

# Fire Engineering

[Close](#)

## Suburban Fire Tactics: Prioritizing Functions and Developing Preferred Operating Methods

BY JAMES SILVERNAIL

The challenges of managing structure fires can be unique and regionally specific; however, all underlying themes are constant. Whether your organization is urban, suburban, or rural, the objectives of rescue, containment, confinement, and extinguishment are the same. What are different are the tactics undertaken to accomplish these objectives. For the majority of suburban-based operations, this means making the most out of what you have and prioritizing essential functions. One way to do this is to establish preferred operating methods (POMS), or suggested operating guidelines.

POMS should reflect the conditions that affect your agency's ability to deliver desired tactics/strategies. These variables include available staffing, responding apparatus, and response-area characteristics. POMS should reflect the minimal staffing available, and tactics should be consistent with the staff's abilities and training levels. When considering the apparatus variable, evaluate placement, availability, and apparatus type. Know the limitations and capabilities of the vehicles responding. It is typical for many suburban fire departments/districts not to staff dedicated truck companies. Booster tank sizes can also alter tactical decisions. Response-area characteristics include not only construction and occupancy type but also terrain, street conditions, and water main size/availability.

Our district's POMS, or suggested operating guidelines, for structure fires are undergoing their first revision since 2005. In this time, both significant and slight changes have transpired districtwide. These changes included apparatus movement, staffing variations, new construction and commercial additions, and tactical considerations.

Our organization is similar to many agencies in the Midwest and suburbia. We operate five engine houses and multiple automatic-aid agreements to serve 57.5 square miles in St. Louis County. Operating under a "modified" *quint concept*, our equipment cache consists of engines, rescue/engines, and 75-foot quint aerials. Fireground functions are not assigned by apparatus type; however, they are nondiscriminantly assigned by arrival order.

Predetermined POMS are absolutely imperative for agencies operating without dedicated truck companies that rely solely on arrival order for functional assignments. POMS assist with consistency, efficiency, and safety. Deciding whether to call a company an engine or a truck company can be a

complicated decision. A predetermined “playbook” will help eliminate this confusion and organize the fireground chaos.

## PRIORITIZING FUNCTIONS

Begin prioritizing functions at the basic level. Answer the question “What are we trying to accomplish?” Fundamentally, the answer should be “save lives, protect property, and minimize impact to the environment.” Simply broken down, this can be accomplished by containing, confining, and extinguishing the hazard.

The most important priority of and basis for a fire organization’s existence is to save lives. Rescue is always the number-one consideration. However, tactically, the search and rescue function may not always be prioritized first. As controversial as this comment may be, it can be backed up with the following assumption: No action taken on the fireground saves more lives than the proper size attack line stretched to the correct location and placed into service at the proper time. Therefore, this can be asserted to be the first tactical priority/strategy. After establishing this strategy, analyze what tasks/tactics need to be performed, sometimes simultaneously, to achieve this goal.

There are some occasions where the first-due company may have to abandon deploying the first attack line and attempt a rescue. Examples of such rescues can include ladder rescues and, for properly trained companies, vent-enter-search (VES). VES is a tactic that assumes a higher level of risk and should be attempted only by trained, experienced firefighters. Keep in mind that when a crew delays fire attack, the company officer is “writing off” confining the fire and possibly giving up the structure to an advancing fire. Life always takes priority over property; however, if more than one occupant is in the structure, or if occupants’ whereabouts are unknown, this is a bad tactic. In suburbia, where a truck company may not be arriving simultaneously, a single crew should attempt a rescue only under the following conditions: (1) There is a minimal number of occupants (one or two); (2) the exact locations of the occupants are known; and (3) the fire may be so far advanced that a single attack line will not be effective, leaving rescue in viable areas as the only alternative (Table 1). Containing, confining, and extinguishing a fire obviously begin with having a handline of an adequate size in the correct location in a timely manner.

| <b>Table 1. Rescue vs. Attack</b>  |  |
|--|--|
| <b>Rescue</b>  | <b>Attack</b>  |
| Exact location of victim is known  | Unknown location of victims  |
| There are a minimal number of victims (1 or 2)   | Unknown number of victims  |
| Extensive fire conditions  | Large number of victims trapped  |
| Not enough firefighters for both rescue and attack, and the above conditions are present | Unknown location of fire, or fire prevents rescue access or egress                       |
|  | Not enough firefighters for both rescue and attack, and the above conditions are present |

## Size-Up

This is the first function that must be undertaken. The size-up can cause you to win or lose the incident. Size-up can be as simple as the first-due officer's getting a three-sided view and then conducting a 360° walk-around or as complicated as the first-due officer's going to the alarm panel and sending the next-due up three flights of stairs. Access may also be locked, blocked, or nonexistent, necessitating forcible entry.

## Water Supply

The first decision involves water supply. As the first-due unit, do you secure your own water supply? Your decision may be affected by variables such as the size of the booster tank, the immediate use of a master stream, and the timeliness of the second-arriving engine. Some tactics may dictate a forward lay, depending on hydrant placement and the immediate need for water. Consider building this into your POMs.

Once you know the location of the fire and have estimated its extent/volume, select the desired water flow rate (gallons per minute) and handline size. If staffing on your first-due unit consists of a chauffeur, an officer, and a nozzle firefighter, can you deploy a hoseline in an efficient, timely manner? What if it is a 2½-inch attack line stretch? If this is the case, consider combining the second-due crew with the first-in crew. Even a 1¾-inch handline stretch above- or below-grade is too much for a two-person team to handle. At minimum, there should be a nozzle firefighter, a backup, and an officer. Ideally, there should be a firefighter at every bend of the hose. The actions of the second-due officer are now critical. This first attack line must be "facilitated" into place before any other functions are attempted. Resist the urge to deploy a second line until the first has been established. Also, once the attack line has met the seat of the fire, members who assisted with placement can now begin search and rescue from the nozzle back.

## **"Facilitate" the Interior Attack (Truck Company Operations)**

Certain fireground functions must transpire simultaneously to assist with the attack line. "Facilitating" can be translated as the suburban term for truck company operations. As stated in the previous paragraph, however, this may include helping to deploy and stretch the main attack line. If your apparatus is an engine, it may include securing a water supply.

Essential truck company operations that must be performed include ladders, overhaul, ventilation, entry (forcible), rescue (search), salvage, and utilities. The functions that facilitate the attack line the most will have priority unless there is a known rescue. Therefore, early-arriving companies (excluding the first due) will be assigned "fire floor" truck company functions. They include horizontal ventilation, search and rescue, further forcible entry, and locating fire (overhaul). The remaining functions can be split and assigned to later-arriving companies. Also consider above-fire searches, VES, and vertical ventilation. Keep in mind that splitting and prioritizing the truck duties will necessitate communication. Often, the secondary support functions, such as ladder placement and utility control, can be overlooked. Organizations that operate without dedicated truck companies have to have a system in place and have fireground discipline to ensure all essential support functions are complete.

## Secondary Line

Once the main attack line has been placed, you must deploy a secondary line for backup or as a secondary attack line. If this line goes into operation as an attack line, you must consider placing a backup line. If the resources on your first-alarm assignment do not support a second operating handline, call for additional apparatus or alarms. Compliance with NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2010 edition, Ch. 5.2.3.2.2, dictates there be a backup line and a minimal 300-gpm capability between the main attack line and secondary line.

There is a very strong possibility that a second crew will be needed if the second line goes into operation, to support the line placement. A variable in this, once again, is personnel.

## Rapid Intervention Team (RIT)

Finally, no fireground should be without a trained and competent RIT; it is an absolute must and is mandated by the NFPA standard. Members who staff this role must be well-trained and have the proper tools. Depending on the size of the structure, you may need to assign more than one RIT. The RIT officer should conduct a separate 360° size-up and consider throwing additional ground ladders for egress.

It has been argued that RIT be prioritized higher on the functional assignment list. Many agencies have detailed their most experienced and trained personnel to staff this role at every structure fire. Each organization should determine who is capable of staffing a RIT. Be careful: RIT should not be perceived as the safety “catch-all.” RIT is a “parachute” used to save members in peril. Fix the plane before it is broken.

## Key to Success: Avoid the Urban Trap

The key to fireground success is prioritizing the essential tasks and having a plan. Whether that plan is detailed by a POM or an incident situation assignment, a framework should be in place. Many suburban fire departments/districts fall into the trap of attempting to accomplish too much with too little. Suburban companies cannot operate like urban, large-city companies because of staffing and resource limitations. Adjustments have to be made, and they must be representative of each organization. The objectives are the same, but the tactics and strategies must reflect individual prioritization.

## DEVELOPING POMs

Customize POMs for your operations based on three main considerations:

1. response area,
2. available apparatus/resources, and
3. staffing/personnel.

The response area should be reflected in tactical decision making. There are different priorities to consider when differentiating between commercial vs. residential, high-rise vs. single-story structure, and older construction vs. lightweight/truss construction.

## Some Considerations

- The availability of a water supply.
- Available apparatus and resources: Do the units assigned to your first alarm adequately satisfy the functions necessary for a coordinated interior fire attack? What kind of apparatus will respond? Are any dedicated truck companies responding? If so, this changes the whole game plan. No longer are functions completely assigned by arrival order but also by division into direct suppression and support designations.
- Fireground objectives: Many agencies use REVAS (**R**escue, **E**vacuate, **V**entilate, **A**ttack, and **S**alvage) as a blanket priority statement to follow. Others choose to develop more detailed objectives, such as the following modified algorithm:
  1. To Save Lives:
    - a. attack fire (locate, confine, contain),
    - b. ventilate,
    - c. search, and
    - d. rescue.
  2. To Conserve Property:
    - a. locate the fire,
    - b. stop fire spread (contain and confine),
    - c. attack and extinguish the fire, and
    - d. ventilate.
  3. To Minimize Impact to Environment:
    - a. confine and
    - b. extinguish.

## Divide Functions

For reference purposes, use NFPA 1710, specifically section 5.2.3.2.2., and NFPA 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments. Efficiently and accurately divide all functions among assigned companies. It is vital to realize the minimal capabilities of each company. You can use a worksheet for this task (Figure 1).

## Figure 1. Preferred Operating Methods for Structure Fires Worksheet

| Assigned Apparatus             | Necessary Functions  |
|--------------------------------|--|
| • First-arriving apparatus     | <b>General functions</b><br>Size-up<br>Command<br>Safety   |
| • Second-arriving apparatus    |  |
| • Third-arriving apparatus     | <b>Engine functions</b><br>Primary attack line   |
| • Fourth-arriving apparatus    | Water supply<br>Backup line  |
| • Fifth-arriving apparatus     | Secondary lines  |
| • First-arriving ALS unit      | <b>Auxiliary (truck) functions</b><br>Search and rescue<br>Ventilation<br>Locating fire<br>Forcible entry<br>Utilities<br>Assisting with hoseline placement<br>Ladders<br>Salvage and overhaul |
| • First-arriving chief officer | RIT<br>EMS<br>Rehab<br>Transport   |

**Considerations**  
Ladder truck gets the front of the structure. Secondary lines come from different pumpers/quints.

The main goal of a fire attack is to place water on the fire, extinguish the hazard, and save lives in the process. The first attack line constitutes the heart and soul of a coordinated fire attack. Emphasize accurately placing the correct size of attack line: As goes the first handline, so goes the fire. The initial handline's attacking the fire and removing the hazard in a timely fashion is the safest approach for firefighters and occupants at a structure fire. Notice that I said the main goal is to remove the hazard and to save lives in the process, not to directly save lives. Saving lives is always our number-one consideration; however, this statement was purposely worded this way. In many instances when resources are scarce and there is not enough immediate staffing for rescue and fire attack, placing a line on the fire is the best approach to rescue.

Many functions have to take place, sometimes simultaneously, to facilitate and assist effective placement of this line. Some may look at these functions as inferior, but they are essential. Imagine trying to attempt to attack a fire without gaining access, locating the fire, or ventilating smoke and heat. One of the biggest challenges of the *quint concept* and "truckless" responses is to decide which arriving company will perform these support functions. Do you detail your second- or third-arriving unit? Do you detail more than one? That debatable answer is specific to the agency's response area and resources and staffing available.

The best coordinated fire attack involves efficiently using all available resources safely. POMs can provide direction in consistently achieving this desired outcome. Keep in mind, however, that a POM is "preferred." Every fire is different and may require adaptation.

## Add General Statements

Once all functions have been assigned and each apparatus has an established list of guidelines, add general statements to the POMs. General statements assist in guaranteeing accuracy and the administration of generally accepted practices. For example, if the agency is operating under the *quint concept*, there should be a statement dictating that aerial devices get the front of the building and noting the limitations of the assigned apparatus. If your initial first-alarm POMs are intended to support only one attack line and one backup line, the guidelines should note that the assignment be increased when necessary.

## IMPLEMENTATION

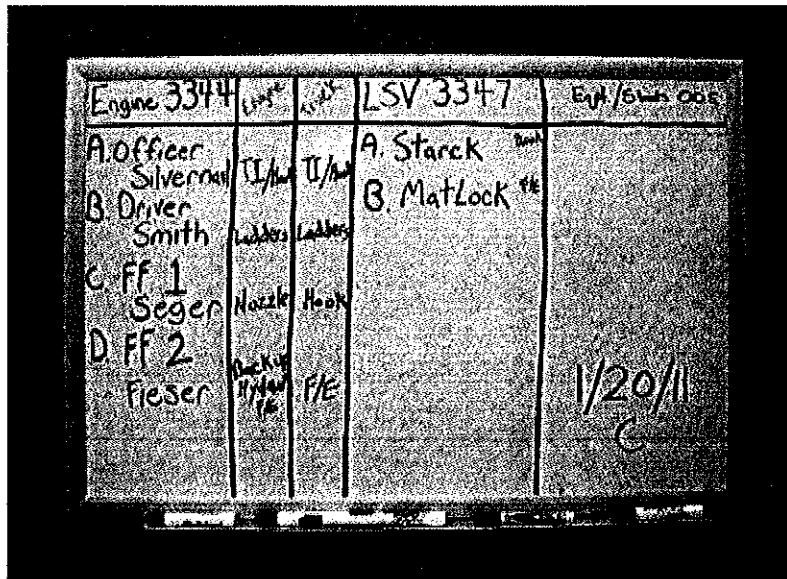
Implementation is just as important as development. Command staff members must embrace and accept the policy by formally adopting the document and adhering to it. Once this occurs, all members, as well as automatic and mutual-aid companies, must be familiar with the POMs.

Training is the most important aspect of the implementation. Training can be accomplished with formal presentations, tabletop exercises, and practical evolutions. The orientation aspect, however, is just the tip of the iceberg.

Ongoing training schedules should reflect truck and engine company activities for agencies operating when functions are dictated by order and without assigned truck companies. Companies under this system have double the duty and should be familiar not only with stretching and operating handlines but also with essential truck company functions, such as forcible entry techniques, ladder raises, ventilation, and search and rescue.

Another important aspect is discipline, which should be practiced and enforced. Each member should be taught that support functions are just as important as stretching a line and directly extinguishing a fire (although they may not be as “glorious”). Just because the assigned apparatus has hose and a pump doesn’t mean that the company has to deploy it. A single residential structure fire doesn’t always require three attack lines.

Finally, enforce preestablished riding and tool assignments for all companies. This can become confusing for companies that might have to operate as either a truck or an engine. To facilitate this, have an assignment board in your engine house with two columns: Truck Assignments and Engine Assignments (photo 1).



(1) Assignment board. (Photo by author.)

## REEVALUATE AND REVISE

No system is completely flawless; it should be reevaluated periodically. Chief and company officers should keep track of which aspects work and which need improvement. Response areas, available resources, and staffing all can change; therefore, your POMs must also be dynamic.

POMs are tools to help firefighters develop a game plan during emergency situations. They organize the chaos, manage resources efficiently, and increase responder safety. The key concept is that POMs should be customized for each agency's capabilities and challenges. What works in Manhattan will not always work in suburban Missouri.

**James Silvernail will present "Suburban Fire Tactics" at FDIC 2011 in Indianapolis, Indiana, on Friday, March 25, 8:30 a.m.-10:15 a.m.**

**JAMES SILVERNAIL**, a 14-year veteran of the fire service, is a captain and training officer for the Metro-West Fire Protection District of St. Louis County, Missouri. He instructs for the St. Louis County Fire Academy and the National Fire Academy, is a member of MO-TF1 (FEMA USAR), and has a master's degree.

[More Fire Engineering Issue Articles](#)

[Fire Engineering Archives](#)

To access this Article, go to:

<http://www.fireengineering.com/content/fe/en/articles/print/volume-164/issue-3/features/suburban-fire-tactics-prioritizing-functions-and-developing-preferred-operating-methods.html>



# Fire Engineering

[Close](#)

## Back to Basics Ventilation Practices

By **THOMAS J. RINOLDO**

Scenario: You are the on-duty deputy chief when the station tones sound. The dispatcher reports a possible house fire at 14 South Street. South Street is downtown, and it will take a few minutes to get there. Engine 3 arrives and reports smoke showing from the second floor of a 2½-story wood-frame structure. Command is passed to Ladder 3 while Engine 3 begins to stretch a handline to the second floor. The remaining ladder firefighters begin setting up the aerial to the roof. Engine 5 arrives and lays a supply line into Engine 3, then takes in a backup line. Rescue 1 arrives and starts up to the second floor for a primary search. You arrive at the scene, do a quick 360° size-up of the structure, and consider strategies and tactics with the incident commander (IC). You reassign the ladder officer back to his company, and you assume command.

As you observe the structure and the conditions, you radio Engine 3 to get a progress report. The officer answers that they are with Rescue and are trying to advance to the second floor but cannot because of the tremendous heat. Walking around the structure again, you see fire from inside the window at the B/C corner, but it has not yet broken out. You quickly look for the ladder company and see the members just getting to the roof.

Does this scenario sound familiar? Does your department send the ladder company only to the roof at every fire? Does your department routinely stretch handlines into the fire building without coordinated ventilation? Do you use fans only for overhaul? If yes, then it may be time to revisit your ventilation practices.



(1) Photos 1-3 by David Studley.

Ventilation is the planned and systemic removal of heat, smoke, and fire gases from a structure and replacing them with fresh, cooler air. As a fire grows and consumes fuel, it begins to change the environment within the structure (the building and contents) and generates heat, smoke, and gases that rise and begin to increase the internal pressure within the structure. The heat, smoke, and gases confined within that structure bank back down into the structure, creating the mushroom effect and a flashover condition. As the fire grows, it generates more heat and consumes more fuel, making occupant survival impossible and conditions more dangerous for interior companies. Good, proven ventilation practices can help stretch the line easier and buy time for any victims still trapped. Poor practices can be disastrous.

There are two basic ways to ventilate a structure—vertically and horizontally. The methods used to accomplish these vary, usually by cutting, breaking, or opening the structure's exterior to create an opening and give the heat, smoke, and combustion products an avenue to exit.

The fire's location and size; location of victims and interior crews; building construction and, if present, features such as skylights, scuttles, or rooftop bulkheads; available equipment; and available personnel are all factors to consider when choosing which type of ventilation to use.

## **VERTICAL VENTILATION**

Vertical ventilation is the process of creating an overhead opening as high up and as close to the seat of the fire as possible. This allows the heat, smoke, and combustion products to travel up and out of the structure—much like a chimney—following the path of least resistance (lower pressure). Unless the fire is in the space directly under the roof or a backdraft condition is present, ventilating the roof may not be the best first choice. If you are battling a first-floor fire in a multistory structure, this would cause all of the heat, smoke, and combustion products to travel up through the remaining floors and expose them and anyone high in the structure to the fire's effects.



(2)

A basement fire in a balloon-frame structure does require the roof to be opened, so vertical ventilation will be needed early in the attack. However, this venting must be coordinated with the interior companies. Additionally, the hoselines must be ready to, or be in a position to, apply water; and the walls and ceilings need to be opened up to access the void spaces. This minimizes horizontal travel within the void spaces. Use the natural features of the building such as skylights, scuttle openings, or vent shafts whenever possible to facilitate rapid movement of the heat, smoke, and combustion products from the structure. Give careful consideration when using natural features; this may lead these products to travel through unaffected areas of the structure and create a potential for autoexposure, especially in air or light shafts. Also, vertical ventilation is sometimes problematic if the attic space is finished. Your crews may do a great job of opening the roof only to find it impossible to punch down the ceiling below because of the flooring.

## **HORIZONTAL VENTILATION**

Horizontal ventilation is the process of creating an opening on the fire floor to allow heat, smoke, and combustion products to travel horizontally out of the building without affecting or, at least, minimizing the effect, to the uninvolved areas of the structure. For most fires, horizontal ventilation is the best first option.

ventilation during the fire attack, also called positive pressure attack (PPA). However, it is still considered off limits in many parts of the country, except during the overhaul phase, for a variety of reasons.

There is no substitute for good ventilation practices. Ventilation is critical to fire control, second only to the application of water. Vertical ventilation works when the fire is in the space directly below or in the walls of a balloon-frame constructed structure. However, aggressive interior operations are critical for opening up and cutting off the fire. Horizontal ventilation allows for rapid fire removal in the affected area. Both allow for the removal ahead of the advancing hose team.

Mechanical ventilation will help make ventilation more effective. If PPA is used, an aggressive interior attack must be established and coordinated with the interior crew, and the entrance and exit openings must be controlled. The large volume of air created and the rapid removal of the heat, smoke, and combustion products will increase the safety of the interior crew and allow for a faster advance on the seat of the fire. Used improperly, this and other techniques can contribute to fire growth, extension, and great danger to trapped occupants.

The obstacles encountered will differ from structure to structure. However, you must establish standard operating guidelines to address ventilation practices and give your personnel direction in its proper application. Training on sound, proven ventilation practices provides personnel the skills necessary to apply them on the fireground and to understand the importance of early, coordinated ventilation for a fire attack.

**THOMAS J. RINOLDO** is a 16-year fire service veteran and a lieutenant with the Framingham (MA) Fire Department, assigned to Platform Company 1, Group 1. He is a nationally certified firefighter I/II, fire officer II, fire instructor II, and rope rescue technician. Rinoldo is an instructor at the Massachusetts Firefighting Academy working for the Recruit Firefighter Training program and is a lead instructor for the Technical Rescue Training program. He is also an examiner for the Massachusetts Fire Training Council, which oversees all firefighter training and firefighter certifications in the Commonwealth of Massachusetts. Rinoldo is also a member of the International Society of Fire Service Instructors.

[More Fire Engineering Issue Articles](#)  
[Fire Engineering Archives](#)

---

To access this Article, go to:

**[http://www.fireengineering.com//content/fe/en/articles/print/volume-164/issue-3/departments/The\\_Truck\\_Company/back-to-basics-ventilation-practices.html](http://www.fireengineering.com//content/fe/en/articles/print/volume-164/issue-3/departments/The_Truck_Company/back-to-basics-ventilation-practices.html)**