



Why Proper Equipment Checks Make Business Sense for Fire Departments

The Ultimate Tool for Fire Department Asset Management

Vector Solutions offers a comprehensive solution for streamlining routine inspections and maintenance for vehicles, equipment, controlled substances, medical supplies, and other logged inventory through its Vector Solutions brand.

Accessible via the mobile application or any web-enabled device, Vector Check It makes it simple to perform and track inspections, ensure assets are functioning correctly, and identify needs for repair or maintenance. Vector Check It is the only operations and asset management system fully integrated with the Vector Solutions online training management system.

Whether conducting an apparatus check, counting inventory of controlled substances, or inspecting equipment, Vector Check It enables agencies to track and report it all.

At its core, the fire service is in the risk-mitigation business. Externally, that is evidenced as we attempt to reduce life and property loss when called to an emergency scene. It is also evidenced by our preventive measures, such as code enforcement and fire safety outreach efforts in the community. Risk mitigation also plays a significant role in our internal operations. This can be seen in firefighter training designed to reduce line-of-duty death and injury. It can be seen in our decontamination protocols to reduce exposure to carcinogens and in our routine equipment checks to ensure vital tools are operational. The last item is critical and often overlooked.

Before doing a deep dive into the risks associated with routine equipment checks, let's take a step back and examine what risk mitigation means. In 2018, the Federal Emergency Management Agency's U.S. Fire Administration published the 110-page "Risk Management Practices in the Fire Service." As the title suggests, the document covers a gamut of risks fire departments confront. The authors consider risk probability as both the likelihood something terrible could happen and the consequences of it. The three ways to mitigate risk, the report says, are through administrative, engineering, and personal protection controls.

Here are Vector Solutions' key differentiators that make it stand apart in the industry:

Integrated mobile application and web-based platform accessible 24/7 to complete inspections anytime, anywhere.

Exclusive module for cradle-to-grave tracking of controlled substances

Produce comprehensive reports with visually-driven data to view check history, performance, and other measurable step

Ability to securely track expiration dates of all types of controlled substances and other resources assigned to a specific vehicle, person, or storage facility

Push notifications, email alerts, and custom check-step comments to communicate the completion of an inspection, create check-step comments, or notify supervisors of issues

Built-in verification features, such as eSignatures, employee pin numbers, and facial recognition technology, to ensure accountability

Ability to open service tickets for an apparatus or piece of equipment in need of repair and track its status, costs, and other information with intuitive workflows

When it comes to daily and weekly apparatus and equipment checks, documentation, and communication, fire departments face personal and financial risks. Career, part-time, and volunteer fire departments are extended families. While not easy to put hard numbers to, the psychological effect on members when a firefighter is hurt or killed in the line of duty is profound. Also challenging to measure are the additional repair or early replacement costs due to a lack of routine inspection and maintenance.

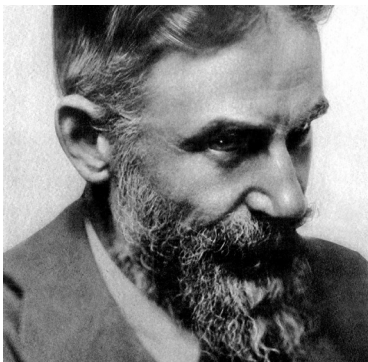
What's easier to measure are the legal costs and workers' compensation claims associated with wrongful injury, death, or property damage. Much of that is within a department's control. In an anonymous letter to the newspaper regarding fire safety practices, fire service founding father Benjamin Franklin issued his famous line that "an ounce of prevention is worth a pound of cure." And a paraphrase of that timeless line rings true to this day when it comes to firefighting equipment — a penny of prevention is better than a dollar of cure.

For a more modern take, here's what the U.S. Fire Administration report has to say on the responsibility for risks:

“The managers of public safety organizations are also custodians of public funds and assets. They must restrict any undesirable outcome that costs money, consumes public dollars, and reduces the government's capability to spend those funds where they would do the best. For example, an agency could run up large bills replacing or repairing damaged, lost or stolen equipment and apparatus. It could also incur high expenses paying liability claims for vehicle accidents, paying medical bills for injured members, legal expenses to defend against claims, and paying overtime replacing them. In other words, the agency could be spending money to compensate for circumstances that should have been avoided. It is the manager's responsibility to prevent such things from happening.”

After all, every firefighter who has been on a department longer than five minutes can run through a full list of why regular truck checks are a critical part of firefighter safety and mission readiness. And yet, every firefighter knows that individual or crew who either skips or half-heartedly does truck checks. Many of us have been that person from time to time. We're all human, and humans are hard-wired to look for short cuts offering a more efficient way. It is easy to assume all the equipment is sufficient or that someone else checked it thoroughly. And that's where the administrative (SOPs, SOGs, and officers willing to enforce them) and engineering (digital solutions) controls to reduce risk referred to by the U.S. Fire Administration document come into play.

Of course, the problems go beyond the truck checks not getting done. For each item to be checked, there must be concise documentation stating what was checked, when it was checked, by whom it was checked, and what that check revealed. This documentation will be worth its weight in gold if something fails. And whatever problems are found and documented must be effectively communicated throughout the department. That may sound easy, but we're humans, and often, we struggle to communicate effectively.



“The single biggest problem in communication is the illusion that it has taken place.”

— George Bernard Shaw



The Irish playwright could have been speaking about the modern-day fire service. Much like the fire service builds redundancies into its equipment capabilities — frontline and reserved rigs — so too must it build processes to ensure communication is overlapping, so it doesn't go unreceived. Again, this is not a problem exclusive to the fire service. A survey of 400 companies with more than 100,000 employees by the Society for Human Resources Management revealed that each company was losing \$62.4 million per year due to poor communication. Multiply that across all 400 companies, and you are looking at \$24 billion annually.

In her article "6 Barriers to Effective Communication," Drexel University professor Anne Converse Wilkomm offered up these reasons communication goes awry.

- Dissatisfaction or disinterest in one's job
- Inability to listen to others
- Lack of transparency or trust
- Differing communication styles
- Conflict in the workplace
- Cultural differences and language

Certainly, no fire department has anyone who is a malcontent that won't listen, trusts no one (and can't be trusted), talks in circles, and is only happy when starting an argument. Effective communication is a big deal, so most major universities offer degree programs studying it. When it comes to equipment checks in the fire service, it is essential to over-communicate. It needs to be done verbally, visually via notes and tags, and recorded and accessible on a digital platform.

As with ineffective communication, ineffective fleet maintenance has a real cost. U.K.-based Chevin has been designing fleet management systems for nearly 30 years. Regular checks and maintenance are part of their recommendations to all fleets, regardless if it's a trash truck, city bus, or fire apparatus.

Here's Chevin's advice from author Lynn White:

“Higher costs can result from something as simple as not preparing for and adhering to schedules and procedures outlined in routine fleet maintenance program. Scheduled maintenance has predictable costs because allows you to plan efficiently, to know how long a service interval will take and the parts, technicians, tools and shop space required.

Planning a maintenance program — and more importantly executing it — leads to a higher quality work and improved shop productivity, which in turn means lower costs.

With clear and concise instructions in the form of checklists that details and define services that need to be performed, and having the information from on-board telematics systems and driver reports, it becomes easier to lower costs by making repairs during routine service intervals when they are less costly to complete.”

Likewise, the National Fire Protection Association recognizes the vital role regular equipment checks play in firefighter safety. In "NFPA 1911: Standard for the Inspection, Maintenance, Testing and Retirement of In-Service Emergency Vehicles," all of Chapter 7 is dedicated to what should be checked on a daily and weekly basis and why. That chapter lists 70 visual and operational checks that need to be completed routinely. It also insists the fire jurisdiction document those checks, implement a means reporting any defects found, and a set procedure for removing any defective apparatus from service.

Incident Type	Total	Percentage Total	Fire Dept as Defendant	Firefighter as Defendant	Fire Dept as Plaintiff	Firefighter as Plaintiff
Structure	397	41%	305 (77%)	78 (20%)	24 (6%)	187 (47%)
EMS	262	27%	236 (90%)	99 (38%)	6 (2%)	47 (18%)
Apparatus	131	14%	104 (79%)	61 (47%)	5 (4%)	38 (29%)
Wildland	68	7%	41 (60%)	3 (4%)	20 (29%)	21 (31%)
Hazard Mat	34	4%	13 (38%)	3 (9%)	11 (32%)	14 (41%)

Likewise, significant pieces of equipment, such as SCBA, have regular inspection requirements as is spelled out in “NFPA 1852: Standard on Selection Care and Maintenance Open-Circuit Self-Contained Breathing Apparatus.” But the real low-frequency, high-risk aspect of equipment checks is liability exposure.

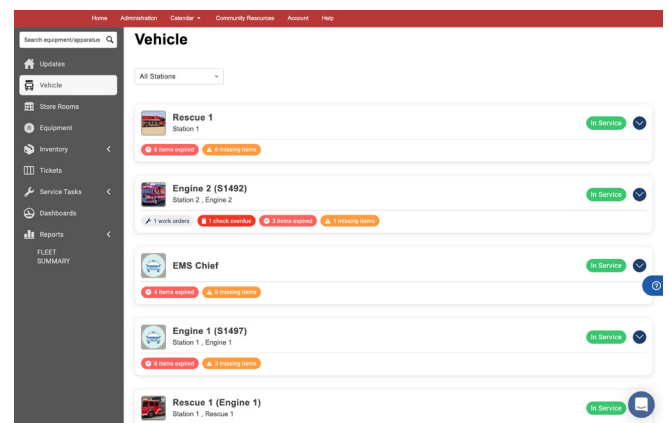
Isolated instances of municipalities being sued over something the fire department allegedly did abound. But what are cities paying in legal costs? In 2016, Governing collected legal-cost data from 20 of the largest U.S. cities. They found that larger, more densely populated cities paid significantly more in lawsuit expenses. Those cities had a three-year average payout of judgments and settlements of nearly \$1.2 billion covering 2013 to 2016. The median annual total cost — including payouts, legal, and insurance costs — was \$12 million for the 20 cities.

More specifically, noted fire service attorney and Firehouse Magazine legal columnist Curt Varone maintains a database of nearly 10,000 fire service cases. In a recent Firehouse article “Fire Law: Incident-Related Liability,” he examined the nature of those cases. There were almost 4,000 civil suits filed, 962 were incident-related. Of those, 758 were for negligence, with 285 being for gross negligence. Varone writes:

“The most common legal theory that is alleged in incident-related cases is negligence, which accounts for 79 percent of the cases. In 14 percent of the cases, attorneys alleged civil rights violations in an effort to circumvent immunity protection that otherwise might shield a fire department from liability. Our best defense against both theories are effective policies, training and supervision.”

One of the most significant events in recent memory was Boston’s tragic incident on Jan. 9, 2009, when the brakes failed on an aerial, sending it into parked vehicles and a building. A lieutenant was killed, and three other firefighters were injured. According to the National Institute of Occupational Safety and Health’s line-of-duty death investigation:

“The apparatus maintenance division did not have policies or procedures for preparing, performing, and verifying work completed on department apparatus by division staff or vendors. At the time of the incident, the division did not have an apparatus inspection program or preventive maintenance schedule within the fire stations. The division relied on the driver/operator and/or station officer to notify them of apparatus concerns or problems. Although not routinely used, a form was available which allowed the station officer to notify the maintenance division of apparatus needing to be serviced and document the problem(s). However, no guidance had been provided to field fire fighters or officers to make a determination on what was considered a potential problem.”



Vector Solutions’ asset management system delivered through its Vector Solutions brand tracks all types of fire department inspections, including apparatus checks, tools, medical supplies, controlled substances, and other items logged in inventory records.

One of the recommendations from the NIOSH report reads as follows:

Develop and implement fire apparatus inspection procedures and check sheets for their fleet, provide a systematic approach for communicating and receiving inspection sheets from the field, and institute a system to file and track fleet records (e.g., inspection sheets, work orders, repairs, apparatus specifications, and maintenance).”

That case brought at least two suits, including one from the family of the deceased and one from the company that insured the building the rig hit. The latter claim named the fire department as a defendant and sought \$410,000. The lieutenant’s family did not sue the fire department as it settled the wrongful death claim for \$100,000 shortly after the crash. The family did sue six companies involved with the truck’s maintenance.

But not every incident is of that once-a-generation variety. Most are lower profile and often forgotten soon after being settled.

In 2018, an Illinois building owner sued the Village of Valmeyer for negligence, charging that the fire department did not properly maintain its apparatus and fire hydrants. He sought \$100,000 over a 2017 fire that destroyed his building and several vehicles inside. The town sought to have the suit dismissed, saying it has no duty to provide fire protection; therefore, it has no liability for insufficient water supply.

In 2017 an artist in Neversink, N.Y., who lost his home and artwork in a 2014 fire, sued four volunteer departments for negligence because the first-arriving rig had no water on it. If ever there was an issue that routine truck checks should catch, it is tank level.

In 2016, Hartford, Conn. paid out \$350,000 for a 2014 firefighter line-of-duty death. While most of the violations had to do with on-scene behavior (primarily by command), noncompliant SCBA was cited as a factor in the firefighter's death.

In Joliet, Ill., a woman sued an ambulance company because one of its rig's fire extinguishers discharged while she was being transported.



An Oregon fire department was sued for \$4.2 million when its defibrillator failed to deliver a shock on seven attempts. The patient subsequently died nine days after his initial heart attack. And while there was no indication that routine checks were lacking, Scott Technologies agreed to a \$10.6 million settlement in 2015 regarding a New York firefighter who suffered significant injuries when his PASS device did not activate after being trapped under debris from a partial collapse. Both PASS and AED performance are part of most routine checks.

Fire service leaders know firefighter and civilian safety, not liability risks, should be the main reason for doing things the right way. Ensuring that apparatus and equipment are correctly inspected, inspections are fully documented, and findings from those inspections are communicated across the department are paramount to firefighter safety and effectiveness. This point needs to be taught from the first day of the recruit academy and reinforced in the firehouse's day-to-day activities. But what shouldn't be lost in this is that these sound safety practices are also sound business practices for fire departments looking to mitigate its risks.



800.840.8046 www.VectorSolutions.com

NIOSH Boston
<https://www.cdc.gov/niosh/fire/reports/face200905.html>

Chevin: reduce maintenance costs (importance of checks)
<https://www.chevinfleet.com/us/news/reduce-fleet-maintenance-costs/>

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<https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1852>

FEMA text on risk management, may provide some background, common definitions, etc. P.25, 30 https://www.usfa.fema.gov/downloads/pdf/publications/risk_management_practices.pdf

US History Org on Ben Franklin ounce/pound
<https://www.ushistory.org/franklin/philadelphia/fire.htm>

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<https://drexel.edu/goodwin/professional-studies-blog/overview/2018/July/6-barriers-to-effective-communication/>

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<http://www.firelawblog.com/2015/02/19/jury-awards-10-6-million-ny-firefighter/>