



# How Fire Station Type Factors into Evaluating Community Fire Protection





# Volunteer or Paid Firehouse

When property insurers assess the relative quality of fire protection by address, one simple binary question may seem to offer a fairly straightforward measure: Is the responding station staffed by paid career firefighters or by volunteer firefighters? Some may assume that a full-time, paid fire company delivers superior protection through better training, experience, equipment, and response time.

According to recent Verisk estimates, fire departments broke down as 72 percent all volunteer, 8 percent career, and 20 percent a mix of volunteer and career. But our estimates also show that more than half of the U.S. population is covered by all-career departments.

Densely populated areas are more likely to be served by departments staffed with full-time, paid firefighters, while rural areas more often depend on volunteers. And some fire departments may not fall neatly into one category or the other but be a combination of paid and volunteer. Levels of community support and local availability of volunteers can vary widely, leading to substantial differences in these stations' capabilities.

One volunteer department may receive scant funding and struggle to recruit enough personnel to provide coverage—a growing problem for volunteer emergency services of all kinds. But another such department may attract strong local government support, generous community donations, and a large and willing pool of volunteers.

It's not necessarily an either-or question. Some departments combine volunteers with paid professionals who staff stations around the clock, eliminating the wait for firefighters to respond in their personal vehicles to the fire station. The protection afforded by such hybrid models, and even by some volunteer companies, may be on par with that of entirely paid fire services.

Regardless of the type of responding station, these distinctions may gloss over numerous details that determine the effectiveness of individual fire companies in their mission. In turn, quality of fire protection affects ultimate loss experience, for better or worse. For example, does the volunteer department have several

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responders or just a few; does the career department have a single person on a truck or are there several? It matters. Are the responders well trained in the best approaches to firefighting based on the circumstances? Again, it matters.

New data confirms significant differences between considering fire station type alone and taking a more holistic approach—the kind that ISO’s Public Protection Classification (PPC®) uses. The data reveals PPC to be more than three times more predictive of future losses than fire station type alone when comparing modeled with actual experience.

Property insurers need tools that can capture the nuances of the fire service when evaluating a community’s fire protection capabilities. Applying granular information to underwriting and rating decisions can have material effects on loss experience, which in turn has implications for profitability across a portfolio.

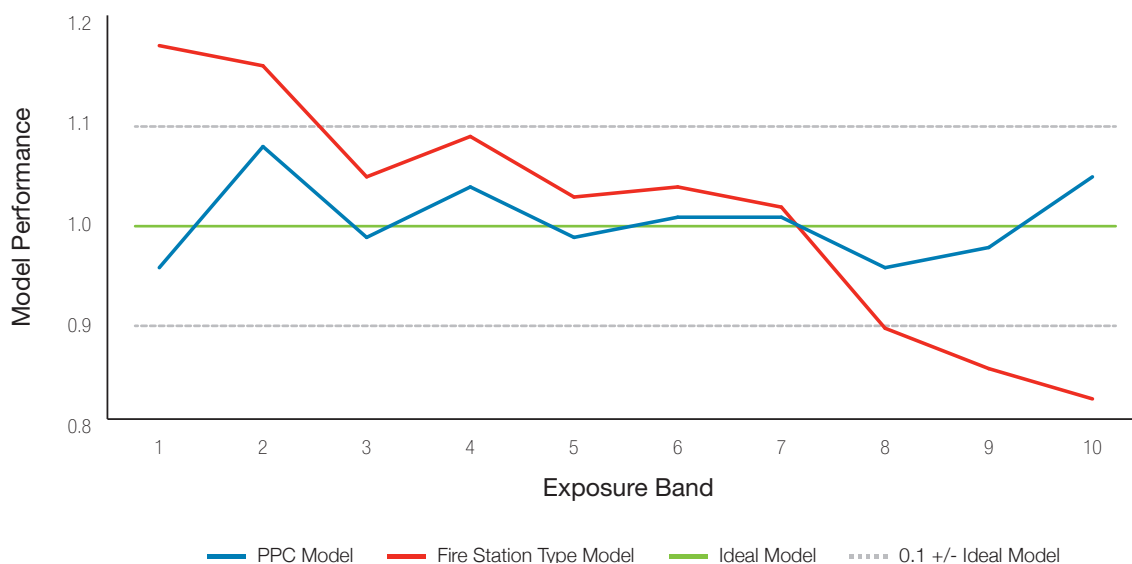
# Fully capture the nuances of the fire service

We set out to analyze the effectiveness of fire station type and PPC separately and in combination with each other. All runs, representing almost 10 million exposures, included loss costs at current levels and construction type (frame versus masonry). Each of the ten exposure bands in the graph below contained the same number of exposures throughout.

## Comparing PPC head-to-head with fire station type

The chart below demonstrates the enhanced precision that PPC offers. The green line represents an ideal state, in which a loss projection model would produce a perfect rating 100 percent of the time. The blue line represents a model for PPC projected losses, whereas the red line shows a model for projected losses based only on fire station type. Using station type alone may drive pricing as much as 18 percent too high or 17 percent too low.

PPC Model Performance vs. Fire Station Type Model Performance



These findings enable us to quantify the power of PPC versus fire station type as we measure each, including the overlap or correlation where both are effective:

- Using fire station type alone, 40 percent of a book of business may be mispriced by 14 percent or more.
- Fire station type (with the PPC correlation) picks up 28 percent of the combined effect.
- PPC (with the fire station type correlation) picks up 100 percent of the combined effect of PPC and station type.

Thus, we conclude PPC is 3.58 times more predictive of future losses than fire station type alone.

What does PPC do that fire station type alone can't? PPC examines numerous traits that characterize each community's fire protection and its relative fire prevention and firefighting capacities. For example, fire companies have varying levels of access to water—ranging from hydrants supplied by municipal water utilities to tanker-shuttle arrangements that carry water to fire scenes from other locations.

Additionally, fire station type does not demonstrate the capabilities of the companies' career or volunteer staff with regard to equipment, training, number of personnel, and many more important factors. PPC measures more than 1,000 unique data elements that support detailed analysis of the community's fire suppression capabilities.



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## Our methodology

The analysis started with common rating factors (age and type of construction, limits of insurance, territory) without any PPC factors. Two models were then built: one including PPC and the other including fire station type. The fire station type used in the analysis was type of responding fire station rather than type of nearest fire station. With the two models in hand, a two-way lift chart (see page 4) was generated comparing the performance of the two rating solutions.

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