



RESEARCH FOUNDATION

RESEARCH FOR THE NFPA MISSION

PROJECT SUMMARY

Economic Impact of Fire: Cost and Impact of Fire Protection in Buildings

1 October 2021

Background: The National Fire Protection Association's (NFPA's) vision includes the elimination of economic loss from fire and related hazards. An important component in realizing that loss is its measurement – what are the various dimensions of the economic impact of fire? How can this be measured so that the cost of fire prevention and other interventions can be weighed against their benefits?

The economic impact of fire needs to be considered in macro scale, the national impact of fire, and in micro scale, the cost of fire protection and its potential return of investment. NFPA has traditionally been the recognized source of information on the national economic impact of fire through our study on the cost of structure fire. This study has however identified several gaps in the data available on cost of fire and hence further research is needed to provide a more comprehensive study.

With a continued focus on bringing the cost of construction down and with fire protection measures being a significant portion of the construction cost of new buildings it is necessary to provide updated models for calculating the fire protection part of building construction expenditure. Additionally, the recurring maintenance costs of fire protection installations as part of operating expenses for the building should also be estimated.

To justify the investment in fire protection the question is often asked about the return on investment. Whereas the total cost of fire shows the total loss and expenditure due to fire the impact of fire protection specifically is not identified. To better understand the impact of installing fire protection in buildings the cost of this needs to be considered in relation to the potential property loss in case of fire. However, there is no method that has been applied to calculate this at present.

Research Goal: Recommend an updated calculation model for the fire protection part of building construction expenditure as used in the [Total Cost of Fire study](#) that is more holistic and includes the impact of fire protection on property loss.

Project Tasks: This project involves the following tasks:

Task 1 - Literature Review: Conduct a literature review that includes the following:

- Studies relating to the cost-benefit or return on investment of fire protection features in buildings.
- Available data sources for property loss of buildings from fires.
- Current methods used to estimate property loss from fires.
- Holistic methods that could be applied to calculate the impact of building fire protection including the cost of installation, on-going maintenance and operating costs, and the potential impact on property loss in case of fire.

Task 2 – Analyze Methodologies: For the methods identified in bullet three of Task 1, evaluate each for the following:

- Types of data needed for each method and evaluation of what data is available and what is not available. For data that is not available, provide recommendations on how to estimate.
- Benefits of each method
- Limitations of each method
- Any other critical features identified

Task 3 – Methodology Prototype: Based on the analysis in Task 2, provide a recommendation for a calculation method (or methods) for evaluating the total benefits and costs related to fire protection features in buildings. Provide justification that includes the data needs. Document how this calculation method could be applied generally to fire protection systems in buildings.

Develop an interim report that includes a summary of tasks 1 through 3.

Task 4 – Case Studies: Using the recommended method from Task 3, calculate the total benefits and costs for five case studies of fire protection features in buildings. Provide a description of how the methodology is applied in each case. Document all data sources and any gaps. Where estimates are necessary, provide a description of how estimates are generated. Case studies should include a variety of building types and fire protection system types.

Task 5 – Final Report: Develop a final report that includes a summary of all tasks and identifies any knowledge and data gaps.

Implementation: This research program will be conducted under the auspices of the Research Foundation in accordance with Foundation Policies and will be guided by a Project Technical Panel who will provide input to the project, recommend contractor selection, review periodic reports of progress and research results, and review the final project report.

Schedule: A final report will be available in July 2022.

About us:

About the Fire Protection Research Foundation

The [Fire Protection Research Foundation](#) plans, manages, and communicates research on a broad range of fire safety issues in collaboration with scientists and laboratories around the world. The Foundation is an affiliate of NFPA.



About the National Fire Protection Association (NFPA)

Founded in 1896, NFPA is a global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission. [All NFPA codes and standards can be viewed online for free.](#) NFPA's [membership](#) totals more than 65,000 individuals around the world.

