

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Discussion of Mandatory Fire Sprinklers for New Single Family/Duplex Residential Construction
DEPARTMENT:	Planning & Community Development Shoreline Fire Department
PRESENTED BY:	Ray Allshouse, Building Official Derek LaFontaine, Fire Marshal
ACTION:	<input type="checkbox"/> Ordinance <input type="checkbox"/> Resolution <input type="checkbox"/> Motion <input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Public Hearing

PROBLEM/ISSUE STATEMENT:

The Shoreline Fire Department is seeking to move towards expanding mandatory fire sprinkler installation coverage to include all new single family and duplex projects constructed in the City. This would potentially occur with the next update of the Construction and Building Code, which is currently slated to take effect on February 1, 2021. If approved, this will allow adoption of model code language originally adopted nationally as part of the 2009 International Residential Code (IRC). This requirement has not been adopted in Washington State by the Washington State Building Code Council (WASBCC) due to recognized implementation barriers, such as concern from local water purveyors and the cost of installation. Over the ensuing years, several local jurisdictions in the State have adopted this regulation.

This past Spring, the Shoreline Fire Commission authorized the Fire Marshal to pursue implementation of this mandatory fire sprinkler regulation. Tonight, staff is seeking direction from the Council on whether the Council would like to include this new requirement in the forthcoming amendments to the Construction and Building Code (SMC Chapter 15.05) when it is brought before Council for discussion on January 4 and potential adoption on January 25, 2021.

RESOURCE/FINANCIAL IMPACT:

There will be little or no impact to City resources. Fire Department permit fee revenue will see a modest increase as reflected below.

RECOMMENDATION

No formal action is required tonight. Staff recommends that the Council discuss this potential requirement and provide direction on whether to include this requirement in the Construction and Building Code amendments when they are brought back to Council for review and adoption in January. Staff recommends that Council expand mandatory fire

sprinkler installation coverage to include all new single family and duplex projects constructed in the City in the forthcoming Building Code update.

Approved By: City Manager **DT** City Attorney **MK**

BACKGROUND

Since 2006, the City of Shoreline has had a ‘sprinkler ordinance’ requiring installation of residential fire sprinkler systems in new single-family and duplex homes based on any one of these three factors:

- **Size** - Residences in excess of 4,800 square feet;
- **Low Fire Flow** - Residences over 3,600 square feet (sf) require 1,750 gallons per minute (gpm) in flow and residences under 3,600 sf require 1,000 gpm; or
- **Distance to the Fire Hydrant** – Residences over 500 feet away from the hydrant.

This has resulted in 45% of new homes, and almost all new townhomes, installing fire sprinkler systems.

All King County Zone One Fire jurisdictions¹ have similar sprinkler ordinances to Shoreline’s current requirements. Over the years, the nearby jurisdictions of Kenmore, Redmond, Tukwila and Mercer Island have expanded to full coverage fire sprinkler regulations, meaning all new single family and duplex projects constructed in those cities must have residential fire sprinkler systems. Additionally, five other jurisdictions in the State of Washington have full fire sprinkler regulations, for a total of nine jurisdictions statewide. The Shoreline Fire Department, through authorization of the Shoreline Fire Commission, is now seeking to include this requirement in the City’s Building Code.

Residential Fire Sprinkler History and Regulations

The following provides a brief history of residential fire sprinklers in the United States and locally:

- **1973 - America Burning Report Issued:** Because residential fires are responsible for 70% of fire loss, civilian and firefighter fatality and injury, the report states “*Automatic extinguishing systems in residences would not only save lives and reduce direct losses from fire, but would also reduce other expenses to the Nation, such as the costs of treating burn and smoke injuries, insurance costs (both premiums and payouts), and the costs of maintaining fire departments.*”
- **1975 - National Fire Protection Association (NFPA) Standard 13D Developed:** The first residential sprinkler code developed in response to the America Burning Report.
- **2006 - NFPA Standard 5000 Adopted:** Building Construction and Safety Code includes first ever requirement in a US building code for sprinklers in one-and two-family dwellings.
- **2006 - International Residential Code (IRC) Adopted:** Adds optional sprinkler provision.
- **2006 – Current Shoreline Fire Sprinkler Ordinance (in Construction and Building Code; SMC Chapter 15.05) Adopted:** Added fire sprinkler ordinance based on size, low fire flow, and distance to hydrant thresholds (current City regulations as described above).

¹ Zone One Fire jurisdictions include Shoreline, Northshore, Bothell, Woodinville, Redmond, Kirkland, Bellevue, Mercer Island and Eastside Fire and Rescue.

- **2009 - IRC Adopted:** Makes sprinklers a requirement in all new single-family homes. However, the Washington State Building Code Council (WASBCC) does not adopt this portion of the IRC and leaves it up to municipalities to adopt these regulations if they choose to. The IRC has since maintained the requirement with every edition.

Today, while all US model building codes include sprinkler requirements for one-and-two family dwellings, the WASBCC has not adopted this requirement and continues to leave it up to local jurisdictions to adopt this requirement or not.

Fire Response Calls in Shoreline

For context, the following information provides fire response calls by type of fire and year. Between 2015 and 2019, Shoreline has experienced 861 fire involved calls, 276 of which were structure fires. The data breaks down as follows:

2015-19 Structure Fire Data

	2015	2016	2017	2018	2019	Total
Unconfined Structure Fires	32	45	30	43	40	190
Confined Cooking	9	10	17	14	17	67
Confined Chimney	3	6	3	1	6	19
Total	44	61	50	58	63	276

These fires have resulted in a fatality, civilian injuries, firefighter injuries, and several instances where a citizen or firefighter were very close to becoming seriously injured. For instance, there were a number of times where successful escapes from smoke and fire would have resulted in a very different outcome yet for a moments delay.

National Residential Fire Statistics

Additionally, the following data provides more context about residential fires across the Country. This data spans the years of 2008 through 2017:

- 1.34 million fires per year; 38% (510,758) are residential
- 3,190 deaths per year; 72% (2,296) are in residences
- 16,225 civilian injuries; 76% in residential fires
- \$14.7 billion in direct property loss value
- Cooking fires are the leading cause of residential fire loss and injury

DISCUSSION

As is noted above, since 2006, Shoreline’s Construction and Building Code (SMC Chapter 15.05) has required sprinkler systems based on size, low fire flow, distance to hydrant, or access issues. The issue with this current regulation is that fire does not care how big or small your residential structure is; fires happen in homes both big and small. In fact, 79% of the Shoreline structure fires from 2015 to 2019 occurred in homes under 3,000 sf.

Based on this issue, this past Spring, the Shoreline Fire Commission authorized the Shoreline Fire Marshal to pursue implementation of this regulation. A letter from Shoreline Fire Department Chief Matt Cowan to the City Council supporting this regulation is attached to this staff report as Attachment A.

Tonight, staff is seeking direction from the Council on whether the Council would like to include this new requirement in the Construction and Building Code amendments when they are brought before Council in January 2021. Full fire sprinkler coverage can be achieved by a local amendment that simply removes the WASBCC rulemaking provisions that repealed the applicable sprinkler sections of the IRC residential model code language (See Attachment B).

Regulation Analysis

The following section provides the pros and cons of this regulation for Council consideration:

Pros:

- Nationally, sprinklers are responsible for an estimated 65% reduction in fire-fighting injuries.
- Sprinklers reduce direct property damage by 69%.
- National average fire loss in a sprinklered home is \$2,166 versus \$45,019 for an un-sprinklered home.
- Shoreline has had several one-head sprinkler fires in new multi-family residences. These are huge success stories as the residents can re-occupy the building immediately after cleanup. This minimizes temporary lodging needs.
- Much less water is used for fire suppression: A 13 gpm sprinkler head puts the fire out in its incipient phase, as opposed to a 150 gpm hose line.
- Fewer catastrophic house fires reduce contaminated runoff into the City storm water utility infrastructure.
- Use of sprinklers results in less smoke production and associated air-quality degradation including carbon monoxide (CO) and carbon dioxide (CO₂).

Cons:

The primary downside of required residential sprinkler systems is the cost. The current average installation cost of a sprinkler system is \$2.00-\$2.50 per square foot in the Puget Sound area and the cost of a Fire Sprinkler permit is currently \$612. This additional cost may reduce demand for new residential development in the City. However, Shoreline allows “flow through” sprinkler systems which tie the sprinkler system to a regularly used plumbing fixture such as a toilet. This removes both the need for an extra water meter as well as a backflow device (which otherwise must be professionally tested annually). These provisions have resulted in making the installation of fire sprinklers in residential structures easier and less expensive. Furthermore, “flow through” sprinkler systems can be constructed with less expensive pex (flexible plastic) piping material.

ALTERNATIVES ANALYSIS

If the Council is not in support of moving forward with this full sprinkler regulation, then the existing Code thresholds established locally in 2006 can be revisited with the intent of expanding the number of new residences that would need to have sprinklers installed. For instance, the building size threshold can be dropped below 4,800 square feet and/or the distance to the closest hydrant can be reduced to less than 500 feet. The existing standards are based on a combination of historic code-based criteria and Shoreline Fire Department' operational standards.

Options for Council Consideration

Options for Council consideration tonight include:

- Including this mandatory fire sprinkler regulation for all new single family and duplex projects constructed in the City in the forthcoming Construction and Building Code amendments, including amendments to provisions related to establishing a threshold for requiring fire sprinklers for the full structure when a single family or duplex addition is proposed, or
- Amending the thresholds in the City's current fire sprinkler regulations as identified in the Alternatives Analysis section above, or
- Maintaining the status quo and not amending the City's current residential fire sprinkler regulations.

The local amendments to the Construction and Building Code (SMC Chapter 15.05) will be presented to Council for discussion on January 4, 2021, with potential adoption scheduled for January 25, 2021. Staff will include any amendments to the draft Code language based on direction provided tonight for Council's review on January 4th.

RESOURCE/FINANCIAL IMPACT

There will be little or no impact to City resources. Fire Department permit fee revenue will see a modest increase.

RECOMMENDATION

No formal action is required tonight. Staff recommends that the Council discuss this potential requirement and provide direction on whether to include this requirement in the Construction and Building Code amendments when they are brought back to Council for review and adoption in January. Staff recommends that Council expand mandatory fire sprinkler installation coverage to include all new single family and duplex projects constructed in the City in the forthcoming Building Code update.

ATTACHMENTS

- Attachment A – November 30, 2020 Letter from Shoreline Fire Chief Matt Cowan to the Shoreline City Council Regarding Citywide Sprinkler Ordinance
- Attachment B - Draft Local Amendments to the International Residential Code and International Fire Code Related to Mandatory Fire Sprinklers in Single Family and Duplex Structures



Shoreline Fire Department
Dedicated to the Protection of Life and Property
Serving the Shoreline Community for over 80 years, since 1939

FIRE CHIEF
Matt Cowan

COMMISSIONERS
Ken Callahan Rod Heivilin
Kim Fischer Barb Sullivan
David Harris

November 30, 2020

Dear City Council Members,

I am writing today because I understand that you will be considering a City-wide sprinkler ordinance. I know for many that this is a contentious topic considering the pressure that the building industry has exerted on these types of requirements. While I agree with the builders that this will increase the cost of construction and might be passed along to the homeowner, I believe that the benefits far outweigh the costs. The most recent estimate is between \$2.00 and \$2.50 per square foot, which on a 2,000 square-foot house would be \$4,000 to \$5,000 dollars. While this may appear like a significant amount of money, it is a small fraction of the overall construction costs.

In the fire service, we are continually performing cost/benefit analyses. On emergency scenes, the cost is more commonly referred to as "risk," which is the risk of personnel being injured versus what we can save. In other programs, we consider the cost of a program versus the benefit gained, and sprinklers are a significant and undeniable benefit. The saying that "sprinklers save lives" is absolutely true, as it makes it much more likely that victims will have a chance to survive by "buying time." Even if sprinklers do not put the fire out, it slows the progress allowing the time to arrive and fully extinguish or perform a rescue.

We have fewer structure fires today than 20 years ago, but the ones we encounter are much more powerful due to the materials used in construction. And most structures are more likely to fail due to the use of trusses and other engineered construction practices. Again, I understand that there is a cost, but can we ignore the great benefits that can be provided by sprinklers? Please consider this when weighing the arguments for and against this measure. Speaking for myself and the Shoreline Fire Department, we hope that you rule in favor of the ordinance. Thanks for your time and consideration!

Sincerely,

Matt Cowan
Fire Chief
Shoreline Fire Department

Proposed Local Amendments Excerpt
Residential Sprinklers

International Residential Code (IRC) Section R313.1 is adopted and Section R313.2 is amended to read as follows:

R313.2 One- and two-family dwellings automatic fire sprinkler systems.

An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings.

Exception: An automatic residential fire sprinkler system shall not be required for additions to existing buildings that are not already provided with an automatic residential sprinkler system unless otherwise required under IFC Section 102.5.

R313.2.1 Design and installation. *(no changes)*

International Fire Code (IFC) A. Section 102.5 is amended to read as follows:

102.5 Application of residential code.

Where structures are designed and constructed in accordance with the International Residential Code, including all new licensed adult family homes in existing dwellings without exception, the provisions of this code shall apply.

102.5.1 Scope. Construction and design provisions of this code pertaining to the exterior of the structure shall apply including, but not limited to, premises identification, fire apparatus access and water supplies. Where interior or exterior systems or devices are installed, construction permits required by Section 105.7 of this code shall apply.

Exceptions:

1. Additions to existing structures of up to 500 square feet with a resulting total area that does not exceed 6,200 square feet are not required to comply with fire apparatus access or water supply requirements.
2. Additions to existing structures greater than 500 square feet are not required to comply with fire apparatus access or water supply requirements, provided the addition to a dwelling is less than 25% of the existing total living area square footage and the resulting total does not exceed 6,200 square feet.
3. Additions to existing structures greater than 500 square feet are not required to comply with fire apparatus access or water supply requirements, provided the addition to a dwelling is greater than 25% but less than 50% of the existing total living area square footage, the resulting total does not exceed 6,200 square feet, and interconnected carbon monoxide and smoke alarm devices are monitored by an approved central station.