

FIRES AT THE URBAN INTERFACE



Risks to Buildings, Occupant Safety & Environment

- ◆ Damage to, or destruction of buildings
- ◆ Utility service interruption
- ◆ Potential loss of property and personal assets
- ◆ Decreased outdoor and indoor air quality and associated risk to human health
- ◆ Risk of human injury or loss of life through exposure to fire, smoke, and/or decreased air quality

Site Strategies

Strategy	Cost	Impact	Alignment
Identify prevailing wind direction and airshed characteristics to determine direction of potential fires	\$	***	
Conduct a full risk assessment, considering fuel types, building location relative to slope, and the nature of the structure	\$\$	***	
Maintain 10m setback from all combustible materials to create a natural firebreak. Increase this setback for structures or vegetation closest to the forest interface	\$	***	
Install outdoor water fixtures connected to a gravity-fed source in a location easily accessible to building occupants	\$	***	

Design Strategies

Strategy	Cost	Impact	Alignment
Include mesh debris screens in gutters, eaves and vents to reduce accumulation of flammable vegetation and limit exposed areas from sparks and embers	\$	*	
Install a chimney spark arrestor to reduce release of sparks and embers to surrounding areas	\$	*	
Select higher performance fire-retardant or -resistant siding materials (e.g. stucco, metal siding, brick, concrete and fibre cement, log or heavy timbers)	\$\$	***	
Select fire-retardant roofing materials, such as metal, asphalt, clay and composite rubber tiles with Class A, B or C ratings – avoid green roofs for buildings at the wildland-urban interface	\$\$	***	
Use double-paned tempered windows and frames with an air barrier seal to provide greater air quality protection and heat resistance	\$\$	**	
Ensure building and garage entry doors are fire-rated and sealed with an air barrier	\$	**	
Install high-efficiency air filtration media (MERV 11 or higher) for all outdoor air building ventilation systems to improve indoor air quality	\$\$	***	
Install air cleaners equipped with highest-efficiency particle air (HEPA) filters and activated carbon filters in refuge areas (e.g. amenity spaces)	\$\$\$	***	
Make use of demand-controlled ventilation based on CO2 levels to reduce the introduction of outdoor air beyond required air flow rates.	\$\$\$	**	
Install mechanical systems such as air source heat pumps that allow for cooling during fire events	\$\$	***	
Design a common building area to act as a cooling room or clean air refuge	\$	***	
Connect cooling and ventilation systems in refuge areas to a source of back-up power.	\$\$	**	
Ensure a minimum of 72 hours of fuel storage for power to refuge area and key services, including building pumps, fans, emergency lighting, and security systems	\$\$	***	
Design building entry and exits that can be operated manually	\$	***	

Power Outages & Emergencies	Air Quality	Flood Events
Severe Storms	Seismic Events	Heat Waves

Relative Cost/ Cost Premium		
Low	Medium	High
\$	\$\$	\$\$\$

Relative Impact		
Low	Medium	High
*	**	***

An interface fire is an unplanned fire with the potential to threaten building safety. Risks occur when the close combustion of natural fuels (e.g. trees, grasses and shrubs) spread to human-made structures. Wildfires at the urban interface are more complex as a result of the compounding fuel sources presented by combustible building and other materials. At the wildland-urban interface, fires can start either as wildfires and spread to adjacent structures, or as “urban” fires that ignite vegetation and spread through the wilderness. Interface fires are projected to increase in severity and magnitude as a result of climate change, and can in turn lead to air quality advisories across the province.

Operations Strategies

Strategy	Cost	Impact	Alignment
Trees should be set back 10m from all buildings or any combustible materials upon mature canopy growth	\$	***	
Plant fire-resistant vegetation with moist, supple leaves and low sap or resin production	\$	*	
Ensure planting groups are a minimum of 6m apart, and trees are a minimum 3m apart	\$	*	
Prune lower branches within 6' (1.8m) of ground for trees taller than 18' (5.5m)	\$	*	
Regularly mow lawn areas and check roof gutters to remove flammable vegetation	\$	*	
Inspect, maintain and replace high-efficiency air filtration media for all outdoor air building ventilation systems	\$	**	
Close building openings to temporarily reduce the intake of outdoor air during extreme events	\$	***	
Plan, rehearse, and identify procedures necessary to maintain a successful refuge area (e.g. testing equipment, checking shelf life of stored provisions)	\$	*	
Provide occupant education on refuge areas, evacuation measures, exit locations, etc.	\$	***	
Educate building maintenance staff in firefighting/resistance measures to help delay need to evacuate (e.g. operating sprinklers, wetting down surfaces, removing flammables)	\$	***	
Provide sufficient personal protective equipment for building occupants, (e.g. N95 masks or N95 respirators) to minimize exposure to particulate matter	\$	**	
Ensure personal cooling devices are available to building occupants (e.g. cooling blankets)	\$	*	
Ensure there is adequate means for people who don't have cars to evacuate the vicinity (e.g. public transportation or a carpool-evacuation plan)	\$	*	
Ensure alternate access routes are available and known to building occupants	\$	**	

Community Benefits



Consider the following strategies to help improve the resilience of the community overall:

- ◆ Provide access to local outdoor air quality data and indoor CO2 levels via occupant displays
- ◆ Design amenity rooms to act as cooling centres/clean air refuge areas for at-risk community members (e.g. seniors) and a central location for emergency support and services
- ◆ Ensure refuge areas and common spaces are designed to foster social connection, mental health, and overall cultural safety
- ◆ Ensure building connection to community fire response plans (e.g. notification systems)

Potential Design Conflicts



Take care and ensure resilient strategies do not exacerbate vulnerability and other risks

- ◆ Vegetation setbacks may eliminate benefits associated with trees for shading and heat island reduction
- ◆ Consider the durability of siding materials to withstand storms, freeze/thaw and seismic events
- ◆ Consider the impact of roofing materials on the heat island effect
- ◆ Passive ventilation strategies that rely on natural air flow to cool and ventilate a building may exacerbate indoor air quality issues during times of poor air quality (e.g. forest fire smoke). Ensure buildings have back-up cooling and ventilation systems that allow for mechanical ventilation when necessary.

Additional Resources

- ◆ BC Air Quality, Current Air Quality Data Map – Air Quality Health Index
- ◆ FireSmart Your Property
- ◆ FireSmart Homeowner’s Manual