

### Abstract

The effects of global climate change are increasing the frequency and intensity of wildfires in North America. The continued growth of wildland-urban interface (WUI) communities are placing more and more homes and businesses in regions where wildfires are a common occurrence.

Without incentives and cost offsets from private insurers and government, homeowners have little incentive to invest in FireSmart adaptations to their property. In densely built neighbourhoods, a classic free rider problem develops where neighbours benefit from the FireSmart adaptations of their neighbours, but, in turn, place their neighbours at risk by remaining susceptible to fire.

A cost analysis of FireSmart's homeowner recommendations was conducted to estimate the compliance costs faced by the average homeowner in Fort McMurray, Alberta. This study determined that, over the lifecycle of a home, FireSmart's recommended adaptations cost approximately 4% of average property value.

If levels of government were to include fire-resistant adaptations within current home renovation rebate programs and if insurers were to include wildfire risk in their actuarial calculations, homeowners would benefit from increased awareness and financial incentives to carry out fire resistant adaptations on their property.

### Introduction

- FireSmart Canada is a Partners in Protection organization that began in Alberta to address the concern over wildfires threatening WUI communities.
- Radiant heat and thrown embers can still ignite unprotected buildings at distance. The recommendations in FireSmart's home guide are designed to minimize the combustible material on a property.
- Combined, the adaptations to the yard and building have the potential to significantly reduce a home's risk profile (Calkin et al., 2013).

### Methods

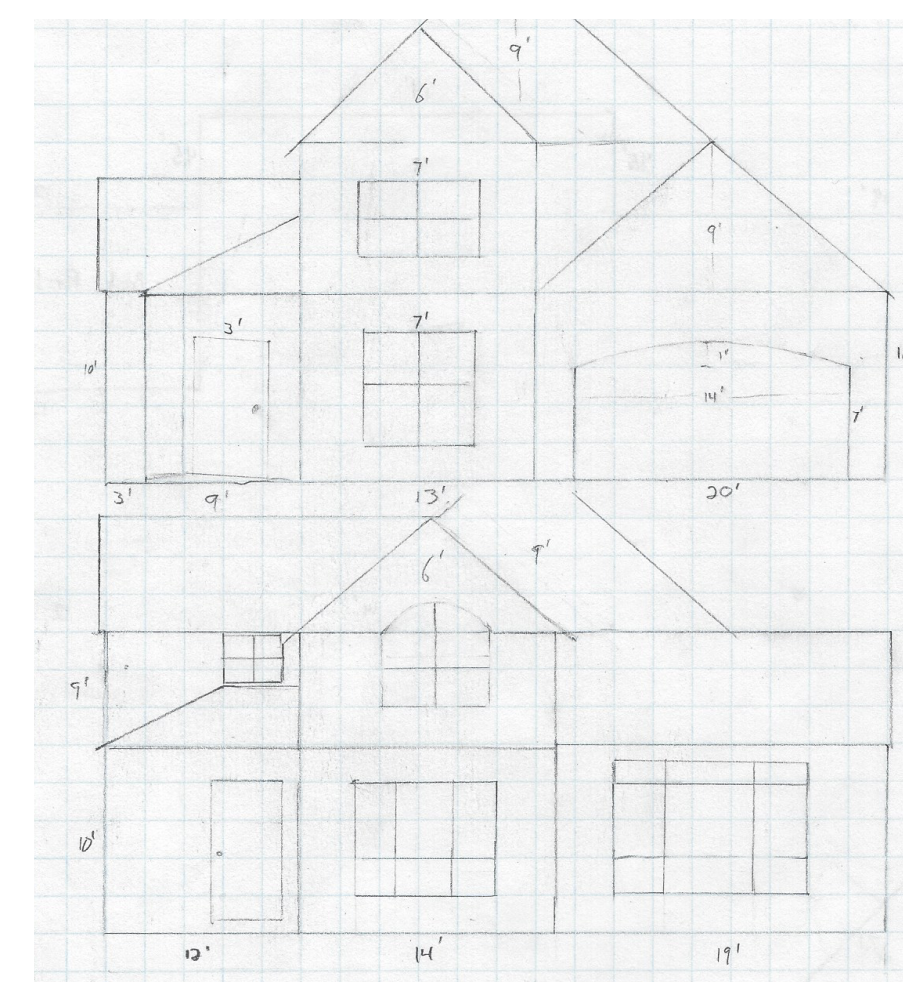
A cost comparison was conducted based on a model, average, detached home in a WUI suburb. Such a house was found to be 2-story, approximately 2,000 square feet with an attached garage.

This model house was the comparison case over a 50-year cost of ownership period. The lifecycle costs of FireSmart adaptations, as specified in their Homeowner Manual, were compared against the lifecycle costs of base house.

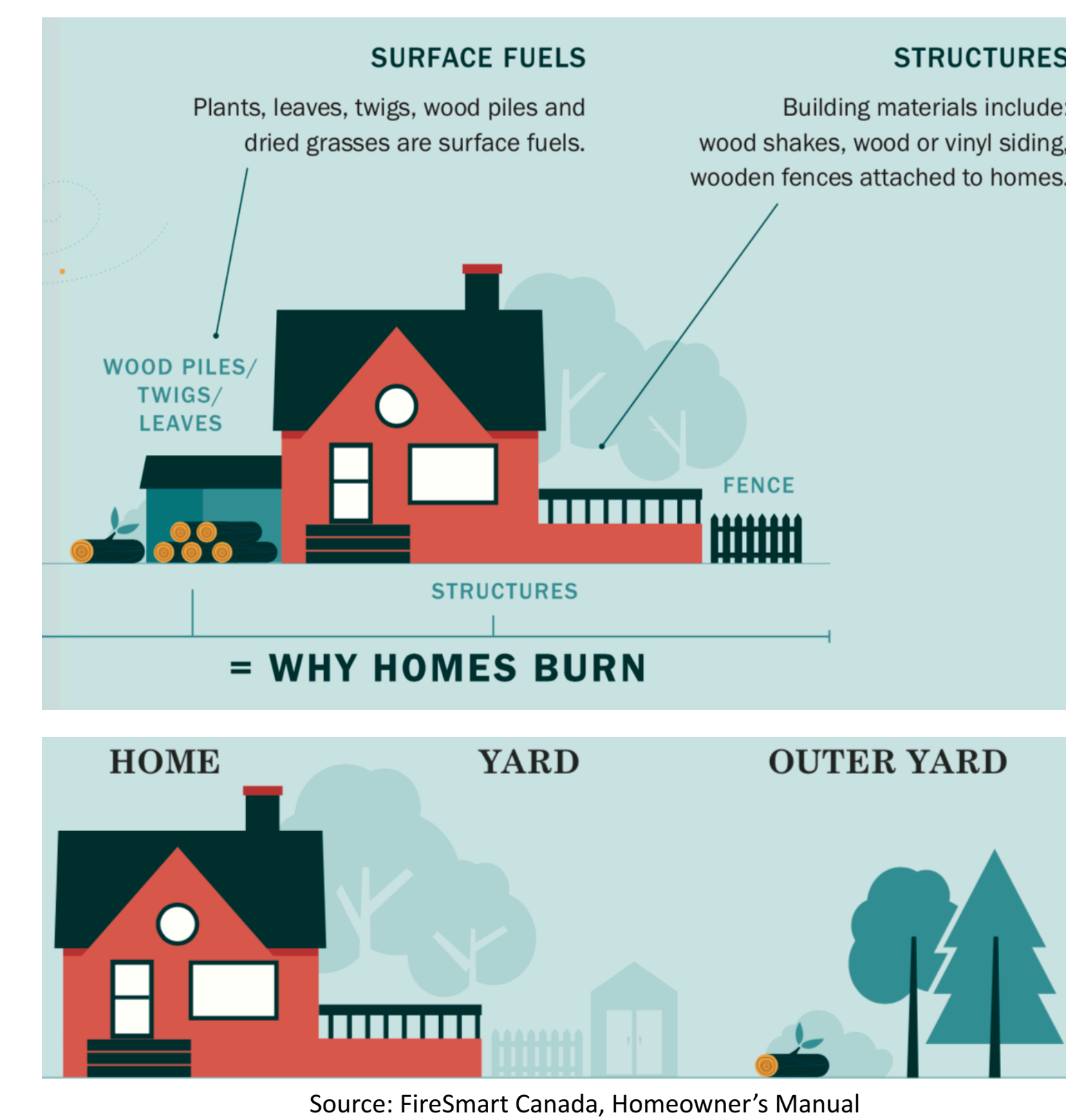
All estimated prices were generated using ClearEstimates software. Project totals carry an installer markup of 25%.

All quotes were produced in USD and converted to CAD by an exchange rate of 1.27.

All future costs carry a 3% discount rate.



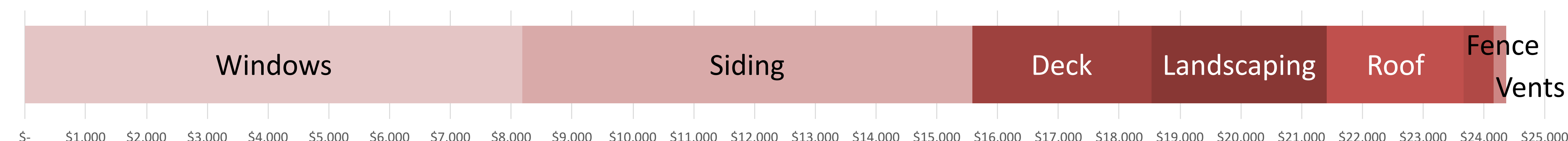
#### FireSmart Recommendations



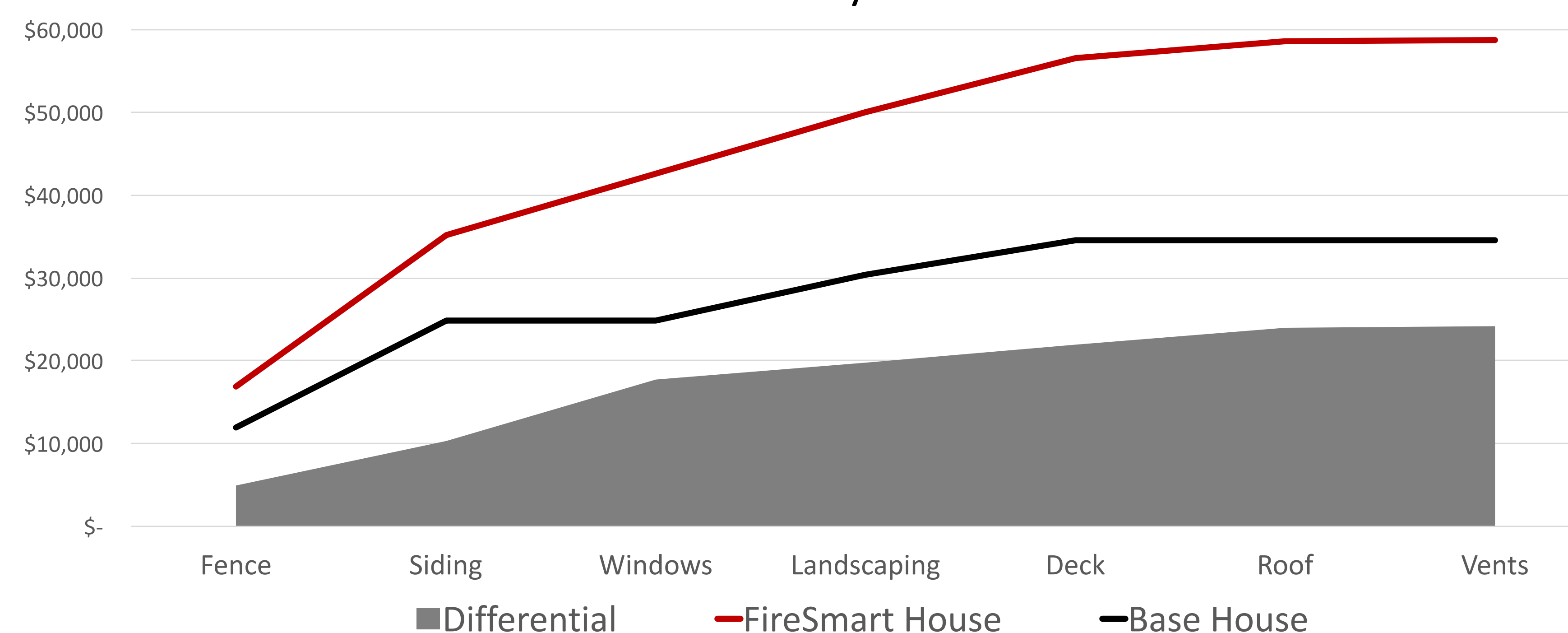
### Results

- The total, net cost of FireSmart adaptations over a 50yr ownership period were found to be \$24,356.
- This represents an expense in the range of 4% of property value.

#### Net Cost Components



#### Additive Lifecycle Costs



### Conclusions

- Most homeowners are unlikely to bear these pre-emptive, out-of-pocket expenses without encouragement.
- While most homeowners do not feel like they stand to lose because they are covered by replacement value home insurance, the average home price in Fort McMurray is nearly \$100,000 less than it was a year ago.
- A combination of incentives by levels of government and insurance providers in the form of regulations, rebates, education, and wildfire risk related premiums would increase homeowner participation through awareness and reduced cost.
- The higher the participation the more effective the program. Managing wildfire risk must be done on a coordinated, community level.
- If government and insurance incentives can encourage homeowners to invest in FireSmart adaptations out of self-interest, it will assist communities in pursuing more comprehensive FireSmart mitigation strategies and reduce the disaster relief and rehabilitation costs borne by the region in the long-run.

### References

Calkin, D.E., Cohen, J.D., Finney, M.A., & Thompson, M.P. (2014). How risk management can prevent future wildfire disasters in the wildland-urban interface. *PNAS*, 111(2), 746-751.

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Partners in Protection. (2017). Homeowner's Manual: FireSmart begins at home. *Alberta Government*. Retrieved from <https://www.firesmartcanada.ca/resources-library/category/manuals>.

### Acknowledgements

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