

Review of Foundation Research on Economic Impact of Fire

Urban Fire Forum, NFPA Headquarters

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OUTLINE

Economic research activity update

Completed activities

Current projects

Proposed ASHER research

Feedback from the group

Ecosystem assessment



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NFPA Workshop – August 2016

- Goal: Explore the resources currently in the fire and electrical safety community, what we might learn from other fields of endeavor that are exploring related questions, and most importantly hear from our stakeholders about their needs in this regard.
- The anticipated outcome was a prioritized roadmap of research activities designed to meet those needs.



Key Findings

1. There is an increasing need to demonstrate return on investment related to fire and electrical safety requirements to demonstrate the value of fire protection systems, fire department interventions, and community risk reduction efforts.
2. There is no standard approach toward this type of evaluation. Simple models that can be used by non-economics trained individuals are needed, with relatively simple inputs but with rigorous back end independent models.
3. Outputs need to be in a form that can be used at the local jurisdiction level.



Key Findings (cont.)

4. Data is needed for all of these applications and includes both direct and indirect costs, opportunity costs, more sophisticated assumptions related to injuries, life cycle costs, and various community related data sets.
5. NFPA can play an important role as an independent source of fire related data and tools that are standardized and can be used across jurisdictions.
6. Collaboration with other organizations with similar needs can extend the resources and the impact of these activities.



Enveco Tool

- Origin – the “Arizona Study”
- Worked with SP/RISE to combine both the environmental and economic impact into one prototype “tool”
 - Goal: determine whether it is feasible to develop a tool that provides a consistent methodology for assessing the performance of the fire service with respect to two impacts of fire on communities:
 - Environmental impacts
 - Economic impacts



Enveco Approach

- Quantitative Risk Assessment (QRA)
- Life Cycle Assessment (LCA)
- Cost Benefit Analysis (CBA)
- Warehouse fire case study
- Compares actual case of a warehouse fire with a hypothetical case of no fire service response



Case Study 1 – Economic Impact

No Fire Service - Quantitative		Fire Service Intervention - Quantitative		Savings due to Fire Service Response - QRA		
Likelihood for fire spread to adjacent building				On average:		
South	North			0.72 Warehouses		
0.47	0.00					
No Fire Service - Economic Assessment		Fire Service Intervention - Economic Assessment		Savings - Economic Assessment		
Value	Unit	Value	Unit	Value	Unit	Description
0	USD	0	USD	0	USD	Firefighter fatalities
0	USD	0	USD	0	USD	Firefighter injuries
2219472	USD	1289642	USD	929829	USD	Property damage
4317688	USD	2508828	USD	1808860	USD	Job disruption
649350	USD	377310	USD	272040	USD	Direct business interruption
64935	USD	37731	USD	27204	USD	Indirect business interruption
0	USD	43200	USD	-43200	USD	Fire service intervention
57277	USD	33281	USD	23996	USD	Rent reduction
7308721	USD	4289992	USD	3018728	USD	TOTAL ECONOMIC SAVINGS



Initial Feedback

- Need to simplify inputs for use in the fire service
- Consider other occupancy types – specifically residential
- Focus more on the economic analysis
- The report and prototype tool are available through the Foundation



Total Cost of Fire

- The total cost of fire in 2014 was \$328.5 billion, accounting for 1.9% of the U.S. Gross Domestic Product (GDP).
 - The total cost of expenditures in 2014 was \$273.1 billion.
 - The total cost of losses were \$55.4 billion.
- In 2014, the biggest tab on expenditures was on passive efforts such as fire safety costs in building construction at \$57.4 billion and the cost of fire grade products at \$54.0 billion.
- The highest loss is from fire deaths with the cost of statistical deaths reaching \$31.4 billion.



“California Study”

- Goal: To conduct an assessment of the economic impact of home fire sprinkler regulation in California – five years later.
- Finding: Sprinkler requirements had very little to no impact on housing activity



Workshop on Economic Impact of Codes and Standards

- Code adoption and enforcement: Need more information on societal cost – what is true impact of a code adoption or code change?
- Economic analysis: need a standard methodology for cost-benefit analysis
- Data: need for neutral data without bias (specifically data around benefits)
- General: need more collaboration with building industry



Cost of Firefighter Injury

- Award from Assistance to Firefighters Grant
- Collaboration with NIST's Engineering Laboratory Applied Economics Office and supported by IAFF
- Two year project from August 2017 to August 2019
- Goal: Assess the economic impact of firefighter injuries in the United States



Cost of Firefighter Injury (cont.)

- Building off existing information, this project will:
 - 1) characterize the annual number and types of firefighter injuries;
 - 2) research both indirect and direct costs of these injuries borne by firefighters and their communities;
 - 3) establish and utilize a framework to assess and benchmark these costs; and
 - 4) communicate the results of this study broadly in the fire service community.



Economic Guidance for FDs

- Goal: Develop guidance for fire departments to illustrate the economic savings to the community they provide through firefighting/interventions
- Same premise as Envenco – generalized methodology
- Start with development of a general methodology and feasibility study using an actual fire department



Data Sharing

Improving the Data Environment for First Responders during Hostile Events

The Question

- *How to take advantage of an increasingly “smart” environment to securely provide relevant, credible, real-time data to first responders to help them save lives during a hostile event?*



Challenges

- Technical: Collecting, processing, and transmitting data as an event is unfolding
- Legal/Cultural: Privacy Concerns
- Marketplace: Proprietary data formats
- Practicality: Providing timely, relevant information to the right responder (or responder agency)



Project

- The FPRF working with University of California, Irvine looking at ways responders can receive data from an event environment—specifically sensors in buildings, on equipment, and those on first responders
- Goal: Develop the technological framework needed for the transfers to occur
- Next Steps: Convene a workshop to begin to flesh out the other challenges



The Toll of Hostile Events

Assessing the Economic and Emotional Impact
of ASHER Events

Issue

- *Making the case for expending the time and resources necessary to develop a comprehensive Active Shooter/Hostile Event Response Program . . .*



Proposal

- Objective: Develop Data on the Economic & Psychological Impacts of Hostile Events to Help Drive Evidence-Based Policymaking.
- Components:
 - Literature Review/Data Collection: Gather data on human/social costs of immediate, short, and long-term impacts on differently sized and situated communities (i.e., metro, suburban, rural)
 - Create method to model impact
 - Where possible, compare/contrast impacts in communities with and without 3000-type program components



Next Steps

- Reached out to a small group of 3000-related experts to help us put together a research agenda to tackle this issue and any others related to supporting an ASHER-program. Plans to convene this fall.
- From UFF group, we would appreciate any input on:
 - Framing the question of Human/Social/Economic Impacts in a way Relevant to Supporting Responders
 - Other Ideas for Research to Support 3000 in your Community

