STATE OF MAINE
130th LEGISLATURE
FIRST REGULAR SESSION

A REPORT PUSUANT TO LD 1364, A RESOLVE, TO SUDY INCENTIVES FOR RESIDENTIAL FIRE SPRINKLER SYSTEMS

Joint Standing Committee on Criminal Justice and Public Safety

December 1, 2021

MEMBERS:
SEN. Susan Deschambault, Chair
SEN. Scott Cyrway
SEN. Mark Lawrence
REP. Charlotte Warren, Chair
Rep. Grayson Lookner
Rep. Victorian Morales
Rep. Daniel Newman
Rep. Danny Costain
Rep. Lois Reckitt
Rep. Richard Pickett
Rep. Bill Pluecker
Rep. Lois Reckitt
Rep. Braden Sharpe

Staff:
Jane Orbeton, OPLA Analyst
Suzanne Voynik-OPFR Analyst
Lauren Metayer, OFPR Analyst
Deborah Fahy, Committee Clerk

Committee on Criminal Justice and Public Safety
c/o Legislative Information
100 State House Station
Augusta, Maine 04333

Prepared by Richard E. Taylor, Senior Research and Planning Analyst
Office of the Maine State Fire Marshal

Table of Contents

THE TASK FORCE

I. PURPOSE

The 130th Maine Legislature established the Task Force (Chapter 97 Resolves, L.D. 1364) to "Study and recommend incentives for residential fire sprinkler systems" and directs the State Fire Marshal to convene a task force to "study whether it is feasible and desirable to provide incentives for developers, builders and homebuyers to install residential sprinklers."

The Task Force is charged with preparing a report based on its findings and recommendations, and the State Fire Marshal with presenting the report to the Joint Standing Committee on Criminal Justice and Public Safety by December 1, 2021. The State Fire Marshal shall invite fire chiefs, firefighters, builders and contractors, real estate agents, fire sprinkler contractors, fire safety educators, insurance carriers, water districts and other persons who express interest in the work of the task force to serve on the task force.

In developing its findings and recommendations, the task force shall:

A. Examine the form and delivery of incentives to the public through advertising.
B. The study must include consideration of incentives that differ in urban and rural areas.

II. COMPOSITION AND PROCESS FOR STUDY

A. Task Force Members

The Task Force is comprised of individuals representing the fire service (state, local and federal), state regulatory, real estate, insurance, municipal government, and other industries. For a complete list of participants and the industries they represent see Appendix A.

B. Meetings

The task force met virtually on Thursday, November 18, at 1:00 PM with 49 in attendance. The meeting lasted over 90 minutes and was deemed a valuable experience for all. Participants represented the fire service, fire protection engineering and equipment, real estate, and other industries.

III. BACKGROUND

A. Fire in Maines Homes and Sprinklers

Maine Fire Departments respond to an average 4,229 total fire incidents each year and an average 1,567 (37%) of them take place in or around single and multifamily housing units. An estimated 76% of these fires are in single family units. These home fires account for an estimated 83% of all fire fatalities and the insurance industry is paying out an average of $72 million dollars from 2011 – 2016 each year in property losses in residential fires. In all, more than 2,000 fire departments with firefighters, apparatus, and other equipment are needed to respond to these fires each year.[1] The average cost associated with property losses alone over the last decade would amount to just over 1% of Maine's 2020 Gross Domestic Product.

The number of fires each year in Maine has increased over the past decade. Building fires and in particular home building fires comprise the greatest share of those fires. Figure 1 shows that over the past ten years, 2011 – 2020, total building and home building fires have trended higher. Home building fires account for 34 to 41% of all fires in Maine annually and 73 to 79% of all building fires.[2]

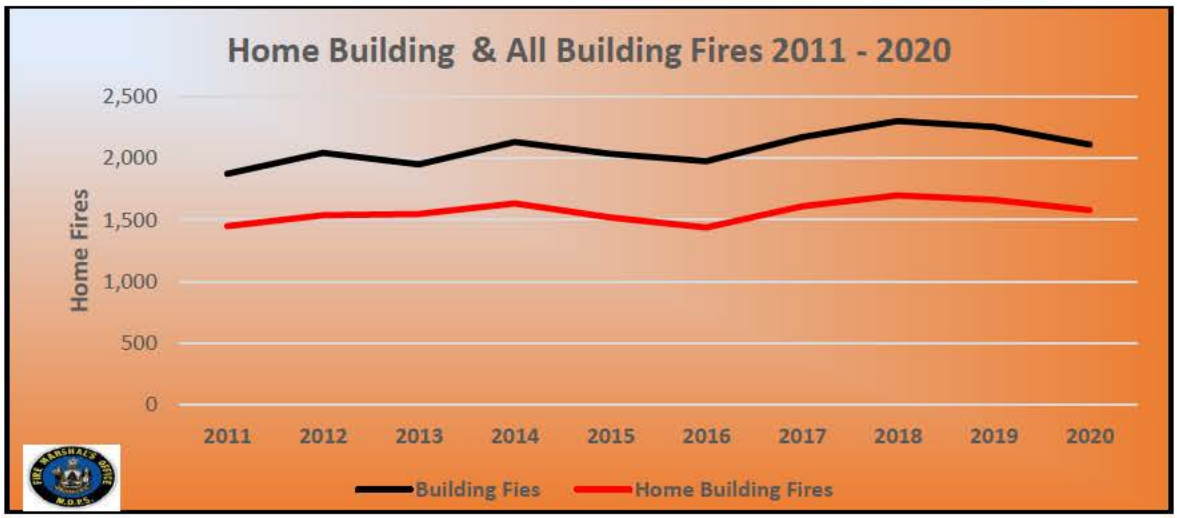

Figure 1

Because Maine residents, like those in all states, spend most of their hours at home it shouldn't be surprising that this is where we see so many fires. Likewise, it is in the home where we see most injuries and fatalities. In addition, home is where we sleep, and while sleeping; we are most likely to be injured or killed in a home fire. An estimated 67% of fire fatalities take place in the early a.m. hours in Maine.[3] Overall, 83% of fire fatalities take

[1] Office of the Maine State Fire Marshal; Maine Bureau of Insurance; and, Maine's Fire Incident Reporting System (MEFIRS) as reported to by Maine's Fire Departments from 2011 - 2020.
[2] Homes are defined as 1 or 2 single family or apartments multifamily.
[3] Richard E. Taylor, 2007. *Fire Fatality in Maine: Part 1.* Office of the Maine State Fire Marshal, Maine Topical Fire Research Series, Volume 1- Issue 1

place in the home (see figure 2). Sixty-six percent of all home fire deaths occurred in 1 or 2 family unit dwelling as opposed to apartments.

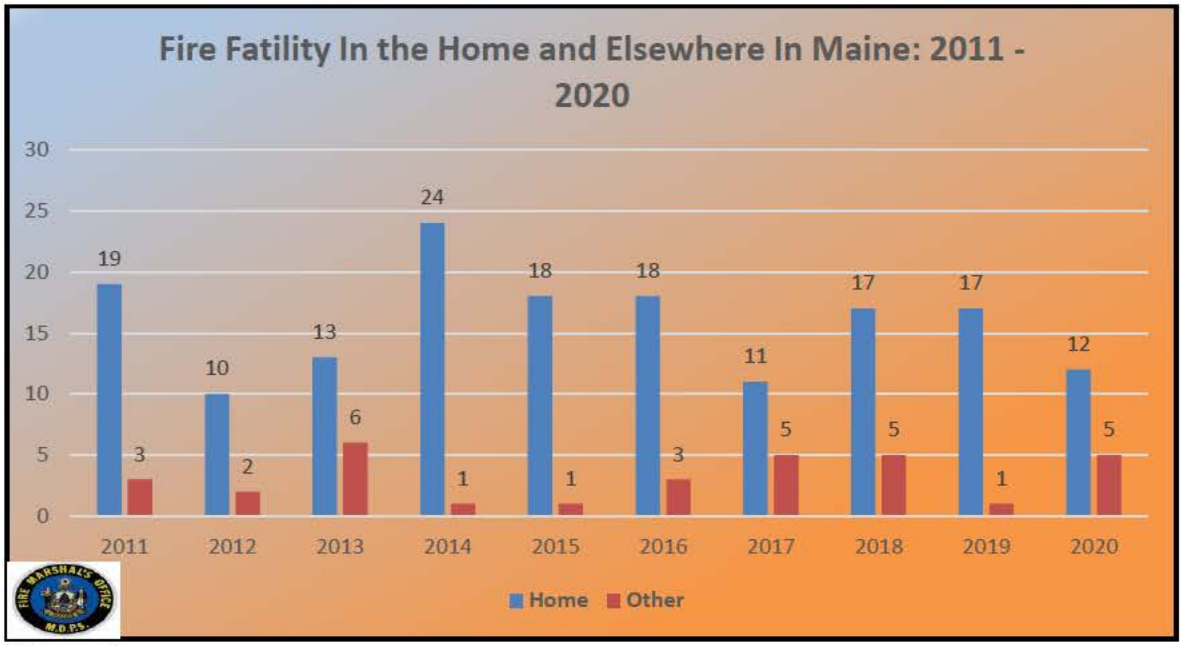

Figure 2

In discussing sprinklers, it is important to look at where home fires originate most often and see how losses in those fires might be impacted by fire sprinkler systems. Under the National Fire Protection Association (NFPA) Standard 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes* sprinklers would be required in bedrooms, the kitchen, hallway, common areas (den, living room, etc.) and dining rooms.[4] However, the five rooms requiring a sprinkler (see Table 1) comprise three of the top five rooms where fires originate most frequently and 23% of all rooms of origin in the home.

Tables 1 and 2 on the following page show that though fires that originate in rooms where sprinklers are required account for only a third of all home fires, the losses incurred in those fires are significant. Hence, having sprinklers in those rooms could reduce those losses substantially.

According to Maine's Bureau of Insurance residential losses due to fire averaged $72,000,000 per year from 2011 to 2016 (see figure 3).[5] Overall these losses increased 43% during that time. Increases in the counts of residential fires and subsequent increase in dollar loss, drives up insurance premiums for homeowners.[6]

[4] See NFPA 13D at nfpa.org Other rooms may require sprinkling depending upon size and other variables.
[5] Residential fires would include dorms, hotels, and other types of residential property in additional to single and multifamily homes.
[6] Maine Bureau of Insurance.

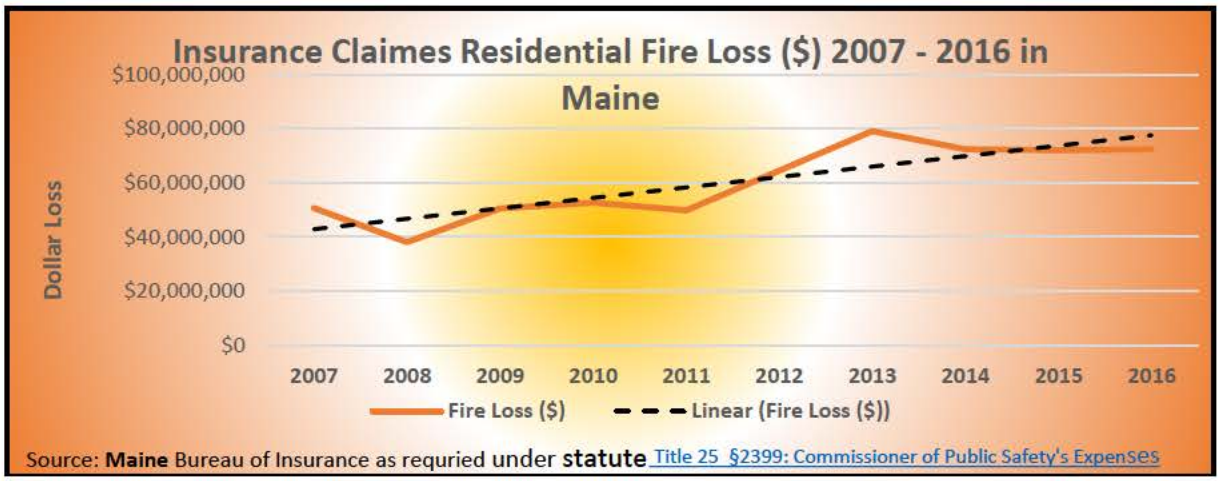

Figure 3

Room of Origin	Count	Civilian Death	Civilian Injury	Sum of Total Loss
Bedroom	404	8	54	$15,391,346
Common room, den, family room	370	24	72	$14,550,649
Cooking area, kitchen	841	14	146	$19,159,186
Corridor, hall	33	0	1	$1,731,500
Dining room	39	0	0	$2,530,471
Sprinkled Room Totals	1,687	46	273	$53,363,152
All area of origin	5,062	90	537	$227,241,495
% of all areas of origin in a room that would be sprinkled	33.3%	51.1%	50.8%	23.5%

Table 1

Examining fire spread is another way of evaluating the potential impact of fire sprinkler systems in a home. In looking at Table 2 below fewer than half of the fires in Maine homes get past the room of origin. However, when it does spread beyond the room of origin, the outcomes are grim. In every category 50 to 90% of the injures, deaths and property loss occur when the fire spreads beyond the room of origin.

Area of Origin	Frequency	Civilian Deaths	Civilian Injuries	FF Deaths	FF Injuries	Property Loss	Contents Loss	Total Loss
Confined to Room	2,795	14	144	0	17	$21,167,214	$6,050,782	$27,217,996
Outside of room	2,664	77	184	1	234	$133,759,394	$44,034,301	$177,793,695
Total	5,459	91	328	1	251	$154,926,608	$50,085,083	$205,011,691
% of Fire Damage when the fire escapes the room of origin.		84.6%	56.1%	100.0%	93.2%	86.3%	87.9%	86.7%

Table 2

When Maine fire departments have recorded sprinkler systems in a home operating, the effectiveness of those systems has been 97% (see table 3). Effective means the sprinkler system either completely extinguished the fire or contained it until the fire department arrived. In both cases, the fire was held to the area/room of origin.

Operation Effectiveness	Count	%
Operated and Effective	60	95%
Operated and NOT Effective	5	5%
Total	**65**	**100%**

Table 3

The response costs of home fires in Maine are considerable. Every time a fire department is called to respond to any fire, those responders are at risk. As you can see from Table 2, over 200 fire fighters were injured responding to home fires in Maine. The 5,459 home fires alone, where a sprinkler could make a difference, required a response of 58,793 total personnel and 31,221 apparatus over the course of 10 years from 2011 – 2020. An average of 5,879 individuals and 3,122 fire apparatus annually.

B. Traditional Models of Fire Suppression Strategy and Components

Current fire suppression strategies are premised upon the fire triangle: the chemical reaction between heat, fuel, and oxygen. Suppression efforts seek to take out one side of the fire triangle which could include eliminating either heat, fuel source, and subsequently removing a key element needed to complete the reaction. This is often accomplished using a fire hose that will distribute a certain gallonage of water per minute. The idea being that if the gallons of water per minute exceeds the heat (measured in British Thermal Units or BTUs) the fire will be suppressed.

In action, this strategy is employed when firefighters arrive upon the fireground and begin to employ practices often referred to as SLICE-RS and DICERS.[7] Broken down this refers to:

1. **S**ize up the incident
2. **L**ocate the fire
3. **I**dentify the fire
4. **C**ool the fire from a safe distance
5. **E**xtinguish the fire
6. **R**escue
7. **S**alvage

DICERS adds the following steps to SLICE-RS:

1. **D**etect
2. **I**solate Functions to size up and locate steps that emphasize rescue and salvage following

[7] National Institute of Scientific Testing Publication 1191, Research Roadmap for Smart Fire Fighting: Summary Report. May 2015, p. 4

3. **C**onfining the fire
4. **E**xtinguishing the fire
5. **R**escue
6. **S**alvage

The difficulty with this approach is that the fire scene is rapidly changing, and information can be piecemeal as it comes from firefighters in different areas of the fireground making assessments based on what they are seeing. Subsequently, the incident commander puts together what he/she perceives to be the entire situation and issues commands based on that perception. The result is often a series of tactical errors that delay the control of the fire.

In addition to these difficulties is the lack of any real fire service set of standard operating procedures (SOP) for the entire fire service to manage the fireground. There are almost as many SOPs as there are fire departments. There is no national SOP for training fire fighters, use of equipment, and other areas of fire department activities.

Overall, this traditional model assumes adequate resources are there to respond effectively. Otherwise known as the readiness model. The model comes at a high cost because it necessitates building up both personnel and equipment needed to meet all potential situations.[8]

C. Alternatives to Traditional Models of Fire Suppression Strategy: Smart Fire Fighting

The most important difference between the traditional models and alternative models is data utilization. Alternative models, which many fire departments have already begun to use, utilize data to a greater extent. Utilization refers to data collection, processing, and targeted communications. Known as "Smart Fire Fighting" this strategy is realized by utilizing "the power of emerging information, communication, sensors, and simulation technologies to enable markedly better situational awareness, predictive models and decision making."[9] Smart Firefighting does not begin at the fireground but involves pre-incident, during-incident, and post-incident analysis.

Fire departments also assist in fire suppression indirectly through fire prevention and safety education efforts. These efforts come in the form of public awareness programs as well as direct training in the use of a fire extinguisher to suppress a fire in an individual or families own home without the fire departments involvement. Most fire prevention and education efforts focus primarily on prevention and safety. The latter being able to escape personnel injury. The idea of putting out a fire yourself is not encouraged.

Other fire suppression systems, and the focus of this task force, are mechanical in nature and unlike any systems discussed thus far, **do not require people to be directly involved in the suppression of the fire**. The water systems include both wet and dry systems.

---

[8] FireRescue1 Magazine, Alternative deployment models for the fire service, June 11, 2018

[9] National Institute of Scientific Testing Publication 1191, Research Roadmap for Smart Fire Fighting: Summary Report. May 2015, p. 6

Challenges to Traditional Fire Suppression Strategies

All four approaches seek to minimize fire service personnel involvement, save lives, reduce property and contents damage, and subsequently reduce cost. This is important given Maine's declining count of firefighters and the aging of that personnel in rural and urban areas of Maine. The shortage of firefighters impacts both fire department suppression efforts and the fire departments capacity to train residents in fire suppression through fire prevention and safety education. Because not all fire fighters have the same skills and certifications, some of them arrive and must wait for others. Response times essentially depend on:

- Availability – the degree to which resources are available and ready to respond
- Capability – the abilities of those deployed to manage an incident
- Operational Effectiveness – The ability of the resources deployed to match the risk the event entails[10]

Availability, capability, and operational effectiveness will vary depending upon the amount of resources a community is able to use to adequately train and equip that fire department. In addition to standards for equipment, the National Fire Protection Association has created standards for response times. Those standards treat urban and rural fire service response times differently in large part, due to varying capacities.[11]

Finally, the nature of fire in homes today is not the same as it has been in the past. Research conducted by United Laboratories shows that 30 years ago you had about 17 minutes to escape a house fire. That's down to about three minutes today. This is due to both the construction of homes and contents in those homes. The contents of homes today, including the furniture and building materials, burn hotter and faster. Furnishings once primarily composed of feather-down cushions, cotton upholstery and natural materials have been replaced by chemical-based materials such as polyurethane. [12] Building materials are lighter in weight and home designs are more open. Open space furthers fire spread and lighter construction can lead to buildings collapsing sooner endangering both the occupants and fire fighters responding to the fire. In many instances today, the fire has already reached the point of flashover or the point where everything in the area combusts at once due to the intense heat alone. In summary, fire departments need to respond sooner but even if they do the fire they face will be more difficult to suppress than it used to be.

D. Where homes are being built in Maine

From 2011 to 2022 home building permits issued in Maine increased 93% from 2,744 per year to 5,304. Of those new homes 80% were single family units. During that same time frame the construction value of total units increased 174% from $435 million to $1.1 billion. As one might expect, most new homes in Maine are being built in the south-central portion

[10] Lexipol, Understanding and Measuring Fire Department Response Times. Lori Moore-Merrell, July 2019.
[11] See Appendix B
[12] Today https://www.today.com/home/newer-homes-furniture-burn-faster-giving-you-less-time-escape-t65826

of the state. Over 50% of total residential units were being built in Cumberland and York Counties with Androscoggin and Kennebec Counties combining for 18%.

E. Recognized Incentives/Benefits for Residential Fire Sprinkler Systems

Residential sprinkler systems have been proven to minimize fire related losses and costs to individuals and communities.[13] In addition they can help lower insurance premiums, a communities infrastructure costs and benefit all of us by limiting environmental damage incurred from fighting fire with fire hoses. Fire sprinklers also save lives and reduce injuries due to fire. All these dollar and social cost savings can be achieved by supporting developers and builders in their efforts to build homes in both urban and rural settings when they incorporate residential fire sprinklers into the construction of homes. The following describes some of the benefits and potential incentives that come with residential fire sprinklers.

- Sprinklers reduce the damage to the home from a fire. This is accomplished in two ways: the fire spread is limited to the area of origin, or the spread is kept under control until the fire department arrives.
    - Primary savings to the: Homeowner
    - Area of benefit: Mostly rural where fire department response time is much greater than those in urban areas.

- Reduce the number of fire apparatus and personnel needed at the scene to put out the fire.
    - Primary savings to: Community and in particular rural communities with already diminishing fire fighter recruitment and retention
    - Area of benefit: The dollar amount might be greater in urban areas as opposed to rural due to greater personnel and equipment capacity but both urban and rural areas benefit

- Reduce intangibles associated with injuries and deaths to citizens and firefighters. (Losses associated with residential fire deaths in Maine indicate an average $17.6 million annually in work loss and medical costs per year from 2011 – 2017).[14]
    - Primary savings to: Community and homeowner
    - Area of benefit: Urban and rural

- Reduce insurance premiums or increase insurance policy credits. The reduction varies based on a number of variables.
    - Primary savings to: Homeowner
    - Area of benefit: Urban and rural

- Reduce the number of fire hydrants needed by increasing space requirements and subsequently lowering water demand. This reduction would reduce infrastructure costs such as water storage tanks and pumps and inspections and maintenance.

[13] Communities in this context primarily refers to the cost a community incurs through response costs associated with the publicly funded fire department.
[14] CDC WISQARS Cost of Injury Reports, https://wisqars.cdc.gov:8443/costT/

- Primary savings to: Community and developer
- Area of benefit: Urban and rural
- Primary savings to the developer in the cost of construction of the road. This incentive is important to developers as it saves them money, makes the lots larger, therefore they can charge more for the land they are selling. This is where we get the buy-in from the contractors/developers.

- Reduce street width requirements lowering the amount of road surface needed to cover the road and subsequently reduce storm water runoff which benefits ecosystems.
  - Primary savings to: Community and the environment
  - Area of benefit: Urban and rural

- More space for more housing units, as limited fire spread allows homes to be closer together.
  - Primary savings to: Community, developer, and builder
  - Area of benefit: Urban and rural

- Sprinkled homes in residential subdivisions do not have to have fire rated exterior walls.
  - Primary savings to: Developers and builders
  - Area of benefit: Urban and rural

- Reduced or waived construction fees for water metering, utility connections and permitting.
  - Primary Savings to: Developers and builders
  - Area of benefit: Urban and rural

- Wall separation (fire rating) requirements can be reduced in duplex buildings and townhouses saving material costs.
  - Primary savings to: Developers and builders
  - Area of benefit: Urban and rural

- Residential sprinklers removes the necessity of the secondary means of escape i.e. egress windows in a dwelling
  - Primary savings to the Homeowners
  - Primary savings for the contractors
  - Area of Benefit: Urban and Rural

- Reduce the cost of Home Fire sprinkler installations. As the incentives continue to increase the number of installations, Home fire sprinklers become less of a specialty and more of a common practice thus driving the costs of installation down
  - Primary savings to the Homeowners
  - Primary savings to the contractors
  - Area of Benefit: Urban and Rural

- Residential fire sprinklers can add to a community's risk reduction (CRR) efforts by reducing fire risk and subsequently, potential property, response and death/injury costs associated with those fires.
    - Primary savings to: Communities
    - Area of benefit: Urban and rural

- Residential fire sprinklers also have a Green benefit in that they conserve/reduce the amount of water used to put out a fire and the smoke emitted into the air for fires that continue to burn for an extended period of time. Traditional methods of fire suppression can use up to 250 gallons of water per minute in contrast to the 20 gallons that would be used with a sprinkler system that limits fire spread to a single room.
    - Primary savings to the entire community and in particular those communities facing a water shortage
    - Area of benefit: Urban and rural

- Though most fire departments use either tanker trucks or fire hydrants as a source of water, many departments and in particular those in rural areas will draft water from ponds, lakes, rivers, streams and cisterns and as such, both private and public water supplies. Sprinklers would reduce the use of this vital community resource.
    - Primary savings to the public in general and in some instances as single landowner
    - Area of benefit: Property owner and rural communities

- By reducing the amount of water used to put out a fire, sprinklers also reduce the amount of debris and chemical residues running of the surface of the fire site, down the road or street, and eventually into the water shed.
    - Primary savings to the ecosystem, immediate community, and the population beyond
    - Area of benefit: Urban and rural

- Eliminates the need for fire pond or cisterns in rural subdivisions. The sprinkler substitutes for the ponds. The ponds were costly to both the town and residents of the subdivision and many believe they create a hazard. They require long term maintenance.
    - Primary savings to the owners
    - Primary savings for the developers as the ponds take up valuable real estate that could essentially be another house lot. This incentive is important to the developers as it saves them money and potentially adds an entire house lot into the sub-division.
    - Area of benefit: Rural areas

F. CURRENT FORMS AND METHODS OF PUBLIC DISSEMINATION OF PUBLIC INFORMATION ABOUT FIRE SPRINKLER INCENTIVES

Education about and public dissemination efforts regarding residential sprinklers has been led by the National Fire Protection Association (NFPA), the National Fire Sprinkler Association (NFSA), the Home Fire Sprinkler Coalition and others. These organizations provide information in a variety of mediums to local and state organizations and professional organizations about sprinkler systems and their benefits. In addition, these organizations will provide direct assistance in designing campaigns for residential sprinklers where and when requested.

As a result of NFPA and NFSA efforts and guidance, many local and state fire sprinkler associations/coalitions (Chapters) have been started around the country. The NHFSC has 15 Chapters nationwide and the NFPA has affiliated sprinkler coalitions in 31 states including Maine. Maine's voluntary coalition acts as a resource of information about home fire sprinklers in the state of Maine and works actively to educate groups on residential fire sprinklers. Maine's coalition also collaborates with key state fire service organizations to address and overcome barriers to residential fire sprinkler requirements. Both state and national organizations utilize digital platforms, print, radio and TV media, PSAs, displays, publications (in industry magazine), and in conferences and trainings focused directly on sprinklers, as well as booths at various trade industry conferences.

The organizations develop and implement public awareness campaigns that target professionals in the building, development, planning, fire service, real estate, insurance industry, public policy makers and others. They focus on advocating for and communicating the impact of sprinklers.

IV. FINDINGS AND RECOMMENDATIONS

A. Findings

1. Home fires deaths rose for the first time per decade (2011 – 2020) since the 1970s. Home fire injuries and property losses in addition to response related costs have also risen.
2. Municipalities can create local rules or ordinances and be more stringent than the State's adopted code.
3. Maine's fire service is losing members and aging.
4. There is a lack of skilled/trained fire service personnel as numbers decline.
5. Despite the numerous benefits of sprinkler systems, efforts to educate the public and key decision makers about those benefits have generally not been successful.

6. As a result of the lack of education it has been difficult to partner with other industries including builders, realtors, developers, and others to work out

policy that would provide incentives to build or retrofit homes with fire sprinklers.

7. Once implemented, requirements to put home fire sprinklers in homes has done little to nothing to impact continued construction of new home.
8. Builders and developers have generally continued to build and develop without any change as new sprinkler requirements were implemented.
9. Maine has made little effort to address sprinklers in existing homes.

B. Recommendations

1. Promote the incentives associated with home fire sprinklers to the Maine Municipal Association as they are better able to educate their own members.

2. Work with realtors to create a marketable safe home model that promotes all aspects of technological active and passive fire and life safety features of the home.

V. **APPENDIX**

Appendix A

L.D. 1364 Resolve to Study Incentives for Residential Fire Sprinkler Systems Task Force Group

1. Chief Scott Guillerault – Ellsworth Fire Department
2. Gary West – National Fire Sprinkler Association
3. Jim Robinson – Mainely Plumbing Company
4. D/C Steven Sloan – Westbrook Fire Department
5. Chief Glen Garland – Bridgton Fire Department
6. Josh Wise – LHR Fire Protection Company
7. Patrick Cotter – Sanford Fire Department
8. Chief Michael Robitaille – Yarmouth Fire Department
9. Aaron Marden – State Fire Marshal's Office
10. Chief Jeff Chretien – Newport Fire Department
11. Chris Maheux – Maine Fire Protection Systems Company
12. Dominic DiBiase – Warren Mechanical Incorporated
13. Chief Nate Schools – Buxton Fire Department
14. Chief Steve Benotti – Sanford Fire Department
15. Chief Josh Mailman – Milford Fire Department
16. Pierre Lemieux – Fire Equipment Incorporated
17. Chief Greg Payson – North Yarmouth Fire Department
18. Brittany White – State Fire Marshal's Office
19. Chief Brent Libby – Windham Fire Department
20. Barb Skelton – City of South Portland CEO
21. Desiree Cain – Foos Fire Company
22. Chief Robert Chase – Auburn Fire Department
23. Chief Chris Reed – Rumford Fire Department
24. Chief Russell Osgood – Ogunquit Fire Department
25. Vicki Schmidt – Maine Fire Protection Services Commission
26. Lt. Eric Pelletier – Bangor Fire Department
27. Chief Andrew Turcotte – Westbrook Fire Department
28. Jeff Denis – Life Safety Fire Protection Company
29. Chief Chris McLaughlin – Topsham Fire Department
30. Steve Spang – Victaulic Fire Protection – PE
31. Richard McCarthy – State Fire Marshal's Office
32. Chief Chris Wytock – Rockland Fire Department
33. Chief David Emigh – Togus VA Hospital Fire Department
34. D/C David Pendleton – Saco Fire Department
35. Chief Thomas Higgins – Bangor Fire Department
36. Bryan Belliveau – City of Skowhegan CEO
37. Jeremy Foss – High Tech Fire Protection Company
38. D/C Chris Cummings – Bath Fire Department
39. Chief Paul Hewey – Oxford Fire Department

40. Daryen Granata – State Fire Marshal's Office
41. David O'Connell – Auburn Fire Department Fire Prevention Officer
42. Gregory Day – State Fire Marshal's Office
43. Jeff Wallace – City of Bangor CEO
44. Vivian Mikhail – Drummond Woodsum (State Farm Insurance Company)
45. Richard Taylor – State Fire Marshal's Office
46. Marc Veilleux – State Fire Marshal's Office
47. Joel Corneliusen – FPE Consulting Company
48. Bill Ninteau – Tri-State Sprinkler Corporation
49. Dana Michaud – CB Plourde Real Estate

Appendix B

Chapter 97, L.D. 1364

Resolve, To Study Incentives for Residential Fire Sprinkler Systems

Sec. 1. Study and recommend incentives for residential fire sprinkler systems. Resolved: That the State Fire Marshal shall convene a task force to study whether it is feasible and desirable to provide incentives for developers, builders and home buyers to install residential sprinklers. The study must examine the forms and delivery of incentives and dissemination of public information about and advertising of incentives. The study must include consideration of incentives that differ in urban and rural areas. The State Fire Marshal shall invite to serve on the task force individuals representing the following: fire chiefs, firefighters, builders and contractors, real estate agents, fire sprinkler contractors, fire safety educators, insurance carriers, water districts and other persons who express interest in the work of the task force.

Sec. 2. Report. Resolved: That the State Fire Marshal shall present the findings and recommendations of the task force to the Joint Standing Committee on Criminal Justice and Public Safety by December 1, 2021. The joint standing committee may report out legislation based on the recommendations in the report to the Second Regular Session of the 130th Legislature.

Sec. 3. Funding. Resolved: That the costs to the Department of Public Safety, Office of the State Fire Marshal to convene and staff the task force and to report to the Legislature must be absorbed within the department's existing budgeted resources.

Appendix C

NFPA 1710, 1720, and response time

Fire service response is a complex system involving variables and constants. All emergency responses follow a timeline beginning with a discovery of an event and ending with closure or mitigation of the event. The variables are discovery of the event, reactions of the people involved, amount of time to react, weather conditions, and traffic conditions. The constants are emergency system infrastructure and the road network. To manage response time you have to manage these elements. **Technology like GPS in fire vehicles and GIS software when used with incident reports provide the tools and data to fully evaluate incident response.** The staffing systems used by the fire service in North America are various, but principally include career, paid-call, and volunteer personnel. Any given fire department may be staffed in one manner or in a combination. The NFPA treats volunteer and career departments differently when it comes to response time standards. For those departments that are substantially (>80%) career there is NFPA 1710. For departments that are substantially (>80) volunteer there is NFPA 1720. For those departments in between the range there is nothing. The two standards are often misunderstood, the 1710 standard for response time has been used in news reports to evaluate all types of fire departments, including volunteers. It is not intended for that purpose and using it in that manner is misleading. The goal in 1710 (for career firefighters) is as follows: 60 seconds to turn-out, 4 minutes for the first engine company to arrive, and 8 minutes for the full first-alarm assignment for at least 90 percent of all fire calls. The rationale behind this is the fact that a room fire will reach a critical stage in fire development (point of flashover) in about 8 to 10 minutes. The variables are whether or not the fire room is ventilated (open doors or windows), size of the compartment, configuration, fuel load, etc. In the worst case scenario, the critical temperature is reached and the flashover engulfs the room in fire before firefighters arrive to control the event. With flashover, the fire moves beyond the room of origin. NFPA 1710 response times are meant to ensure that flashover is prevented through fire control. (Automatic fire sprinklers are intended to control fire development to prevent flashover, thus keeping the fire to the area or room of origin.) With a good response time and adequate available water supply, fully staffed fire departments stand a much better chance of minimizing fire damage. NFPA 1720 applies to volunteers who typically don't have personnel on-duty in stations and instead respond to page-out from home, work, or elsewhere. It is this fact of volunteer response that introduces a key variable into the picture. Volunteers cannot guarantee availability like career, on-duty staff can do unless the volunteers are in the station when actually alerted. In this standard response goal criteria are very different and intended to reflect the nature of a volunteer response system.

In general, 1720 provides the following benchmarks:

- **Urban Zones** with >1000 people/sq. mi. call for 15 staff to assemble an attack in 9 minutes, 90% of the time.
- **Suburban Zones** with 500-1000 people/sq. mi. call for 10 staff to assemble an attack in 10 minutes, 80% of the time.
- **Rural Zones** with <500 people/sq. mi. call for 6 staff to assemble an attack in 14 minutes, 80% of the time.

- **Remote Zones** with a travel distance =8 mi. call for 4 staff, once on scene, to assemble an attack in 2 minutes, 90% of the time.

There is a direct relationship between fire development, temperature, and time. Intervention is the strategy, whether it is through the use of automatic fire sprinklers or firefighters. Community resources dictate fire service capacity. The larger the town, the more fire stations may be needed. Having fire stations implies staff and equipment. Staffing presents an option, to a point volunteers are less expensive than paid staff, however the savings in personnel costs may translate into a higher community-wide fire loss. The distribution of fire companies (stations) is important and ISO looks for the built-upon area of a community to have a first-due engine company within 1.5 road miles of its assigned district and a ladder-service company within 2.5 road miles. Using a formula developed by the RAND Corporation **(Expected Travel Time = 0.65 + 1.7 Distance Traveled)**, ISO set a benchmark criteria of an expected response time of 3.2 minutes for an engine company and 4.9 minutes for a ladder-service company in a defined standard response district. The formula has been validated on numerous occasions and yields an average speed of 35 MPH for a fire apparatus responding with emergency lights and siren (considering average terrain, average traffic, weather, and slowing down for intersections). The NFPA uses this formula in the 1142 standard. ISO determines standard response districts (SRD) for each existing fire station. An SRD for an engine company is a polygon defined by streets leading from the fire station out to a distance of 1.5 road miles. For a ladder-service company, the standard response district is a polygon defined by streets out to a distance of 2.5 road miles. The ISO then considers the number of fire hydrants within the SRD. (When fire hydrants are not available they measure the total linear road miles in the standard response district.) Thus, the presence of hydrants signifies a built-up area. They then identify contiguous built-upon areas in the community that do not have a fire station within the specified distance. If such an area has at least 50 percent of the number of fire hydrants (or, in areas without hydrants, 50 percent of the linear road miles) found in the SRD, they consider that the area may need a fire station. The SRD in cities with multiple engine company locations is the average number of hydrants served by the existing engine companies as determined by the total of hydrants within 1-1/2 mile areas divided by the number of engine company locations. Consideration may be given for excluding relatively low number hydrant stations as described below. (from ISO's mitigation website) (Note: This is only a cursory review of this subject as it applies to ISO's rating schedule criteria for response and station location.) In addition, the ISO provides exceptions to their response area coverage criteria for cities and towns lacking a hydrant system or only having partial hydrant coverage. The exceptions vary by state and are sometimes referred to as the suburban rule.

Summary of the ISO Suburban Rule Exceptions:

- Properties 5 road miles or less to a responding fire station and with a hydrant within 1,000 feet are classified as being within the hydrant area. Thus, these properties receive better public protection classifications.
- Properties 5 road miles or less to a responding fire station and with a hydrant more than 1,000 feet away are classified as protected, but outside the hydrant system. These properties receive a lower public protection classification.

- Properties more than 5 road miles to a responding fire station receive the poorest public protection classification, essentially being without unrecognized protection. These properties receive the absolute lowest public protection classification.

(Note: The public protection classification (or PPC) scale is 1 - 10, with 1 being the best.)

Appendix D

5 Year Maine Bureau of Insurance Data

Maine Bureau of Insurance Title 25, §2399: Commissioner of Public Safety's Expenses			
Year	Loss ($)		
2007	$50,642,619		
2008	$38,031,485		
2009	$50,563,536		
2010	$52,598,386		
2011	$49,774,286	$48,322,062.40	2007 – 2011, 5 - Year Average
2012	$64,445,082		
2013	$79,113,004		
2014	$72,366,538		
2015	$72,064,314		
2016	$72,358,799	$72,069,547.40	2012 – 2016, 5 - Year Average