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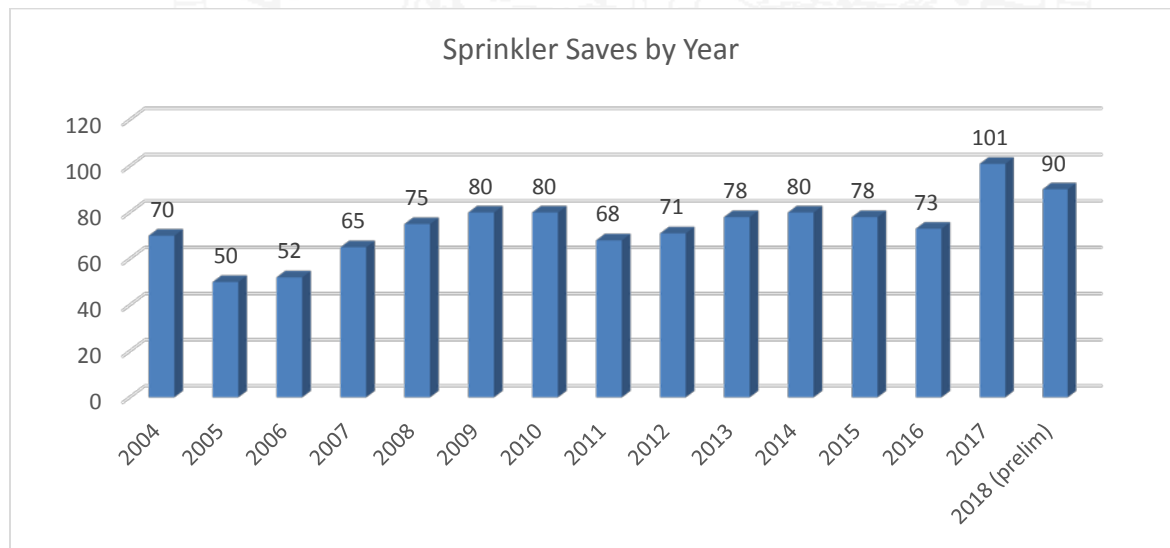
MEMORANDUM

DATE: April 11, 2019
TO: Minnesota Fire Protection Contractor Update
FROM: Jon Nisja, State Fire Safety Supervisor
SUBJECT: State Fire Marshal Information – April, 2019

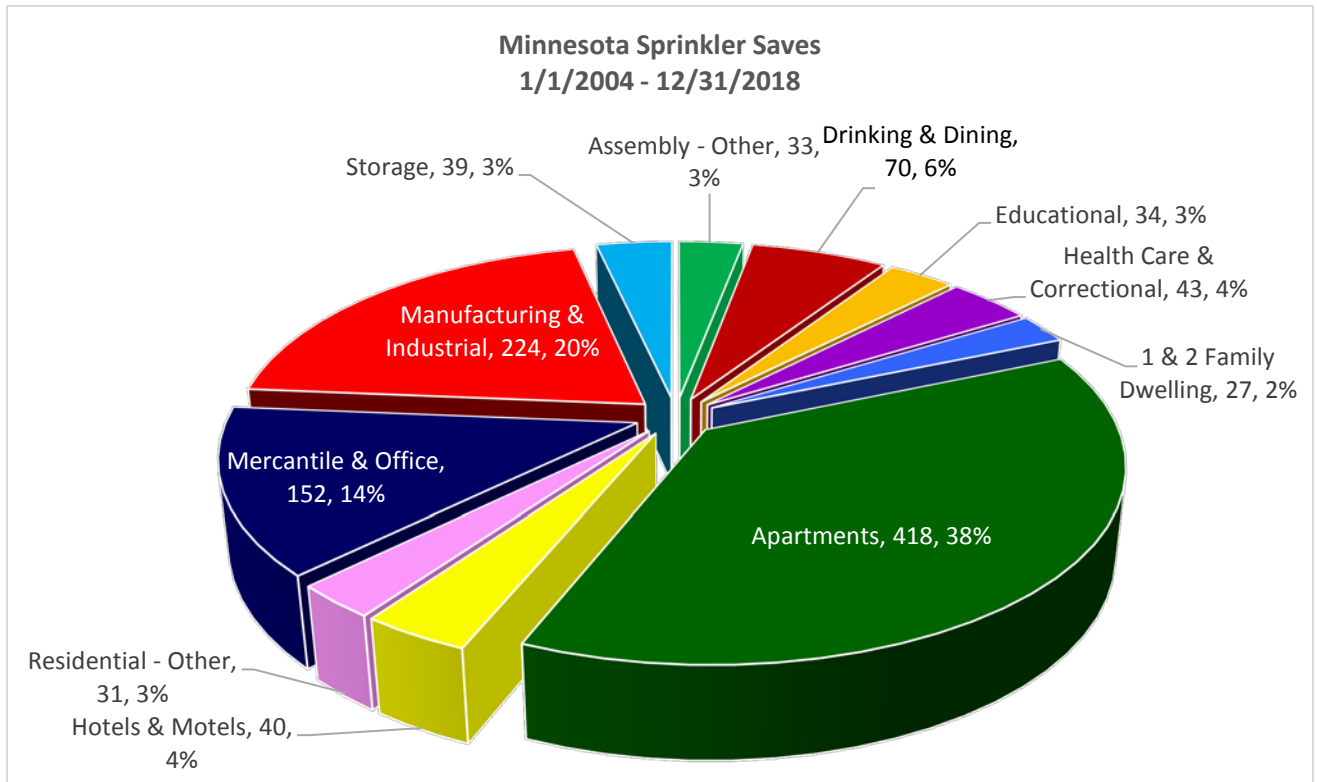
The following is an update from the State Fire Marshal Division on issues relating to fire sprinkler installation and fire protection systems. Please share this information with your staff and employees.

1. Sprinkler Saves:

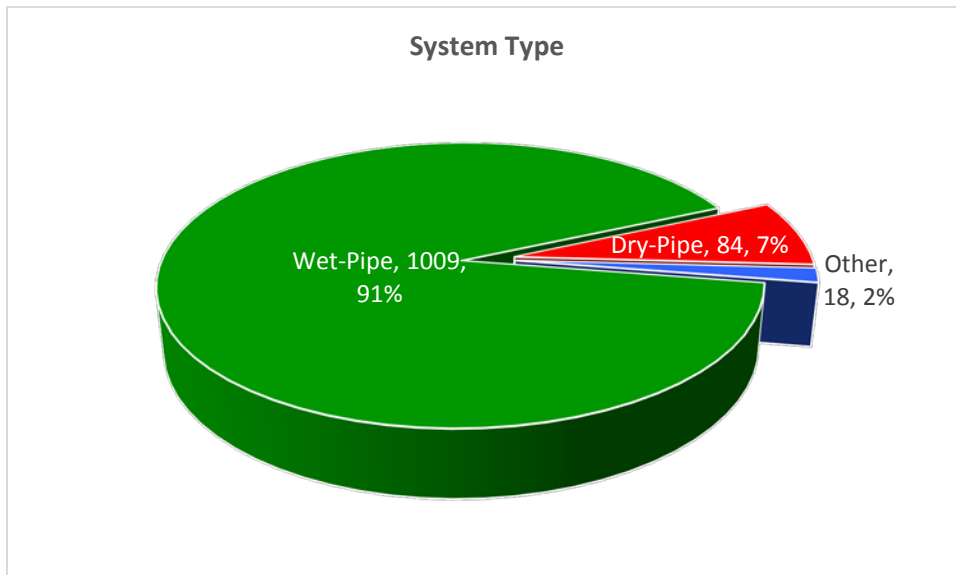
Preliminary fire data shows that there were 90 documented sprinkler saves in Minnesota in 2018. We started tracking these in earnest in 2004 and the total number of sprinkler saves from 2004-2018 is 1,111.



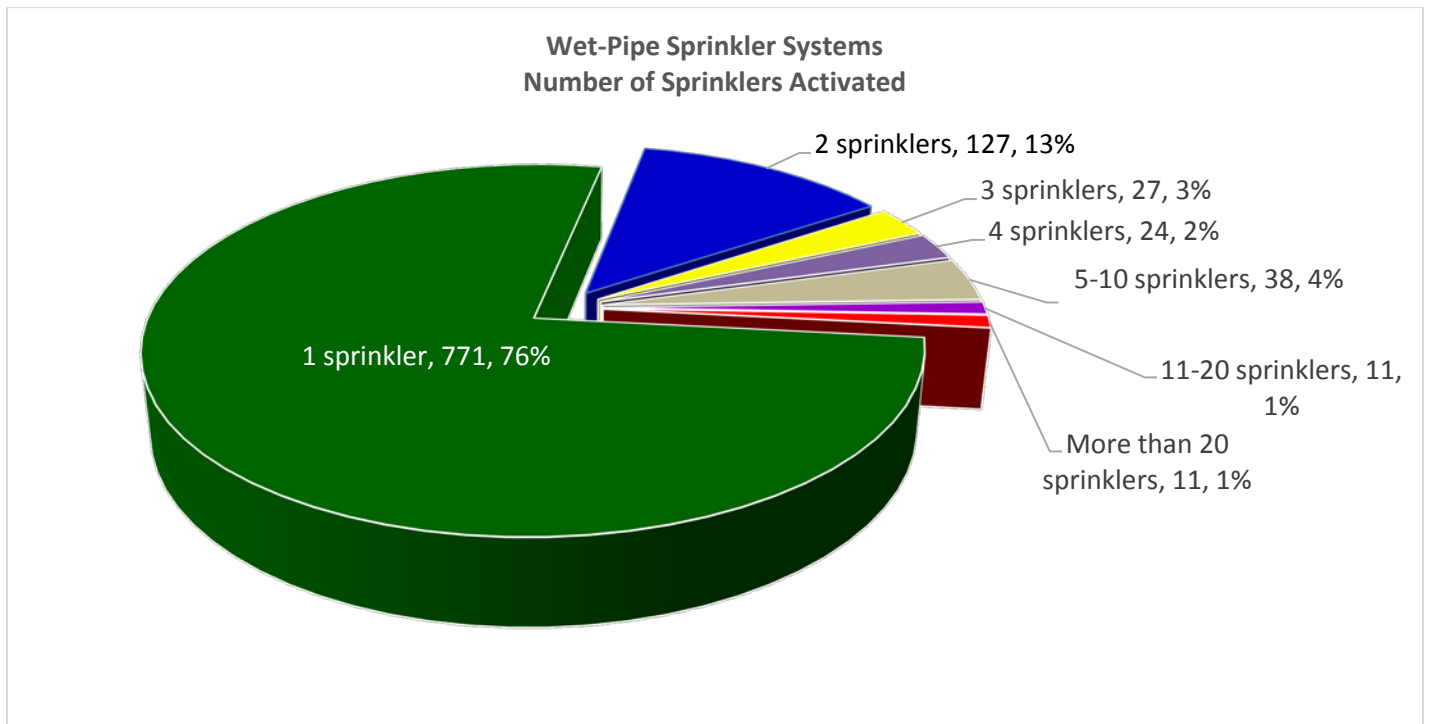
The following tables and charts show where those saves have occurred and how much the loss was reduced in sprinkler-controlled fires.



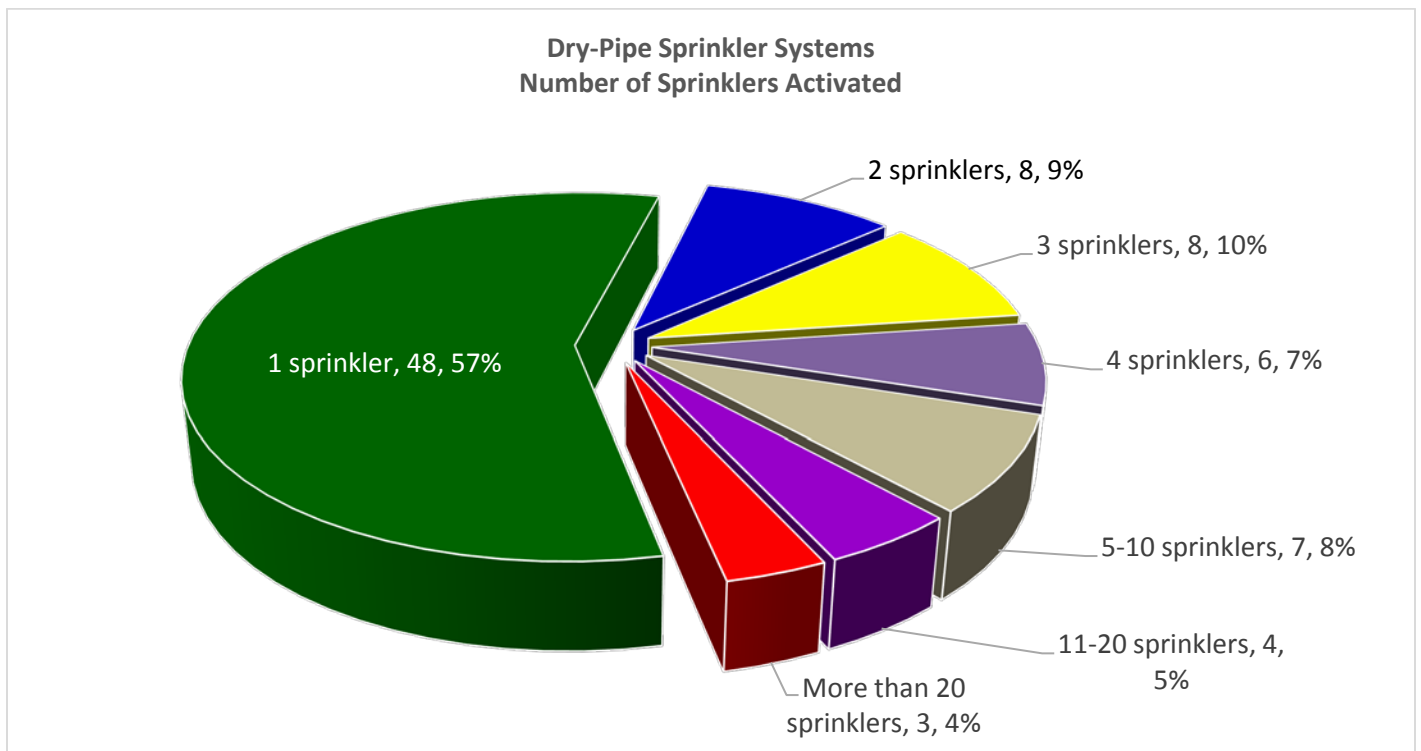
The majority of the sprinkler saves in Minnesota involved wet-pipe systems (91%).



In the majority of the wet-pipe sprinkler system activations (94%), the fire was controlled with four (4) sprinklers or less. In 98% of the fires, ten or fewer sprinklers operated. A breakdown of the number of sprinklers activated can be seen in the chart below.



The effectiveness in dry-pipe systems was diminished due to the delay in releasing air and getting water onto the fire. Nonetheless, the data is still fairly impressive. In 91% of the fires involving dry-pipe systems, ten or fewer sprinklers operated and controlled the fire.



In 2017 and 2018, the average building and contents loss from these fires was \$33,528. The average valuation of the building and contents in these fires was \$5,994,544. That equates to 99.4% save

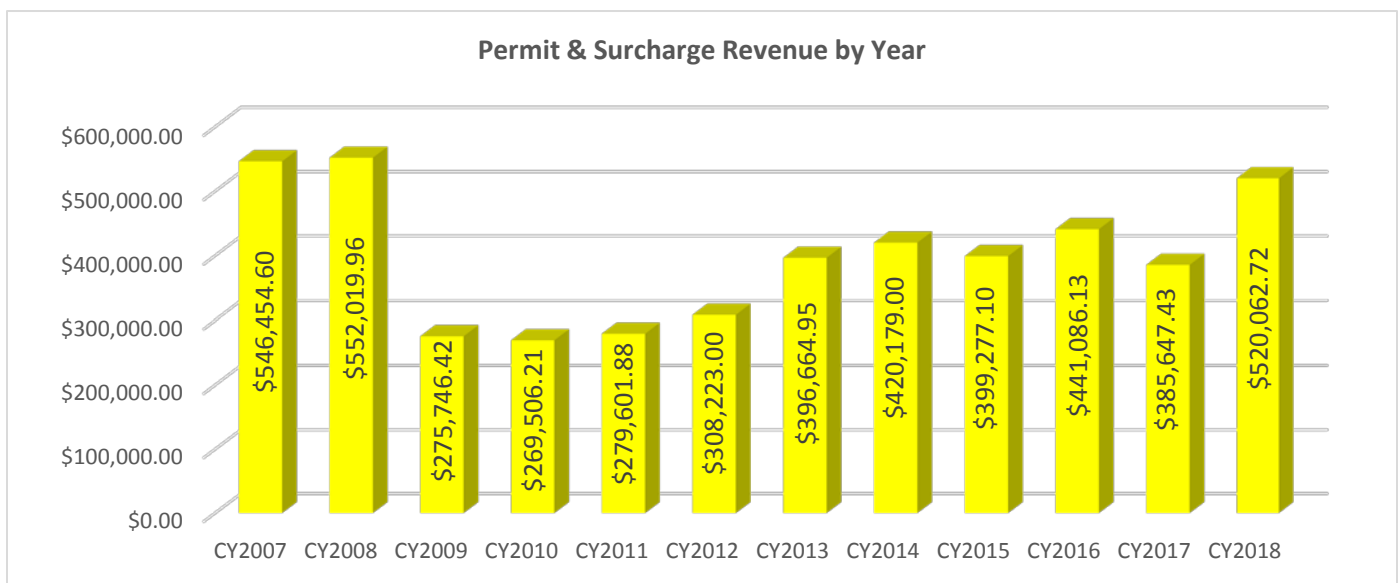
percentage. Another way of looking at this: sprinkler-controlled fires involve less than 1% of the value of the building and contents.

We also analyzed data comparing the fire loss reduction that was experienced in sprinkler-controlled fires in the various types of occupancies.

Type of Occupancy:	Average Loss-Sprinkler	Average Loss - No Sprinklers	Damage Reduction With Sprinklers
Assembly - Other	\$ 13,468	\$ 126,499	89%
Drinking & Dining	\$ 39,771	\$ 131,445	70%
Educational	\$ 13,720	\$ 260,513	95%
Health Care & Correctional	\$ 62,549	\$ 62,078	-1%
1 & 2 Family Dwelling	\$ 22,937	\$ 63,866	64%
Apartments	\$ 37,976	\$ 51,624	26%
Hotels & Motels	\$ 26,570	\$ 93,831	72%
Residential - Other	\$ 20,419	\$ 60,928	66%
Mercantile & Office	\$ 101,604	\$ 147,549	31%
Manufacturing & Industrial	\$ 65,197	\$ 208,477	69%
Warehouses	\$ 121,395	\$ 276,349	56%
Totals	\$ 47,782	\$ 134,833	65%

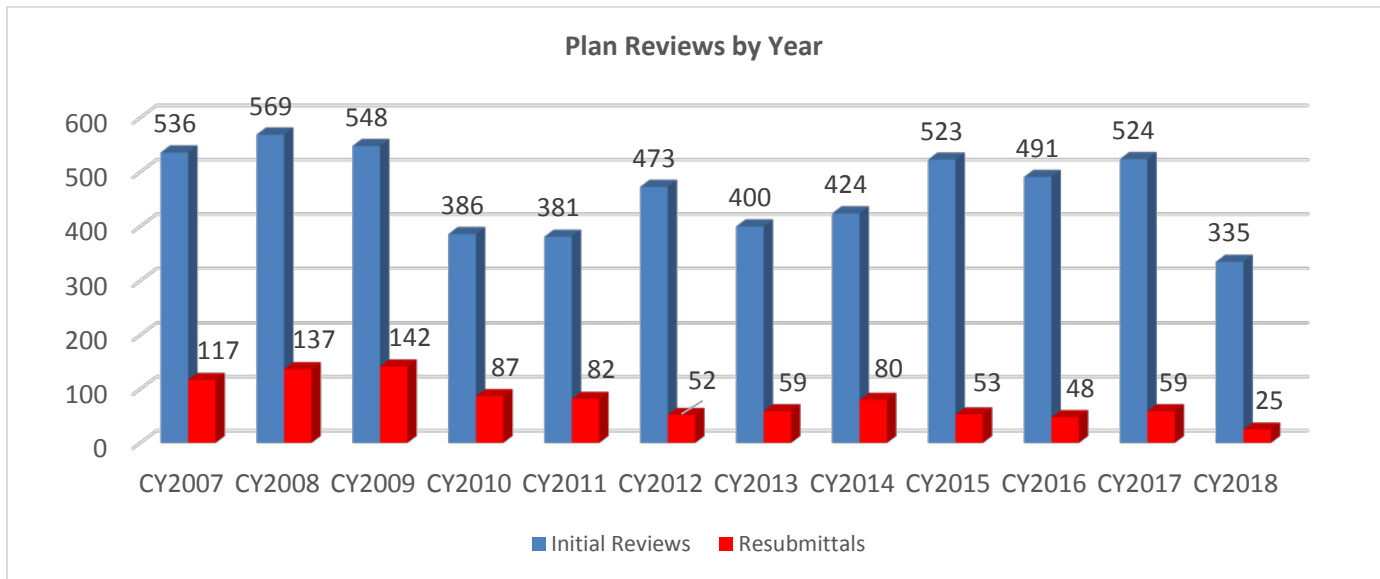
2. Permit and Surcharge Revenue:

The following chart shows the permit and surcharge revenue for the past twelve calendar years:



3. Plan Review Comparisons:

Below is a graph showing the number of plan reviews (initial and resubmittal reviews) conducted for the past twelve calendar years:



4. Contractor Licenses, Fitter Renewals & Managing Employee Renewals:

Contractor licenses, journeyman sprinkler fitter, and managing employee renewals are being mailed out this week. They are due back by June 1, 2019. Here is a breakdown of the current licenses and certificates:

License / Certificate Type:	Licensed April, 2019:	Licensed April, 2018:	Change from Last Year:
Contractors	61	59	+2
Design Contractors	9	10	-1
Limited Contractors	3	3	0
Journeyman Fitters	612	610	+2
Limited Journeyman Fitters (3M)	15	16	-1
Managing Employees	78	78	0

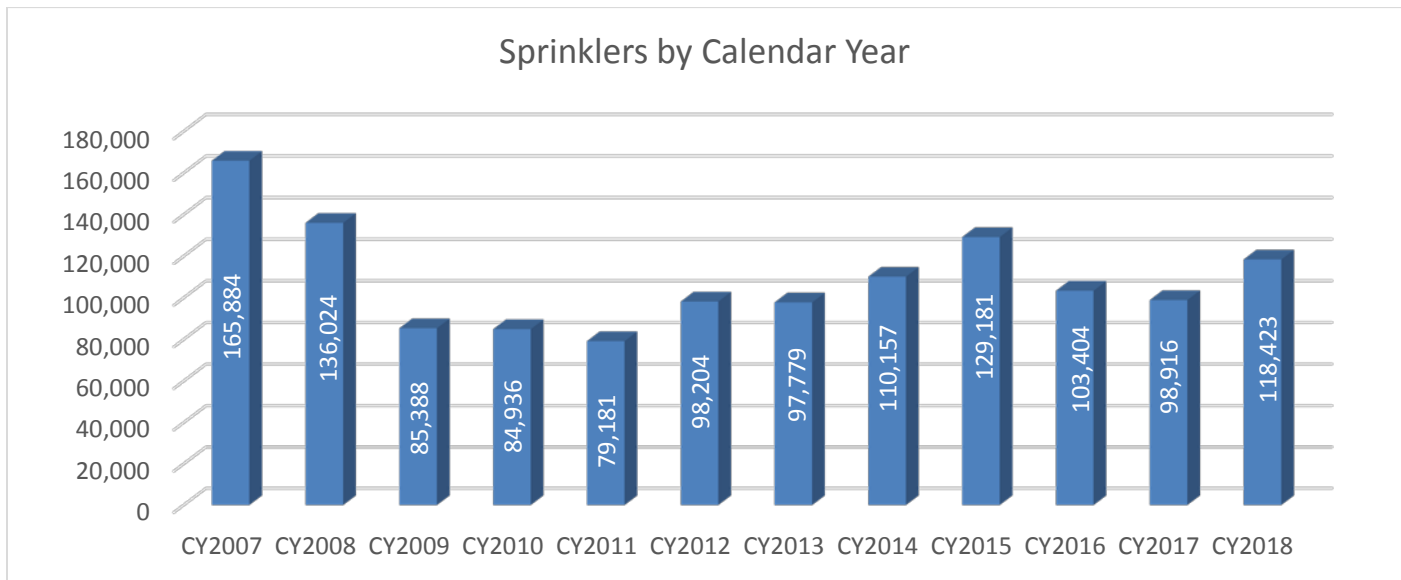
5. Electronic Plan Review:

The State Fire Marshal Division is transitioning toward electronic plan reviews. This will be an optional method of submitting plans and permit applications in the future.

The hardware has been purchased and the software is currently being ordered. It will take a few months to get the software and hardware installed and operational but watch for more information on this transition in upcoming months.

6. Sprinklers Installed per Year:

The following chart shows the number of sprinklers installed for the past twelve fiscal years. This represents permits issued by the State Fire Marshal Division only; it does not include projects permitted by local AHJs. The State Fire Marshal estimates that we review about half of the sprinkler projects statewide.



7. Exams – Fitter and Managing Employee:

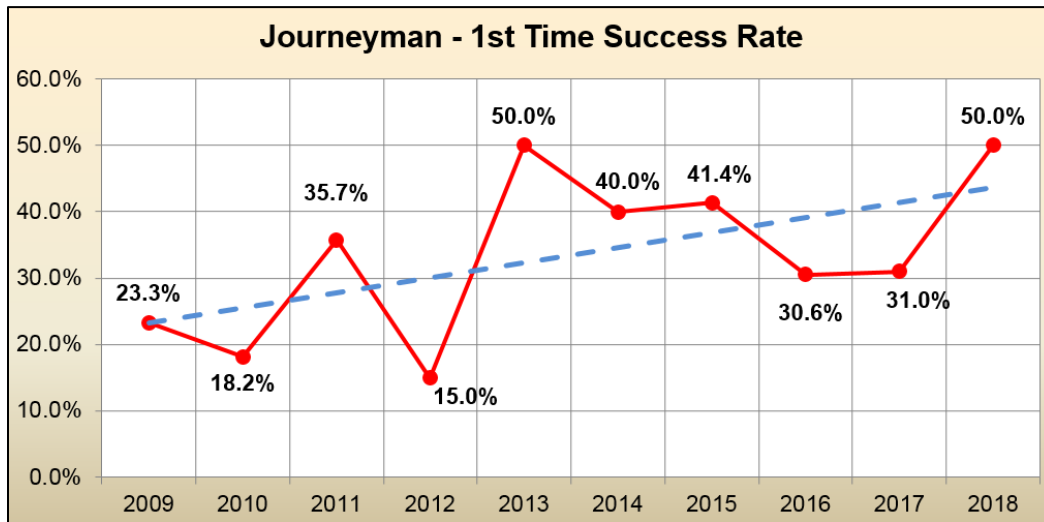
From previous updates, you might recall that some concerns were raised two years ago suggesting that the journeyman sprinkler fitter and managing employee exams are too difficult. We have agreed to:

- Convene subject matter experts to validate the exam questions
- Explore conversion to an “open-book” exam
- Provide feedback to exam-takers on “weak areas” (which subject areas they did not pass)

The State Fire Marshal Division has taken several steps to address the concerns, including the following:

- Contracted with a testing and measurement consultant
- Performed job task analysis for journeyman sprinkler fitter and managing employee
- Placed the tasks into categories:
 - 21 categories for journeyman sprinkler fitter
 - 22 categories for managing employee
- Reviewed and revised the existing test bank questions (including the elimination of several questions)
- Convened a group of seven subject matter experts from the fire protection industry in Minnesota to review the questions, validate their applicability to journeyman sprinkler fitters or managing employees, rate them on difficulty, and suggest revisions
- Reduced the number of answer options for each question from five to four
- Purchased software to scan and score the answer sheets and provide feedback to exam-takers on how they did for each of the categories
- Purchased equipment (iPads) to administer the exam electronically at some point in the future:
 - Even with a move to electronic exam administration, these will continue to be proctored exams
 - For exam security reasons, we do not see a movement toward an on-line exam in the foreseeable future
- We did not transition to an open-book exam but tables, charts and diagrams from NFPA 13 have been brought into the exam where that information is needed to answer the question

The data we have collected and research that we have done shows that first-time exam-takers tend to do better on the exam. In 2018 those taking the journeyman fitter exam for the first time had a 50% pass rate while the overall pass rate (first-time and repeat exam-takers) was 35%.



8. Fitter & Managing Employee Training:

Since January 1, 2019, we have been involved with several training sessions for fitters and managing employees. Here is a breakdown of the training sessions conducted:

Date(s):	Location:	Group / Sponsor:	Audience:	Number Attending:
01/12/2019	Shoreview	Local 417	Fitters / MEs	125
02/15/2019	St. Cloud	Local 669	Fitters / MEs	80
03/12/2019	Shoreview	Local 417	Fitters	25
03/15/2019	Fargo	Local 669	Fitters / MEs	38
03/22/2019	Rochester	Local 669	Fitters / MEs	108
03/29/2019	Duluth	Local 669	Fitters / MEs	46
04/05/2019	St. Cloud	AFSA	Fitters / MEs	113
	TOTALS			535

There are 690 certified journeyman fitters and managing employees. This means that about 78% of the state's journeyman fitters and managing employees attended this training.

9. Fire Protection Demonstration Trailer Training:

In 2012, the State Fire Marshal Division purchased and outfitted a fire protection demonstration trailer. Here is the activity for that trailer from 2012-2018:

Year	Demonstrations	Participants
2012	12	263
2013	49	906
2014	47	934
2015	16	223
2016	22	434
2017	43	772
2018	44	786
	233	4,318

On behalf of the State Fire Marshal Division, thank you for your commitment to fire safety.