Fire departments across the nation are challenged by the economic crisis, rising call volume, personnel and equipment shortages, security issues and the overall expectation to do more with less. These and other factors put IAFF members at increased risk for line-of-duty injury and death.

As part of the effort to improve fire fighter safety and resources, the IAFF is participating in a multi-phase study to design an acceptable resource deployment model based on contemporary community risks and type of service delivery. The study seeks to determine the technical basis for deployment vs. risk decisions and what factors help improve such decisions in light of available funding and the level of service the community expects. The study will ultimately provide scientific evidence to guide local government decision-makers in making informed choices regarding fire fighter safety.

The multi-year project, a collaboration of five top fire research organizations, including the IAFF, the Commission on Fire Accreditation International (CFAI), the International Association of Fire Chiefs (IAFC), the National Institute of Standards and Technology (NIST) and Worcester Polytechnic Institute (WPI), will establish a technical basis for risk evaluation and deployment of resources by local fire departments, create tools to better assess the risks and hazards in their communities, plan adequate resource deployment to respond to and mitigate emergency events and measure the effectiveness in responding to and handling events.

“This is a study many fire industry leaders have dreamed of for several years,” says Chief Dennis Compton of the International Fire Service Training Association (IFSTA) who is also a technical advisor to the project. “Until now, it has simply not been possible, due to the complexity of the tasks proposed and the costs involved.”

Over the past 15 years, other studies have consistently supported the importance of adequate staffing per piece of apparatus in the efficacy and safety of fire fighters during emergency response and fire suppression.

Two studies in particular look closely at which distinct tasks could be performed safely and effectively by three- and four-person fire companies. Following a series of common fire ground simulations, investigators from the Austin Fire Department assessed the physiological effects and injury rates among the variably staffed fire crews.

In these simulations, an increase from a three- to four-person crew resulted in marked improvements in time-to-task completion in a two-story residential fire drill, aerial ladder evolution and high-rise fire drill. Researchers concluded that — independent of fire fighter experience, preparation or training — loss of life and property increases when an insufficient number of personnel are conducting the required tasks. Injury reports from the Austin Fire Department further revealed that the injury rate for three-person companies in the four years preceding the study was nearly 1.5 times more than for
Study In Progress

The intent of the fire fighter safety and resource deployment study is to determine how well fire service decision-makers match resources to risk, and identify what factors are important in establishing these matches in the future — recognizing that decisions are made based on available funding in the community and the level of service the community expects.

The overall goal is to reduce fire fighter and civilian injury and death and increase property conservation by improving resource deployment in a risk-filled environment. The study includes three phases:

- **Phase I** - Develop a scientifically-based community risk assessment and resource deployment model.
- **Phase II** - Conduct field experiments to assess resource deployment, including crew size and time-to-task analysis.
- **Phase III** - Develop performance evaluation tools for fire departments to assess how well they match their community risk level to resources deployed.

Based on analysis of data collected in Phase I (currently underway), investigators will look at fire fighter injury and death, civilian injury and death and economic impact and identify the most important factors in determining appropriate deployment to varied levels of adverse risk events occurring in a community.

These data will be used to develop software that can determine appropriate deployment-to-risk events in a community in order to limit fire fighter injury and death, civilian injury and death and economic impact.

More than 400 U.S. fire departments are participating in the study by entering incident data into a web-based survey. Data analysis from the online survey will be coupled with data from the field experiments conducted at the Montgomery County Fire Rescue Services Training Academy. Relevant NFPA standards, including NFPA 1403 and NFPA 1500, were followed during the experiments. The resulting data are now being analyzed and will be used to develop educational products and materials for dissemination to local government decision-makers. The overall study results, report and the education products are anticipated for release in the fall of 2009.

For more information, visit [www.firereporting.org](http://www.firereporting.org) or contact Dr. Lori Moore-Merrell at (202) 824-1594 or lmoore@iaff.org.