traffic stops, and issued 5,226 citations.



CRAIG T. BRACKEN
PUBLIC SAFETY OPERATIONS BUILDING

This building is dedicated in the name of Twin Falls Police Officer Craig T. Bracken who was killed in the line of duty on May 8, 1939. Officer Bracken was shot trying to apprehend two robbery suspects during a traffic stop near Washington Street and 4th Avenue West.

The "Craig T. Bracken Public Safety Operations Building" will stand as a memorial to the ultimate sacrifice made by Officer Bracken and his family to this community. This structure is further dedicated to the public safety professionals who have served and continue to serve this great city.

Dedicated May 8, 2019

In honor and memory of Officer Craig T. Bracken who gave the ultimate sacrifice as a Twin Falls Police Officer on May 8, 1939, Chief Kingsbury dedicated the police operations building to now be named the Craig T. Bracken Public Safety Operations Building.

SPECIAL INVESTIGATIONS UNIT – S.I.U.

Crimes and criminals do not stay within jurisdictional boundaries. The Twin Falls Police Department and Twin Falls County Sheriff's Office joined forces and created the Special Investigations Unit (SIU) which investigates violent repeat offenders.



May 2, 2019 - Twin Falls Police Supervisor's Coalition presented CSO Tracy Bramwell the Employee of the Year and Detective Josh Hayes the Police Officer of the Year awards.



Nov 12, 2019 - Staff Sergeants Chuck Garner and Brent Wright were formally promoted to the position of Lieutenant following a competitive testing process.



October 9, 2019 - Director Steven Snow of the Idaho Council for the Deaf and Hard of Hearing provided comprehensive training to our police officers on deaf & hard-of-hearing cultural awareness and understanding how to communicate.



Top Calls for Service 2019

Call Description	
911 Drop Off	3157
Welfare Check	2044
Accident	2007
Disturbance	1380
Reckless Driver	1282
Alarm Response	1282
Civil Matter	1250
Suspicious Vehicle	991
Theft Report	869
Suspicious Subject	851
Agency Assists	846
Noise Disturbance	715
Traffic Complaint	624
Fraud	558
Drug Call	457
Burglary	301
Drunk Driver	287
Domestic	250
Shoplifting	177
Drunk Person	168
Abandoned Vehicle	95





Date: Monday, July 27, 2020
To: Honorable Mayor and City Council
From: Les Kenworthy, Fire Chief, Tim Lauda, Fire Marshal

PRESENTATION

Request:

PRESENTATION: A presentation of the Twin Falls Fire Department's 2019 Annual Report.

Time Estimate:

This presentation will take approximately 20 minutes.

Background:

Fire Chief Les Kenworthy will present the Fire Department's 2019 annual report to the City Council.

Approval Process:

This is an informational presentation.

Budget Impact:

N/A

Regulatory Impact:

N/A

History:

N/A

Analysis:

N/A

Conclusion:

This discussion should bring the City Council up to date on the Twin Falls Fire Department's activities in 2019.

Attachments:

None



Date: Monday, July 27, 2020
To: Honorable Mayor and City Council
From: Tim Lauda, Fire Marshal

PRESENTATION

Request:

PRESENTATION: Fire Protection Systems Inspection Third Party Reporting Discussion.

Time Estimate:

Approximately 15 minutes.

Background:

The fire code requires businesses with life safety systems to have their systems inspected, quarterly, semiannually, or on an annual basis, depending on the system. These inspections have to be performed by certified inspectors. Currently, the inspector sends a copy of their report to Tim Lauda, the City Fire Marshal and fire code official.

Reports are delivered in a variety of ways including copies of report forms in the mail, manually dropped off at the fire station, and copies sent via email. All forms of delivery are often received months after the inspection is completed causing the hazards to remain unrepaired, or inspected, for several weeks and sometimes months. Obviously, this is a time-consuming process and often stifles our ability to mitigate deficiencies and ensure compliance.

Proper enforcement requires systematic tracking of businesses that are out of compliance.

Unfortunately, fire departments across the country are not equipped with the tools for such tracking.

Many departments have partnered with reporting companies to realize the savings listed above. Idaho is no exception. Seven fire departments across the state (Boise, Caldwell, Idaho Falls, Meridian, Nampa, Pocatello, and Teton County) have chosen to use a third-party reporting company.

Inspection companies send an electronic copy of their report to the third-party reporting company as soon as the inspection is complete. This mitigates the problems stated above.

Deficiency letters that are generated and sent by the third-party reporting company to the business owner and the Fire Marshal's office all based on the outcome of inspection.

This reporting would also allow for more focus on follow up inspections and would increase life safety and property conservation educational opportunities.

Here are some of the benefits of utilizing a third-party reporting company: Increase in compliance rates. (Most cities have seen a 110%-125% increase.) Increased efficiency for Fire Department Prevention staff. Businesses and their life safety systems are tracked by the reporting company. Notices, and schedules for inspections are generated and sent by the reporting company. Standardized forms, letters, and response times. 32% reduction in false alarms. Much needed data collection and documentation. Most importantly, the added safety to our firefighters and citizens described above.

Approval Process:

City staff will be presenting fee schedules for numerous city departments on Monday, August 10, 2020

during a public hearing.

Budget Impact:

There are no direct costs to the city or business owners to utilize a third-party reporting company. The reporting company charges a fee to the certified inspector. The going rate for this type of fee is \$15.00 per report, unless the local jurisdiction opts for the cost sharing option. The cost sharing option creates a \$30.00 per report fee, \$15.00 goes to the reporting company and \$15.00 goes to the local fire department.

Most fire departments, including five of the seven in Idaho, opt for the cost sharing option because these departments have seen an uptick in inspections as a result of the better tracking and compliance. In this option the inspector is charged \$30.00 per report and the reporting company disperses the fee accordingly. This ensures that the additional costs associated with more inspections is not borne by citizen taxes, but rather fees on those using the services.

Regulatory Impact:

None

History:

N/A

Analysis:

Two third party reporting companies are working in Idaho and have positive outcomes in other cities and states. This is a trend in municipalities throughout the region and beyond. This program will increase staff efficiency and stabilize costs associated with fire prevention and code enforcement. Fire staff envisions this process to have a significant positive impact on those items noted above with minimal costs associated with the increased benefits.

Conclusion:

Fees collected would help to fund additional needed prevention staff in the future and help to mitigate the increasing overtime costs associated with the workload of the Fire Marshal's office from the impacts of growth.

Attachments:

1. Fire Service Guide to Reducing Unwanted Fire Alarms
2. US Experience with Sprinklers

Fire Service Guide to Reducing Unwanted Fire Alarms





Fire Service Guide to Reducing Unwanted Fire Alarms



Copyright © 2012 National Fire Protection Association®

All or portions of this work may be reproduced, displayed or distributed for personal or non-commercial purposes. Commercial reproduction, display or distribution may only be with permission of the National Fire Protection Association.

About NFPA®: NFPA has been a worldwide leader in providing fire, electrical, building, and life safety to the public since 1896. The mission of this international nonprofit organization is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education.

The Fire Service Guide to Reducing Unwanted Fire Alarms was developed in response to the emphasis that has been placed on the need to properly address the unwanted fire alarm issue and reduce response by fire departments. This Guide addresses the minimum information necessary to remedy the existing stress of unwanted fire alarms. This Guide is available to everyone in a free, downloadable format from the NFPA website, www.nfpa.org/redgd.

Contact Steven Sawyer, Senior Fire Service Specialist, with comments and suggestions at ssawyer@nfpa.org or 617-984-7423.



FOREWORD

Kenneth Willette

Division Manager
NFPA Public Fire Protection Division

With the emergence of more fire alarm systems in residential and commercial occupancies, fire departments today find that they are receiving more notifications of activated fire/smoke detection devices via fire alarm systems. This increase in notification includes a dramatic increase in the number of responses to activated alarms where no emergency services are needed, and while the number of responses due to malicious or mischievous false alarms has fallen over the past 20 years, the responses to unintentional activations continue at a rate that challenges the fire service. A recent NFPA study found that in 2009, U.S. fire departments responded to an estimated 2.1 million false alarms, which included 979,500 responses due to unintentional activations (45%) and 698,000 due to system malfunctions (32%).

The International Association of Fire Chiefs (IAFC) has flagged the response to unwanted alarms as a major challenge for the fire services of North America. At a time of decreasing financial resources, reduced staffing, and increased call volume due to the provision of emergency medical services and all-hazards responses, fire chiefs across the continent are looking for ways to meet their core mission of protecting life and property. In February 2011, the IAFC and National Fire Protection Association (NFPA), along with the U.S. Fire Administration, hosted a summit on how to address this challenge.

This guide is a product of that summit. It is intended to inform line fire officers and fire fighters how they can assist in reducing unwanted responses by gathering basic information during a response to an activated fire alarm system. The guide provides a quick review of the varied technologies and appliances that comprise today's fire alarm fire protection systems and identifies the most frequent reasons for unwanted activations. Lastly, it illustrates how line personnel can work with their authority having jurisdiction (AHJ) to identify problematic sites and develop a plan to reduce the unwanted activations.

In 1898, NFPA addressed the role of fire alarm systems within structures, with the establishment of the Committee on Thermo Electric Fire Alarms. Since that time, fire alarm systems have become integral parts of the life safety systems in many structures across North America—their installation often required by property insurers, fire departments, and code enforcing officials. The work started in 1898 has evolved into *NFPA 72®*, *National Fire Alarm and Signaling Code*, the recognized standard for the design, installation, testing, and maintenance of fire alarm systems. Today, as then, NFPA, in partnership with the IAFC, is working to address the challenges faced by responders across the world.



INTRODUCTION

Of the total fire alarms to which fire departments respond each year, approximately 7 percent are unwanted.¹ An *unwanted alarm* is defined by *NFPA 72®*, *National Fire Alarm and Signaling Code*, as *any alarm that occurs that is not the result of a potentially hazardous condition*. This guide is intended to assist the fire department to determine the cause of unwanted fire alarms and to find solutions to reduce responses to facilities where no fire department response was required.

The intent of this guide is to describe common causes of unwanted fire alarms, assist fire suppression personnel to determine alarm causes, and provide a framework for local officials to develop possible solutions to reduce unwanted alarms. This guide addresses commercial and residential (hotel, dormitory, apartment, and similar occupancies) building fire alarm systems. It also addresses single-family dwellings and single- or multiple-station smoke alarms within dwelling units.

In this guide the term *authority having jurisdiction (AHJ)* means an organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure. This is usually the fire chief, fire marshal, or other personnel assigned the responsibility of enforcement of the jurisdiction's codes, standards, and ordinances.

FIRE ALARM TECHNOLOGY

Types of Signals

Fire Alarm Signal

A fire alarm signal is initiated by a fire alarm-initiating device such as a manual fire alarm box, automatic fire detector, water flow switch, or other device in which activation is indicative of the presence of a fire or fire signature. Receipt of a fire alarm signal at the monitoring facility should require a response from the fire department.

Supervisory Signal

A supervisory signal indicates the need for action in connection with the supervision of guard tours, the fire suppression systems or equipment, or the maintenance features of related systems. Receipt of a supervisory signal at the monitoring facility should be directed to the appropriate individual at the building to ensure that the correct action is taken and the issue is corrected. A response by the fire department is usually not needed.

Trouble Signal

A trouble signal is initiated by a system or device indicative of a fault in a monitored circuit, system, or component. Receipt of a trouble signal at the monitoring facility should be directed to the appropriate individual to ensure that the correct action is taken and the issue is corrected. A response by the fire department is usually not warranted.

¹Michael J. Karter, Jr., "False Alarm Activity in the U.S. 2010," NFPA, Quincy, MA, issued September 2011.



Smoke Detectors/Alarms

Smoke detectors are common components associated with many unwanted alarms. The activation of the smoke detector may not be the result of a faulty detector, as it only responds to the surrounding conditions. If burnt toast, steam, or dust is in the area of the smoke detector, it may activate because it cannot differentiate smoke from other particulates. Smoke detectors operate on two basic principles: *ionization* (see Figure 1) and *photoelectric* (see Figure 2). Ionization detectors have a very small amount of radioactive material (an alpha emitter) that ionizes the air in the sensing chamber, rendering the air in the sensing chamber conductive and permitting a minute current flow through the air between two charged electrodes. This gives the sensing chamber an effective electrical conductance. When smoke or other airborne particles enter the ionization area, they decrease the conductance of the air by attaching themselves to the ions, causing a reduction in ion mobility. The current flow is monitored, and when conductance is below a predetermined level, the detector is in alarm. Photoelectric detectors operate when smoke particles enter a light path, producing a light-scattering effect. A light source and a photosensitive device are arranged so that the light rays normally do not fall onto the device. When smoke or other particles enter the light path, light strikes the particles and is scattered onto the photosensitive device, causing the detector to respond.

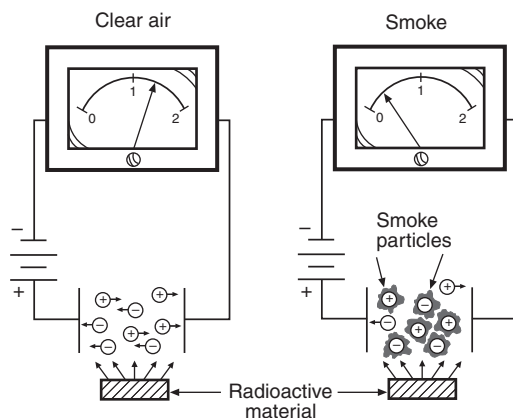


Figure 1
Ionization Detector.

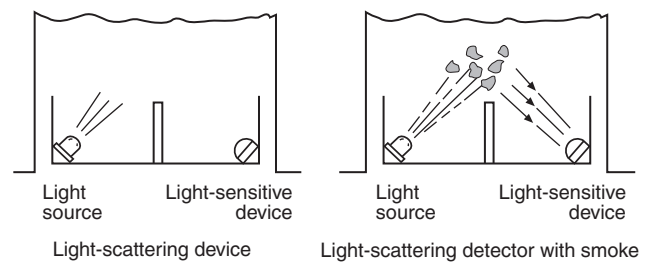
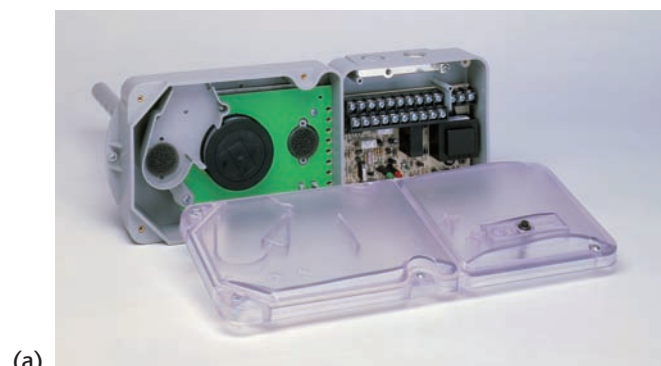
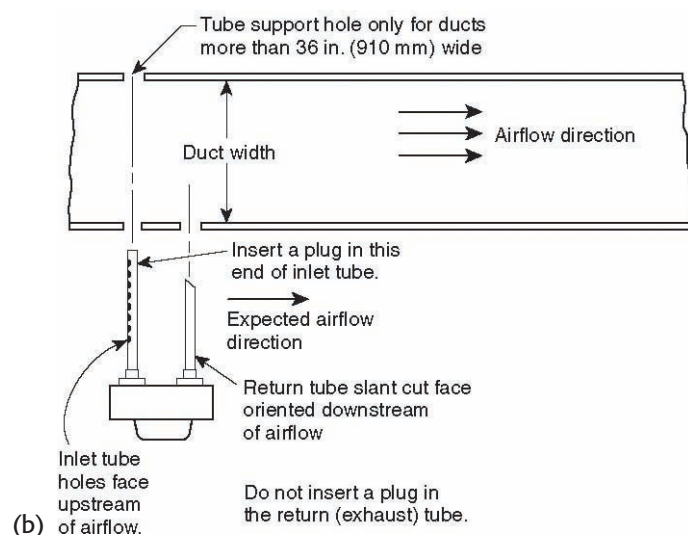


Figure 2
Photoelectric Detector.

Like photoelectric smoke detectors, beam smoke detectors operate on the light obscuration principle. A beam of light is passed a distance of 33 to 330 feet through a space, such as a large room. Duct detectors operate on smoke detector technology and have a smoke detector installed within the HVAC duct work (see Figure 3). These detectors may be difficult to locate as they are installed behind ceilings or within mechanical rooms.



(a)



(b)

Figure 3

Duct Detector. (a) Example of a Duct Detector (Courtesy of System Sensor Corp., St. Charles, IL); (b) Inlet Tube Orientation.

Heat Detectors

Heat detectors can also be associated with unwanted alarms. Unwanted activations can occur when heat detectors are placed in the wrong locations or too near a heating source. Heat detectors work on two basic principles: *fixed temperature* and *rate of rise*. Some heat detectors have both technologies within one device. Fixed-temperature heat detectors are designed to alarm when the temperature of the operating element reaches a specified point. Rate-of-rise detectors, however, will function when the rate of temperature increase exceeds a predetermined value, typically around 12°F to 15°F (7°C to 8°C) per minute. Rate-of-rise detectors are designed to compensate for the normal changes in ambient temperature (less than 12°F [6.7°C] per minute) that are

expected under nonfire conditions. Figure 4 shows a heat detector with both fixed-temperature and rate-of-rise operating elements.

Rate compensating detectors respond to a predetermined temperature regardless of the rate of temperature rise.

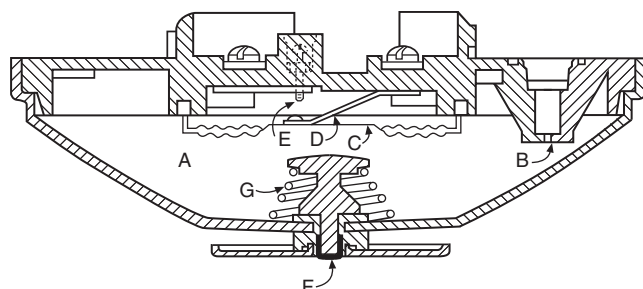


Figure 4

Example of a Spot-Type Combination Rate-of-Rise, Fixed-Temperature Detector. The air in chamber A expands more rapidly than it can escape from vent B. This causes pressure to close electrical contact D between diaphragm C and contact screw E. Fixed-temperature operation occurs when fusible alloy F melts, releasing spring G, which depresses the diaphragm closing contact points.

Manual Fire Alarm Boxes

Manual fire alarm boxes (also called manual pull stations) can also be associated with unwanted alarms when installed in areas where they can be struck accidentally, such as a gymnasium or warehouse, or in areas subject to malicious activation, such as schools. There are two basic types of manual pull stations: single-action and double-action (see Figure 5). A single-action manual fire alarm box requires only one action to operate, making it more prone to activation when struck or leaned on. Double-action manual fire alarm boxes require two actions to operate, generally one to gain access to the activation device and one to activate it.

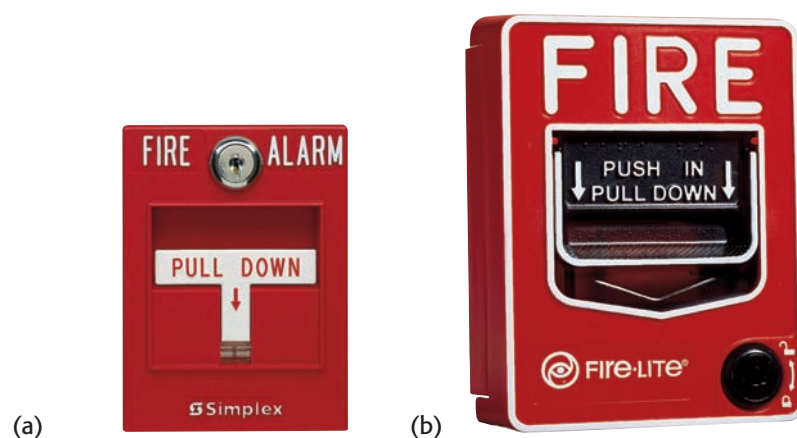


Figure 5

Examples of Single- and Double-Action Pull Stations. (a) Single-Action Pull Station. (Courtesy of SimplexGrinnell, Westminster, MA); (b) Double-Action Pull Station. (Courtesy of Fire-Lite Alarms)

Water Flow Devices

Water flow devices (water pressure switches and water flow switches) are installed on automatic fire sprinkler systems as a means of providing an alarm when the system activates. Water flow devices can be the type that operates on pressure, pressure differential, or mechanical sensor. Water pressure switches operate when the switch actuator senses pressure or differential pressure due to water flow within the sprinkler system. Water flow switches operate when the flow of water moves a mechanical operator, such as a paddle. In both cases, the point of sensor activation is intended to occur on the detection of the discharge of a certain number of gallons per minute that is equivalent to the amount of water discharged from a single operating sprinkler. However, water pressure/flow switches have a retard feature that can be programmed to hold the alarm for a set period of time before sending an alarm. The retard feature is intended to prevent slight pressure changes and water surges that occur within the systems from causing an alarm due to activation of the flow switch. The retard time is determined for each system during design. Water flow switches are usually located at the system riser and flow switches are located on the systems (see Figure 6).

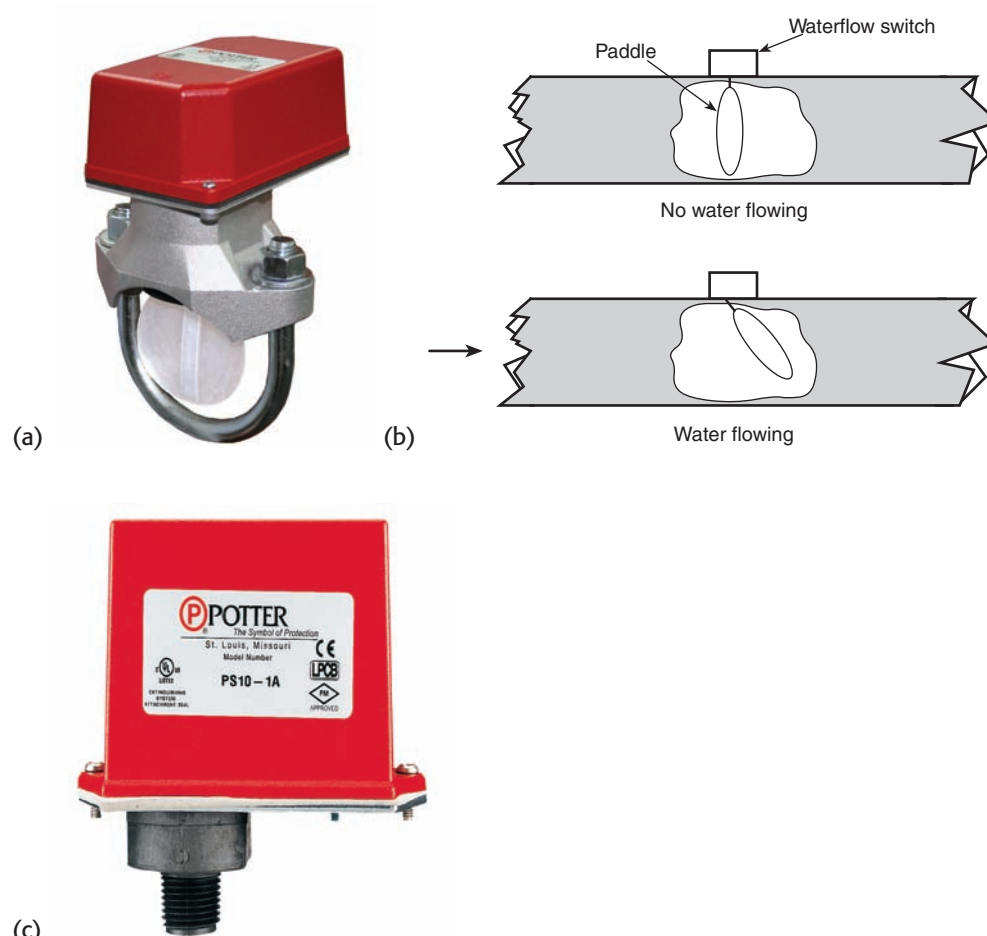


Figure 6

Water Flow and Water Pressure Switches. (a) Example of Water Flow Switch. (Courtesy of Potter Electric Signal Company, LLC, St. Louis, MO); (b) Water Flow Switch Operation. (Source: FIREPRO Incorporated, Andover, MA); (c) Example of Water Pressure Switch. (Courtesy of Potter Electric Signal Company, LLC, St. Louis, MO)

Other Devices

Detectors can also have two or more sensing devices called multi-sensor or multi-criteria detectors, such as a combination smoke/heat detector, combination smoke/carbon monoxide detector, or combination photoelectric and ionization detector.

There are many other types of detection devices not discussed in this guide. They are usually used for special application and are not usually the cause of unwanted alarms. These devices include line detection, video image detection, and aspiration.

Inspection, Testing, and Maintenance

The first line of defense to ensure that systems operate properly is a well designed, installed, tested, and accepted system. Once the system has been installed it must have a proper inspection, testing, and maintenance (ITM) program. Another key reason for unwanted alarms is the lack of an established ITM program. ITM programs are the next line of defense in the reduction of unwanted alarms. By having qualified individuals inspect, test, and maintain fire alarm system components, many issues that can cause an unwanted alarm can be discovered and corrected.

FIRE DEPARTMENT PERSONNEL RESPONSIBILITIES

It is important for fire suppression personnel to assist in the reduction of unwanted alarms by observing and reporting unwanted alarms to the AHJ to take appropriate corrective action. Responding fire suppression personnel need to locate the particular device in alarm and investigate what caused the alarm to activate, document this information on the incident report, and, if necessary, report to the AHJ. You should follow your department's SOPs on how to respond to fire alarm activation.

The means of finding the device in alarm depends on the type of system installed in the building. If the fire alarm control unit (panel) is a zoned panel, the system will only advise you of the area where the device is located, for example, first floor north. If the fire alarm control unit is an addressable type (a point ID type), the panel will advise you of the type of device and location, for example, smoke detector first floor room 110.

Smoke detectors will usually be located on the ceiling and sometimes above the ceiling or under floors. They can be found in almost any area of the building with the exception of some mechanical spaces, cooking areas, and areas subject to dust. The device in alarm will usually have a steady red light.

Duct detectors will be located within ducts or on ducts (with the airflow sensor inside the duct) in mechanical spaces, above ceilings, and other areas typically used for mechanical equipment or spaces. The device in alarm will usually have a steady red light. If a zone type of fire alarm control unit is used, a labeled remote indicator light will be provided on the ceiling or wall nearby to help locate the activated smoke detector (see Figure 7).



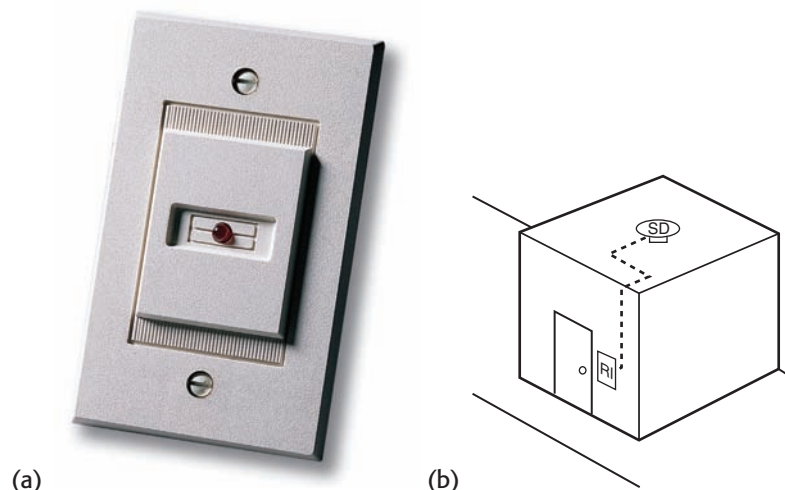


Figure 7

Remote Indicator Light. (a) Example of a Remote Indicator Light. (Courtesy of System Sensor Corp., St. Charles, IL); (b) Concealed Smoke Detector (SD) in Locked Room with Remote Indicator (RI). (Source: FIREPRO Incorporated, Andover, MA)

Heat detectors will usually be located on ceilings, sometimes above the ceiling or under floors, in mechanical spaces, and other spaces subject to dust, debris, and heat. The device in alarm may have a steady red light, the heat-sensing element may be missing, or no indications may be shown at the device.

Manual fire alarm boxes (pull stations) are usually located near exits and along corridors. An activated manual fire alarm box handle will be out of normal position (down), or the handle will be sticking out from the box.

Devices that have cleared or been reset if the panel has been reset will not show an alarm condition. Some panels permit the viewing of signals, or the alarm monitoring company may have the information.

If a water flow/pressure switch has been activated, there will be no indications on the switch. On a fire sprinkler riser, you would need to view the system pressure gauge to determine whether water is flowing. If the switch is located on a fire sprinkler pipe, you would need to listen for water flow or see water flowing from a sprinkler. If a water surge has caused the alarm, you may notice water at the water motor gong or from the drain of the retard chamber.

Determining Cause of Activation

Once you have determined which device has activated, you must then determine why. The reason the alarm activated is crucial to determining whether the activation is unwanted and getting corrective action started. Talking with those that were in the area and observing the activities in the area of the activated device should assist you in determining the cause. See the “Common Causes” section to assist with finding the cause and solutions. The AHJ should be notified if activation is unwanted to initiate corrective action in order to eliminate future alarms.

Common Causes

The solutions in this section require approval from the AHJ and should be in compliance with local building, fire, and mechanical codes. Qualified personnel should perform work required to make changes to fire alarm systems per local requirements. It is best to consult with the AHJ and design professionals on the optimal method to reduce unwanted alarms in a manner that complies with the codes and design intent of the system.

Cooking

Cooking is one of the leading causes of unwanted fire alarms. The activation of the smoke detector has many causes: burnt food, unattended cooking, detectors too close or in the same room as cooking operations, cooking taking place in areas where it is not permitted, fans not in operation during cooking, and steam from cooking.

Solution

- Ensure that cooking equipment is installed properly and that the ancillary cooking equipment is located in proper places. For example, office areas protected with smoke detectors are probably not proper locations for coffee pots and microwaves.
- Smoke detectors should not be placed too close to or in the same room as cooking equipment. This will also help in the reduction of activation for unattended cooking or burnt items with not much smoke production. If permitted, change the smoke detector to a heat detector, or the cooking appliances could be moved to a different location. Smoke alarms should not be placed within 10 feet of a cooking appliance. If within 10 to 20 feet, a photoelectric smoke detector should be used.
- Hood ventilation fans are often not in operation during cooking—this can be fixed by connecting the fan to the light switch, causing the fan to come on anytime the light is turned on.
- Ductless residential hood ventilation systems do not vent the exhaust outside, permitting the exhaust to enter the room. Proper detector placement is the best method to reduce unwanted alarms.

Smoking

Many states prohibit smoking within or in close proximity to a building. In some cases, smoking is allowed in designated smoking areas in buildings.

Solution

- Smoke detectors should not be located within or in close proximity to designated smoking areas. Proper ventilation should be provided in the designated smoking area to prohibit smoke migration to other areas. If smoke detectors are located too close to smoking areas, they should be relocated or changed to heat detectors.

Steam

Steam from showers, cooking equipment, or other appliances can be a cause of unwanted fire alarms.



Solution

- Smoke detectors should not be placed in areas subject to showers or other areas that produce steam. Steam from cooking is covered under the section on cooking.
- Buildings with steam heating systems will sometimes have leaks causing unwanted alarms. Until the leak is shut off, the system will remain in alarm. When the leak will take time to fix, the device could be changed from a smoke detector to a heat detector until the steam leak is fixed. Where the issue of the steam leak is moisture, the detector could be removed and jumped out (i.e., the specific device is taken out of service by qualified personnel), letting the rest of the circuit be in service.

Construction

Construction causes many unwanted alarms. Construction dust, hot work, fumes, and other construction work cause alarm activation, and once construction is complete, if the detectors are not cleaned and calibrated, they can cause more alarms.

Solution

- Smoke detectors should be covered during construction to prevent dust accumulation in the detector chamber. At the end of the day covers should be removed. If permitted, smoke detectors may be changed to heat detectors during construction and restored back to smoke detectors after work is complete. After construction is completed all smoke detectors should be cleaned and sensitivity checked.
- When hot work is performed, smoke detectors may need to be protected or placed out of service in the immediate area of the hot work.
- Sawing, grinding, and drilling operations all cause dust that can set off a smoke detector. In areas where these activities are taking place, the detector needs to be temporarily covered or placed out of service.
- Detectors in areas where painting is taking place should be removed or covered to prevent paint and paint fumes from entering the chamber or getting on chambers or elements of the detector. Detectors with paint exposure or painted detectors will need to be replaced.
- Before construction takes place, the AHJ should be involved in the fire protection requirements for the construction site, such as which detectors will be permitted to be out of service, the type of protection required, the notifications required, and other issues affecting the building, occupants, and fire department response.

Alternate Heating Appliances (Wood Stove/Fireplace/Furnaces)

Smoke and heat detectors placed too close to alternate heating appliances can cause unwanted alarms. Improperly maintained heating appliances can cause improper or incomplete combustion, causing alarms.

Solution

- Where possible, smoke detectors should not be in the same room as alternate heating appliances, especially wood stoves and fireplaces.
- Heat detectors should be placed away from alternate heating appliances and furnaces.



- Heat detectors placed too close to heating appliances should have the correct temperature rating for the area.

Weather Conditions

Detectors and devices can be set off by high humidity, wind, high air movement, and cold and hot temperatures. Heat detectors can be set off by installation exposed to high temperature extremes.

Solution

- Smoke detectors placed near exterior doorways need more frequent maintenance than other detectors. They are susceptible to temperature variations, dust, vehicle exhaust, condensation from temperature changes, and other conditions that cause them to alarm. Smoke detectors should be moved away from exterior doorways or, if permitted, changed to heat detectors.
- Rate-of-rise heat detectors should not be placed in areas subject to fast temperature changes.

Cleaning

Dust from cleaning and certain cleaning solutions can cause smoke detector activation.

Solution

- Care should be taken when sweeping to limit dust from becoming airborne. In areas with large volumes of dust, a smoke detector may not be the best device to protect that area. If a smoke detector is required, use a vacuum to remove the dust or cover the smoke alarm during cleaning, but be sure to remove the cover when completed.

Working on Fire Alarm or Fire Protection Systems

Individuals working on fire alarm or fire protection systems also can cause unwanted alarms. Individuals working on fire alarms and fire protection systems and components should notify the monitoring company, the AHJ, and the fire department to disregard alarms until notified that testing or work has been completed. In some communities, a permit is required from the AHJ and/or the fire department prior to performing system inspection, testing, and maintenance on fire alarm or fire protection systems. The permit and notification information can be on the permit as a condition of the permit and posted at the fire alarm control panel.

General Placement

There are certain areas, other than those discussed above, where the installation of smoke detectors/alarms should be avoided. Avoiding these locations will help reduce unwanted alarms.

Solution

- *Exterior doorways and high traffic areas*—Smoke detectors placed near exterior doorways need more frequent maintenance than other detectors. They are susceptible to temperature variations, dust, vehicle exhaust, and other conditions that cause them to alarm. Detectors should be moved away from exterior doorways or, if permitted, changed to fixed-temperature heat detectors.
- *Linen, lint, and laundry areas*—These areas have a large amount of lint that can activate smoke alarms. Changing to heat detectors will eliminate the unwanted alarm problem.



- *Areas protected by projected beam detectors*—Most unwanted alarms are caused by banners or other items hung in the area that block the beam and cause an alarm. Building owners should be reminded not to hang items within the beam area and, if banners are permitted by the AHJ, the device should be shut down before hanging.
- Some unwanted alarms can be corrected by changing the smoke detector type from ionization to photoelectric, or vice versa, or by changing detector placement.

Water Flow/Pressure Switches

Water flow/pressure switches can cause unwanted alarms when not set up properly or when changes to the water system have taken place.

Solution

- If unwanted alarms are being received, the retard feature of the switch must be checked to ensure it has been set correctly. It needs to be set to prevent fluctuations of water pressure from setting it off. Have the switch checked out to make sure that it is working and set properly.
- Retard chamber drains on the alarm check valve of sprinkler systems can also become clogged, preventing water from draining from the chamber. This eliminates or reduces the retard function of the chamber, causing alarm activation. The drain should be checked to make sure it is not blocked and is draining properly.
- Vane type water flow switches should have the retard function set to eliminate pressure fluctuations.
- Retard functions should not be set to “0.” Settings should be per the system design.

Duct Detectors

Duct detectors are subject to dust and humidity. Maintenance of duct detectors is important to reducing unwanted alarms.

- During maintenance, make sure that the proper type of smoke detector/alarm has been installed in the duct.
- Normally, duct detectors are required to transmit a supervisory alarm and should not transmit a fire alarm signal. If duct detectors are required to transmit a fire alarm, the devices should be programmed to transmit a fire alarm.
- High humidity can set off the duct detectors. If the humidity is high, changes to the system may be needed to prevent activation. Many times humidity activations are due to the system being shut off when the building is not occupied and then started before occupancy. The system may need to be programmed to run at a higher setting to prevent humidity from entering the system.

Manual Fire Alarm Boxes (Pull Stations)

The main cause of manual fire alarm box unwanted alarms is the device being struck in places such as gymnasiums or stocking areas. Other times the location is a prime target for malicious activation.



Solution

- Where the likelihood of the manual fire alarm box being hit by an object is high, it should have a listed cover installed. These covers protect the manual fire alarm box from activating when struck.
- If the building is equipped with single-action manual fire alarm boxes and unwanted alarms are taking place, unwanted activation can be reduced by changing them to double-action manual pull stations.
- In stocking areas or areas subject to traffic from forklifts, hand trucks, pallets, etc., consideration of the placement of manual fire alarm boxes should be given to prevent them from being struck.
- In areas subject to malicious activation, listed covers can be installed with a local alarm warning the device has been tampered with.

CONCLUSIONS

How Do We Get the Issue Corrected?

The goal in reducing unwanted alarms is to correct issues that cause them. There are many means of accomplishing this goal. Voluntary correction of the unwanted fire alarms is the first step, followed by abatement/legal corrective action.

Both national fire codes—NFPA® 1, *Fire Code*, and ICC's *International Fire Code*®—contain provisions for corrective action to reduce unwanted alarms. The fire codes, as well as NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, and NFPA 72®, *National Fire Alarm and Signaling Code*, have provisions that require fire alarms and other fire protection systems to be ITM. It also grants the AHJ the authority to cite building owners when ITM is not being performed per code. Systems that have a good ITM program will have fewer unwanted alarm problems. Suggestions provided in the ITM report should be reviewed and acted on to further reduce unwanted alarms. During inspections, fire prevention personnel should be aware of issues that can reduce unwanted alarms and report them.

What Do We Do in the Interim?

If you have identified an unwanted alarm cause and corrective action has been initiated, other actions may be needed in the interim until corrective action has been taken. Some of the corrective actions needed will take time and money, with the possibility of unwanted alarms still occurring. During the time that corrective action is taking place, you may need to consider many different additional safeguards, such as a fire watch, modified response, and alarm verification.

NFPA 25 and NFPA 72 have specific provisions for handling impairments to fire protection systems. These documents provide guidance on those systems that are impaired and the steps to be taken to eliminate the problem, including the appropriate entities to contact.

Fire departments should look at the type of occupancy protected by the alarm systems, other fire protection equipment installed (e.g., sprinkler systems), fire code violations in the building, and other factors before determining what type of modified response (if any) should be permitted during the time corrective action is taking place. Fire departments have used one or more of the following modified response protocols:



- Fire watch
- Verification of alarm by contacting site
- Response based on type of alarm received, e.g., water flow
- Second alarm device
- Modified response of one engine
- Modified response of battalion or district chief
- No response unless receipt of call from building

Individuals placing fire alarm or fire protection systems out of service for inspection, testing, or maintenance should remember to notify the alarm monitoring company, the AHJ, and the fire department to ensure that they do not respond to unwanted alarms.

The solutions in this guide require approval from the AHJ and other code enforcement personnel and should be in compliance with local building, fire, and mechanical codes. Qualified personnel should perform work required to make changes to fire alarm systems per local requirements. It is best to consult with the AHJ and design professionals on the optimal way to reduce unwanted alarms that comply with the codes and design parameters of the system.

For additional information, see the following:

- *NFPA 1[®], Fire Code*
- *NFPA 13, Standard for the Installation of Sprinkler Systems*
- *NFPA 13R, Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies*
- *NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*
- *NFPA 72[®], National Fire Alarm and Signaling Code*
- *NFPA 101[®], Life Safety Code*
- *International Building Code[®]*
- *International Fire Code[®]*





RESEARCH

U.S. Experience with Sprinklers

July 2017

Marty Ahrens

Abstract

Sprinklers are a highly effective and reliable part of a building's fire protection system. National estimates of reported fires derived from the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS) and NFPA's annual fire department experience survey show that in 2010-2014 sprinklers were present in 10% of reported U.S. fires. The death rate per 1,000 reported fires was 87% lower in properties with sprinklers than in properties with no automatic extinguishing systems (AES). The civilian injury rate was 27% lower and the firefighter fireground injury rate per 1,000 fires was 67% lower in sprinklered properties than in fires in properties without AES.

In fires considered large enough to activate the sprinkler, sprinklers operated 92% of the time. Sprinklers were effective in controlling the fire in 96% of the fires in which they operated. Taken together, sprinklers both operated and were effective in 88% of the fires large enough to operate them. In three-fifths of the fires in which the sprinkler failed to operate, the system had been shut off.

This report provides information about the performance of sprinklers in general as well as wet pipe and dry pipe sprinklers. Estimates are provided of sprinkler performance in all fires, with additional details provided about fires in all homes. Properties under construction are excluded from these estimates.

Keywords: Fire suppression, sprinklers, fire statistics, sprinkler performance, home fires

Acknowledgements

The National Fire Protection Association thanks all the fire departments and state fire authorities who participate in the National Fire Incident Reporting System (NFIRS) and the annual NFPA fire experience survey. These firefighters are the original sources of the detailed data that make this analysis possible. Their contributions allow us to estimate the size of the fire problem.

We are also grateful to the U.S. Fire Administration for its work in developing, coordinating, and maintaining NFIRS.

To learn more about research at NFPA visit www.nfpa.org/research.

Copies of this report are available from:
NFPA Research, Data and Analytics Division
1 Batterymarch Park
Quincy, MA 02169-7471
www.nfpa.org
E-mail: research@nfpa.org
Phone: 617-984-7451

NFPA No. USS14



FACT SHEET » RESEARCH

Sprinklers in Reported U.S. Fires during 2010 to 2014

Fire sprinklers can control a fire while the fire is still small. Some type of sprinkler was present in an estimated average of 49,840 (10%) reported structure fires during 2010 to 2014. Automatic extinguishing systems (AES) are designed to control fires until the fire department arrives. Sprinklers are a type of AES that uses water to control fires. Other types of AES use something other than water.

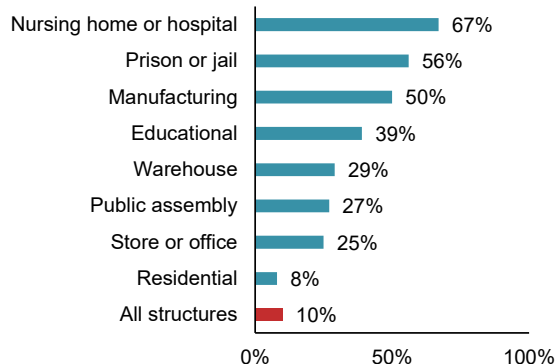
Sprinkler Presence

Sprinklers were most likely to be found in institutional occupancies such as nursing homes, hospitals, and prisons or jails.

Most structure fires and fire deaths occurred in residential properties, particularly homes, but only 8% of the reported residential fires were in properties with sprinklers.

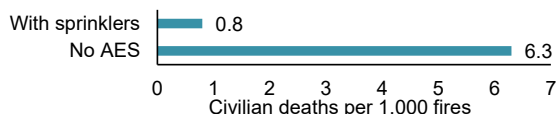
Wet pipe sprinklers accounted for 87% of the sprinklers in reported structure fires, dry pipe systems accounted for 10%, and other types of sprinklers accounted for 3%.

Presence of sprinklers in reported fires by occupancy



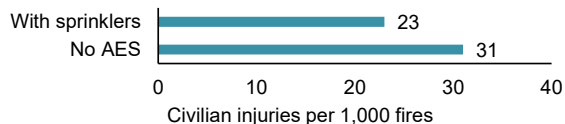
Impact of Sprinklers

Civilian death rates per 1,000 fires in properties with sprinklers and with no AES



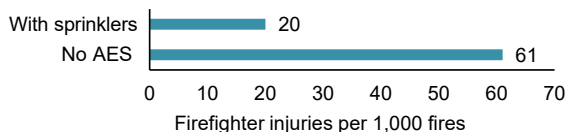
The civilian fire death rate of 0.8 per 1,000 reported fires was 87% lower in properties with sprinklers than in properties with no AES.

Civilian injury rates per 1,000 fires in properties with sprinklers and with no AES



The civilian injury rate of 23 per 1,000 reported fires was 27% lower in properties with sprinklers than in properties with no AES. Many injuries occurred in fires that were too small to activate the sprinkler or in the first moments of a fire before the sprinkler operated.

Firefighter injury rates per 1,000 fires in properties with sprinklers and with no AES



The average firefighter fireground injury rate of 20 per 1,000 reported fires was 67% lower where sprinklers were present than in fires with no AES.



NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource on fire, electrical and related hazards

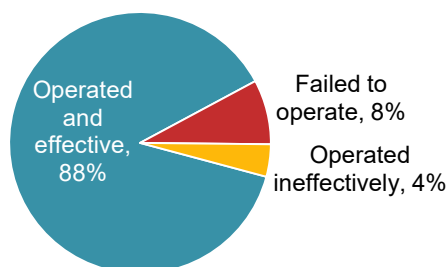
This information is provided to help advance fire safety. It does not represent the official position of the NFPA or its Technical Committees. The NFPA disclaims liability for any personal injury, property, or other damages of any nature whatsoever resulting from the use of this information.



FACT SHEET » RESEARCH *(continued)*

Sprinkler Operation and Effectiveness

Sprinkler operation and effectiveness

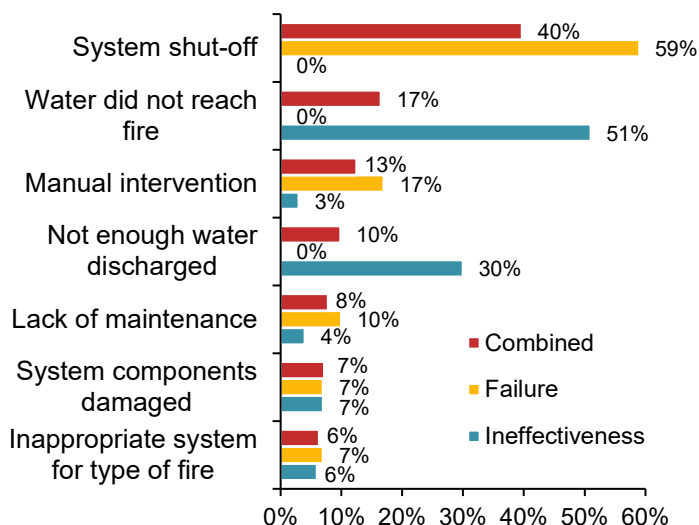


Sprinklers operated in 92% of the fires in which sprinklers were present and the fire was large enough to activate them.

- Sprinklers were effective at controlling the fire in 96% of fires in which they operated.
- Sprinklers operated effectively in 88% of the fires large enough to activate them.

Only one sprinkler head operated in four out of five (79%) fires in which sprinklers operated. In 97% of fires with operating sprinklers, five or fewer heads operated.

Reasons for combined sprinkler failure and ineffectiveness



Reported sprinkler failures (660 per year) were twice as common as reported fires in which sprinklers were ineffective and did not control the fire.

- 40% of the combined sprinkler problems were due to system shut-offs.
- In three of every five (59%) incidents in which sprinklers failed to operate, the system had been shut off.
- In half (51%) of the fires in which sprinklers were ineffective, the water did not reach the fire.

Source: *U.S. Experience with Sprinklers*, National Fire Protection Association report, 2017.

Source: NFPA Research: www.nfpa.org/research
Contact information: 617-984-7451 or research@nfpa.org



NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource
on fire, electrical and related hazards

For more of these resources,
become an NFPA member



FACT SHEET » RESEARCH

Sprinklers in Reported U.S. Home Fires During 2010 to 2014

Some type of sprinkler was present in an estimated total of 24,440 (7%) reported home structure fires during 2010 to 2014. These fires caused an average of 35 (1%) civilian deaths, 616 (5%) civilian injuries, and \$198 million (3%) in direct property damage per year. Homes include one- or two-family homes and apartments or other multi-family homes. Properties under construction were excluded from the analysis.

Sprinkler Presence

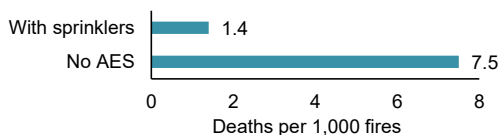
Automatic extinguishing systems (AES) are designed to control fires until the fire department arrives. Sprinklers are a type of AES that uses water to control fires. Other types of AES use something other than water.

According to the 2011 American Housing Survey, 5% of all occupied housing units had sprinklers. Buildings with more housing units were more likely to have sprinklers. Almost one-third (31%) of units in buildings with 50 or more units were sprinklered.

Wet pipe sprinklers accounted for 89% of the sprinklers in reported home fires, dry pipe systems accounted for 9%, and other types of sprinklers accounted for 2%.

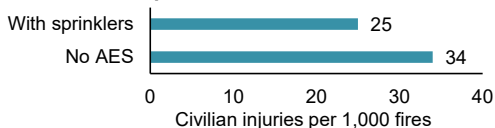
Impact of Sprinklers

Death rates per 1,000 fires in homes with sprinklers and with no AES



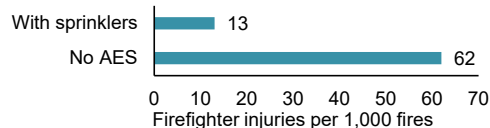
The civilian death rate of 1.4 per 1,000 reported fires was 81% lower in homes with sprinklers than in homes with no AES.

Civilian injury rates per 1,000 fires in homes with sprinklers and with no AES



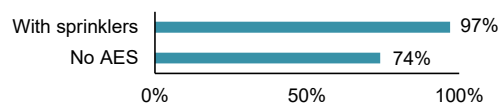
The civilian injury rate of 25 per 1,000 reported fires was 31% lower in homes with sprinklers than in homes with no AES. Many of the injuries occurred in fires that were too small to activate the sprinkler or in the first moments of a fire before the sprinkler operated.

Firefighter injury rates per 1,000 fires in homes with sprinklers and with no AES



The average firefighter injury rate of 13 per 1,000 reported home fires was 79% lower where sprinklers were present than in fires with no AES.

Percent of fires confined to room of origin in homes with sprinklers and with no AES



Where sprinklers were present, flame damage was confined to the room of origin in 97% of fires compared to 74% of fires without AES.



**NATIONAL FIRE
PROTECTION ASSOCIATION**
The leading information and knowledge resource
on fire, electrical and related hazards

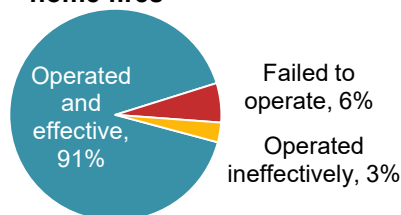
This information is provided to help advance fire safety. It does not represent the official position of the NFPA or its Technical Committees. The NFPA disclaims liability for any personal injury, property, or other damages of any nature whatsoever resulting from the use of this information.



FACT SHEET » RESEARCH *(continued)*

Sprinkler Operation and Effectiveness

Sprinkler operation and effectiveness in home fires



Sprinklers operated in 94% of home fires in which sprinklers were present and the fire was considered large enough to activate them.

- ▶ They were effective at controlling the fire in 96% of fires in which they operated.
- ▶ Sprinklers operated effectively in 91% of the fires large enough to activate them.

Only one sprinkler head operated in 88% of home fires with operating sprinklers. In 98% of fires with operating sprinklers, five or fewer sprinkler heads operated.

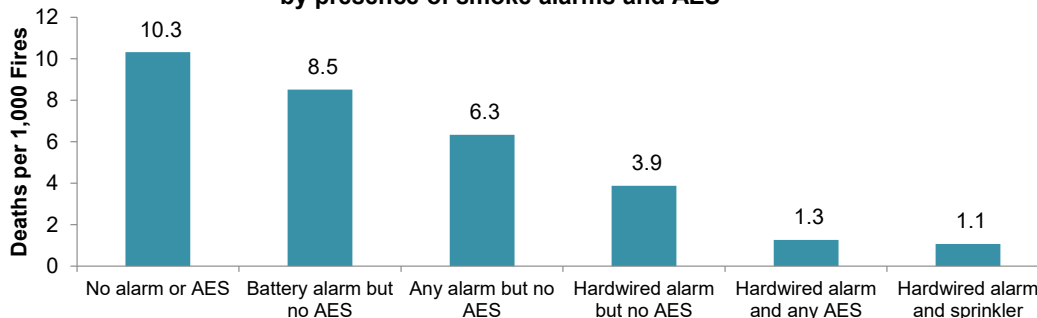
In three out of five (62%) of fires in which sprinklers failed to operate, the system was shut off.

Combined Impact of Smoke Alarms and Sprinklers

The lowest home fire death rate per 1,000 reported fires is found in homes with sprinkler systems and hardwired smoke alarms. Compared to reported home fires with no smoke alarms or AES, the death rate per 1,000 reported fires was as follows:

- ▶ 18% lower where battery-powered smoke alarms were present but AES were not
- ▶ 39% lower where smoke alarms with any power source were present but AES were not
- ▶ 62% lower where hardwired smoke alarms were present but AES were not
- ▶ 88% lower where hardwired smoke alarms and any AES were present
- ▶ 90% lower where sprinklers and hardwired smoke alarms were present

Average fire death rates per 1,000 reported home structure fires by presence of smoke alarms and AES



Source: *U.S. Experience with Sprinklers*, National Fire Protection Association report, 2017.

Source: NFPA Research: www.nfpa.org/research
Contact information: 617-984-7451 or research@nfpa.org



NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource on fire, electrical and related hazards

For more of these resources,
become an NFPA member

Table of Contents

Introduction	1
METHODOLOGY	1
- Estimates were derived from the details collected by the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS) and NFPA's annual fire department experience survey (FES). - To compensate for fires reported to local fire departments but not captured by NFIRS, fire and loss estimates from the FES are divided by comparable totals in NFIRS to develop multipliers. - Fires with one of the six NFIRS confined fire incident types are included in estimates of sprinkler presence, fire spread, and heads operating, but not of operation in general. - All estimates in this report exclude fires in properties under construction. - Casualty and loss estimates can be heavily influenced by the inclusion or exclusion of one unusually serious fire. - Appendix A has more details on how national estimates are calculated and Appendix B contains specific information about the NFIRS data elements related to sprinklers.	
Sprinklers in All Occupancies	2
SPRINKLER PRESENCE AND TYPE	2
- Some type of sprinkler was present in an estimated average of 49,840 (10%) of reported structure fires during 2010-2014. - Wet pipe sprinklers accounted for 87% of the sprinklers in reported structure fires, dry pipe systems were in 10%, and other types of sprinklers were in 3%.	
FIRES IN PROPERTIES WITH SPRINKLERS VS. NO AES	3
- The death rate per 1,000 reported fires was 87% lower in properties with sprinklers than in properties with no automatic extinguishing system (AES). - The civilian injury rate per 1,000 reported fires was 27% lower in properties with sprinklers than in properties with no AES. - The average firefighter fireground injury rate per 1,000 reported fires was 67% lower when sprinklers were present than in fires with no AES. - Reductions in average dollar loss per fire varied greatly by occupancy. - When sprinklers were present, flame damage was confined to the room of origin in 96% of fires compared to 71% of fires without AES, a difference of 25 percentage points.	
SPRINKLER OPERATION, EFFECTIVENESS AND PROBLEMS	5
- Sprinklers operated in 92% of the fires in which sprinklers were present and the fire was considered large enough to activate them. - Only one sprinkler activated in four out of five fires in which sprinklers of any type (79%) or wet pipe sprinklers (80%) operated. - In 97% of the fires in which one sprinkler operated, it was effective. - In three of every five (59%) incidents in which sprinklers failed to operate, the system had been shut off. - In half (51%) of the fires in which sprinklers were ineffective, the water did not reach the fire.	

Table of Contents (Continued)

CIVILIAN DEATHS IN SPRINKLERED PROPERTIES 7

- While sprinklers were present in 10% of all properties, only 2% of all fire deaths occurred in these properties.
- Compared to victims of fires with no AES, people who died in fires in which sprinklers operated effectively were less likely to have been sleeping and more likely to have been in the area of origin, to have been at least 65 or older, to have clothing on fire, or to have been physically disabled.

UNWANTED ACTIVATIONS 8

- Fire departments responded to an estimated 29,800 sprinkler activations caused by a system failure or malfunction and 33,600 unintentional sprinkler activations in 2014.

Sprinklers in Home Fires 9

SPRINKLER PRESENCE AND TYPE IN HOME FIRES 9

- During 2010-2014, some type of fire sprinkler was present in an average 24,440 (7%) reported home structure fires per year.
- According to the 2011 American Housing Survey, buildings with more housing units were more likely to have sprinklers.
- Wet pipe sprinklers accounted for 89% of the sprinklers in reported home fires, dry pipe systems were in 9%, and other types of sprinklers were in 2%.

FIRES IN HOMES WITH SPRINKLERS VS. NO AES 10

- The death rate per 1,000 reported fires was 81% lower in homes with sprinklers than in homes with no AES.
- The civilian injury rate per 1,000 reported fires was 31% lower in homes with sprinklers than in homes with no AES.
- A 2012 Fire Protection Research Foundation study found that that sprinkler presence was associated with a 53% reduction in the medical cost of civilian injuries per 100 home fires.
- The average firefighter fireground injury rate per 1000 reported home fires was 79% lower when sprinklers were present than in fires with no AES.
- When sprinklers were present in reported home fires, the average loss per fire was less than half the average in properties with no AES.
- When sprinklers were present, flame damage was confined to the room of origin in 97% of fires compared to 74% of fires without AES, a difference of 23 percentage points.

SPRINKLER OPERATION, EFFECTIVENESS AND PROBLEMS IN HOME FIRES 11

- Sprinklers operated in 94% of home fires in which sprinklers were present and the fire was considered large enough to activate them.
- In 98% of home fires with operating sprinklers, five or fewer heads operated.
- In three of every five (62%) home fires in which sprinklers failed to operate, the system had been shut off.
- In almost half (46%) of home fires in which sprinklers were ineffective. the water did not reach the fire.

Table of Contents (Continued)

IMPACT OF SMOKE ALARMS AND SPRINKLERS ON DEATHS PER 1,000 HOME FIRES	13
▪ The lowest home fire death rate per 1,000 reported fires is found in homes with sprinkler systems and hardwired smoke alarms.	
UNWANTED ACTIVATIONS	13
▪ Fire departments responded to an estimated 5,600 non-fire activations of home fire sprinklers caused by a system failure or malfunction and 6,800 unintentional sprinkler activations in 2014.	
20 YEARS OF HOME FIRE SPRINKLERS IN SCOTTSDALE, ARIZONA	14
▪ Survey in Scottsdale, Arizona found that home fire sprinklers were still operational after 20 years	
Conclusion and Discussion	14
▪ Sprinklers are a reliable and effective part of fire protection	
▪ NFPA standards provide essential guidance in installation, inspection, testing, maintenance, integration of sprinklers with other systems, and in evaluating needs when an occupancy changes use or contents.	
▪ See www.firesprinklerinitiative.org for resources to help increase the number of new one- and two-family homes built protected by sprinklers and to reduce this death toll.	
▪ The Fire Protection Research Foundation has produced a number of reports to inform home fire sprinkler codes and standards	
Supporting Tables	16
Appendix A. How National Estimates Are Calculated	30
Appendix B. Data Elements in NFIRS 5.0 Related to Automatic Extinguishing Systems	33
References	35

List of Figures and Tables

SPRINKLERS IN ALL OCCUPANCIES

Sprinkler Presence and Type

Figure 1.	Presence of sprinklers in U.S. structure fires, by occupancy	2
Table A.	Summary of AES presence and type in reported structure fires	2
Figure 2.	Types of sprinklers found in U.S. structure fires	3
Figure 3.	Sprinkler type of occupancy	3

Fires in Properties with Sprinklers vs. No AES

Figure 4.	Civilian death rates per 1,000 fires in properties with sprinklers	4
Figure 5.	Civilian injury rates per 1,000 fires in properties with sprinklers and with no AES	4
Figure 6.	Firefighter injury rates per 1,000 fires in properties with sprinklers and with no AES	4
Figure 7.	Percent of fires confined to room of origin in properties with sprinklers and with no AES	5

Sprinkler Operation, Effectiveness and Problems

Figure 8.	Sprinkler operation and effectiveness	5
Figure 9.	When sprinklers operated, percentage of fires in which one or one to five heads operated by type of sprinkler	5
Figure 10.	Percentage of fires in which sprinklers were effective by number operating	6
Figure 11.	Reasons for sprinkler failures	6
Figure 12.	Reasons for sprinkler ineffectiveness	6
Figure 13.	Reasons for combined sprinkler failure and ineffectiveness	7

Civilian Deaths in Sprinklered Properties

Figure 14.	Civilian fire deaths by sprinkler performance	7
Figure 15.	Victim characteristics in fires with effectively operating sprinklers and with no AES	8

Unwanted Activations

Figure 16.	Unwanted sprinkler activations by type and month in 2014	8
------------	--	---

SPRINKLERS IN HOME FIRES Sprinkler

Presence and Type in Home Fires

Table B.	Summary of AES presence and type in reported home structure fires	9
Figure 17.	Percentage of occupied units with sprinklers in 2011 American Housing Survey	9
Figure 18.	Types of sprinklers found in home structure fires	10

Fires in Homes with Sprinklers vs. No AES

Figure 19.	Civilian death rates per 1,000 fires in home with sprinklers and with no AES	10
Figure 20.	Civilian injury rates per 1,000 fires in homes with sprinklers and with no AES	10

List of Figures and Tables (Continued)

Figure 21.	Firefighter injury rates per 1,000 fires in homes with sprinklers and with no AES	11
Figure 22.	Average loss per fire in homes with sprinklers and with no AES	11
Figure 23.	Percent of fires confined to room of origin in homes with sprinklers and with no AES	11

Sprinkler Operation, Effectiveness and Problems in Home Fires

Figure 24.	Sprinkler operation and effectiveness in home fires	12
Figure 25.	When sprinklers operated, percentage of home fires in which one or one to five heads operated	12
Figure 26.	Reasons for sprinkler failures in home fires	12
Figure 27.	Reasons for sprinkler ineffectiveness in home fires	13

Impact of Smoke Alarms and Sprinklers in Deaths per 1,000 Home Fires

Figure 28.	Average fire death rate per 1,000 reported home structure fires by presence of smoke alarms and AES	13
------------	---	----

SUPPORTING TABLES

Table 1.	Presence of Sprinkles in Structure Fires by Property Use, Excluding Properties Under Construction	16
Table 2.	Type of Sprinkler Reported in Structure Fires Where Equipment was Present in Fire Area, Excluding Properties under Construction	17
Table 3.	Estimated Reduction in Civilian Deaths per Thousand Fires Associated With All Types of Sprinklers by Property Use (Excluding Properties Under Constructions)	18
Table 4.	Estimated Reduction in Average Direct Property Loss per Fire Associated With All Types of Sprinklers by Property Use (Excluding Properties Under Construction)	19
Table 5.	Percentage of Fires with Fire Spread Confined to Room of Origin in Fires with Sprinklers Present vs. No Automatic Extinguishing System	20
Table 6.	Sprinkler Reliability and Effectiveness When Fire Was Coded as Not Confined and Large Enough to Activate Sprinkler and Sprinkler was Present in Area of Fire, by Property Use	21
Table 7.	Number of Sprinklers Operating, by Type of Sprinkler 2010-2014 Structure Fires Excluding Properties Under Construction	24
Table 8.	Reasons for Failure to Operate in Fires with Non-Confined Structure Fire Incident Types Large Enough to Activate Sprinkler that was Present in Area of Fire, by Property Use	25
Table 9.	Reasons for Ineffectiveness in Fires with Non-Confined Structure Fire Incident Types Large Enough to Activate Sprinkler that was Present in Area of Fire	27
Table 10.	Characteristics of Fatal Victims In Fires with Sprinklers vs. No Automatic Extinguishing Equipment	28

U.S. Experience with Sprinklers

INTRODUCTION

Sprinklers play a critical role in fire protection. Information about sprinkler presence and performance in reported fires is essential to understanding the prevalence, impact, reliability and effectiveness of these systems, as well as avenues for performance improvement. This report provides a statistical overview of sprinkler presence and performance in reported fires. Because the majority of deaths are caused by home fires, additional details are provided on sprinklers in fires in homes.

METHODOLOGY

Estimates were derived from the details collected by the U.S. Fire Administration's (USFA's) [National Fire Incident Reporting System \(NFIRS\)](#) and NFPA's annual fire department experience survey. NFIRS collects detailed incident-based information about causes and circumstances of fires from local fire departments. The coding structure is documented in the [National Fire Incident Reporting System Complete Reference Guide](#) [1]. Participation in NFIRS is voluntary at the federal level. Some states require fire departments to report all incidents or all fires, some have a loss threshold, and in other states, reporting is completely voluntary.

NFPA's annual Fire Experience Survey (FES) collects summary data from a sample of fire departments to calculate estimates of fires and associated losses by broad category. More details can be found in NFPA's report, *U.S. Fire Loss during 2015* and other reports in the series. [2]

To compensate for fires reported to local fire departments but not captured by NFIRS, fire and loss estimates from the FES are divided by comparable totals in NFIRS to develop multipliers. NFIRS data are scaled up by these multipliers. In most cases, unknown data are allocated proportionally. The basic approach was documented in a 1989 *Fire Technology* article by John Hall and Beatrice Harwood. [3]

Fires with one of the six NFIRS confined fire incident types are included in estimates of sprinkler presence, fire spread, and heads operating, but not of operation in general. NFIRS 5.0 includes six types of structure fires collectively referred to as "confined fires," identified by incident type codes 113-118. These include confined cooking fires, confined chimney or flue fires, confined trash fires, confined fuel burner or boiler fires, confined commercial compactor fires, and confined incinerator fires. Losses are generally minimal in these fires, which by definition, are assumed to have been limited to the object of origin. Although NFIRS rules do not require data about automatic extinguishing systems for these fires, local departments do sometimes provide it.

All estimates in this report exclude fires in properties under construction. Fires in which partial systems were present and fires in which sprinklers were present but failed to operate because they were not in the fire area were excluded from estimates related to presence and operation.

Casualty and loss estimates can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Property damage has not been adjusted for inflation. In most cases, fires are rounded to the nearest ten, civilian deaths and injuries are generally rounded to the nearest one, and direct property damage is rounded to the nearest million dollars. Less rounding is used when the numbers are smaller.

Appendix A has more details on how national estimates are calculated and Appendix B contains specific information about the NFIRS data elements.

Sprinklers in All Occupancies

SPRINKLER PRESENCE AND TYPE

Some type of sprinkler was present in an estimated average of 49,840 (10%) of reported structure fires during 2010-2014. Sprinkler presence varies widely by occupancy. Figure 1 shows the percentage of fires by occupancy in which any type of sprinkler was present. Sprinklers were most likely to be found in institutional occupancies, such as nursing homes, hospitals, and prisons or jails. Although the majority of structure fires, civilian fire deaths and injuries, and property damage occurred in residential properties, particularly homes, only 8% of the reported residential fires were in properties with sprinklers. [Sprinklers in home fires](#) are discussed in greater detail later in the report. High-rise buildings were much more likely to have sprinklers than were shorter structures. [4]

Figure 1. Presence of sprinklers in U.S. structure fires, by occupancy: 2010-2014

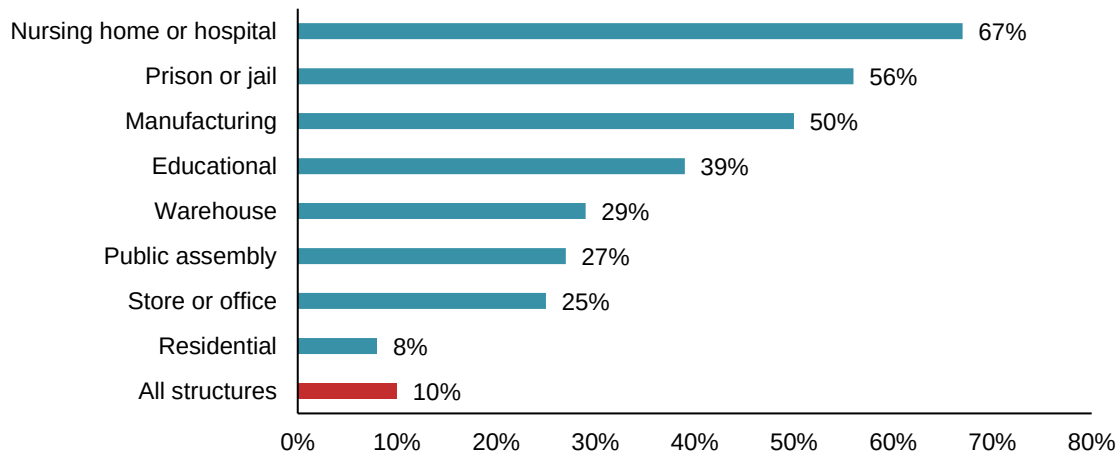


Table 1 provides information about more occupancies and shows estimates of automatic extinguishing system (AES) presence in 1980-1984 and 1994-1998 for historical context.¹ Table A summarizes information about AES in all reported structure fires *except those under construction*.

Table A.
Summary of AES presence and type in reported structure fires
2010-2014 annual averages

AES Presence of Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
AES present	57,430	(12%)	45	(2%)	1,259	(9%)	\$793	(8%)
Sprinkler present	49,840	(10%)	42	(2%)	1,148	(8%)	\$709	(7%)
Wet	43,540	(9%)	39	(1%)	1,058	(7%)	\$579	(6%)
Dry	4,770	(1%)	2	(0%)	69	(0%)	\$120	(1%)
Other	1,530	(0%)	1	(0%)	21	(0%)	\$10	(0%)
Non-sprinkler AES present	7,590	(2%)	4	(0%)	110	(1%)	\$84	(1%)
Partial system AES of any type	2,190	(0%)	5	(0%)	56	(0%)	\$66	(1%)
AES of any type not in fire area and did not operate	1,630	(0%)	2	(0%)	47	(0%)	\$75	(1%)
No AES present	422,180	(87%)	2,659	(98%)	13,241	(91%)	\$8,609	(90%)
Total	483,430	(100%)	2,711	(100%)	14,602	(100%)	\$9,544	(100%)

¹ Data about specific types of AES was first collected in NFIRS 5.0, introduced in 1999.

Wet pipe sprinklers accounted for 87% of the sprinklers in reported structure fires, dry pipe systems were in 10%, and other types of sprinklers were in 3%. See Figure 2.

Figure 2. Types of sprinklers found in U.S. structure fires: 2010-2014

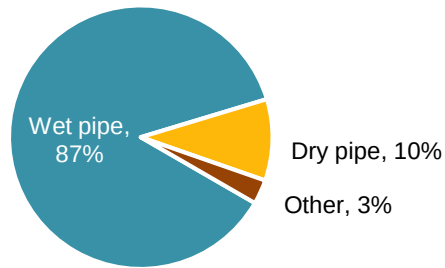
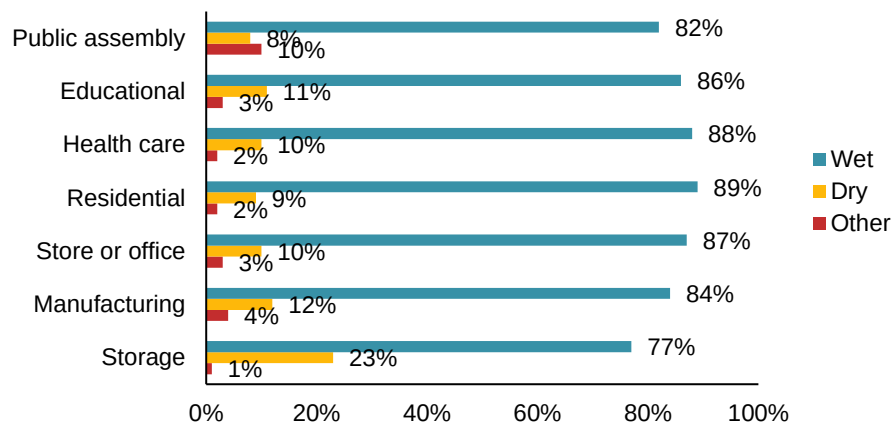


Figure 3 and Table 2 show that dry pipe sprinklers were more common in storage occupancies. “Other” sprinklers were seen most frequently in eating and drinking establishments. It is possible that some of these other sprinklers were actually miscodes of systems designed specifically for cooking equipment.

Figure 3. Sprinkler type by occupancy: 2010-2014

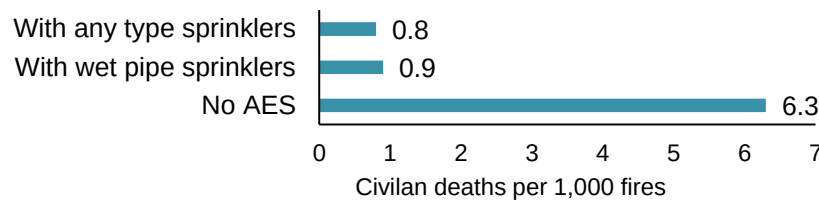


FIRES IN PROPERTIES WITH SPRINKLERS VS. NO AES

The death rate per 1,000 reported fires was 87% lower in properties with sprinklers than in properties with no AES. These rates are based strictly on reported presence or absence. Operation is not considered. Figure 4 shows that in reported structure fires with no automatic extinguishing systems (AES), the civilian death rate was 6.3 per 1,000 fires. When any type of sprinklers were present, the death rate was 0.8 per 1,000 fires. When wet pipe sprinklers were present, the death rate of 0.9 deaths per 1,000 fires was 86% lower than in home fires without AES. Table 3 shows these rates for all sprinklers and wet pipe sprinklers by occupancy. The smallest reduction (33%) was seen in manufacturing properties. Civilian deaths in sprinklered properties are discussed in greater detail later in this report.

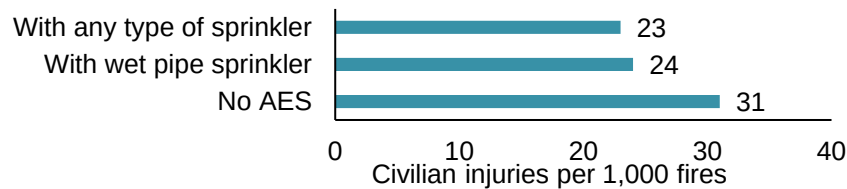
While the reduction in deaths was greater in some occupancies with wet pipe sprinklers than total sprinklers, the differences were small. With so few deaths in sprinklered properties, the differences are not meaningful.

Figure 4. Civilian death rates per 1,000 fires in properties with sprinklers and with no AES: 2010-2014



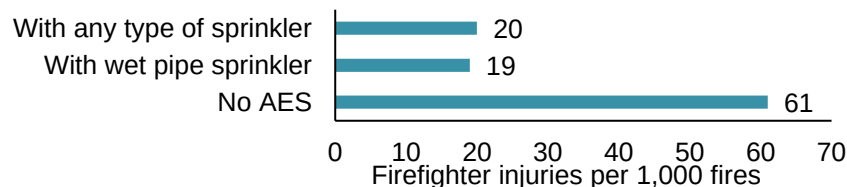
The civilian injury rate per 1,000 reported fires was 27% lower in properties with sprinklers than in properties with no AES. Figure 5 shows that when sprinklers of any type were present, reported civilian injuries averaged 23 per year, compared to 31 per year in which no AES was present. The injury rate in fires with wet pipe sprinklers was 24 per 1,000 fires or 22% lower than in fires with no AES. In more than half of these cases, the fire was too small to trigger the sprinkler. In others, someone was injured while trying to fight a fire in the initial moments before a sprinkler operated.

Figure 5. Civilian injury rates per 1,000 fires in properties with sprinklers and with no AES: 2010-2014



The average firefighter fireground injury rate per 1,000 reported fires was 67% lower when sprinklers were present than in fires with no AES. Figure 6 shows that when sprinklers of any type were present, 20 firefighters were injured per 1,000 fires, compared to 61 firefighter injuries per 1,000 fires in properties without AES protection. The 19 firefighter injuries per 1,000 fires in properties with wet pipe sprinklers was 68% lower than the rate in fires without AES.

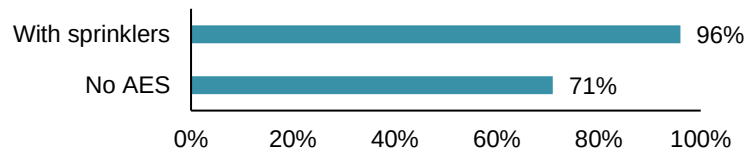
Figure 6. Firefighter injury rates per 1,000 fires in properties with sprinklers and with no AES 2010-2014



Reductions in average dollar loss per fire varied greatly by occupancy. Table 4 shows that compared to properties with no AES, the average overall loss was 30% lower when sprinklers of any type were present and 35% lower when wet pipe sprinklers were present. The average loss was actually higher in sprinklered warehouses than in those with no AES. The reduction in property loss in manufacturing properties ranged from 23% to 34%. Average losses were higher in warehouses and manufacturing than in other properties. A very small fire can damage expensive equipment. Warehouse contents may be rendered valueless by smoke. The reduction in average losses for public assembly and various residential occupancies ranged from 55% to 86%.

When sprinklers were present, fire spread was confined to the room of origin in 96% of fires compared to 71% of fires without AES. See Figure 7. Table 5 shows these percentages in different occupancies. In a change from previous editions of this report, fires with NFIRS incident types indicating confined structure fires (NFIRS incident type codes 113-118) were all considered to have been confined to the room of origin.

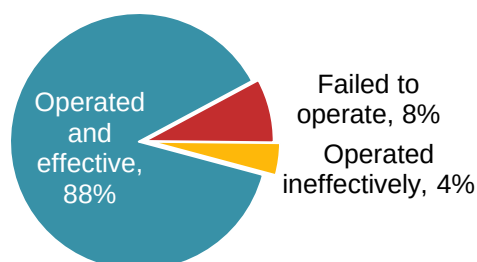
Figure 7. Percent of fires confined to room of origin in properties with sprinklers and with no AES 2010-2014



SPRINKLER OPERATION, EFFECTIVENESS AND PROBLEMS

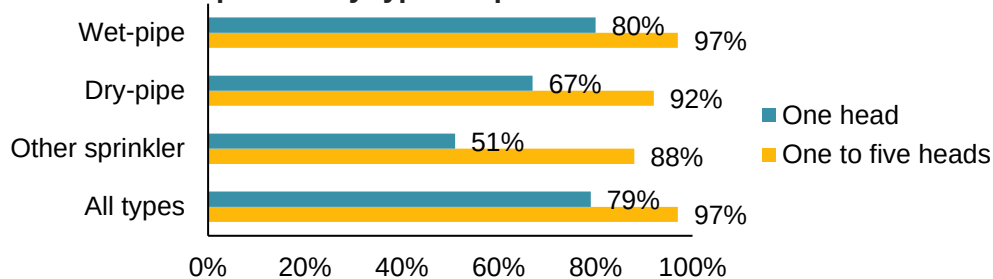
Sprinklers operated in 92% of the fires in which sprinklers were present and the fire was considered large enough to activate them.² They were effective at controlling the fire in 96% of fires in which they operated. Figure 8 shows that sprinklers operated effectively in 88% of the fires large enough to trigger them. [Table 6](#) provides details on sprinkler operation and effectiveness in different occupancies and for different types of sprinklers.

Figure 8. Sprinkler operation and effectiveness: 2010-2014



Only one sprinkler activated in four out of five fires in which sprinklers of any type (79%) or wet pipe sprinklers (80%) operated. Figure 9 shows that in 97% of fires with operating sprinklers, five or fewer heads operated. The percentages were smaller for dry pipe and other sprinklers. [Table 7](#) provides more details on number of sprinklers. The percentage of fires in which only one head operated is higher in this report than in previous editions because fires sprinklers operating in fires with the NFIRS confined fire incident types were included in the calculations.

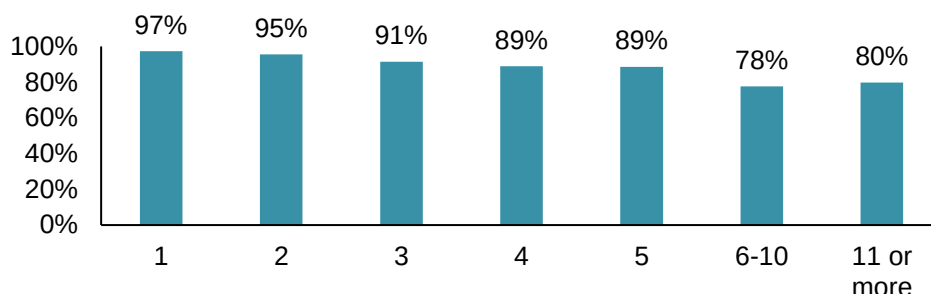
Figure 9. When sprinklers operated, percentage of fires in which one or one to five heads operated by type of sprinkler 2010-2014



In 97% of the fires in which one sprinkler operated, it was effective. [Figure 10](#) shows that sprinklers were somewhat less likely to have operated effectively when more heads operated.

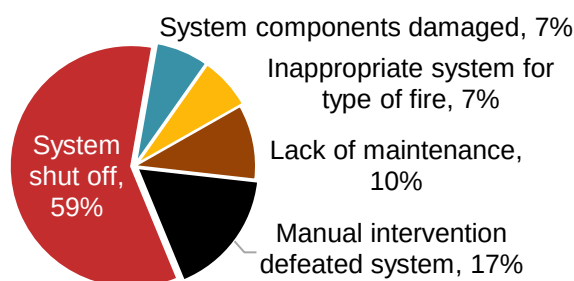
² These calculations exclude fires with confined structure fire incident types (NFIRS incident types 113-118). Among confined fires with sprinklers present, the fire was too small to operate 76% of the time, sprinklers operated and were effective 19% of the time and failed to operate 4% of the time. Since these fires are, by definition, confined, it is likely that a substantial share of fires in which the sprinklers were said to fail, were, in fact, too small to cause the sprinkler to operate. The 44% of non-confined (NFIRS incident types 110-123, excluding 113-118) that were too small to activate the sprinkler and 1% of non-confined structure fires with unclassified operation were also excluded.

Figure 10. Percentage of fires in which sprinklers were effective by number operating 2010-2014



In three of every five (59%) incidents in which sprinklers failed to operate, the system had been shut off. Figure 11 shows that manual intervention defeated the system in 17% of the incidents. In some cases, someone turned off the system prematurely.

Figure 11. Reasons for sprinkler failures: 2010-2014.

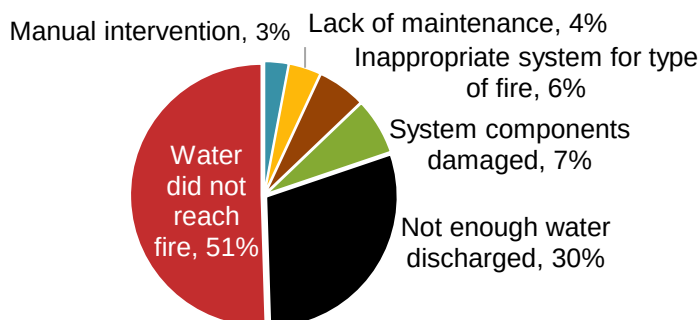


The system was inappropriate for the type of fire in 7% of the incidents in which sprinklers failed to operate. Throughout a building's life cycle, the use and occupancy type may change. A system that was designed for the original purpose may not be sufficient to meet the requirements of the changed building use. In another 7% of sprinkler failures, system components were damaged.

[Table 8](#) shows the failure reasons for different occupancies and different types of sprinklers. In all cases, system shut-off was the leading reason.

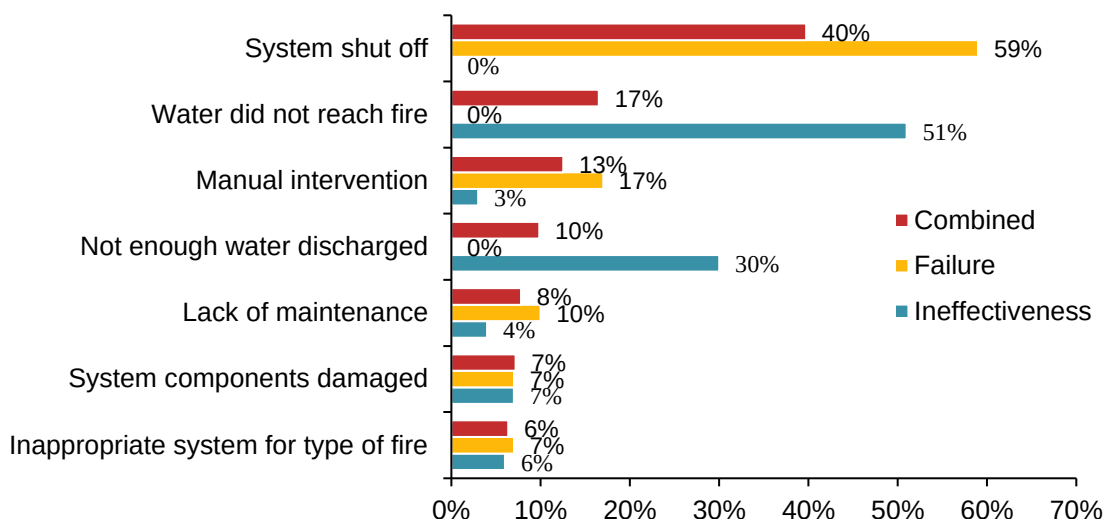
In half (51%) of the fires in which sprinklers were ineffective, the water did not reach the fire. Figure 12 shows that in 30% of the incidents, not enough water was discharged. In 7%, system components were damaged. The system was inappropriate for the type of fire in 6%. Lack of maintenance was identified as a factor in 4% of the incidents. Manual intervention was the cause of 3% of ineffective systems. [Table 9](#) provides more details by occupancy and by type of sprinkler.

Figure 12. Reasons for sprinkler ineffectiveness: 2010-2014



In 2010-2014, reported sprinkler failures (660 per year) were twice as common as reported fires in which sprinklers were ineffective (320 per year). Figure 13 shows that 40% of the combined sprinkler problems were due to system shut-offs. In 17% of these incidents, water did not reach the fire. In 13%, manual intervention defeated the system. In 10%, not enough water was discharged. Lack of maintenance was a factor in 8%, system components were damaged in 7%, and in 6%, the system was inappropriate for the type of fire.

Figure 13. Reasons for combined sprinkler failure and ineffectiveness: 2010-2014

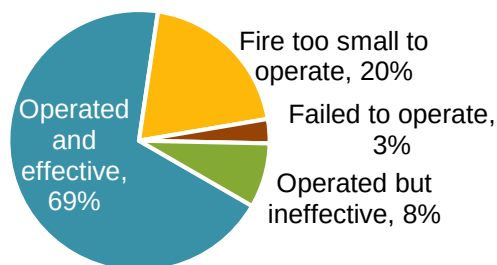


CIVILIAN DEATHS IN SPRINKLERED PROPERTIES

While sprinklers were present in 10% of all properties, only 2% of all fire deaths occurred in these properties. Fires in sprinklered properties killed an average of 42 people per year in 2010-2014. During the same period, fires in properties with no automatic extinguishing systems caused an average of 2,660 civilian deaths per year.

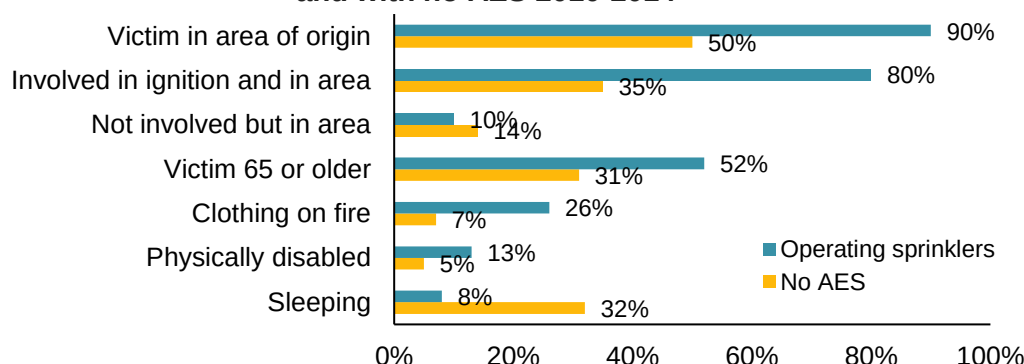
Figure 14 shows that 69% of the deaths in properties with sprinklers were caused by fires in which the sprinklers operated and were effective in controlling the fire. In some of these cases, the sprinklers actually extinguished the fire. The victims were typically fatally injured before the sprinklers activated. In one of every five (20%) such deaths, the fire never became large enough to activate the sprinkler. The sprinklers failed to operate in fires causing 3% of the deaths in sprinklered properties, and operated or were ineffective in controlling fires that caused 8% of the fatalities.

Figure 14. Civilian fire deaths by sprinkler performance: 2010-2014



Compared to victims of fires with no AES, people who died in fires in which sprinklers operated effectively were less likely to have been sleeping and more likely to have been in the area of origin, even more likely to have been involved in the ignition and in the area, to have been at least 65 or older, to have clothing on fire, or to have been physically disabled. Figure 15 shows this contrast; more details are provided in Table 10. Note that many of these differences are also seen in victims of fires with and without working smoke alarms. [5] There are limits to even the best fire protection. When someone is directly involved in the ignition or their clothing is burning, they may be fatally injured before the fire protection operates. If someone is physically incapable of getting themselves to safety, even a fire controlled by sprinklers may still cause harm.

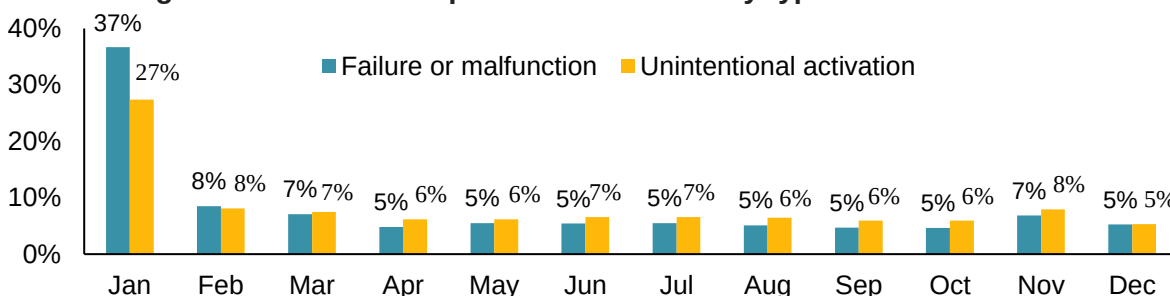
Figure 15. Victim characteristics in fires with effectively operating sprinklers and with no AES 2010-2014



UNWANTED ACTIVATIONS

Fire departments responded to an estimated 29,800 sprinkler activations caused by a system failure or malfunction and 33,600 unintentional sprinkler activations in 2014. According to the *NFIRS 5.0 Complete Reference Guide* [7], false alarms due to sprinkler failures or malfunctions include “any failure of sprinkler equipment that leads to sprinkler activation with no fire present.” It “excludes unintentional operating caused by damage to the sprinkler system.” Unintentional activations also include “testing the sprinkler system without fire department notification.” Figure 16 shows that more than one-third (37%) of the system failures or malfunctions occurred in January, as did one-quarter (27%) of the unintentional activations. This suggests that cold weather may have played a role.

Figure 16. Unwanted sprinkler activations by type and month in 2014



Not all activations result in water flow outside the system. For example, water may flow in the pipes of a dry-pipe system. This could alert a monitoring company and trigger a fire department response.

Sprinklers in Home Fires

SPRINKLER PRESENCE AND TYPE

During 2010-2014, some type of fire sprinkler was present in an average 24,440 reported home structure fires per year. These fires caused an average of 35 civilian deaths, 616 civilian injuries, and \$198 million in direct property damage per year. Properties under construction were excluded from these calculations.

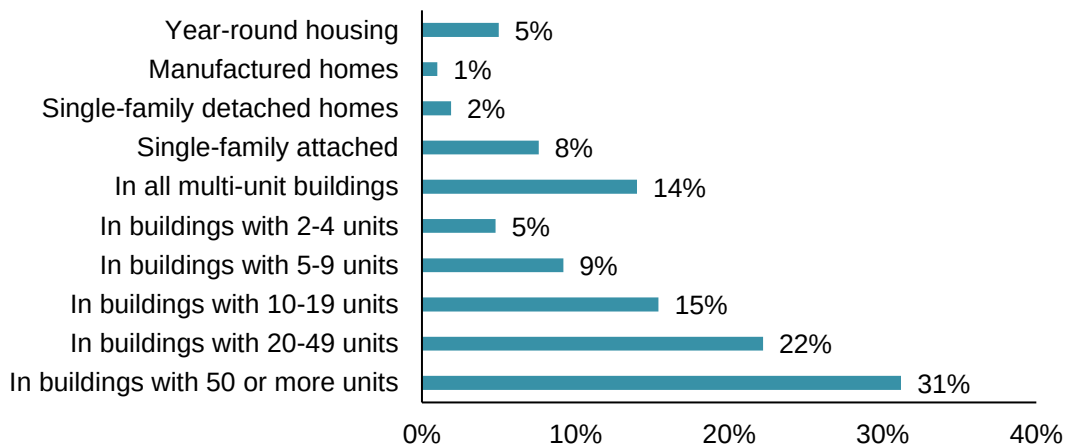
Table B summarizes information about AES in all reported home structure fires except those under construction.

Table B.
Summary of AES presence and type in reported home structure fires
2010-2014 annual averages

AES Presence of Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
AES present	25,700	(7%)	36	(1%)	650	(5%)	\$203	(3%)
Sprinklers present	24,440	(7%)	35	(1%)	616	(5%)	\$198	(3%)
Wet	21,760	(6%)	34	(1%)	581	(5%)	\$184	(3%)
Dry	2,140	(1%)	0	(0%)	26	(0%)	\$10	(0%)
Other	540	(0%)	1	(0%)	9	(0%)	\$4	(0%)
Non-sprinkler AES present	1,260	(0%)	1	(0%)	34	(0%)	\$5	(0%)
Partial system AES	970	(0%)	5	(0%)	31	(0%)	\$17	(0%)
AES Not in fire area and did not operate	600	(0%)	2	(0%)	24	(0%)	\$19	(0%)
None present	329,460	(92%)	2,471	(98%)	11,979	(94%)	\$6,359	(96%)
Total	356,740	(100%)	2,514	(100%)	12,684	(100%)	\$6,599	(100%)

According to the 2011 American Housing Survey, buildings with more housing units were more likely to have sprinklers. Figure 17 shows that 5% of occupied year-round housing units had sprinklers, ranging from a low of 1% in manufactured homes to a high of 31% in buildings with at least 50 units. [7]

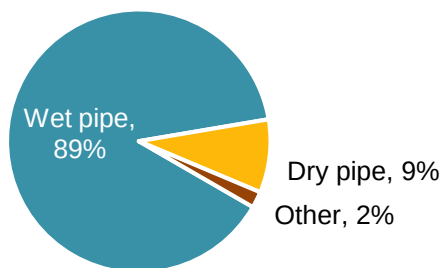
Figure 17. Percentage of occupied units with sprinklers in 2011 American Housing Survey



Source: American Housing Survey

Wet pipe sprinklers accounted for 89% of the sprinklers in reported home fires, dry pipe systems were in 9%, and other types of sprinklers were in 2%. See Figure 18.

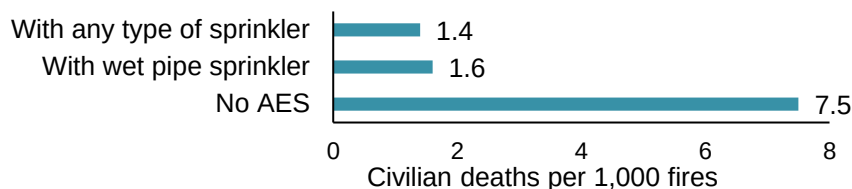
Figure 18. Types of sprinklers found in home structure fires: 2010-2014



FIRES IN HOMES WITH SPRINKLERS VS. NO AES

The death rate per 1,000 reported fires was 81% lower in homes with sprinklers than in homes with no AES. These rates are based strictly on reported presence or absence. Operation is not considered. Figure 19 shows that in reported structure fires with no automatic extinguishing systems (AES) present, the death rate was 7.5 per 1,000 fires. When any type of sprinkler was present, the death rate was 1.4 per 1,000 fires, a reduction of 81%. When wet pipe sprinklers were present, the death rate of 1.4 deaths was 79% lower. With so few deaths in sprinklered properties, the differences are not meaningful.

Figure 19. Civilian death rates per 1,000 fires in homes with sprinklers and with no AES 2010-2014



The civilian injury rate per 1,000 reported fires was 31% lower in homes with sprinklers than in homes with no AES. Figure 20 shows that when any type of sprinklers were present, reported civilian injuries averaged 25 per year, compared to 34 per year in which no AES was present. The injury rate for wet pipe sprinklers of 27 per 1,000 fires was 27% lower than in fires with no AES. In many cases, the fire was too small to operate. In others, someone was injured while trying to fight a fire in the initial moments before a sprinkler operated.

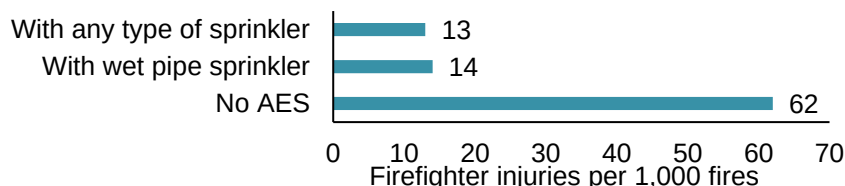
Figure 20. Civilian injury rates per 1,000 fires in homes with sprinklers and with no AES 2010-2014



2012 Fire Protection Research Foundation study found that sprinkler presence was associated with a 53% reduction in the medical cost of civilian injuries per 100 home fires. In addition, larger percentages of injuries in sprinklered homes resulted from fires that were limited to the object or room of origin than in home fires without sprinklers. [8]

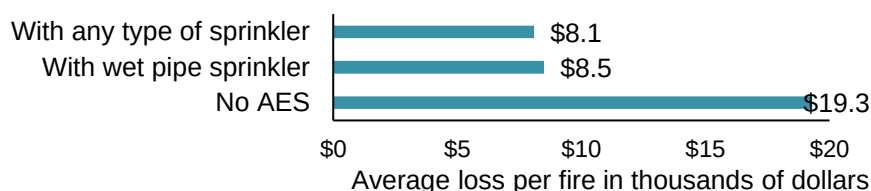
The average firefighter fireground injury rate per 1000 reported home fires was 79% lower when sprinklers were present than in fires with no AES. Figure 21 shows that when sprinklers were present, 13 firefighters were injured per 1000 fires, compared to 62 firefighter injuries per 1,000 fires in properties without AES protection.

Figure 21. Firefighter injury rates per 1,000 fires in homes with sprinklers and with no AES 2010-2014



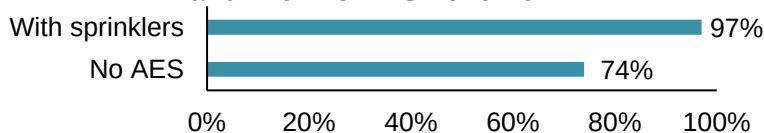
When sprinklers were present in reported home fires, the average property loss per fire was less than half the average in homes with no AES. Figure 22 shows that when any type of fire sprinkler was present in reported fires, the average loss was \$8,100 per fire. This was 58% lower than the \$19,300 average in home fires in which no AES was present. When wet pipe sprinklers were present, the average loss of \$8,500 was 56% lower than in homes with no AES.

Figure 22. Average loss per fire in homes with sprinklers and with no AES 2010-2014



When sprinklers were present, flame damage was confined to the room of origin in 97% of fires compared to 74% of fires without AES. See Figure 23. In a change from previous editions of this report, fires with NFIRS incident types indicating confined structure fires (NFIRS incident type codes 113-118) were all considered to have been confined to the room of origin.

Figure 23. Percent of fires confined to room of origin in homes with sprinklers and with no AES 2010-2014

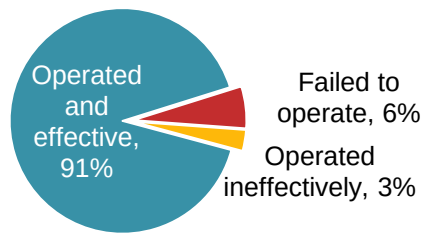


SPRINKLER OPERATION, EFFECTIVENESS AND PROBLEMS IN HOME FIRES

Sprinklers operated in 94% of home fires in which sprinklers were present and fires were considered large enough to activate them.³ They were effective at controlling the fire in 96% of fires in which they operated. Figure 24 shows that, taken together, sprinklers operated effectively in 91% of the fires large enough to trigger them.

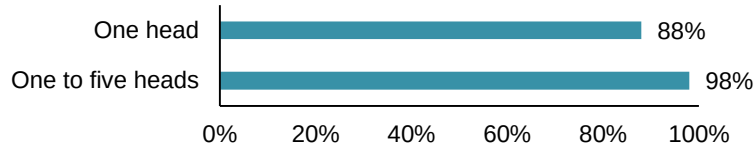
³ These calculation exclude fires with confined structure fire incident types (NFIRS incident types 113-118). Among confined fires with sprinklers present, the fire was too small to operate 74% of the time, sprinklers operated and were effective 22% of the time and failed to operate 4% of the time. Since these fires are, by definition, confined, it is likely that a substantial share of fires in which the sprinklers were said to fail, were, in fact, too small to cause the sprinkler to operate. The 34% of non-confined (NFIRS incident types 110-123, excluding 113-118) that were too small to activate the sprinkler and 1% of non-confined structure fires with unclassified operation were also excluded.

Figure 24. Sprinkler operation and effectiveness in home fires: 2010-2014



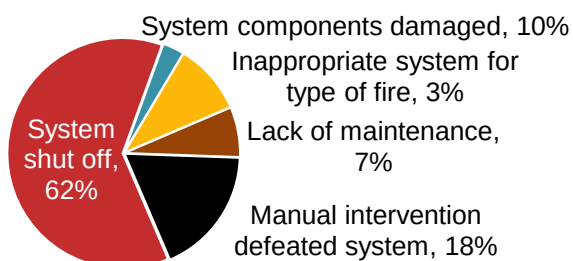
In 98% of home fires with operating sprinklers, five or fewer heads operated. Figure 25 shows that only one sprinkler operated in 88% of fires with operating sprinklers of all types. The percentage of fires in which only one head operated is higher in this report than in previous editions because fires sprinklers operating in fires with the NFIRS confined fire incident types were included in the calculations.

Figure 25. When sprinklers operated, percentage of home fires in which one or one to five heads operated 2010-2014



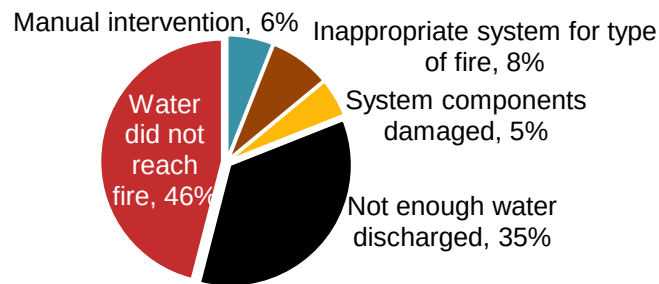
In three of every five (62%) home fires in which sprinklers failed to operate, the system had been shut off. Figure 26 shows that manual intervention defeated the system in 18% of the incidents. System components were damaged in 10% of these fires, lack of maintenance caused 7% of the failures, and 3% occurred because the system was inappropriate for the type of fire that occurred.

Figure 26. Reasons for sprinkler failures in home fires: 2010-2014



In almost half (46%) of home fires in which sprinklers were ineffective, the water did not reach the fire. Figure 27 shows that in one-third (35%) of the incidents, not enough water was discharged. The system was inappropriate for the type of fire in 8% of the incidents. In 5%, system components were damaged. Manual intervention was the cause of 6% of ineffective systems. Table 8 provides more details by occupancy and by type of sprinkler.

Figure 27. Reasons for sprinkler ineffectiveness in home fires: 2010-2014

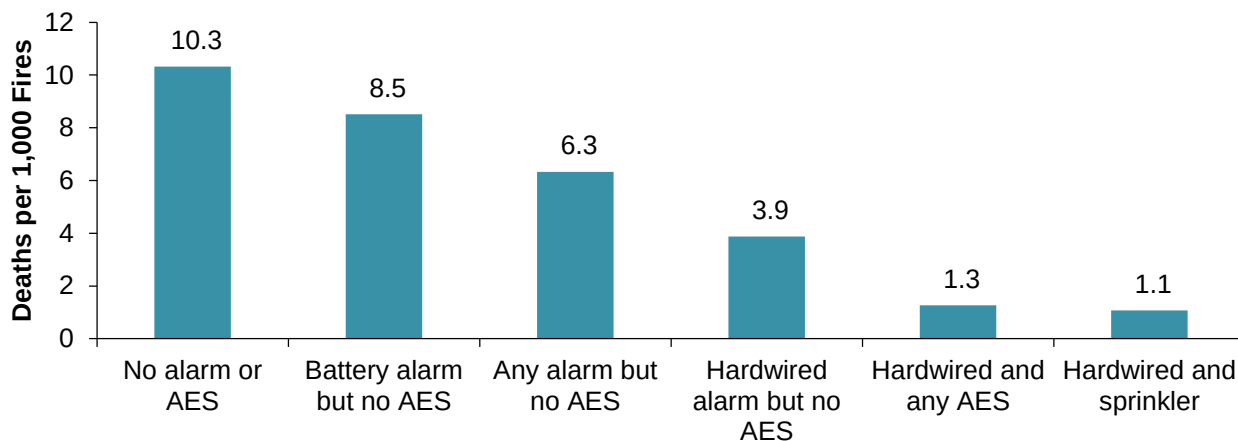


IMPACT OF SMOKE ALARMS AND SPRINKLERS IN DEATHS PER 1,000 HOME FIRES

The lowest home fire death rate per 1,000 reported fires is found in homes with sprinkler systems and hardwired smoke alarms. Figure 28 shows that compared to reported home fires (excluding manufactured home fires) with no smoke alarms or automatic extinguishing systems/equipment (AES) at all, the death rate per 1,000 reported fires was:

- 18% lower when battery-powered smoke alarms were present but AES were not;
- 39% lower when smoke alarms with any power source were present but AES were not;
- 62% lower when hardwired smoke alarms were present but AES were not;
- 88% lower when hardwired smoke alarms and any AES were present; and
- 90% lower when sprinklers and hard-wired smoke alarms were present.

Figure 28. Average Fire Death Rate per 1,000 Reported Home Structure Fires by Presence of Smoke Alarms and AES 2010-2014



UNWANTED ACTIVATIONS

Fire departments responded to an estimated 5,600 non-fire activations of home fire sprinklers caused by a system failure or malfunction and 6,800 unintentional sprinkler activations in 2014. Note that activations in manufactured homes could not be identified or screened out. According to the NFIRS Complete Reference Guide, [9] sprinkler failures or malfunctions include “any failure of sprinkler equipment that leads to sprinkler activation with no fire present.” It. “excludes unintentional operating caused by damage to the sprinkler system.” The latter should be considered unintentional activations. Unintentional activations also include “testing the sprinkler system without fire department notification.

20 YEARS OF HOME FIRE SPRINKLERS IN SCOTTSDALE, ARIZONA

Survey in Scottsdale, Arizona found that home fire sprinklers were still operational after 20 years.

In his 2008 Executive Fire Officer Program Applied Research Project, [Residential fire sprinkler reliability in homes older than 20 years old in Scottsdale, AZ](#), Richard Upham described the results of a survey he conducted of owners of single-family homes built in 1986-1988 after requirements for residential sprinkler systems took effect. [10] Respondents could check yes, no or unsure to four questions. They could also request a free inspection of their system.

Excluding blanks and responses of unsure, all of the respondents answered “Yes” when asked “To the best of your knowledge, is your fire sprinkler system still in operation?”

With the same exclusions, 89% said “No” when asked “Has your sprinkler system ever had a leak or maintenance problem?” The author noted that leaks or maintenance issues on Scottsdale were usually due to either relief valves that had developed a leak or sprinkler heads that were unintentionally damaged. He also noted that more than 300,000 Omega sprinkler heads manufactured between 1983 and 1998 were replaced in Scottsdale after a recall. Some of these may have been considered maintenance issues.

Again, with the same exclusions, slightly more than half (54%) said “Yes” to “Has your fire sprinkler system ever been inspected?” Two (1%) of the respondents said “Yes” to “Has your fire sprinkler system ever been activated as a result of fire?”

Two-thirds provided contact information to request a free fire department inspection of their sprinkler system. No issues were found that would have prevented the systems from working in the 60 inspections completed when his paper was written.

CONCLUSIONS AND FURTHER READING

Sprinklers are a very reliable and effective part of fire protection. Their impact is seen most strongly in the reduction of civilian fire deaths per 1,000 reported fires when sprinklers are present compared to fires without AES. Notable reductions are also seen in injury rates, and in most occupancies, average loss per fire. Increasing the usage of sprinklers will the reduce loss of life and property from fire.

NFPA standards provide essential guidance in installation, inspection, testing, maintenance, integration of sprinklers with other systems, and in evaluating needs when an occupancy changes use or contents. See

- [NFPA 13: Standard for the Installation of Sprinkler Systems](#),
- NFPA, 13D, [Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes](#),
- NFPA 13R, [Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies](#),
- [NFPA 25: Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2017 edition](#), Quincy, MA, U.S.: NFPA, 2016. See NFPA 25 for minimum inspection, testing, and maintenance requirements for sprinkler systems.
- [NFPA 4: Standard for the Integrated Fire Protection and Life Safety Systems Testing](#), 2015 Edition, Quincy, MA, U.S.: NFPA, 2014. See NFPA 4 for test protocols to ensure that the fire protection and life safety systems will function correctly together.
- [NFPA 1, Fire Code](#), 2015 Edition, Quincy, MA, U.S.: NFPA, 2014. NFPA 1 has evaluation requirements to assess the adequacy of existing sprinkler systems if the use or contents in the space have changed.

Because sprinklers control fires in the early stages, far less water is needed than if the fire extinguished by traditional methods. See FM Global's 2010 report, [*The Environmental Impact of Automatic Fire Sprinklers*](#).

See www.firesprinklerinitiative.org for resources to help increase the number of new one- and two-family homes built protected by sprinklers and to reduce this death toll. Three out of every five fire deaths were caused by fires in one- or two-family homes, excluding manufactured housing. Sprinklers were present in only 1.5% of the fires in these properties.

The Fire Protection Research Foundation has produced a number of reports to inform home fire sprinkler codes and standards. See:

- [Stakeholder Perceptions of Home Fire Sprinklers](#) (2016)
- [Home Fire Sprinkler Cost Assessment](#) (2013)
- [Sprinkler Impact on Fire Injury](#) (2012)
- [Residential Fire Sprinklers - Water Usage and Water Meter Performance Study](#) (2011)
- [Sprinkler Insulation: A Literature Review](#) (2011)
- [Incentives for the Use of Residential Fire Sprinkler Systems in U.S. Communities](#) (2010)
- [Analysis of the Performance of Residential Sprinkler Systems with Sloped or Sloped and Beamed Ceilings](#) (2010)
- [Antifreeze Solutions in Home Fire Sprinkler Systems - Phase II Interim Report](#) (2010)
- [Antifreeze Solutions in Home Fire Sprinkler Systems - Literature Review and Research Plan](#)

Table 1.
Presence of Sprinklers in Structure Fires by Property Use, Excluding Properties under Construction

Number of Structure Fires With Equipment Present and Percentage of Total Structure Fires in Property Use								
Property Use	Any Automatic Extinguishing Equipment						Any Sprinkler	
	1980-1984		1994-1998		2010-2014		2010-2014	
All public assembly	4,280	(13%)	4,380	(26%)	6,610	(47%)	3,760	(27%)
Variable-use amusement place	120	(8%)	140	(16%)	240	(21%)	190	(17%)
Religious property	50	(2%)	90	(5%)	230	(14%)	180	(10%)
Library or museum	80	(14%)	110	(28%)	260	(44%)	230	(39%)
Eating or drinking establishment	3,310	(16%)	3,240	(29%)	4,360	(59%)	1,860	(25%)
Passenger terminal	70	(20%)	60	(35%)	400	(54%)	390	(53%)
Educational property	1,620	(13%)	1,820	(24%)	2,130	(43%)	1,950	(39%)
Health care property*	6,920	(47%)	4,400	(68%)	3,350	(53%)	3,100	(49%)
Nursing home	2,250	(61%)	2,060	(76%)	1,870	(70%)	1,780	(67%)
Hospital	3,370	(47%)	1,650	(74%)	900	(79%)	770	(67%)
Prison or jail	370	(10%)	430	(19%)	260	(59%)	250	(56%)
All residential	7,090	(1%)	11,110	(3%)	33,880	(9%)	31,500	(8%)
Home (including apartment)	5,120	(1%)	8,440	(2%)	26,390	(7%)	24,440	(7%)
Hotel or motel	1,590	(15%)	1,690	(35%)	2,130	(58%)	2,020	(55%)
Dormitory or barracks	430	(16%)	620	(29%)	2,210	(56%)	2,100	(53%)
Rooming or boarding home	70	(4%)	230	(17%)	1,120	(40%)	1,100	(39%)
Residential board and care home or assisted living	Not available		Not available		990	(52%)	950	(50%)
Store or office	5,510	(13%)	5,230	(21%)	5,380	(32%)	4,270	(25%)
Grocery or convenience store	1,160	(15%)	1,190	(27%)	1,820	(47%)	1,000	(26%)
Laundry or dry cleaning or other professional service	330	(8%)	310	(13%)	320	(21%)	310	(20%)
Department store	1,340	(44%)	1,100	(52%)	460	(46%)	440	(44%)
Office	1,240	(12%)	1,470	(25%)	1,150	(37%)	1,100	(36%)
Manufacturing facility	11,910	(44%)	6,400	(50%)	2,660	(55%)	2,390	(50%)
All storage	1,430	(2%)	1,090	(3%)	680	(3%)	660	(3%)
Warehouse excluding cold storage*	1,060	(13%)	740	(22%)	370	(30%)	360	(29%)
All structures	38,620	(4%)	37,100	(7%)	57,430	(12%)	49,840	(10%)

* “Health care property” includes other facilities not listed separately. In 1980-84 and 1994-98, this category excludes doctors’ offices and care of aged facilities without nursing staff (which are assumed to be residential board and care facilities).

Notes: These are structure fires reported to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. Post-1998 estimates are based only on fires reported in Version 5.0 of NFIRS and include fires reported as confined fires. After 1998, buildings under construction are excluded. Sprinkler statistics exclude partial systems and installations with no sprinklers in fire area.

Table 2.
Type of Sprinkler Reported in Structure Fires
Where Equipment Was Present in Fire Area, Excluding Properties under Construction
by Property Use: 2010-2014 Annual Averages

Property Use	Fires per year with any type of sprinkler	Wet pipe sprinklers	Dry pipe sprinklers	Other sprinklers*
All public assembly	3,760	3,080 (82%)	300 (8%)	380 (10%)
Variable-use amusement place	190	170 (91%)	20 (8%)	0 (1%)
Religious property	180	160 (88%)	10 (3%)	10 (6%)
Library or museum	230	210 (91%)	20 (9%)	0 (1%)
Eating or drinking establishment	1,860	1,450 (78%)	130 (7%)	280 (15%)
Passenger terminal	390	280 (73%)	50 (13%)	50 (13%)
Educational property	1,950	1,670 (86%)	220 (11%)	60 (3%)
Health care property**	3,100	2,740 (88%)	300 (10%)	60 (2%)
Nursing home	1,780	1,550 (87%)	180 (10%)	40 (2%)
Hospital	770	690 (89%)	80 (10%)	0 (0%)
Prison or jail	250	210 (85%)	30 (11%)	10 (4%)
All residential	31,500	28,050 (89%)	2,700 (9%)	660 (2%)
Home (including apartment)	24,440	21,760 (89%)	2,140 (9%)	540 (2%)
Dormitory or barracks	2,100	1,910 (91%)	160 (8%)	20 (1%)
Hotel or motel	2,020	1,850 (92%)	130 (7%)	40 (2%)
Rooming or boarding house	1,100	970 (88%)	130 (12%)	0 (0%)
Residential board and care or assisted living	950	840 (89%)	90 (9%)	20 (2%)
Store or office	4,270	3,710 (87%)	430 (10%)	140 (3%)
Grocery or convenience store	1,000	830 (83%)	90 (9%)	80 (8%)
Laundry or dry cleaning or other professional service	310	270 (87%)	40 (13%)	0 (1%)
Department store	440	380 (86%)	60 (13%)	10 (1%)
Office	1,100	980 (89%)	100 (9%)	20 (2%)
Manufacturing facility	2,390	2,010 (84%)	290 (12%)	90 (4%)
All storage	660	510 (77%)	150 (23%)	0 (1%)
Warehouse excluding cold storage	360	300 (82%)	60 (17%)	0 (1%)
All structures ***	49,840	43,540 (87%)	4,770 (10%)	1,530 (3%)

* Includes deluge and pre-action sprinkler systems and may include sprinklers of unknown or unreported type.

** Nursing home, hospital, clinic, doctor's office, or development disability facility

*** Includes some property uses that are not shown separately.

Note: These are based on structure fires reported to U.S. municipal fire departments in NFIRS Version 5.0 and so exclude fires reported only to federal or state agencies or industrial fire brigades. Row totals are shown in the leftmost column of percentages, and sums may not equal totals because of rounding error. In Version 5.0 of NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. This field is not required if the fire did not begin within the designed range of the system. Buildings under construction and partial systems are excluded.

Source: NFIRS and NFPA fire experience survey.

Table 3.
Estimated Reduction in Civilian Deaths per Thousand Fires
Associated With All Types of Sprinklers,
by Property Use (Excluding Properties under Construction): 2010-2014 Annual Averages

Property Use	Without AES	With sprinklers of any type	Percent reduction from no AES	With wet pipe sprinklers	Percent reduction from no AES
All public assembly	0.7	0.0	100%	0.0	100%
Health care	0.9	0.3	71%	0.1	83%
Residential	7.5	1.1	85%	1.2	84%
Home (including apartment)	7.5	1.4	81%	1.6	79%
Dormitory or barracks	0.4	0.0	100%	0.0	100%
Hotel or motel	7.0	0.3	95%	0.0	100%
Rooming or boarding house	8.4	0.3	96%	0.4	96%
Residential board and care or assisted living	7.2	1.3	82%	1.5	80%
Store or office	0.9	0.3	68%	0.3	63%
Manufacturing facility	1.6	1.0	33%	1.2	21%
Warehouse excluding cold storage	2.7	0.6	79%	0.7	74%
All structures	6.3	0.8	87%	0.9	86%

Note: These are national estimates of structure fires reported to U.S. municipal fire departments, based on fires reported in NFIRS Version 5.0, and so exclude fires reported only to federal or state agencies or industrial fire brigades.

Source: NFIRS and NFPA fire experience survey.

Table 4.
Estimated Reduction in Average Direct Property Loss per Fire
Associated With All Types of Sprinklers
by Property Use (Excluding Properties under Construction): 2010-2014 Annual Averages

Property Use	Loss without AES	Loss with sprinklers of any type	Percent reduction	Loss with wet pipe sprinklers	Percent reduction from no AES
All public assembly	\$37,900	\$9,100	76%	\$8,900	77%
Health care*	\$14,900	\$4,000	73%	\$3,700	75%
Residential	\$19,200	\$7,100	63%	\$7,300	62%
Home (including apartment)	\$19,300	\$8,100	58%	\$8,500	56%
Dormitory or barracks	\$3,900	\$1,300	67%	\$1,400	65%
Hotel or motel	\$35,200	\$10,900	69%	\$10,700	70%
Rooming or boarding house	\$12,200	\$1,700	86%	\$1,800	85%
Residential board and care or assisted living	\$5,500	\$2,300	58%	\$2,400	55%
Store or office	\$52,400	\$26,100	50%	\$26,300	50%
Manufacturing facility	\$107,200	\$82,500	23%	\$70,900	34%
Warehouse excluding cold storage	\$90,700	\$138,300	no reduction	\$120,800	no reduction
All structures	\$20,400	\$14,200	30%	\$13,300	35%

*Nursing home, hospital, clinic, doctor's office, or other medical facility.

Note: These are national estimates of structure fires reported to U.S. municipal fire departments, based on fires reported in NFIRS Version 5.0, and so exclude fires reported only to federal or state agencies or industrial fire brigades.

Source: NFIRS and NFPA fire experience survey.

Table 5.
Percentage of Fires with Fire Spread Confined to Room of Origin in Fires
with Sprinklers Present vs. No Automatic Extinguishing System
2010-2014 Annual Averages

Property Use	Percentage of fires confined to room of origin excluding structures under construction and sprinklers not in fire area		
	With no AES	With sprinklers of any type	Difference (in percentage points)
Public assembly	75%	93%	18%
Religious property	72%	90%	18%
Library or museum	83%	97%	14%
Eating or drinking establishment	70%	92%	22%
Educational	88%	97%	9%
Health care property*	92%	98%	6%
Residential	73%	97%	24%
Home (including apartment)	74%	97%	23%
Dormitory or barracks	96%	99%	3%
Hotel or motel	82%	97%	15%
Store or office	65%	92%	26%
Grocery or convenience store	69%	93%	24%
Department store	65%	72%	7%
Office building	72%	94%	22%
Manufacturing facility	62%	85%	22%
Storage	26%	87%	61%
Warehouse excluding cold storage	53%	77%	24%
All structures**	71%	96%	25%

* Nursing home, hospital, clinic, doctor's office, or other medical facility.

** Includes some properties not listed separately above.

Note: Percentages are based on structure fires reported in NFIRS Version 5.0 to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. All fires with one of the six NFIRS confined structure fire incident types were considered confined to the object of origin by definition. Fires that were confined to the room of origin include fires confined to the object of origin. In NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. This field is not required if the fire did not begin within the designed range of the system.

Source: NFIRS and NFPA fire experience survey.

Table 6.
Sprinkler Reliability and Effectiveness When Fire Was Coded as Not Confined and Large Enough to
Activate Sprinkler and Sprinkler Was Present in Area of Fire,
by Property Use: 2010-2014 Annual Averages

A. All Sprinklers

Property Use	Number of fires per year where sprinklers were present	Non-confined fires too small to activate or unclassified operation	Fires coded as confined fires	Number of qualifying fires per year	Percent where equipment operated (A)	Percent effective of those that operated (B)	Percent where equipment operated effectively (A x B)
All public assembly	3,760	590	2,540	640	90%	94%	85%
Eating or drinking establishment	1,860	300	1,150	410	90%	92%	83%
Educational property	1,950	420	1,360	180	87%	96%	84%
Health care property*	3,100	600	2,200	310	85%	97%	82%
All residential	31,500	2,490	24,870	4,140	93%	96%	89%
Home (including apartment)	24,440	1,900	18,970	3,570	94%	96%	91%
Hotel or motel	2,020	350	1,340	330	90%	98%	89%
Store or office	4,270	1,030	2,200	1,040	91%	96%	87%
Grocery or convenience store	1,000	240	570	190	89%	93%	83%
Department store	440	160	170	120	90%	98%	88%
Office	1,100	230	700	180	91%	96%	87%
Manufacturing facility	2,390	610	760	1,030	91%	94%	85%
All storage	660	140	220	300	86%	96%	82%
Warehouse excluding cold storage	360	80	90	180	84%	97%	81%
All structures**	49,840	6,350	35,460	8,040	92%	96%	88%

* Nursing home, hospital, clinic, doctor's office, or other medical facility.

** Includes some properties not listed separately above.

Note: These are percentages of fires reported to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. In Version 5.0 of NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. This field is not required if the fire did not begin within the designed range of the system. Buildings under construction are excluded. Percentages are based on estimated total fires reported in NFIRS Version 5.0 with the indicated type of automatic extinguishing system and system performance not coded as fire too small to activate systems. Fires are excluded if the reason for failure or ineffectiveness is "system not present in area of fire." Fires are recoded from "operated but ineffective" to "failed to operate" if the reason for failure or ineffectiveness was "system shut off." Fires are recoded from "failed to operate" to "operated but ineffective" if the reason for failure or ineffectiveness was "not enough agent" or "agent did not reach fire."

Source: NFIRS and NFPA fire experience survey.

Table 6. (Continued)
Sprinkler Reliability and Effectiveness When Fire Was Coded as Not Confined and Large Enough to
Activate Sprinkler and Sprinkler Was Present in Area of Fire,
by Property Use: 2010-2014 Annual Averages

B. Wet Pipe Sprinklers Only

Property Use	Number of fires per year where sprinklers were present	Non-confined fires too small to activate or unclassified operation	Fires coded as confined fires	Number of qualifying fires per year	Percent where equipment operated (A)	Percent effective of those that operated (B)	Percent where equipment operated effectively (A x B)
All public assembly	3,080	490	2,030	560	90%	96%	86%
Eating or drinking establishment	1,450	250	860	340	93%	95%	89%
Educational property	1,670	370	1,140	160	90%	96%	86%
Health care property*	2,740	530	1,940	270	88%	97%	85%
All residential	28,050	2,320	21,970	3,770	96%	96%	93%
Home (including apartment)	21,760	1,680	16,730	3,350	95%	96%	91.2%
Hotel or motel	1,850	320	1,240	300	91%	99%	89.8%
Store or office	3,710	890	1,860	950	90%	96%	87%
Grocery or convenience store	830	210	460	170	89%	95%	85%
Department store	380	140	140	110	89%	99%	88%
Office	980	200	620	160	91%	98%	89%
Manufacturing facility	2,010	520	650	850	91%	94%	86%
All storage	510	100	150	250	82%	96%	79%
Warehouse excluding cold storage	290	60	80	160	84%	97%	82%
All Structures**	43,540	5,540	30,790	7,210	89%	96%	86%

* Nursing home, hospital, clinic, doctor's office, or other medical facility.

** Includes some properties not listed separately above.

Note: These are percentages of fires reported to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. In Version 5.0 of NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. This field is not required if the fire did not begin within the designed range of the system. Buildings under construction are excluded. Percentages are based on estimated total fires reported in NFIRS Version 5.0 with the indicated type of automatic extinguishing system and system performance not coded as fire too small to activate systems. Fires are excluded if the reason for failure or ineffectiveness is "system not present in area of fire." Fires are recoded from "operated but ineffective" to "failed to operate" if the reason for failure or ineffectiveness was "system shut off." Fires are recoded from "failed to operate" to "operated but ineffective" if the reason for failure or ineffectiveness was "not enough agent" or "agent did not reach fire."

Source: NFIRS and NFPA fire experience survey.

Table 6. (Continued)
Sprinkler Reliability and Effectiveness When Fire Was Coded as Not Confined and Large Enough to
Activate Sprinkler and Sprinkler Was Present in Area of Fire,
by Property Use: 2010-2014 Annual Averages

C. Dry Pipe Sprinklers Only

Property Use	Number of fires per year where sprinklers were present	Non-confined fires too small to activate or unclassified operation	Fires coded as confined fires	Number of qualifying fires per year	Percent where equipment operated (A)	Percent effective of those that operated (B)	Percent where equipment operated effectively (A x B)
All residential	2,700	240	2,230	230	79%	95%	76%
Homes	2,140	180	1,800	160	91%	95%	88%
Store or office	450	110	260	80	77%	89%	68%
Manufacturing facility	290	70	80	150	82%	93%	77%
All storage	150	40	70	50	73%	93%	68%
All structures*	4,770	660	3,480	630	79%	94%	74%

* Includes some properties not listed separately above.

Note: These are percentages of fires reported to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. In Version 5.0 of NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. This field is not required if the fire did not begin within the designed range of the system. Buildings under construction are excluded. Percentages are based on estimated total fires reported in NFIRS Version 5.0 with the indicated type of automatic extinguishing system and system performance not coded as fire too small to activate systems. Fires are excluded if the reason for failure or ineffectiveness is “system not present in area of fire.” Fires are recoded from “operated but ineffective” to “failed to operate” if the reason for failure or ineffectiveness was “system shut off.” Fires are recoded from “failed to operate” to “operated but ineffective” if the reason for failure or ineffectiveness was “not enough agent” or “agent did not reach fire.”

Source: NFIRS and NFPA fire experience survey.

Table 7.
Number of Sprinklers Operating, by Type of Sprinkler
2010-2014 Structure Fires Excluding Properties under Construction

Number of Sprinklers Operating	Percentage of structure fires where that many sprinklers operated			
	Wet pipe	Dry pipe	Other type sprinkler	All sprinklers
1	80%	67%	51%	79%
1 or 2	93%	82%	66%	91%
1 to 3	95%	87%	77%	94%
1 to 4	97%	89%	86%	96%
1 to 5	97%	92%	88%	97%
1 to 10	99%	97%	99%	99%

Note: Percentages are based on structure fires reported in NFIRS Version 5.0 to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. Percentages are based on fires where sprinklers were reported present and operating and there was reported information on number of sprinklers operating. Figures reflect recodings explained in Introduction: Fires are excluded if the reason for failure or ineffectiveness is “system not present in area of fire.” Fires are recoded from “operated but ineffective” to “failed to operate” if the reason for failure or ineffectiveness was “system shut off.” Fires are recoded from “failed to operate” to “operated but ineffective” if the reason for failure or ineffectiveness was “not enough agent” or “agent did not reach fire.” In NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. Buildings under construction are excluded, as are partial systems and fires reported as confined fires.

Source: NFIRS and NFPA fire experience survey.

Table 8.
Reasons for Failure to Operate in Fires with Non-Confined Structure Fire Incident Types
Large Enough to Activate Sprinkler that Was Present in Area of Fire, by Property Use
Based on Estimated Number of 2010-2014 Structure Fires per Year

A. All Sprinklers

Property Use	System shut off	Manual intervention defeated system	System component damaged	Lack of maintenance	Inappropriate system for type of fire	Total fires per year
All public assembly	45%	17%	4%	22%	12%	63
Eating or drinking establishment	43%	12%	3%	27%	15%	39
All residential	59%	21%	9%	7%	4%	257
Home (including apartment)	62%	18%	10%	7%	3%	203
Store or office	62%	16%	7%	5%	9%	97
Manufacturing facility	59%	14%	5%	12%	9%	89
All structures*	59%	17%	7%	10%	7%	657

* Includes some properties not listed separately above.

Note: Percentages are based on structure fires reported in NFIRS Version 5.0 to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. Percentages are based on fires where sprinklers were reported present and operating and there was reported information on number of sprinklers operating. Figures reflect recodings explained in Introduction: Fires are excluded if the reason for failure or ineffectiveness is “system not present in area of fire.” Fires are recoded from “operated but ineffective” to “failed to operate” if the reason for failure or ineffectiveness was “system shut off.” Fires are recoded from “failed to operate” to “operated but ineffective” if the reason for failure or ineffectiveness was “not enough agent” or “agent did not reach fire.” In NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. Buildings under construction are excluded, as are partial systems and fires reported as confined fires. Fires reported with unclassified reason for failure are treated as cases of unknown reasons for failure.

Source: NFIRS and NFPA fire experience survey.

Table 8. (Continued)
Reasons for Failure to Operate in Fires with Non-Confined Structure Fire Incident Types
Large Enough to Activate Sprinkler that Was Present in Area of Fire, by Property Use
Based on Estimated Number of 2010-2014 Structure Fires per Year

B. Wet Pipe Sprinklers Only

Property Use	System shut off	Manual intervention defeated system	System component damaged	Lack of maintenance	Inappropriate system for type of fire	Total fires per year
All public assembly	50%	24%	3%	13%	10%	44.00
Eating or drinking establishment	47%	16%	5%	21%	11%	25.00
All residential	60%	21%	9%	6%	4%	225.00
Home (including apartment)	63%	19%	9%	6%	3%	181.00
Store or office	60%	19%	8%	4%	10%	81.00
Manufacturing facility	58%	18%	2%	8%	14%	64.00
All structures*	59%	20%	7%	7%	7%	530.00

C. Dry Pipe Sprinklers Only

Property Use	System shut off	Manual intervention defeated system	System component damaged	Lack of maintenance	Inappropriate system for type of fire	Total fires per year
All structures	61%	9%	8%	16%	5%	98.00

* Includes some properties not listed separately above.

Note: Percentages are based on structure fires reported in NFIRS Version 5.0 to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. Percentages are based on fires where sprinklers were reported present and operating and there was reported information on number of sprinklers operating. Figures reflect recodings explained in Introduction: Fires are excluded if the reason for failure or ineffectiveness is “system not present in area of fire.” Fires are recoded from “operated but ineffective” to “failed to operate” if the reason for failure or ineffectiveness was “system shut off.” Fires are recoded from “failed to operate” to “operated but ineffective” if the reason for failure or ineffectiveness was “not enough agent” or “agent did not reach fire.” In NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. Buildings under construction are excluded, as are partial systems and fires reported as confined fires. Fires reported with unclassified reason for failure are treated as cases of unknown reasons for failure.

Source: NFIRS and NFPA fire experience survey.

Table 9.
Reasons for Ineffectiveness in Fires with Non-Confined Structure Fire Incident Types
Large Enough to Activate Sprinkler that Was Present in Area of Fire, by Property Use
Based on Estimated Number of 2010-2014 Structure Fires per Year

A. All Sprinklers

Property Use	Water did not reach fire	Not enough water released	System Component damaged	Manual intervention defeated system	Lack of maintenance	Inappropriate system for type of fire	Fires per year
All public assembly	69%	21%	0%	0%	5%	5%	41
Eating or drinking establishment	69%	25%	0%	0%	6%	0%	33
All residential	39%	40%	7%	3%	5%	7%	119
Home (including apartment)	40%	35%	8%	3%	6%	9%	102
Store or office	39%	32%	8%	13%	4%	4%	34
Manufacturing facility	39%	26%	9%	9%	13%	6%	62
All structures*	44%	30%	8%	7%	7%	5%	300

* Includes some properties not listed separately above.

Note: Percentages are based on structure fires reported in NFIRS Version 5.0 to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. Percentages are based on fires where sprinklers were reported present and operating and there was reported information on number of sprinklers operating. Figures reflect recodings explained in Introduction: Fires are excluded if the reason for failure or ineffectiveness is “system not present in area of fire.” Fires are recoded from “operated but ineffective” to “failed to operate” if the reason for failure or ineffectiveness was “system shut off.” Fires are recoded from “failed to operate” to “operated but ineffective” if the reason for failure or ineffectiveness was “not enough agent” or “agent did not reach fire.” In NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. Buildings under construction are excluded, as are partial systems and fires reported as confined fires. Fires reported with unclassified reason for failure are treated as cases of unknown reasons for failure.

Source: NFIRS and NFPA fire experience survey.

Table 9. (Continued)
Reasons for Ineffectiveness When Fire Was Coded as Not Confined and Large Enough to Activate Sprinkler
and Equipment that Was Present in Area of Fire, by Property Use
Based on Estimated Number of 2010-2014 Structure Fires per Year

B. Wet Pipe Sprinklers Only

Property Use	Water did not reach fire	Not enough water released	System component damaged	Manual intervention defeated system	Lack of maintenance	Inappropriate system for type of fire	Total fires per year
All public assembly	66%	26%	0%	0%	0%	8%	25
Eating or drinking establishment	66%	34%	0%	0%	0%	0%	17
All residential	42%	37%	8%	3%	3%	6%	108
Home (including apartment)	43%	33%	10%	4%	3%	7%	93
Store or office	34%	35%	6%	19%	0%	5%	29
Manufacturing facility	36%	31%	3%	12%	12%	6%	46
All structures*	43%	32%	6%	10%	5%	5%	240

C. Dry Pipe Sprinklers Only

Property Use	Water did not reach fire	Not enough water released	System component damaged	Manual intervention defeated system	Lack of maintenance	Inappropriate system for type of fire	Total fires per year
All structures	42%	27%	11%	0%	12%	8%	33

* Includes some properties not listed above.

Note: Percentages are based on structure fires reported in NFIRS Version 5.0 to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. Percentages are based on fires where sprinklers were reported present and operating and there was reported information on number of sprinklers operating. Figures reflect recodings explained in Introduction: Fires are excluded if the reason for failure or ineffectiveness is “system not present in area of fire.” Fires are recoded from “operated but ineffective” to “failed to operate” if the reason for failure or ineffectiveness was “system shut off.” Fires are recoded from “failed to operate” to “operated but ineffective” if the reason for failure or ineffectiveness was “not enough agent” or “agent did not reach fire.” In NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. Buildings under construction are excluded, as are partial systems and fires reported as confined fires. Fires reported with unclassified reason for failure are treated as cases of unknown reasons for failure.

Source: NFIRS and NFPA fire experience survey.

Table 10.
Characteristics of Fatal Victims
In Fires with Sprinklers vs. No Automatic Extinguishing Equipment
2010-2014 Annual Averages

A. Fire or Victims by Sprinkler Presence and Performance

Sprinkler/AES Status	Deaths when sprinklers present		Deaths when no AES present	
Total civilian deaths	42	(100%)	2,659	(100%)
<i>Operated and effective</i>	29	(69%)		
<i>Fire too small to operate</i>	8	(20%)		
<i>Failed to operate</i>	1	(3%)		
<i>Operated but ineffective</i>	3	(8%)		

B. Characteristics in Fires with Operating Sprinklers vs. No AES

Fire or Victim Characteristic	Deaths when sprinklers present		Deaths when no AES present	
With operating Sprinklers	29	(100%)	2,659	(100%)
Victim in area of origin	26	(90%)	1,319	(50%)
<i>Involved in ignition</i>	23	(80%)	940	(35%)
<i>Not involved in ignition</i>	3	(10%)	379	(14%)
Victim 65 or older	15	(52%)	833	(31%)
Clothing on fire	7	(26%)	192	(7%)
Physically disabled	4	(13%)	139	(5%)
Victim returned to fire, unable to act, or acted irrationally	7	(25%)	535	(20%)
Intentional fire	5	(16%)	368	(14%)
Sleeping	8	(8%)	854	(32%)

Note: Statistics are based on structure fires reported in NFIRS by U.S. municipal fire departments and so exclude fire reported only to federal or state agencies or industrial fire brigades. In NFIRS, if multiple systems are present, the system coded is supposed to be the one system designed to protect the hazard where the fire started. This field is not required if the fire did not begin within the designed range of the system. Buildings under construction are excluded.

Here is an example of how to read this table: Nearly all (90%) the people who died in fires despite the presence of operating sprinklers were located in the area of fire origin, hence closer to the fire and probably less able to escape than victims located farther from the fire, compared to only 50% of fatal victims in fires with no automatic extinguishing equipment present who were located in the area of fire origin.

Source: NFIRS and NFPA fire experience survey.

Appendix A.

How National Estimates Are Calculated

The statistics in this analysis are estimates derived from the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA's) annual survey of U.S. fire departments. NFIRS is a voluntary system by which participating fire departments report detailed factors about the fires to which they respond. Roughly two-thirds of U.S. fire departments participate, although not all of these departments provide data every year. Fires reported to federal or state fire departments or industrial fire brigades are not included in these estimates.

NFIRS provides the most detailed incident information of any national database not limited to large fires. NFIRS is the only database capable of addressing national patterns for fires of all sizes by specific property use and specific fire cause. NFIRS also captures information on the extent of flame spread, and automatic detection and suppression equipment. For more information about NFIRS visit <http://www.nfirs.fema.gov/>. Copies of the paper forms may be downloaded from http://www.nfirs.fema.gov/documentation/design/NFIRS_Paper_Forms_2008.pdf.

NFIRS has a wide variety of data elements and code choices. The NFIRS database contains coded information. Many code choices describe several conditions. These cannot be broken down further. For example, area of origin code 83 captures fires starting in vehicle engine areas, running gear areas or wheel areas. It is impossible to tell the portion of each from the coded data.

Methodology may change slightly from year to year.

NFPA is continually examining its methodology to provide the best possible answers to specific questions, methodological and definitional changes can occur. *Earlier editions of the same report may have used different methodologies to produce the same analysis, meaning that the estimates are not directly comparable from year to year.*

NFPA's fire department experience survey provides estimates of the big picture.

Each year, NFPA conducts an annual survey of fire departments which enables us to capture a summary of fire department experience on a larger scale. Surveys are currently sent to all municipal departments protecting populations of 5,000 or more and a random sample, stratified by community size, of the smaller departments. Typically, a total of roughly 3,000 surveys are returned, representing about one of every ten U.S. municipal fire departments and about one third of the U.S. population.

The survey is stratified by size of population protected to reduce the uncertainty of the final estimate. Small rural communities have fewer people protected per department and are less likely to respond to the survey. A larger number must be surveyed to obtain an adequate sample of those departments. (NFPA also makes follow-up calls to a sample of the smaller fire departments that do not respond, to confirm that those that did respond are truly representative of fire departments their size.) On the other hand, large city departments are so few in number and protect such a large proportion of the total U.S. population that it makes sense to survey all of them. Most respond, resulting in excellent precision for their part of the final estimate.

The survey includes the following information: (1) the total number of fire incidents, civilian deaths, and civilian injuries, and the total estimated property damage (in dollars), for each of the major property use classes defined in NFIRS; (2) the number of on-duty firefighter injuries, by type of duty and nature of illness; (3) the number and nature of non-fire incidents; and (4) information on the type of community protected (e.g., county versus township versus city) and the size of the population protected, which is used in the statistical formula for projecting national totals from sample results. The results of the survey are published in the annual report *Fire Loss in the United States*. To download a free copy of the report, visit <http://www.nfpa.org/assets/files/PDF/OS.fireloss.pdf>.

Projecting NFIRS to National Estimates

As noted, NFIRS is a voluntary system. Different states and jurisdictions have different reporting requirements and practices. Participation rates in NFIRS are not necessarily uniform across regions and community sizes, both factors correlated with frequency and severity of fires. This means NFIRS may be susceptible to systematic biases. No one at present can quantify the size of these deviations from the ideal, representative sample, so no one can say with confidence that they are or are not serious problems. But there is enough reason for concern so that a second database -- the NFPA survey -- is needed to project NFIRS to national estimates and to project different parts of NFIRS separately. This multiple calibration approach makes use of the annual NFPA survey where its statistical design advantages are strongest.

Scaling ratios are obtained by comparing NFPA's projected totals of residential structure fires, non-residential structure fires, vehicle fires, and outside and other fires, and associated civilian deaths, civilian injuries, and direct property damage with comparable totals in NFIRS. Estimates of specific fire problems and circumstances are obtained by multiplying the NFIRS data by the scaling ratios. Reports for incidents in which mutual aid was given are excluded from NFPA's analyses.

Analysts at the NFPA, the USFA and the Consumer Product Safety Commission developed the specific basic analytical rules used for this procedure. "[The National Estimates Approach to U.S. Fire Statistics](#)," by John R. Hall, Jr. and Beatrice Harwood, provides a more detailed explanation of national estimates.

Version 5.0 of NFIRS, first introduced in 1999, used a different coding structure for many data elements, added some property use codes, and dropped others. The essentials of the approach described by Hall and Harwood are still used, but some modifications have been necessary to accommodate the changes in NFIRS 5.0.

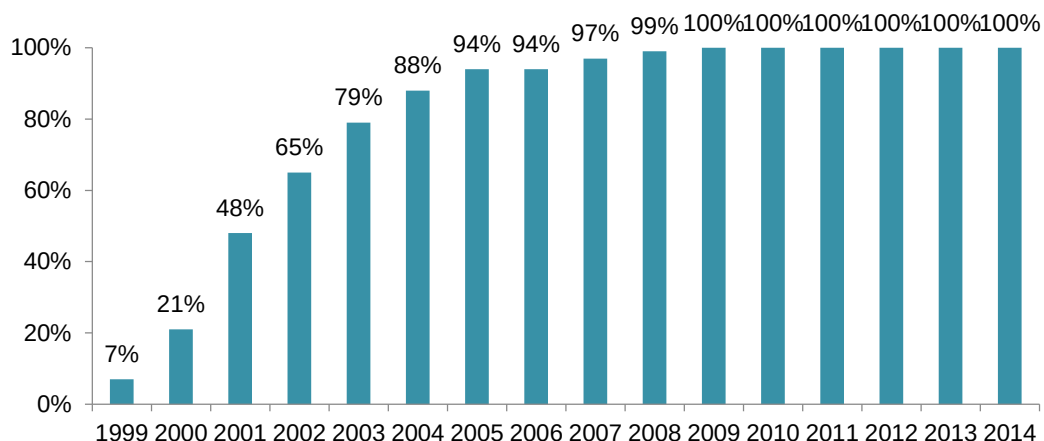
Figure A.1 shows the percentage of fires originally collected in the NFIRS 5.0 system. Each year's release version of NFIRS data also includes data collected in older versions of NFIRS that were converted to NFIRS 5.0 codes.

From 1999 data on, analyses are based on scaling ratios using only data originally collected in NFIRS 5.0:

NFPA survey projections
NFIRS totals (Version 5.0)

For 1999 to 2001, the same rules may be applied, but estimates for these years in this form will be less reliable due to the smaller amount of data originally collected in NFIRS 5.0; they should be viewed with extreme caution.

Figure A.1. Fires Originally Collected in NFIRS 5.0 by Year



NFIRS 5.0 introduced six categories of confined structure fires, including:

- cooking fires confined to the cooking vessel,
- confined chimney or flue fires,
- confined incinerator fire,
- confined fuel burner or boiler fire or delayed ignition,
- confined commercial compactor fire, and
- trash or rubbish fires in a structure with no flame damage to the structure or its contents.

Although causal and other detailed information is typically not required for these incidents, it is provided in some cases. Some analyses, particularly those that examine cooking equipment, heating equipment, fires caused by smoking materials, and fires started by playing with fire, may examine the confined fires in greater detail. Because the confined fire incident types describe certain scenarios, the distribution of unknown data differs from that of all fires. Consequently, allocation of unknowns must be done separately.

For most fields other than Property Use and Incident Type, NFPA allocates unknown data proportionally among known data. This approach assumes that if the missing data were known, it would be distributed in the same manner as the known data. NFPA makes additional adjustments to several fields. *Casualty and loss projections can be heavily influenced by the inclusion or exclusion of unusually serious fire.*

Rounding and percentages. The data shown are estimates and generally rounded. An entry of zero may be a true zero or it may mean that the value rounds to zero. Percentages are calculated from unrounded values. It is quite possible to have a percentage entry of up to 100% even if the rounded number entry is zero. The same rounded value may account for a slightly different percentage share. Because percentages are expressed in integers and not carried out to several decimal places, percentages that appear identical may be associated with slightly different values.

Appendix B

Data Elements in NFIRS 5.0 Related to Automatic Extinguishing Systems

M1. Presence of Automatic Extinguishment System (AES)

This is to be coded based on whether a system was or was not present in the area of fire and is designed to extinguish the fire that developed. (The latter condition might exclude, for example, a range hood dry chemical extinguishing system from being considered if the fire began in a toaster.)

Codes:

N	None Present
1	Present
2	Partial system present (Added in 2005 for use beginning in 2006)
8	NFPA recode when M1AES Presence was coded as 1- Present, M3 AES Operation was coded as 4- Failed to operate and M5 AES Failure Reason was coded as 5- Fire not in area protected
U	Undetermined (restored to coding in 2003 for use beginning in 2004)

M2. Type of Automatic Extinguishment System

If multiple systems are present, this is to be coded in terms of the (presumably) one system designed to protect the hazard where the fire started. This is a required field if the fire began within the designed range of the system. It is not clear whether questions might arise over a system that is not located in the area of fire origin but has the area of fire origin within its designed range; this has to do with the interpretation of the “area” of fire origin.

Codes:

1	Wet pipe sprinkler
2	Dry pipe sprinkler
3	Other sprinkler system
4	Dry chemical system
5	Foam system
6	Halogen type system
7	Carbon dioxide system
0	Other special hazard system
U	Undetermined

M3. Automatic Extinguishment System Operation

This is designed to capture the “operation and effectiveness” of the system relative to area of fire origin. It is also said to provide information on the “reliability” of the system. The instructions say that “effective” does not necessarily mean complete extinguishment but does mean containment and control until the fire department can complete extinguishment.

Codes:

1	System operated and was effective
2	System operated and was not effective
3	Fire too small to activate the system
4	Failed to operate
0	Other
U	Undetermined

M4. Number of Sprinklers Operating

The instructions say this is not an indication of the effectiveness of the sprinkler system. The instructions do not explicitly indicate whether this data element is relevant if the automatic extinguishment system is not a sprinkler system (as indicated in M2). The actual number is recorded in the blank provided; there are no codes.

M5. Automatic Extinguishment System Failure Reason

This is designed to capture the (one) reason why the system “failed to operate or did not operate properly.” The instructions also say that this data element provides information on the “effectiveness” of the equipment. It is not clear whether this is to be completed if the system operated properly but was not effective.

Text shown in brackets is text shown in the instructions but not on the form. Note that for code 4, the phrase “wrong” is replaced by “inappropriate” in the instructions; the latter term is more precise and appropriate, although it is possible for the type of fire to be unexpected in a given occupancy.

Codes:

- 1 System shut off
- 2 Not enough agent discharged [to control the fire]
- 3 Agent discharged but did not reach [the] fire
- 4 Wrong type of system [Inappropriate system for the type of fire]
- 5 Fire not in area protected [by the system]
- 6 System components damaged
- 7 Lack of maintenance [including corrosion or heads painted]
- 8 Manual intervention [defeated the system]
- 0 Other _____ [Other reason system not effective]
- U Undetermined

References

- [1] U.S. Fire Administration, National Fire Data Center, *National Fire Incident Reporting System Complete Reference Guide* (U.S. Fire Administration, 2015), https://www.usfa.fema.gov/downloads/pdf/nfirs/NFIRS_Complete_Reference_Guide_2015.pdf.
- [2.] H.J. Haynes, *U.S. Fire Loss during 2015* (FLX10), (Quincy, MA, U.S.: National Fire Protection Association, 2016), 2-3, <http://www.nfpa.org/~media/files/news-and-research/fire-statistics/overall-fire-statistics/osfireloss.pdf>.
- [3] J. R. Hall, Jr. and B. Harwood, B. “The National Estimates Approach to U.S. Fire Statistics,” *Fire Technology* 25 no. 2 (1989): 99-113, <http://www.nfpa.org/~media/files/news-and-research/fire-statistics/latest-estimates/nationalestimatesapproach.pdf?la=en>
- [4.] M. Ahrens, *High-Rise Building Fires* (USS30) (Quincy, MA: National Fire Protection Association, 2016), 8, <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fires-by-property-type/high-rise-building-fires>.
- [5] M Ahrens, *Smoke Alarms in U.S. Home Fires* (USS04) (Quincy, MA: National Fire Protection Association, 2015), 47, <http://www.nfpa.org/~media/files/news-and-research/fire-statistics/fire-protection-systems/ossmokealarms.pdf?la=en>.
- [6] U.S. Fire Administration, National Fire Data Center, *National Fire Incident Reporting System Complete Reference Guide* (U.S. Fire Administration, 2015) 3-27- 3-28. https://www.usfa.fema.gov/downloads/pdf/nfirs/NFIRS_Complete_Reference_Guide_2015.pdf.
- [7] U.S. Census Bureau, American Housing Survey, “2011 National - Health and Safety Characteristics - All Occupied Units, Variable 1, Units by Structure Type.” *American Housing Survey Table Creator*, accessed March 23, 2017 , https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=a00000&s_year=n2011&s_tableName=TableS01&s_byGroup1=a3&s_byGroup2=a1&s_filterGroup1=t1&s_filterGroup2=g1
- [8] J. Hall, Jr., M. Ahrens, and B. Evarts, *Sprinkler Impact on Fire Injury*, (Quincy, MA: Fire Protection Research Association, 2012), 6, 19.
- [9] U.S. Fire Administration, National Fire Data Center, *National Fire Incident Reporting System Complete Reference Guide* (U.S. Fire Administration, 2015): 3-27- 3-28. https://www.usfa.fema.gov/downloads/pdf/nfirs/NFIRS_Complete_Reference_Guide_2015.pdf
- [10] Richard Upham, *Residential fire sprinkler reliability in homes older than 20 years old in Scottsdale, AZ* (Emmitsburg, MD: National Fire Academy, 2008), 17-19, 28-29. <https://nfa.usfa.fema.gov/pdf/efop/efo42677.pdf>



Date: Monday, July 27, 2020
To: Honorable Mayor and City Council
From: Les Kenworthy, Fire Chief

ACTION ITEM

Request:

ACTION ITEM: Request to allocate \$80,000.00 funds from contingency reserves to replace the roof at Fire Station One.

Time Estimate:

Approximately 10 minutes.

Background:

During the the fire station planning and programming the parallel teams also recommended Station 1 would remain in place, and not be demolished, even if fire operations are moved to another location to facilitate the growth of the public safety campus. It was determined a full roof replacement was a valid expenditure depending on the outcome of the 2019 fire station replacement bond measure.

After the failure of the fire station replacement bond measure city staff, and community advisory members, determined replacement of three fire stations would most likely not be supported anytime in the near future. After analysis of station priorities, staff considers full replacement of fire stations 2, 3, are priority over station 1. We feel this is the appropriate time to reduce damage from roof leaks at station one by replacing the roof and continuing fire operations. We hope to propose additional remodeling measures in the future.

The current proposed 2020-21 budget shows a request for this expenditure. The need for a new roof for station one was vetted through the long-term planning process and placed on the capital list for consideration of funding.

During the bidding process it was determined the best time for application was late August or early September for the best application to ensure the highest rate of longevity. We are asking to remove the \$80,000.00 expenditure form the 2020-21 budget and utilize contingency reserves to fund the repair and replace the roof at station one prior to the new budget in October.

Approval Process:

50% plus 1 of the members present. We are asking the Council to approve the allocation of reserve contingency funds to replace the roof at Fire Station One.

Budget Impact:

\$80,000.00

Regulatory Impact:

None at this time.

History:

The roof at station one on 2nd Ave East has needed repair the past few years. Not knowing the direction of building new fire stations, fire staff has hired roof companies to repair roof leaks as they occurred during weather precipitation events throughout the year. During fire station study, findings also determined that station one would need some additional work to slope the roof and drainage in appropriate places to allow for water flow. The attached bid includes the cost for this additional work.

Analysis:

N/A

Conclusion:

N/A

Attachments:

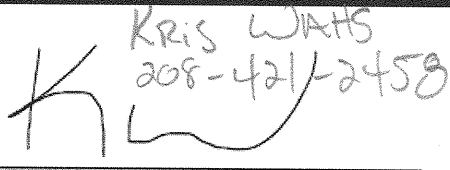
1. Lewis Roofing - Proposal - Fire Station 1

Proposal



Lewis Roofing Inc

179 Osterloh Ave W
Twin Falls, ID. 83301
208-735-1219
robertplewis@icloud.com

Proposal Submitted To Mitchell Brooks II	Date Apr 22, 2019
Address 345 2nd Ave. E Twin Falls, Id 83301	Phone (208) 735-7233
	E-mail Address Mbrooks@tfid.org
Job Name and Location Twin Falls Fire Department	
We hereby submit specifications and estimates, subject to all terms and conditions as set forth on both sides, as follows: We will do all the cleanup, prep work, and disposal as needed. We will install one layer of fan fold insulation board. We will install a 60 mill GAF Tpo single ply membrane roof assembly per manufacturers specifications. This roof assembly will include all pipe boots, wall terminations, drains, and eve terminations as needed. Material warranty will be 20 years. Workmanship warranty will be five years. Deposit of 50% due upon acceptance of proposal. Balance due upon completion of work.	
We propose hereby to furnish material and labor - complete in accordance with the above specifications for the sum of: 76,500 Note: This proposal may be withdrawn by us if not accepted within: days.	Authorized Signature:  KRIS WATTS 208-421-2458
Accepted: The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above. Date: Apr 22, 2019	Signature: _____