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WEST HAVEN (CT) FIRE DEPARTMENT COMPANIES arrived to find heavy smoke and fire issuing from the top-floor front of a three-story private dwelling. They stretched multiple lines to the top floor while Truck 22, a 2022 Pierce Velocity-Ascendant 100-foot midmount tower, initiated topside ventilation. (Photo by Glenn Duda.)

Integrating Smart Command Vehicles for Enhanced Connectivity and Efficiency

BY KIRK McKINZIE AND KEVIN SOFEN

In the rapidly evolving landscape of emergency services, integrating advanced technological solutions stands at the forefront of transforming operations and enhancing the efficiency and effectiveness of fire, rescue, and emergency medical service (EMS) teams.

As we advance, the focus on developing mobile infrastructure through specific, measurable, achievable, relevant, timely (SMART) apparatus and chief officer rigs, aka "buggies" equipped with high-speed data connectivity, has never been more critical. This article explores these innovative rigs' pivotal role in modernizing public safety operations, highlighting the benefits of integrating compatible technology partners into emergency response frameworks. Moore's law has proven true again to enable a small and affordable technology footprint that provides resilient data connectivity.

EMERGING TRENDS IN EMERGENCY RESPONSE

The need for resilient, advanced mobile infrastructure is becoming increasingly apparent. Integrating interconnected technologies, cyber-physical systems, and high-speed connectivity into vehicles offers a revolutionary approach to managing incidents. These rigs serve as mobile command centers, enabling real-time data sharing, analysis, and decision-making in critical situations. The systems of systems approach can now provide network blending across previously siloed LTE networks to create a single IP address that combines the best of each network and satellite connectivity when LTE is unavailable. Mesh-networked systems can take data connectivity from the command vehicle and extend Internet-protocol-enabled systems for updated voice communications.

THE NEED FOR ADVANCED MOBILE INFRASTRUCTURE

The foundation of these advanced mobile command units is the ability to offer seamless, high-speed data connectivity. Failover and failback—processes where a system automatically switches to a backup network during a failure and then reverts to the primary network once restored—must be carefully managed. Failover failback between different networks at the wrong time during an incident can lead to catastrophic outcomes. Ensuring redundant and resilient self-healing alternative communications is critical to avoid failover failback. This connectivity is crucial for real-time information exchange, [go to Command Vehicles p.8]

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EDITOR'S OPINION CHRIS Mc LOONE

Semper Gumby

I am sure that the members of the military in our audience have seen and heard the above expression countless times, but I have only recently been introduced to it by my son, who is a Plebe at the United States Naval Academy (USNA).

Essentially, it means "always flexible." During his Plebe Summer, he learned how important that mentality was as he often wouldn't know what he was going to be doing from one day to the next. And, as a USNA parent, I've had to grasp that concept as the timing for certain events is not always as advertised.

It reminds me of the firehouse in some ways. If there's a work detail scheduled at the firehouse for a weekend morning or the morning of a holiday, and that work detail is scheduled for 0700 hours, and you arrive there at 0700 to get started, it's a good bet most of the work was already completed by the firefighters who got there at 0630. In my early days, I'd be aggravated by it, but it didn't take me long to start getting there at 0630.

It would be very easy to apply "Semper Gumby" to the current apparatus and equipment purchasing atmosphere. Certainly, if there was ever a time and a need for flexibility, it is now—even with the strides that have been made to eat into backlogs and to solve any supply chain issues that have come up over time. But, I'd like to discuss flexibility in terms of this month's theme: technology.

A few months ago, I asserted that when discussing technology, it's the "why" that must be communicated to potential technology adopters, not so much the "what." When I think of technology, I often think of something that is useful but beyond my scope of understanding in terms of how it works. Think about smartphones. I can't explain how they work; they just do. I use one every day. And, it's obvious to me why it's important to have one.

I still believe that the "why" is critical to understand. Don't worry about how the thermal imaging camera is telling you what it is; just know why the information it is communicating is so important and how to interpret the information. But this is also where flexibility becomes key.

The flexibility regarding technology needs to come from both sides: the leaders being asked to adopt and implement the technology and the firefighters who are asking for it.

Flexibility in this context can be so many things. In some ways, it means being open-minded. It takes a while for technology to be perfected. Using smartphones as an example, think about your first cell phone. I bought my first phone in 1995. I used it sparingly. Its range was sometimes questionable. Dropped calls were part of owning one because the "cellular" network was not as expansive as today's wireless networks are. Today, dropped calls still happen sometimes, but the technology itself is far more reliable.

Take the digital radios used in the fire service today—not as many "bonk" today as they used to. The units themselves and the networks on which they operate are more reliable. Many of the technologies introduced today are in their infancy. See the potential. Don't lock up on one feature that doesn't work the way you want it to.

Being flexible can also mean understanding when a technology is in its infancy that it might not always work as advertised, that it may take a few revisions before a particular product hits its stride. And, it may not happen as quickly as you'd like it to or expect it to. This is why putting new technology through its paces is so important to developers. Volunteer your department to demo a new technology so the creators can acquire real-time feedback and real-world feedback.

Be flexible in how quickly you can adopt a new technology. It is not uncommon for cost to be a barrier to adoption. I like to use thermal imaging cameras as examples of technology whose importance was obvious from the get-go. But, looking back, how long did it take your department to acquire one, let alone several? I remember having a long discussion after training one night about whether to request permission at the monthly fire company meeting to spend the money on one and the justification we would present to the company for it. Be flexible. Remember, these things don't happen overnight.

Technology is a funny thing. It brings about great change, but it also can be very divisive. Bring up electric fire apparatus on social media, and you'll see exactly what I mean. No one intends to force a technology on any fire department. It won't all fit every department. So, be flexible when someone brings it up, and think about how it could benefit your organization. But, also know that it will not be perfect the first time around. If that means you wait until Rev 2 or Rev 3, that's fine. And for those in the fire department espousing the technology use, be flexible with the leadership because the leaders, many of whom have not had a smartphone in their hands for as long as you have, are working to learn what has not been second nature to them.

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[COMMAND VEHICLES] cont from page 3
from live video feeds for enhanced situational awareness to remote sensing and space imaging. Integrating cutting-edge technologies like Quantum at the Edge and bidirectional data flow enhances the onboard router's functionality, preventing failover and failback issues. Additionally, these rigs evolve into critical components within mesh networks, ensuring robust and reliable communication channels bolstered by edge and cloud computing capabilities.

BENEFITS OF HIGH-SPEED CONNECTIVITY IN PUBLIC SAFETY

High-speed connectivity facilitates operational efficiencies, including deploying virtual assistants to streamline processes, Internet of Things (IoT) enabled incident reporting, and live video analytics access for comprehensive situational awareness. This level of connectivity ensures that incident commanders (ICs) have access to the communication systems for more relevant data, enabling them to make informed decisions swiftly. For example, ICs in areas that once experienced a loss of connectivity can reliably deploy their drone operations and stream the video, audio, and remote sensing data feeds to relevant stakeholders in real time.

THE ROLE OF TECHNOLOGY IN MODERN INCIDENT MANAGEMENT

Integrating advanced communication systems into these mobile rigs transforms traditional response strategies. With the advent of GPS, 5G+, and LTE technologies, emergency vehicles are now equipped with constant connectivity, expanding their operational capabilities beyond conventional boundaries. The hardened push-to-talk-capable devices functioning on vendor-agnostic software begin to enable mission-critical push-to-talk (MCPTT), and visual positioning systems (VPS) and spatial-temporal awareness tools further enhance this dynamic, offering unprecedented levels of precision in emergency response.

INTEGRATING ADVANCED COMMUNICATION SYSTEMS

The collaboration with industry giants for cloud computing introduces a new era of advanced communication systems within these rigs. Integrating cloud and edge computing facilitates low-latency processing and data analysis, critical for time-sensitive operations. Incorporating SMART systems into public safety vehicles, including IoT and artificial intelligence (AI), streamlines incident management and significantly improves responder safety and service delivery to communities.

CASE STUDIES

The case studies involving Verizon THOR, T-Mobile, Microsoft, and ATT/FirstNet provide compelling evidence of the significant impact that connected command vehicles have on the landscape of emergency response and public safety operations. Each of these examples brings to light the profound advantages of integrating sophisticated communication technologies into mobile command centers and illustrates the vast potential of these innovations.

Verizon THOR, a state-of-the-art mobile command center, exemplifies how high-speed connectivity and advanced technological capabilities can be deployed rapidly to disaster-stricken or remote areas, ensuring that first responders remain connected and well-informed. This vehicle supports communication within emergency response teams and facilitates seamless interaction with the public, enhancing rescue operations.

The First Responder Network Authority (FirstNet), established after the tragic events of 9/11, and AT&T have forged a vital public-private partnership to construct a dedicated broadband network for first responders. This collaboration leverages a 20-MHz spectrum license and a multibillion-dollar government allocation to build a network that promises improved connectivity and communication during disasters.

AT&T's 25-year commitment to FirstNet has already yielded significant advancements, including deployable units for disaster-stricken areas and innovative mobile command vehicles, which enhance LTE/satellite connections and provide vital live-streaming capabilities. Further innovations include drones for aerial situational awareness and robots for inaccessible or hazardous areas, equipped with cameras and network boosters to enhance the FirstNet network's reach.

Additionally, FirstNet's continuous evolution includes upgrades to smartphones and mobile network boosters, alongside the unique introduction of emotional support dogs for first responders. This partnership underscores a future where advanced technology and dedicated networks empower first responders, ensuring safety and operational efficiency in critical moments.

T-Mobile's partnership with Blueforce and others introduces the BlueforceMOBILE Command Post in a Box (BlueforceMOBILE-CP), a cutting-edge solution enhancing disaster management through rapid deployment and self-sufficiency in communications and decision support optimized for austere environments.

Leveraging T-Mobile's 5G network, this portable system offers comprehensive capabilities, including advanced computing power, high-speed communications with failover options, and a suite of sensor fusion technologies. It facilitates a distributed common operating picture, integrating data across domains, agencies, and networks to improve situational awareness and decision-making in emergency scenarios. This collaboration exemplifies the potential of 5G to revolutionize public safety operations by providing first responders with the tools to adapt quickly to dynamic environments, ensuring more proficient response strategies and ultimately leading to safer communities.

Microsoft has also contributed significantly to the evolution of public safety strategies through its technological innovations. Providing robust platforms for data analysis, cloud storage, and live video streaming enables a level of situational awareness that was previously unattainable, allowing first responders to make quicker, more informed decisions. Microsoft's Public Safety vehicles integrate cutting-edge computing and analytics capabilities, harnessing the power of cloud technology to process and disseminate critical information instantly. These vehicles serve as mobile hubs for data analysis, leveraging AI and machine learning to provide predictive insights, significantly enhancing situational awareness and operational efficiency for emergency services and setting a new benchmark for technological advancement in public safety.

These case studies underscore the transformative effect of digital collaboration and technology integration in public safety operations. The strategic deployment of mobile infrastructure enhances information and knowledge sharing among first responders and fosters a more dynamic, interactive approach to emergency management. By adopting these connected command vehicles, public safety

1 What was formerly possible only with large-scale mobile infrastructure is beginning to be deployed in compact, modest payload vehicles. *(Photos courtesy of authors unless otherwise noted.)* 2 Verizon Frontline's Tactical Humanitarian Operations Response (THOR), pictured on 3/6/2024 in Sacramento, California, is a mobile, private Verizon 5G Ultra Wideband (UWB) and mobile edge compute (MEC) rapid-response command center vehicle capable of deploying Verizon 5G Ultra Wideband along with additional Verizon Frontline technology, applications, and advanced computing solutions. 3 The FirstNet connected vehicle built with AT&T on display at FDIC International 2024. 4 Microsoft and partners demonstrated intelligent features at an International Association of Fire Chiefs - Technology Summit International in Irving, Texas.

5 Ford and Darley showcased the first fire truck built on a Model T and the new Wildland Firefighting Rig at the Chicago Auto Show. 6 The Ford Bronco platform, with 21st-century communications technologies, allows responders to go further into the wildland and maintain consistent communications. *(Photo 6 courtesy of Darley.)* 7 Ford and Darley upfitted Broncos enable wildland fire service members to go places where other vehicles can't while maintaining connectivity throughout the journey. The newest unit garnered attention at FDIC International 2024.

agencies can revolutionize their operational capabilities, offering faster, more efficient, and more functional emergency responses, thereby significantly improving public safety and disaster response scenarios.

DARLEY AND FORD MOTOR COMPANY

The innovative collaboration between Darley and Ford Motor Company spans more than 100 years, from when Henry Ford approached W.S. Darley about building a fire truck on a Ford Model T. In 2023, the two companies aligned to introduce a next-generation incident command rig, enhanced by strategic partnerships with technology leaders like Microsoft, IP Access, Dejero, Kymeta, Hypha, DroneSense, and Stealth Power. These systems integration approaches exemplify the future of emergency response through the lens of advanced mobile infrastructure. This alliance transcends traditional boundaries by crafting mobile command centers that are hubs of comprehensive, high-speed connectivity and technological capabilities. Equipped with technology that provides communication and data analysis tools, these units empower first responders with real-time data sharing, analysis, and a level of situational awareness previously unattainable.

The collaboration showcases a paradigm shift in how emergency services can leverage the synergy of automotive engineering and cyber-physical systems, offering a practical roadmap for future innovation in public safety operations. By integrating solutions from IP Access for resilient integrated communications, Dejero's network aggregation for uninterrupted connectivity, Kymeta's mobile satellite antennas, Hypha's mesh networking, DroneSense's aerial intelligence, and Stealth Power's energy management, these rigs amplify the proficiency, safety, and functionality of public safety response teams.

These forward-thinking partnerships pave the way for a new era in emergency response. The combination of intelligent technologies ensures that responders are equipped, informed, and ready to tackle the evolving

demands of modern public safety, heralding a future where communities are safer, more secure, and persistently resilient.

THE FUTURE OF PUBLIC SAFETY WITH SMART EMERGENCY RESPONSE VEHICLES SYSTEMS

By setting a precedent with the partnership between Darley and Ford and further expanding this collaborative ecosystem, the potential to revolutionize public safety operations with SMART city adjacent mobile command centers that are agile and fully equipped for the digital age is within reach. This holistic approach, underscored by investment in forward-thinking future strategy, aims to enhance the operational capabilities of emergency services and ensure that first responders are equipped with the digital tools necessary to meet the challenges head-on.

8 T-Mobile's latest response vehicle is equipped with advanced satellite communication capabilities to support community recovery efforts. This innovation is part of its expanding fleet, designed to ensure emergency connectivity.

In the ever-evolving landscape of emergency services, integrating sophisticated digital systems in emergency response vehicle systems heralds a transformative era for public safety. The trends to divest legacy systems like land mobile radio (LMR) and invest in radio over Internet Protocol (RoIP) are causing venture capital teams to invest in technologies that promise to redefine how first responders engage with their environments and execute their missions. Through collaborations with industry pioneers, efforts are underway to test and refine prototype trucks that are not merely vehicles but hubs of advanced digital ecosystems.

These initiatives focus on leveraging AI, enhanced connectivity, and comprehensive data analytics to amplify firefighting capabilities. Moreover, addressing broader societal issues through innovative public safety solutions underscores the holistic approach required for proactive community risk reduction in today's complex emergency scenarios. As discussions extend to incorporating cutting-edge technologies like fully self-driving vehicles and quantum computing strategies, it's evident that a multidimensional strategy will underpin the future of emergency response vehicles. This strategy will include data-driven insights and real-time feedback mechanisms and prioritize adaptability, software-defined features, and a commitment to continuous innovation and collaboration.

Integrating an intelligent apparatus as a software-defined vehicle with advanced mobile infrastructure and high-speed connectivity represents a significant leap forward in public safety technology. By embracing these innovations, we can enhance the operational capabilities of fire, rescue, and EMS teams, ensuring they remain at the cutting edge of emergency response. This collaboration with technology leaders and the continuous exploration of new solutions will drive the evolution of public safety, ultimately saving more lives and protecting our communities with greater productivity and effectiveness. The integration of vehicle-to-everything (V2X) autonomous technology with cutting-edge advancements will empower future vehicles to do more than just respond to emergencies. They will anticipate, understand, and take action with exceptional precision and performance, all within a multidimensional, digitally enhanced world.

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KEVIN SOFEN is a leading strategist and innovator in emergency response technologies, committed to elevating public safety via technological advancements in fire, rescue, and EMS operations. He hosts and founded the SMART Firefighting Podcast, a platform for dialogs on tech-driven firefighting, hosting experts and frontline professionals.

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1 Northumberland (PA) Hook & Ladder Company Gets Heavy Rescue Truck from Rescue 1

The Northumberland (PA) Hook & Ladder Company's 30 volunteer firefighters are celebrating the organization's 150th anniversary this year and recently put in service a new heavy rescue truck built by Rescue 1. **MORE:** bit.ly/3XoW8wE

2 Water Delivery: the Chaffing Block

There are many ways this tool can be used. It is most beneficial when a single firefighter is trying to connect two pieces of 6-inch hard sleeve. **MORE:** bit.ly/4cHDpRd

3 Compartment Corner: New City (NY) Rosenbauer Viper Aerial Ladder

The department operates a 2021 Rosenbauer Viper 78-foot aerial ladder. Along with its tower ladder, this will be the first time in department history that it will operate two frontline aerial apparatus. **MORE:** bit.ly/3T8jTWX

THE RIG

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Voltage Drops and Amperage Flow

This article will look at the principles behind unbalanced loads and how we can use what we learn to train our brain to think in a certain way. **MORE:** bit.ly/4cE3ctD

THE FIRE STATION

WWW.FIREAPPARATUSMAGAZINE.COM/THE-FIRE-STATION/

Shive-Hattery Overcomes Challenges in Design and Build of Santa Rita (AZ) Fire District Station 152

The new Station 152 is a single-story, 9,400-square-foot structure with three double-deep, drive-through apparatus bays that's separated into hot, warm, and cold zones. **MORE:** bit.ly/4e23oUm

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THERMAL IMAGING MANFRED KIHN

Using Thermal Imaging to Aid During Farming-Related Fires

A fire service thermal imager (TI) can be a helpful tool for firefighters to assess the situation and make informed decisions at farming incidents involving burning bales of hay or silo fires.

Following are some tips on how to effectively use a TI in such scenarios.

1. **Identification:** TIs can quickly identify hotspots within burning bales of hay and in a grain silo, allowing firefighters to target their efforts more efficiently.
2. **Assessment of fire spread:** Thermal imaging can help firefighters track the spread of the fire within the silo and identify any areas where the fire may be smoldering or hidden from plain sight.
3. **Monitoring temperature changes:** Continuous monitoring with a TI can help firefighters track the progress of the fire and identify any hidden flames or hot spots, track any temperature changes, and help assess the effectiveness of their firefighting tactics.
4. **Safety:** TIs can also be used to ensure firefighters' safety by helping them navigate through smoke-filled environments and locate any potential hazards.
5. **Search and rescue:** In the case of trapped individuals inside the silo, thermal imaging can assist firefighters in locating them by detecting body heat signatures.
6. **Structural integrity assessment:** Thermal imaging can also be used to assess the structural integrity of the grain silo by detecting any hotspots or areas of weakness that may pose a risk of collapse.
7. **Resource management:** By pinpointing the areas of intense heat, firefighters can allocate resources effectively and prevent further spread of the fire.
8. **Post-fire assessment:** Once the fire is extinguished, thermal imaging can be used to conduct a post-incident assessment to ensure all hot spots have been completely extinguished and there are no risks of reignition.

1 Monitoring excessive heat from a silo fire with a TI. *[Photo courtesy of Harrison County (KY) Fire Department.]*

SILO FIRE

Conduct a 360° assessment all around the outside of the silo with a TI, scanning it slowly to be sure to locate all the potential hot spots. Command should draw a sketch of where the hot spots are in the silo so they will know where to begin efforts to cool the fire pockets. Once completing the scan of the outside, firefighters should scan across the surface of the silage (from the loading door—not physically inside the silo). This will tell how far across the silo and how deep they might need to probe.

Once the hot spots have been located, a strategy needs to be put in place. Remember: To put out any fire, you remove the heat source, the air, or the fuel. Taking the air out of the formula is not going to be a good option in a conventional silo. There is just no effective way to make most conventional silos airtight.

So, efforts need to concentrate on either removing the fuel source by unloading the silo to below the hot area or probing into the hot area and cooling it down. This can be done with a penetrating nozzle and, depending on the size of the hot pocket, only a small amount of water is needed (a few hundred gallons possibly).

A hammer drill will drill through most concrete stave silos as well as most poured concrete silos. These holes can be easily repaired with concrete repair material. While probing and cooling, progress can be monitored with the TI. Firefighters should see a marked reduction in temperature readings as the area is being cooled.

HAY BALE FIRE

If you experience a hay bale fire in the barn, wet the hay and remove it as quickly as possible. Bring in any heavy equipment as required to help with this procedure. Wear full personal protective equipment including self-contained breathing apparatus as a precaution, as the hay may have been treated with chemical preservatives.

2 TI assessment after extinguishing burning hay bales. *[Photo courtesy of West Grey (Ontario, Canada) Fire Services.]*

Using gas monitoring equipment is recommended, as any hay treated with preservatives contains ethoxyquin and butylated hydroxytoluene (BHT), which will produce hydrogen cyanide gas at around 240°F. This gas is deadly. Additives containing primarily propionic acid do not produce hydrogen cyanide during a fire.

It is important for firefighters to receive proper training using TI technology and to follow safety protocols and operational guidelines to ensure the best possible outcome when dealing with a grain silo fire. Remember to follow proper safety protocols and operational guidelines when using TIs in firefighting situations to ensure the best possible outcome.

MANFRED KIHN is a 19-year veteran of the fire service, having served as an ambulance officer, emergency services specialist, firefighter, captain, and fire chief. He has been a member of Bullard's Emergency Responder team since 2005 and is the company's fire training specialist for thermal imaging technology. He is certified through the Law Enforcement Thermographers' Association (LETA) as a thermal imaging instructor and is a recipient of the Ontario Medal for Firefighters Bravery. If you have questions about thermal imaging, email him at Manfred_kihn@bullard.com.

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Darley Awarded Major Fire Contracts

Fire & Emergency Services Equipment (F&ESE) Contract - Darley was recently awarded a significant contract by the Department of Defense (DoD). The contract is an indefinite-delivery/ indefinite-quantity (IDIQ) agreement and is part of a larger award that is shared among multiple contractors. This new ten-year contract will provide equipment, training, and product support valued at $2.6 billion over the next ten years.

This is a significant achievement for Darley, and a fifth iteration of the contract over the past twenty years.

Jon Stodola, Tom Darley, James Long, Susy Lemar, and Ryan Darley at Sourcewell HQ.

Sourcewell Contract - We know that no two customers are alike. Some are guided by our Fire Equipment catalog while others prefer to research products and order online. For large purchases, many departments prefer face-to-face meetings. Today we are also seeing more and more requests for increased buying power through cooperative purchasing contracts.

Darley was also recently awarded a multi-year partnership agreement with one of the nation's largest service cooperatives, Sourcewell.

This contract is available to all government entities with no cost, obligation or liability. Darley's offering has been pre-bid and vetted with significant discounts available for items like pumps, fire hose, water flow equipment, thermal imaging cameras, rescue equipment, hand tools, EV car safety solutions. Contact us to today to learn how your agency can take advantage of this program. For details, visit shop.darley.com/sourcewell

Darley Welcomes New Members to Fire Advisory Board

Reggie McKeithen, Assistant Division Chief, Kansas City, MO

Amy Scheller, Fire Chief, Dubuque, IA

Darley is thrilled to announce the addition of two distinguished professionals to our Fire Advisory Board (FAB) - Chief Amy Scheller and Assistant Chief Reggie McKeithen whose vast experience and expertise will undoubtedly enrich the board's collective knowledge and strategic direction.

Their addition to the FAB reinforces Darley's commitment to continually enhance our understanding of the industry's needs and challenges, and enable us to provide more effective and innovative solutions to our customers.

Darley Appoints Lee J. Wise as CFO

Darley has named Lee J. Wise as our new Chief Financial Officer. Wise, formerly Senior VP at Covetrus, brings extensive experience in finance and business development.

CEO Paul Darley praised Wise's financial acumen and leadership, highlighting his fit for the company's growth plans. Wise's background includes roles at Brunswick Corp., Rockwell Collins, and more. He holds degrees from the University of Indiana and the University of Iowa.

Wise will oversee Darley's financial operations, including accounting and treasury. "I am very excited to join Team Darley. The company's customer-centric and values-based culture, along with its strategic market positioning, holds great potential for continued growth and value creation," said Lee.

Lee Wise, Darley CFO

From the Office of

PAUL DARLEY

Culture Eats Strategy for Breakfast

As a leader of an organization, whether it's your fire department, military unit, company, church, or even a family, one of your key concerns should be the health of your group. While strategy is critical, it can't be executed unless you have a strong team that knows the plan, is treated fairly and is empowered to engage.

Patrick Lencioni, in his best-selling book, *The Advantage*, writes, "The seminal difference between successful organizations and mediocre or unsuccessful ones has little, if anything, to do with what they know or how smart they are; it has everything to do with how healthy they are." A healthy organization should have a clear set of values that are adhered to by employees who are supported and respected.

Each year we conduct an employee engagement survey. In 2024, we received the second highest ratings in our company history, with better than a B+ grade point average. Moreover, roughly 95 percent responded that we were headed in the right direction.

Part of the reason for these strong results is that we empower our employees and involve them in the decision-making process, and then we keep them posted on our progress. We are constantly inculcating our culture into our team, not only in our company-wide quarterly meetings and message boards, but more importantly in our daily actions.

This year we decided to take a deeper dive with an organizational health study. Our organizational psychologist Dr. Mark Lowry conducted over 30 employee deep dive interviews to find out what our employees truly like about Darley, and where we can improve. He reported back that our employees truly value our mission of serving first responders and warfighters, and the fact that we are a family business with strong values, stability and transparent leadership that treat our employees, customers and partners respectfully and fairly.

It's been said an opportunity sustains an organization for a year; good management sustains for a decade; good corporate culture sustains an enterprise for a century. Protecting and strengthening our strong culture will allow us to continue to serve you for generations to come. You serve others. We serve you.

Paul C. Darley
President & Chief Executive Officer
pauldarley@darley.com
Cell: 1-708-267-6288

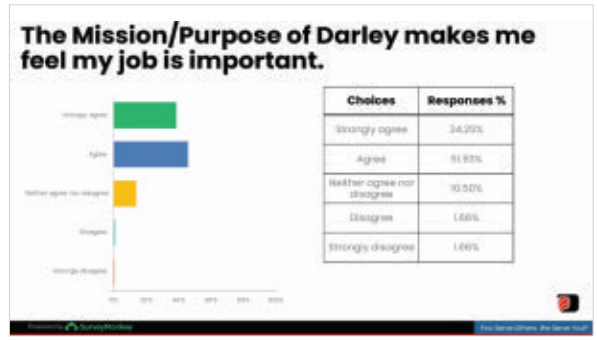
Darley Employees Give Record Scores in Annual Employee Engagement Survey

Our employee survey conducted in May 2024 aimed to measure the satisfaction, engagement, and feedback of the Darley workforce. The survey received a response rate of 93.9%. The survey covered topics such as work environment, communication, recognition, benefits, and values.

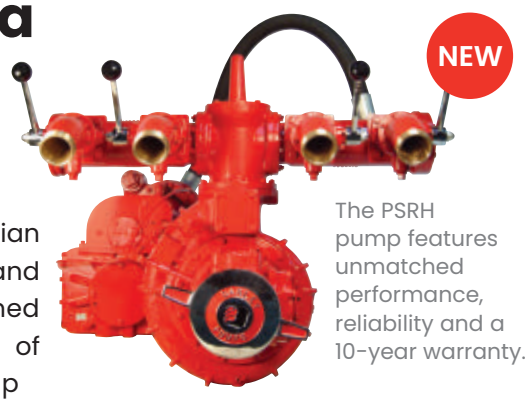
Darley employees gave us the second highest scores in our 25+ years of conducting employee surveys.

The overall results showed that the vast majority of employees are satisfied with their work at Darley and would recommend it to others. The average grade given to Darley's ability to create a positive work environment and make it a great place to work was B+, with 81.53% of respondents giving a score of B or higher. The most common reasons for choosing A or B were the overall culture, the company mission, the work they are doing, and their supervisor/manager.

Overwhelmingly, employees were motivated by our missions/purpose.

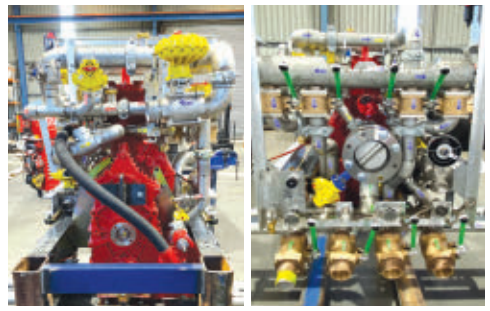


Featured Product: Darley PSRH - Pump of Choice for Australia



The PSRH pump features unmatched performance, reliability and a 10-year warranty.

Darley pumps have been running with great success in the majority of Australian cities for the past 40+ years, mainly in a midmount configuration. Darley was proud to enhance and re-engineer an existing pump to meet the Australian fire services' requests, ensuring a quieter and reliable rear-mounted pump. The unmatched performance, reliability and 10-year warranty of our PSRH with MegaTrans makes this the pump of choice for Australia's frontline pumpers in Queensland, Victoria, South Australia, Northern Territory and Tasmania.



The rear mount PSRH with MegaTrans is capable of flows up to 2000 GPM.

Our PSRH Mega pump was selected for six main reasons:

1. Our high-pressure pump has more flow ability than any other competitor's product, which then allowed for the end user to drive two high pressure hose reels at the same time.

2. Our PSRH Mega pump allowed for gearing that enabled an 882 GPM @ 102 PSI (3340 LPM @ 700 kpa) main pump performance while simultaneously allowing for a 122 GPM @ 363 PSI (460 LPM @ 2500 kpa) performance from the high pressure pump. It was very important to the end user to have at least a 3:1 ratio between the high pressure and main pump pressures while operating simultaneously.

Queensland FRS Type 3 pumper fitted with PSRH Mega.

3. Our high pressure pump could attain a 122 GPM @ 580 PSI (4601 LPM @ 4000 kpa) performance point.

4. Our PSRH Mega pump could attain a 2000 GPM @ 165 PSI (7600 LPM @ 1140 kpa) performance point as well as a 1000 GPM @ 250 psi (3800 LPM @ 1720 kpa) performance point from the main pump with proper drive train.

5. The high pressure pump could be engaged or disengaged. The high pressure pump could be left engaged and dead headed without issue.

6. The pump is light weight (586 lbs. or 266 kg) and has a very low driveline input connection which works well for the long pump rear driveline layout that had multiple Cardan joints.

To learn more and find the right pump to fit your needs, please contact ryandarley@darley.com or visit darley.com/pumps.

Darley Defense In Full Swing

Darley Hosts 15th Annual NDIA Great Lakes Chapter Meeting

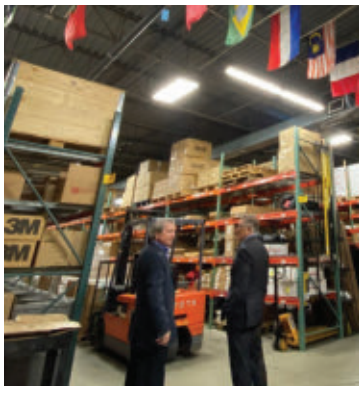
Approximately 100 attendees visited Darley HQ.

In July, Team Darley was proud to host the 15th Annual NDIA Great Lakes Chapter meeting, a remarkable event that brought together industry leaders, innovators, and defense stakeholders alike. The event kicked off with a warm welcome from Todd Streicher, event chairman, and Nick Cucci, NDIA Great Lakes Chapter Board President. The agenda was packed with various supply partners and discussion panels including insights from Darryl Thomas of Illinois APEX Accelerator and Aina Vilumsons of Wisconsin APEX Accelerator. A panel discussion, moderated by Scott Singer of CyberNINES, brought together industry leaders to discuss cybersecurity and CMMC. It was followed by a keynote address from Kelly Callahan, IST Chief - Fire & Emergency Services Equipment, DLA Troop Support. These opportunities are cornerstone to our involvement in the daily operations of warfighters and firefighters alike, as we display modern solutions from our trusted supply partners.

BENS Visits Darley: Strengthening Partnerships for National Security

General Ray and Paul Darley in front of the 1926 Ford Model T.

Earlier this year, we were honored to host a visit from General Tim Ray, USAF (Ret.), the new President and CEO of Business Executives for National Security (BENS), a highly decorated retired United States Air Force four-star general officer. This visit, on April 9th, 2024, was a testament to the ongoing commitment of BENS to foster strong public-private partnerships essential for national security. Paul Darley, CEO of Darley and longtime BENS member, gave General Ray a personal tour of the facility and provided an exclusive opportunity for BENS members to gain insights into Darley's operations and our pivotal role in supporting first responders worldwide. This visit was a significant event, marking General Ray's commitment to leveraging commercial sector experience to support government partners.


General Ray's visit included a tour of our warehouse.

Annual Defense Sales Conference Provides Training, Tech and Team Building


Our Darley defense team members gathered at Darley's HQ.

In June, over fifty of our Darley Defense sales team members gathered from around the world for an exciting week filled with training and insights on the latest tech and innovations, unmanned systems demos, and strategy sessions, dedicated to elevating our capabilities to better serve our military customers.


One of our team building activities included a fun day at the ballpark!


Demos included training on the latest UxS capabilities.

We were sure to include some serious team bonding attending a baseball game! Contact Darley at 630-735-3500 to connect with your defense specialist.

Darley Defense Exhibits at Over 50 Trade Shows in 2024

With over 100 different trade shows and industry events company wide, we will exhibit at over 50 trade shows specifically focused on the defense community and our military customers. Our participation is a reflection of our commitment to our customer-centric approach.

Proudly showcasing our purpose-built solutions for modern firefighting and defense, shows such as AUSA and Sea-Air-Space will allow our specialists the opportunity to build relationships.

See page 8 for our current list of upcoming trade shows and be sure to follow us on social @wsdarley for the latest developments.

Visit Darley at AUSA in Washington, DC October 14 - 16. We'll be at booth #4021 and hope to see you there!

Darley held an industry panel focused on manufacturing at Sea-Air-Space.


Team Darley at Sea-Air-Space 2024.


Team Darley at SOFWeek and AUSA trade shows.

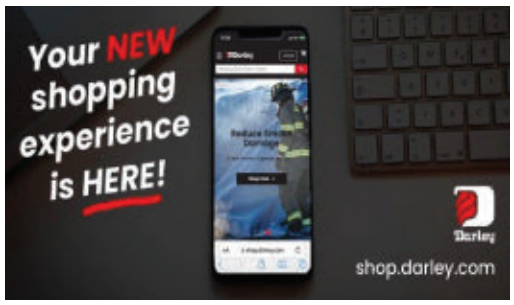
See What's Happening Across Darley

Shop.darley.com Launches as Darley's New Online Shopping Experience

Officially launching in the Spring, shop.darley.com is the next generation online shopping experience of eDarley.com, which has served Darley customers' online shopping needs for the past 20 years.

Built directly from customer feedback and requirements over the last 15 months, shop.darley.com provides expanded features and services and enhanced customer-centric online experiences.

"We need to serve our customers wherever, however, and whenever they need us," said Jerry Bergquist, Director of Digital Performance Marketing, adding, "shop.darley.com is built to perform for our local, state, federal, and business partners now and into the future."



Register on shop.darley.com and enjoy 3% back on every purchase with Darley Dollars.

Equip your department today at shop.darley.com.

Darley Provides Low-Cost Internet to Rural Areas for Emergency Response


The RUCS unit + distribution modules send signals 1000'.

Partnering with Tekniam's Remote Universal Communication System (RUCS), Darley provides low-cost broadband internet to rural areas for emergency response providers and developing countries. Weighing at just 5 lbs., the RUCS is compact, lightweight, and has low power requirements. The unit and its small distribution module antenna can deliver a signal from an access point within a 1000 ft. radius for up to 250 internet users. The signal can be relayed between the portable communication link units placed three miles apart to cover a total distance of up to 35 mi. The RUCS requires a 5-to-8-watt power draw and can be powered with a small battery pack, car battery, solar, or wall plug. It can also propagate a DoD wideband waveform with minor adjustments.

Darley Provides High-Quality Extrication Tools in USA & Canada

Darley is excited that we are offering a complete line of extrication tools. We have partnered with Edilgrappa based in Italy to represent them in the USA and Canada. We're looking for dealers who are interested in taking on a territory to sell these high quality tools.

Edilgrappa has manufactured private-label rescue tools for a well-known American brand, and has earned a reputation worldwide for their quality. It is a brand trusted by firefighters worldwide.

Darley now offers a complete line of extrication tools on shop.darley.com.

If you're interested in becoming a dealer, please reach out to your regional Darley sales representative or email ryandarley@darley.com.

Darley Partners with Wingtra to Offer VTOL Drone Technology

NEW

Darley has partnered with Wingtra, a leader in VTOL drone technology, which offers advanced aerial surveying and data collection tools that transform industries like agriculture and construction. The WingtraOne Gen II drone merges the benefits of fixed-wing and multirotor designs, providing extensive coverage and versatile operation. With Wingtra, users obtain high-resolution imagery, precise 3D mapping, and comprehensive support – enhancing improved decision-making and operational efficiency.

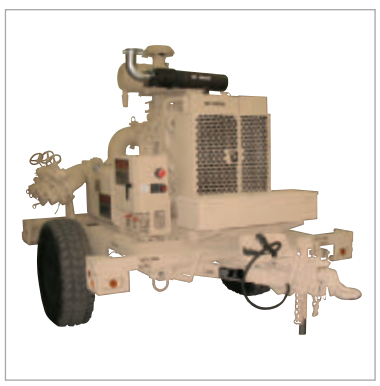

Wingtra drones offer mapping for fast and accurate surveying data and are compatible with leading GIS and 3D mapping companies.

Contact nickfay@darley.com to build a custom drone program to meet your needs with this exciting new technology.

Ohler Pumps Support the DoD Since 1947

Ohler Pumps has manufactured fuel and water distribution systems for the Department of Defense since 1947. We continue supporting the Army, Air Force, Navy, and Marine Corps, which all field Ohler systems.

With many decades of experience and products that have been referred to as "Bullet Proof", we are a trusted source of the DoD.

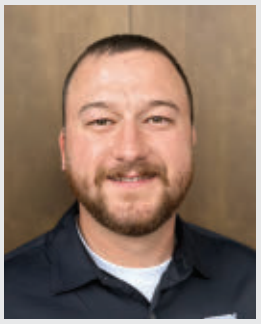


The US DoD has relied on Ohler pumps for over 75 years.

Darley Tactical Evolves

As Jeff Darley likes to say, the one constant in business is change. Over the last two years Darley has realigned the Tactical Division to support global fire, EMS, & military customers with improved business performance leading to increased customer satisfaction. Today, we offer tactical pumpers including: the Max, standard, light, ultralight, fuel and water transfer pumps, pump modules, and bodies. We also offer services such as repair, body installation, and module installation. We've heard positive feedback from end-users and OEM customers including improved quality, ease of order process, and on-time delivery. Our customers continue to motivate our team to meet & exceed expectations. Please contact kyledarley@darley.com for more details.

Darley's tactical team provides unique solutions.

Just Ask Engineering



Garret Yohnk
Sr. Mfg. Engineer
garretyohnk@darley.com

Question:

How is Darley using technology to improve safety in manufacturing operations?

Asked by: John Slawson
VP of Sales & Business, Smyrna Truck & Cargo

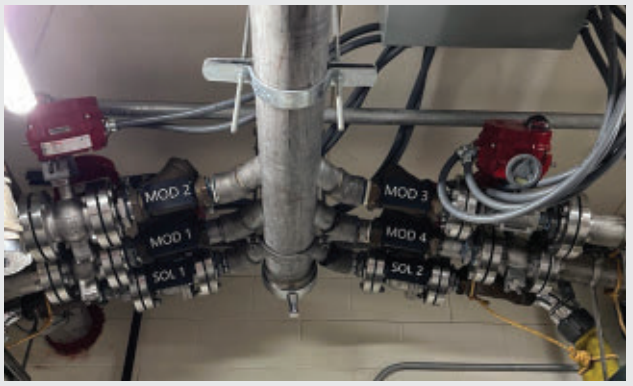
Answer.

Darley has been a trusted and high-quality supplier of fire equipment and apparatus for over a century and manufacturing fire pumps for the last 90 years. Throughout that time, the manufacturing process has changed significantly. Darley is continually adapting its manufacturing operations for improved performance, value, and safety. Most recently, we are working on our pump test operations.

As a manufacturer of life saving equipment, we test 100% of our product before it leaves our facility to ensure the highest quality standard. Each pump is connected to an electric motor and test technicians run those pumps to the NFPA standard for the pump rating. This requires a lot of manual valve adjustment to meet each of the prescribed performance points. With the wide variety of pumps offered in the product line, it leads to valves being in many different locations and most, due to the size of the pump, put the ball valves above the heads of the test technicians. This was an ergonomic and safety concern due to shoulder strain and repetitive motion through valve adjustments.

Mounted on movable carts, the new control screen allows test techinicians to adjust the RPM, ball valve, and suction valves while working on other duties.

To eliminate these potential safety concerns for employees while still ensuring the product quality we are known for, we have installed electronically actuated values to replace the manually adjusted valves. These valves are now controlled through a PLC that displays every piece of information that the test technicians need in order to perform their tests. From the control screen, operators can adjust the motor RPM, ball valve, and suction valves to achieve the various test point requirements while also monitoring the status of each variable that they need to watch for quality. The new control screens are mounted on movable carts which allow the test technicians to move outside of the loud testing environment and monitor their test while they work on other duties like preparing the next pump for testing.



Darley's new electric valves provide enhanced efficiencies and reliability, and eliminate potential safety concerns.

This investment in technology has many benefits for Darley, but the main reason was to improve ergonomics and safety of the workers in the test area. Other gains from this include:

- Enhanced Throughput: Efficient testing processes lead to quicker validation and deployment of the fire pump.
- Reliability: Rigorous testing ensures that the pumps perform optimally during critical situations.

Darley's commitment to innovation and safety underscores the importance of electronic valves in their testing facility. These advancements not only enhance ergonomics but also contribute to overall operational excellence.

Darley Awarded 2nd Contract from FEMA for Tank & Pump Systems

Darley's Ohler Pump division has been awarded a second long term contract from FEMA for tank and pump systems. Having delivered thousands of systems, Darley continues to support disaster survivors' needs for safe, fire protected modular housing.

Ohler's ability to provide customized solutions and implement continuous improvement initiatives has allowed us to traverse the ever changing needs FEMA is faced with. We are proud of our continued support of the disaster survivors FEMA serves.

Fire protection for Mobile Housing Units.

DRS – Enhanced Capabilities & Competitiveness through OEM Partnership

Darley began manufacturing centrifugal pumps for the fire service in 1934. Since then, Darley has developed centrifugal pumps for myriad applications including firefighting, water transfer, fuel transfer, dewatering, mining, water purification, and agriculture. Darley's diverse capabilities have presented many opportunities for OEM partnership. Darley commonly partners with OEMs and contractors to enhance product capabilities and joint competitiveness.

At the heart of the E2FDS is a modified version of our LE600 pump.

Recently, Darley has been working on a fuel transfer program for the US Army's Early Entry Fuel Distribution System (E2FDS.) Darley is a subcontractor on the program to Leonardo DRS. Leonardo DRS encompasses a broad range of skills including, but not limited to: advanced manufacturing, cargo handling, SCADA system development, and tactical communications. While DRS has a wide array of capabilities, it made business sense for DRS to work jointly with Darley on the E2FDS Program. Darley has supported DRS's contract by supplementing their existing capabilities with in-depth centrifugal pump knowledge, understanding of hydraulic profile analytics, & DoD contract experience. In partnership, DRS and Darley have been able to field an economically competitive, state-of-the-art solution. Darley is extremely thankful for the trust DRS and the US Army have placed in Darley. We look forward to future opportunities to partner with OEMs and contractors to provide lifesaving equipment. If you are interested in discussing partnership opportunities, please reach out to us at kyledarley@darley.com.

From the Office of

JAMES LONG

Summer of Cairns

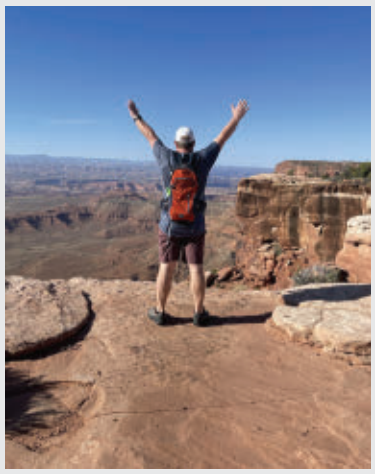
In June I was able to get away for eight days and hike the "Mighty 5" national parks in Utah – Arches, Bryce Canyon, Canyonlands, Capitol Reef and Zion. This wasn't your prototypical vacation of kicking back and putting your feet up. Just the opposite, we covered over 13 miles/day with weather as hot as 104˚ and often strenuous hikes. I was physically still up for the task and felt good about my flexibility and endurance despite blowing out my old hiking boots on the first day.

My vacations are always "working," but with spotty cell phone service even at the lodges, I was forced to "unplug" from emails and phone calls. This was something I hadn't done in a very long time.

If I brought up "Cairns" to anybody in the fire service, the first word out of their mouth would be leather helmets, but during my trip, cairns had another meaning all together. For those walking the dusty trails with nothing but gravel and boulders, cairns are the stacked piles of rocks left by those that came before you. Without these trail markers, I would still be aimlessly walking around southern Utah.

My daily hikes made me slow down and soak in the incredible natural beauty of America, but also look with admiration to those settlers who built the roads and tunnels through mountain ranges over a century ago. These are enduring gifts from a prior generation, where millions today benefit from our ancestors' sacrifices and vision for the future.

We should all strive to be trailblazers. This means appreciating the head start most of us received, making meaningful contributions today, but also leaving your mark for those that come after us.



James Long
President, Defense/Executive VP, Fire
jameslong@darley.com

INSIDE DARLEY

Team Darley Volunteers Support Local Community

Team Darley members from pump and tactical divisions gathered to support our local community by participating in an Adopt-A-Highway clean up. Our team of volunteers gathered at 8 am to clean up trash between County Highways J and S in Chippewa Falls, WI, and enjoyed a pizza lunch and laughs upon return

Team Darley members volunteered their time to clean up a local highway in Chippewa Falls, WI.

Pictured at right: Back row: Ron Miller (Tactical), Andy Nicolai (Tactical), Jon Cote (WJD machine shop), Steve Kuehini (Tactical), Matt Wold (Boos assembly), Aaron Eystad (WJD machine shop), Sean Lein (customer support), Dean Holte (Tactical), Front row: Carmon Bonn (HR), Marilyn Hartung (operations assistant), Becky Pope (logistics coordinator), Josh Vaughn (test room).

Dominican University Honors the Darley Family

In May of 2024, the Darley family and company were honored with the inaugural Pillars Award. This award recognized Darley for our practice of Dominican University's four pillars: faith, study, community and service.

This isn't the first time Darley received an inaugural award from Dominican. The Darley family has been associated with Dominican University for over 75 years. In 1985, Jeanne Morrissy Darley (Class of 1950,) wife of William J. Darley, was honored posthumously with the inaugural Caritas Veritas Symposium honoring her for living a virtuous life.

Bill Darley served on the Board for 16 years, and Paul Darley has served on the Board of Trustees for Dominican University for nine years. Peter, Stephen and Krina Darley all attended school there.

Established in 2011, The William J. Darley and Krina Darley scholarships provide perpetual scholarships that are offered to the sons and daughters of first responders and war fighters.

The Darley company and Darley Family Foundation support over 250 charities each year. To learn more about our CSR initiatives, please visit www.darley.com/corporate-social-responsibility.

Meet the Team: Sean Lein

Customer Support

Sean Lein, a new member and key leader of our Customer Support Team, joined Darley in December of 2023. He has known the Darley name since grade school when he would ride his bike over after school to carry sheets of sheetrock inside the building to help finish what is our Chippewa Falls, WI office.

Sean graduated from Naval Avionics Academy, Naval Air Station in Pensacola, FL, in 2007. He served on Marine Corps Air Stations in Cherry Point, NC, and Yuma, AZ, from 2007-2012 as an avionics technician and detachment leader for VMAT-203's emergency response team. Sean's passion for the firefighting community is rooted deeply in his childhood. He has spent his life surrounded by these amazing people, from his father, Paul, who was a firefighter, to growing up across the street from Mike Hepfler, the retired Fire Chief of Chippewa Falls. This even led to his twin brother, Dan, pursuing a career as a city of Eau Claire, WI, firefighter and paramedic, honorably serving for the past 10 years. Serving the firefighting, first responders, and defense communities is engrained into who he is, and it is an honor to do so daily here at Darley. Former President Ronald Reagan stated that "Some people spend an entire lifetime wondering if they made a difference in the world. But, the Marines don't have that problem." This rings true for him as a Marine and the same rings true for everyone at Darley. They are fortunate to serve those who serve.

His wife, Jessica, and he are both from Chippewa Falls, WI, and they have two children: their son Kasen, who is 13, and their daughter Blake Audrey, who is 5.

Darley Pump Academy

Our tuition-free Pump Academy provides comprehensive knowledge ranging from pump theory to hands-on maintenance and repair of Darley pumps and accessories. To keep up with ongoing advancements, we advise OEM service centers to participate at least once every five years. To register, email pumptraining@darley.com.

Darley Pump Academy Dates

Oct 8 - 10, 2024 | May 6 - 8, 2025 | Oct 7 - 9, 2025

Recent Pump Academy graduates.

1937 Darley Pumper

The Citizen Fire Co. in Gordon, PA, purchased the 1937 Darley Champion Chevy pumper from in Ashland, PA. The pumper is equipped with a Darley 500 GPM type M pump, number 768, with a 150 gal. tank. The truck was sold in December, 2023, to the past chief's grandson, and is stored in the Schuylkill County fire museum. After 87 years, the pumper still runs and moves water with only a minor leak.

The 1937 Darley Champion Chevy Pumper.

Next Gen Darley

Mary Long

Hi! My name is Mary Long. I am a school-based Speech-Language Pathologist serving the children of Western Springs, Illinois. I am the great-granddaughter of W.S. Darley and the granddaughter of Patricia Darley Long. Growing up, my parents, Michael and Tina, taught my siblings and me the importance of family and the significance Darley holds. To this day, I take great pride in being a member of this family and part of a company that serves our heroes and tactical communities. As an educator and fourth generation family member, I hope to help carry on these family values for generations to come.

There are currently 31 fourth and 19 fifth-generation Darley family members who are descendants of William S. Darley.

Darley Demander Spotlight

Scottsdale, Arizona, Fire Department

The Scottsdale, AZ Fire Department (SFD) has a rich history of service to a growing Scottsdale and now offers comprehensive fire, hazardous incident response and emergency medical services in a diverse service area. SFD response area encompasses 184 square miles.

The Pierce PUC is used as both an engine and paramedic unit.

The SFD has about 300 firefighters and paramedics who respond to more than 30,000 calls for service each year from 15 fire stations. Their entire fleet of engines are Pierce PUC trucks. Their brush trucks have Darley pumps as well.

According to Asst. Chief Eric Valliere who oversees the fleet, "Our Darley pumps have served us well over the years. The support from the Darley team is amazing. While we haven't had any pump problems, we know who to call if we ever do."

The entire fleet of front line engines are Pierce PUCs.

Boat Builders Worldwide Demand Darley

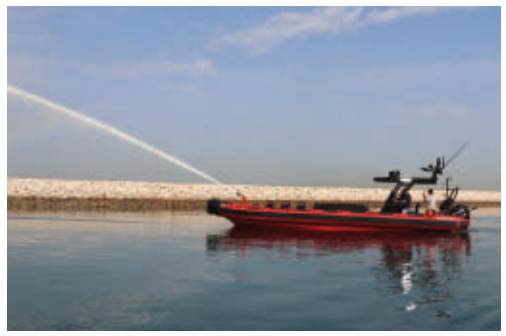
Zycraft USV Pte Ltd, a Singapore company, is now building a 12m Unmanned Fire Fighting Vessel that will be launched in Oct 2024. The company chose the Darley ZSD3000 fire pump driven by a Cummins QSB6.7 550 HP diesel engine and connected to twin Elkhart EXM2 Scorpion monitors each capable of delivering 2500 LPM. With this configuration, the USV FiFi is expected to achieve high water volume at over 80m range.

The Zycraft remote controlled unmanned fire fighting vessel.

James Soon, Zycraft General Manager expressed that Darley was extremely helpful in providing technical solutions during the pump selection process that defined the design needed to ensure a high performing fireboat. He commented, "Darley provided us with a total systems approach to achieve a compact and powerful fire fighting system and it was really a pleasure working with their design team."

Asis Boats, headquartered in Dubai and Maryland (Ocean Craft Marine,) offers a product line-up that includes search and rescue (SAR) boats. They build RHIBS with aluminum and fiberglass hulls and have recently installed a Darley LSDE 1000 GPM pump with a 4.3L V6 VVT DI (LV3) gasoline marine engine.

The Darley pump with foam proportioning system, essential for rapid and effective fire suppression, provides unparalleled efficiency in intense marine fire situations.



ASIS boats with the LSDE Darley pump provides quick and effiicient response.

Two new firefighting vessels for New South Wales are equipped with two Darley PSP 2000 pumps, flowing over 5000 GPM.

David Haines, Sales Manager America Region stated, "We value the support and partnership we received from Darley on these projects."

The Port Authority of New South Wales recently took delivery of two new firefighting vessels built by Birdon. They are equipped with two Darley PSP 2000 GPM (7600 LPM) PTO driven pumps, flowing over 5000 GPM, sold by Darley's Australian Partner, Global Fire Solutions.

Designed with speed, enhanced maneuverability and better accessibility to shallow regions in mind, these vessels are built for enhanced firefighting operations and incident responses. Watch the video at www.darley.com/media/darley-pumps-protect-sydney-harbour

Darley Partners with Microsoft and Ford to Offer Smart Vehicles

Darley and Microsoft have partnered to create integrated public safety vehicles to keep first responders connected and operational during critical incidents. By combining Darley's system integration manufacturing expertise with Microsoft's cloud and software capabilities, we are delivering resilient, connected vehicles that meet the demands of modern public safety.

The connected vehicles ensure reliable communications and operational capabilties in challenging environments.

These vehicles provide unified command and control, ensuring reliable communications and operational capabilities even in challenging environments. With seamless LTE and satellite connectivity, first responders can maintain focus on their mission without worrying about technical disruptions. Enhanced situational awareness tools, including video analytics, AI, and drone integration, offer real-time data and insights, improving decision-making and operational efficiency.

The vehicles are adaptable for urban and rural operations, offering scalable solutions prioritizing mobility and rapid deployment. Their modular design allows easy customization, including communication systems, lighting, and additional features tailored to specific needs. This partnership brings advanced, mission-focused technology to public safety, ensuring first responders have the tools to stay connected, informed, and effective in any situation.

Paul Darley, Kevin Sofen, Lee Wise and Sai Narain, from Microsoft, at FRI.

Darley Sponsors the Leadership Podcast

Jim Vaselopulos

According to Forbes, over 100 million Americans now listen to at least one podcast every week, accounting for 34% of Americans aged 12+. This is an increase from 31% In 2023 and 26% in 2022.

Darley jumped on this trend early and became the exclusive sponsor of The Leadership Podcast in 2016. Hosted by Jan Rutherford, a US Army Special Forces soldier and Jim Vaselopulos, CEO and executive coach.

They have recorded over 400 of the weekly episodes featuring military and business leaders from around the world. Episode #101 featured Four-Star General Stanley McChrystal. General Martin Dempsey, 18th Chairman of the Joint Chiefs of Staff is interviewed in episode #202. Audrey Darley is interviewed in episode #349, while Paul Darley is #237.

Darley has been so impressed with Jim and Jan, that Jim now leads management training at Darley University, our formal management training program at Darley.

Darley University

Darley University is relaunching as a comprehensive education program to develop future leaders, encourage learning, connect employees, and expand skill sets. It focuses on core values, commonly referred to as "The Darley Way," to align employees with the company's mission and values.

The program covers various topics, including generational differences, AI, cybersecurity, and handling difficult conversations, promoting teamwork and collaboration across the organization. By broadening perspectives and equipping employees with essential skills, Darley University aims to empower them to reach their full potential and contribute to the company's success.

Connect With Darley Worldwide at Over 100 Trade Shows Annually

Sept 22 - 25	Fire Rescue Canada	Montreal, Quebec
Sept 29 - Oct 4	Fire Truck Training Conference	Lansing, MI
Oct 1 - 3	GSOF European Symposium	Bratislava, Slovak Rep.
Oct 8 - 10	Darley Pump Academy	Chippewa Falls, WI
Oct 14 - 16	AUSA	Washington, DC
Oct 16 - 19	Minnesota Chiefs	Duluth, MN
Oct 21 - 22	ARC WEPTAC	Tucson, AZ
Oct 21 - 25	CO State FC - Fire Leadership Challenge	Keystone, CO
Nov 19 - 21	Modern Warfare Expo	Ft. Liberty, NC
Dec 3 - 7	Hawaii Fire Chiefs	Oahu, HI
Dec 4	Darley Day - Joint Force Entry Innov. Sym.	Ft. Campbell, KY
Dec 4 - 6	IAFC-TSI	Oklahoma City, OK
Dec 4 - 7	ACTE CareerTech Vision	San Antonio, TX
Jan 6 - 10, 2025	Florida Fire Conference	Orange County, FL
Jan 14 - 16	Intersec	Dubai, UAE
Apr 7 - 9	Sea Air Space	National Harbor, MD
Apr 7 - 12	FDIC	Indianapolis, IN
Apr 29 - May 1	Modern Day Marine	Washington, DC
May 5 - 9	SOF Week	Tampa, FL
May 13 - 15	LANPAC	Honolulu, HI

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LET'S GET STARTED

Drone Special Ops Units Popping Up in Fire Departments Around the Country

BY ALAN M. PETRILLO

Unmanned aerial vehicles (UAVs) are playing a more central part in fire suppression, reconnaissance, search and rescue, and other functions for fire departments, with some agencies setting up special operations units to handle aerial responsibilities. And with drone manufacturers continually improving their aircraft and the equipment they carry, departments are upgrading to more efficient, persistent, and technologically able unmanned aerial systems.

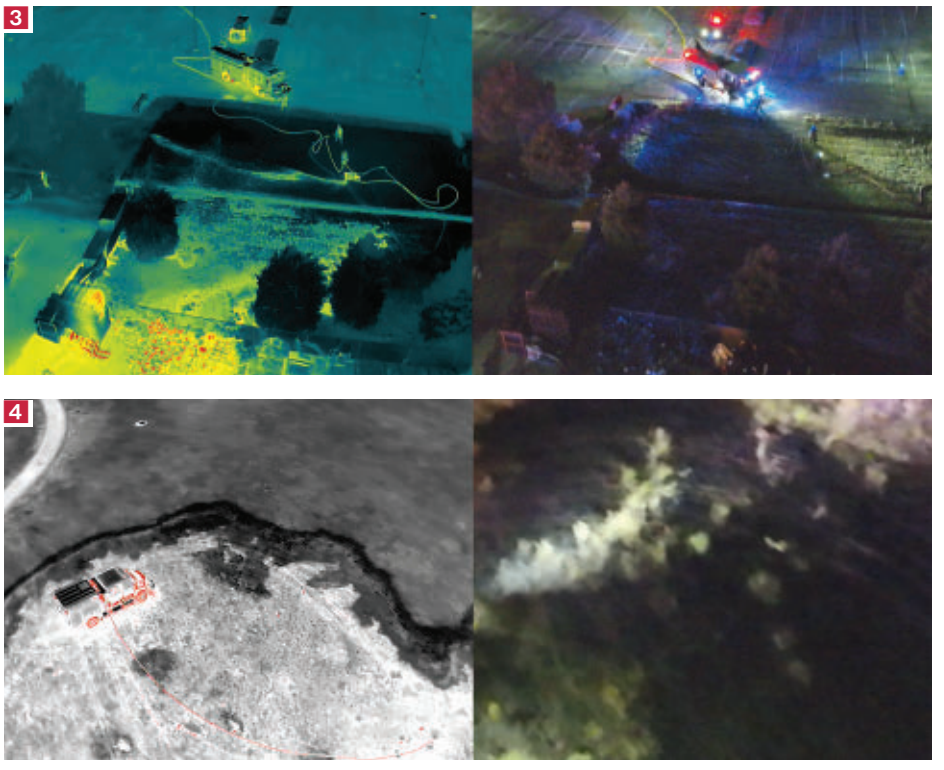
Michael Leo, captain of the Robotics Drone Unit at the Fire Department of New York (FDNY), says the department's dedicated drone unit operates Command Tactical Unit 1 (CCU-1), a GMC quad cab pickup truck staffed 24/7 by an officer, pilot/operator, and visual observer running out of Roosevelt Island. "We carry several different DJI drones and a Fotokite tethered drone that's permanently mounted on top of CCU-1 for when we need persistent aerial operations," Leo says.

CCU-1 carries a DJI M300 UAV with payloads that include a visual light camera with pan/tilt/zoom (PTZ) capabilities, a thermal camera, a spotlight, and a speaker, Leo points out. It also carries a DJI M30T UAV with a visual light camera with zoom and wide-angle capabilities, a thermal camera, and a laser rangefinder to measure distance and identify GPS coordinates, he says. It also includes a DJI Mavic 3E, which is used mostly for mapping, and a DJI Avata, a small drone with a visual camera and spotlight that the FDNY uses for indoor aerial operations.

The FDNY also runs Car 11X, Leo's command vehicle from which he manages airspace and deconflicts with other drone and helicopter agencies, and Command Tactical Unit 3, three utility terrain vehicles that each carry a DJI drone.

"Each mission is different," Leo observes. "If we're looking for someone missing in the water, we usually use the M300 because of its large spotlight and night vision sensors. For structure fires, we'll fly the M30 and use its thermal sensors to track firefighters on a roof, track which way the fire is moving, identify hot spots for the crews, and identify firefighter escape routes. For night operations, we'll use the M300 with its large spotlight that can light up an entire rooftop, use its infrared camera to check all four sides of a building, scan the scene, and give the incident commander a 360-degree picture of the situation."

1 The FDNY uses its drones on structure fires to locate hot spots as well as identify which way a fire is moving. *(Photos 1-2 courtesy of the Fire Department of New York.)* 2 A DJI M30T drone sits ready for launch at the rear of FDNY's CCU-1.



3 The thermal display, left, and digital visual display from a DJI M30 drone of a South Metro (CO) Fire Department crew working a structure fire. *(Photos 3-4 courtesy of South Metro Fire Department.)* 4 A South Metro Fire incident commander got this thermal view of a Type 3 engine crew attacking a wildland fire and a digital view of the progress of the fire.

Leo notes that for a parking garage collapse in 2023, the FDNY used several different drones, including a ground robot. And, while on a recent crane fire, his drone team was able to fly a M30 to a position where it gave the incident commander (IC) views of the fire from above, below, and alongside. "The drone can fly between buildings where a helicopter can't go, and our drone allowed firefighters to see how far and where their water stream was hitting on the crane," he adds.

Chris Carnahan, emergency communications manager for South Metro (CO) Fire Rescue, says South Metro recently did an inventory of what its drone program has been doing, the types of calls it's been on, and which responses it should be included in. "The program is now built into our response plan where the drones are beneficial for certain types of incidents," Carnahan points out. "Flying drones on wildland and brush fires is our bread and butter, giving us an eye in the sky with a view of fire behavior, which is also helpful in searching for hot spots."

Carnahan adds that with three reservoirs in the South Metro district, the drones have been very helpful on water rescue calls. "We get a lot of human traffic on two of the reservoirs with paddle boarders and other water sports," he says. "We use the drones to get to a last known location and then perform a super quick wide area search to locate the missing person. Recently, we used a drone to do a swift water rescue of a tuber in a river, where the drone pinpointed him for the rescue team."

South Metro runs a Ford F-150 that carries a DJI M30 as its on-call unit, backed up by a Chevy Tahoe carrying a M30, another Tahoe with a Mavic 3, and a major response vehicle of a RAM 5500, carrying a M300 and M30.

J.J. Halsey, special operations captain for the Colorado Springs (CO) Fire Department, says the impetus for his department's special operations unit was to aid in wildland fires and search and rescue situations. "The program has evolved since it went into operation, and now we operate on almost every structure fire to give an aerial dimension for the incident commander," Halsey points out. "In some wildland situations where the ICs are in an area occluded by smoke, terrain, or topography, the drone's aerial view allows them to strategically deploy resources. The unit has been a real game changer for us."

Halsey says a special operations unit works every shift with a captain and two lieutenants handling the drones. "We have a Chevy Suburban with a slide-out in the back that holds a DJI Matrice 30T, which has a thermal camera, a digital zoom camera, a laser rangefinder to get coordinates for rescue, a strong spotlight,

5 Colorado Springs (CO) Fire Department Captain J.J. Halsey prepares a drone for flight. 6 Digital video and thermal images of a structure fire as relayed by a Colorado Springs Fire drone. *[Photos 5-6 courtesy of Colorado Springs (CO) Fire Department.]*

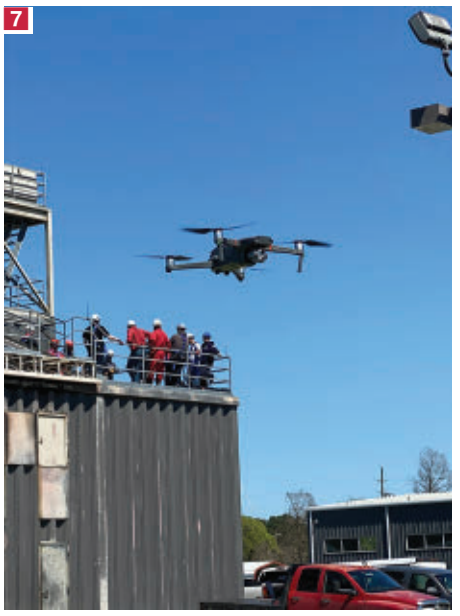
and a loudspeaker for one-way communication; a Mavic 3 Enterprise; and a Matrice 300, where we have the ability to change out different cameras and a spotlight," he notes. "We are looking to purchase another 30T with a grab system that can carry a personal flotation device, a tourniquet, a radio, or Narcan."

Matt Sloane, chief executive officer of Skyfire Consulting, says drone programs have matured in the fire, rescue, and emergency management community. "Drones are a force multiplier for emergency responders," Sloane observes. "It takes one person to operate the drone but serves the purpose of three or four people."

Sloane adds that where drones are used—the types of calls—is expanding, from structure fires to give a three-dimensional survey to search and rescue and hazmat responses. "Drones are being used in confined spaces, like in the Surfside building collapse in Miami and the parking garage collapse in New York City," he says. "They also are being used in tandem with dog teams for search and rescue and in accident scene reconstruction to get a road opened up more quickly."

Bruce Ireland, director of OEM sales for Darley, says most of Darley's drone customers are purchasing models made by DJI and Autel. "They are buying the DJI 3T and M30T models, which are flight-ready in a case and have thermal and digital zoom cameras," Ireland says, "and also the Autel 640T with thermal and digital zoom cameras and the Max4T, where you can swap out the thermal camera payload to a night vision payload."

Sean Phetchanpheng, Darley's robotics sales engineer, says new players are popping up in the U.S. emergency response drone market. "Parrot is the biggest U.S. maker of drones. Its units have a smaller form factor than others and are easy to deploy," he says. "Also, Hoverfly makes a tethered drone, and Wingtra is a vertical takeoff and landing (VTOL) system that can be used for search and rescue, accident reconstruction, and hazardous materials situations."



7 Darley personnel fly a DJI M300 during a training session. *(Photo 7 courtesy of Darley.)* 8 Parrot makes the ANAFI USA drone that weighs less than 2 pounds and is hand-launchable. *(Photo 8 courtesy of Parrot.)*

Wayne Baker, director of stakeholder engagement for DJI, says his company has a new camera system for its Matrice 350 drone. "It's great for fires and search and rescue with a thermal imaging camera that has 1,280×1,024 resolution compared with typical 640-pixel-resolution thermal cameras," Baker points out. "It provides high-detail imagery and has the ability to look at a thermal image at 1,600°C, which is more than 2,000°F. It has full color and black-and-white night vision capability, infrared laser marking and laser range finding with GPS coordinates, and a built-in spotlight."

Peter Wambolt, Parrot's program coordinator, says his company's ANAFI USA drone is the one most used by emergency responders. "The drone has a RGB 31× zoom camera and a thermal imaging camera, five-axes hybrid stabilization, a service ceiling of 6,000 m, and deploys in less than a minute through hand launching," Wambolt says. "This drone was designed on a U.S. Army contract for search and rescue, so it's backpack portable, weighs under two pounds, and has 32 minutes of flight time."

ALAN M. PETRILLO is a Tucson, Arizona-based journalist, the author of three novels and five nonfiction books, and a member of the *Fire Apparatus & Emergency Equipment* Editorial Advisory Board. He served 22 years with the Verdoy (NY) Fire Department, including in the position of chief.

Advances in Emergency Vehicle Lighting Technology

BY ALAN M. PETRILLO

LED lighting has taken the fire service by storm, virtually replacing every other form of lighting on fire apparatus. LED technology continues to offer features such as programmable flashing, colors, patterns and intensities; combination spot and flood light abilities; and several other technological advances that can be deployed depending on situational needs.

Jon Sestrom, product manager for Whelen Engineering Co., says the company's CenCom Core® control systems enhance first responder safety by offering advanced automation, remote connectivity, and true system synchronization through WeCanX, a CAN-based communication system. "The Core system allows us to control what the products that have LEDs can do," Sestrom points out, "by creating scenarios for the LEDs to communicate to the public."

He notes that the Core system features Situation-Based Integration and Events. With Situation-Based Integration, scene-specific functions can be created and automated by using various vehicle components and signals, like automatically turning off a siren when a vehicle arrives on scene. With Events, multiple user-defined rules can be created for specific situations depending on the state of your vehicle, like automatically switching to Dynamic Variable Intensity™ (DVI) light patterns when the vehicle is in Park.

Sestrom says that a calm scene is a safe scene. Using Whelen's V2V Sync, the Core system will automatically synchronize lights and tones on vehicles within any proximity to aid approaching motorists, and when on scene it will synchronize emergency lighting on all the vehicles that have responded.

"Illumination is another big issue with LEDs," Sestrom says. "Our photometric design team has designed optics and reflectors that take the light output from LEDs, collect it, reorganize it, and direct it, focusing the light where it's needed whether it be near field, far field, or a combination of the two." He adds that the Core system can ramp up how LED lights turn on, turning them up slowly so there's no shock to the eyes. That technology is used in Whelen's M series and 100 series scene lights, says Sestrom.

Jason Witmier, director of education and technology for Safe Fleet, says its FRC division introduced a new generation of its Focus line. The Radiant Max and Radiant Lux bend light through the fixture's lens toward the ground directly in front of an apparatus and then gradually drop down to as far as 100 feet away. "It's not about putting out the brightest light; it's about getting the light into the area that's most effective," Witmier says. "It's all about what you want to achieve with the number of lumens you're using. You have to think of the application of the light, whether it's to light up the ground around the rig or the distance down a street."

Lou Zara, FRC product manager, says that FRC's Signature series includes the Radiant Lux, a CAN-Bus-controlled LED that can be controlled by FRC's OmniPlex multiplex system. Using OmniPlex, the operator can turn on spotlights individually, floodlights individually, or both simultaneously; control their intensity by dimming or making them brighter; and flash the lights in different patterns, Zara says. "We have amber integrated into our LEDs that gives us a warm function—a combination of white and amber LEDs that can be changed from low to medium to high intensity," he adds.

Sam Massa, president of HiViz LED Lighting, says customers have asked his company how to reduce the lighting chaos on fire scenes, inquiring about syncing, modes, brightness, and flashing patterns. "Today we're seeing a transition back to central controllers," Massa points out. "So, we designed a smart system that uses distributed electrical architecture and the existing J1939 CAM electrical system on the apparatus to carry light data. We chose to give the configuration control back to the end user and created five color parts that have a single part number per size. This reduces complexity, speeds up install time, and allows apparatus makers to standardize on hardware while giving the customer infinite configurability in software after the sale."

HiViz Connect™ is a communication protocol that enables smart features in HiViz's new HVC warning lights, such as advanced flash pattern programming, multivehicle synchronization, active load management that dims lights if the electrical system capacity is exceeded, automatic systemwide night mode, and integrated digital alerting that transmits data into the HAAS Alert Safety Cloud®.

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1 Whelen makes the CenCom Core control system that offers advanced automation, remote connectivity, and system synchronization through WeCanX. *(Photos 1-2 courtesy of Whelen Engineering Co.)* 2 The Core system can ramp up how Whelen's M series and 100 series scene lights turn on, ramping slowly so there's no shock to the eyes. 3 Safe Fleet's FRC division makes the Radiant Max LED light that bends light through the fixture's lens to put the light into the most effective area. *(Photos 3-4 courtesy of Safe Fleet.)* 4 The FRC Radiant Lux Surface LED light, like its Radiant Max brother in the Focus series, is CAN-bus-controlled and can be controlled by the FRC OmniPlex multiplex system. 5 HiViz makes the FireTech OMEN warning lightbar that can be controlled by HiViz Connect, a communication protocol that enables smart features in the company's warning lighting. *(Photos 5-6 courtesy of HiViz.)* 6 The OMEN warning lightbar uses two optical sensors to calculate daylight and nighttime light modes.

7 The mpower family of LED lights are one-piece units molded with a silicone housing, optic, and weather seal. *(Photos 7-8 courtesy of SoundOff Signal.)* **8** SoundOff Signal's bluePRINT Control System can synchronize lighting on all emergency vehicles at a scene, slow down the pattern of lights, and adjust the intensity of the lights. It can be run off a multiplex screen or programmed into point-to-point contacts. **9** TecNiq Inc. makes the K series of LED emergency lighting that uses AutoSynch technology to allow flasher synchronization without a separate control box. *(Photo 9 courtesy of TecNiq Inc.)*

Massa says HiViz also makes the FireTech OMEN™ warning light bar that's designed with a modern exoskeleton and multicolor modules to reduce complexity and eliminate the need for a department to configure the light. OMEN uses two optical sensors to calculate daylight and nighttime light modes and is global to all fixtures connected to the system so all are set automatically.

Gabe Casucci, national manager of fire and EMS for Sound Off Signal, says his company's patented line of silicone lights is a big advance in lighting technology. The mpower™ family LED lights are one-piece units molded with a silicone housing, optic, and weather seal to provide extreme durability, a compact design, and improved reliability by reducing the number of separate parts, Casucci says. "Additionally, mpower products are equipped with up to tricolor capability," he continues. "Their higher heat point makes them great for use in high-temperature and high-humidity areas, and they are highly resistant to ultraviolet (UV) light and most hard chemicals, actually becoming clearer when exposed to sunlight."

Casucci says the mpower lights can be controlled through Sound Off Signal's bluePRINT® Control System, which can be run off a multiplex screen or programmed into point-to-point contacts. The system can synchronize lighting on all emergency vehicles at a scene, slow down the pattern of lights to bring firefighter adrenaline down, and adjust the intensity of the lights.

Charlie Gerds, national sales manager for TecNiq Inc., notes his company makes the K series of LED emergency lighting. "The series has great heat dissipation and are very thin lights that fit flush against the side of an apparatus," Gerds points out. "Using our AutoSynch technology, all the flashers are synchronized without requiring a separate control box." The lights have a durable impact-resistant lens and offer excellent UV resistance. K series lights are made in 5- by 3.3-, 5- by 2-, 6- by 4-, 7- by 3-, and 9- by 7-inch sizes.

ALAN M. PETRILLO is a Tucson, Arizona-based journalist, the author of three novels and five nonfiction books, and a member of the *Fire Apparatus & Emergency Equipment* Editorial Advisory Board. He served 22 years with the Verdoy (NY) Fire Department, including in the position of chief.

CONTROLLING THE SCENE CHRISTIAN BREWER

Enhancing First Responder Safety and Efficiency with Cloud-Based Technology

As the demands on emergency responders continue to grow, so does the urgency to improve their safety and efficiency. Implementing cloud-based technology is not just a modern convenience; it is a critical advancement that can save lives.

This technology is transforming how emergency response teams operate, offering real-time solutions to age-old challenges. The need for such innovation has never been more pressing.

THE URGENCY OF THE SITUATION

Distracted driving has become a significant threat to first responders. According to a recent study by Autoinsurance.com, since 2020, nearly 500 first responders have been killed on the nation's roadways by distracted drivers. Despite all 50 states having "move over" laws, compliance is inconsistent, with many drivers unaware or indifferent to the presence of emergency vehicles. The National Fire Protection Association (NFPA) reported that in 2017, more than 15,000 fire department vehicles were involved in collisions nationwide, leading to 18 fatalities. These incidents also resulted in 1,080 injuries, highlighting the critical need for improved safety measures.

The statistics reveal a troubling trend: According to the United States Fire Administration (USFA), up to 25% of annual line-of-duty firefighter fatalities are attributable to motor vehicles. This figure underscores the daily dangers that responders face not just from the emergencies they are called to handle but from the very act of getting to the scene. Moreover, the National Highway Traffic Safety Administration (NHTSA) found that in 2019, approximately 2,500 vehicles crashed into fire trucks parked as blockers, translating to nearly seven such incidents per day.

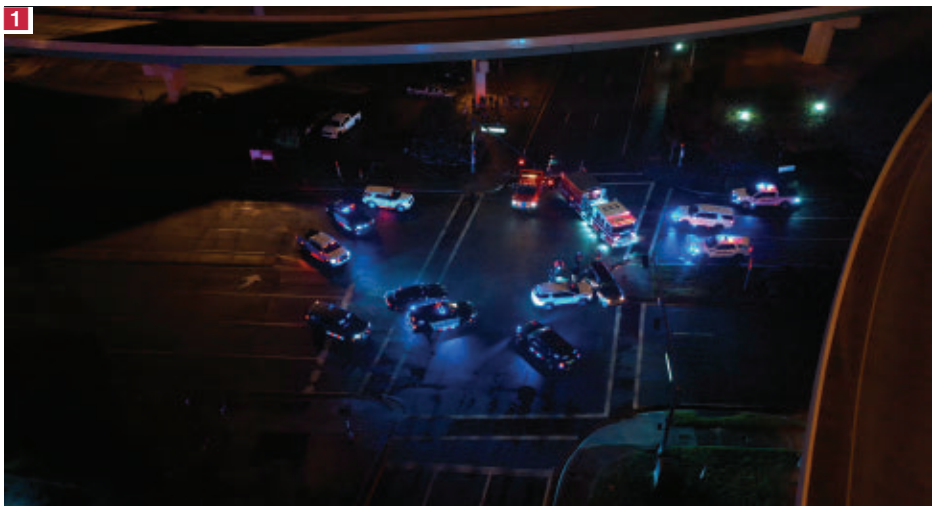
These figures are not just numbers; they represent the lives of first responders—men and women dedicated to protecting their communities. The rising number of distracted drivers, combined with the inherent risks of emergency response, creates a perilous environment for these professionals. Implementing advanced technologies is, therefore, not just beneficial but essential in addressing these critical safety concerns.

THE ROLE OF CLOUD-BASED TECHNOLOGY

Cloud-based platforms are revolutionizing emergency response by providing essential tools that enhance situational awareness and safety. One such innovation is Traffic Preemption technology, which grants emergency vehicles priority at intersections and empowers them to request a green light as they approach. This speeds up response times and significantly reduces the risk of accidents.

Chris Watkins, field solution engineer manager at Whelen Engineering, specializes in working nationwide with fire, emergency medical services (EMS), and law enforcement agencies to implement the Whelen Cloud Platform® (WCP®), which provides Traffic Preemption capabilities. "Traffic Preemption can be a game-changer for emergency responders," says Watkins. "It provides a safer passage through intersections, reducing the stress and uncertainty that responders face when approaching these high-risk areas." WCP uses a network of solution providers including Miovision, Applied Information, LYT, ThruGreen, and Econolite to offer traffic preemption and other enhanced safety features.

Integrating cloud-based systems also allows for seamless communication and data sharing between various emergency response units. For example, systems like the WCP enable different agencies in active response mode—fire, EMS, and law enforcement—to share real-time information through Responder-To-Responder alerts that can flash lights on a control panel or trigger a digital voice message as they approach a scene. Advanced warnings such as these increase situational awareness as emergency units converge on the same location at high speeds and has been shown to reduce the risk of collision by up to 90%. This is crucial during multiagency responses, where coordinated efforts can significantly impact the outcome of an emergency.



1 Responder-To-Responder alerts allow agencies to communicate as they approach a scene, reducing the likelihood of collisions. *(Photos courtesy of Whelen Engineering.)*

2 Digital alerts notify motorists of approaching emergency vehicles via their GPS or infotainment system.

Another invaluable feature of cloud-based technology provided by Whelen and other industry leaders is Geofence Controlled Technology, which adjusts vehicle settings based on location. For example, as a vehicle approaches an intersection or enters a high-risk zone, the system can automatically enhance lighting and siren patterns, alerting nearby drivers more effectively and allowing apparatus operators to keep their hands on the wheel. "Geofence Controlled Technology is an exciting innovation that significantly enhances the safety of both first responders and the community," says Watkins. "It allows our first responders to focus less on navigating complex controls and more on reaching the scene quickly and safely, especially during responding events." This system can also streamline vehicle maintenance, allowing fleet managers to monitor engine diagnostics and schedule repairs proactively. The ability to remotely update vehicle software and settings through the cloud reduces downtime and ensures that all units operate with the latest safety protocols.

BEYOND TECHNOLOGY: THE IMPACT ON COMMUNITY SAFETY

Implementing these technologies extends beyond the safety of the responders themselves; it also impacts the broader community. By improving response times and reducing the likelihood of accidents en route to emergencies, cloud-based systems ensure that first responders can arrive more quickly and safely at the scene. This efficiency can be lifesaving, especially in critical situations like fires or medical emergencies.

Digital alerts sent to the public can inform drivers of approaching emergency vehicles or active incidents ahead, giving them ample time to yield or reroute safely. This not only protects emergency responders but also enhances the safety of all road users. For instance, the WCP's digital alerting feature using HAAS Alert's Safety Cloud® service can send notifications to drivers' GPS and vehicle infotainment systems, informing them of an emergency vehicle's presence. This proactive communication can prevent dangerous situations where a distracted driver might not notice flashing lights or hear sirens in time.

Furthermore, these technologies have implications for community relations and public trust. When the public sees tangible improvements in emergency response efficiency and safety, it fosters greater confidence in their local emergency services. This, in turn, can lead to increased cooperation during emergencies and better adherence to safety protocols like moving over for stopped emergency vehicles.

Cloud-based systems also provide invaluable data for post-incident analysis. By recording and analyzing data from each response, agencies can identify patterns and areas for improvement. This data-driven approach allows for continuous refinement of emergency response strategies, ensuring that they evolve in line with emerging challenges and technological advancements.

Integrating cloud-based technology into emergency response protocols represents a significant leap forward in protecting first responders and the communities they serve. As distracted driving continues to pose a growing threat, adopting these advanced systems becomes not just a technological upgrade but a necessary evolution in public safety.

Watkins summarizes the essence of this innovation: "Utilizing the latest technology in conjunction with a high-quality lighting and warning system is the best way to increase safety and efficiency. Cloud platforms like the WCP, which are specifically designed to protect those who protect others, offer tailored features that meet the unique needs of our first responders and provide solutions to the daily challenges they face in service of their communities."

The future of emergency response is here, and it's in the cloud—enhancing safety and efficiency and ultimately saving lives. As industry leaders prioritize continually developing and implementing these technologies, they honor the dedication of first responders who risk their lives daily, ensuring they have the best possible tools to do their jobs safely and effectively.

CHRISTIAN BREWER is a field solution engineer for Whelen Engineering.

Future of Firefighting: Autonomous Quadruped Robots Step Up in Emergencies

BY NI TAO

In recent years, as the application of robotics has evolved in fire prevention and rescue, robot dogs are increasingly stepping into the spotlight. Once the domain of university researchers and tech enthusiasts, these agile four-legged machines—officially known as quadrupedal robots—are now proving their worth in fire rescue and emergency scenarios.

Designed for robust maneuverability, robot dogs can traverse uneven and unstructured terrain with ease, allowing them to navigate earthquake-stricken areas, high-altitude regions, and fire-damaged zones effectively.

Leading the way is Boston Dynamics's Spot, an industrial-grade, large-sized quadruped, which has been adopted by various fire and rescue departments for tasks such as fire reconnaissance and emergency operations. In 2022, the Fire Department of New York purchased two Spot robots to use in search and rescue operations in hazardous situations.

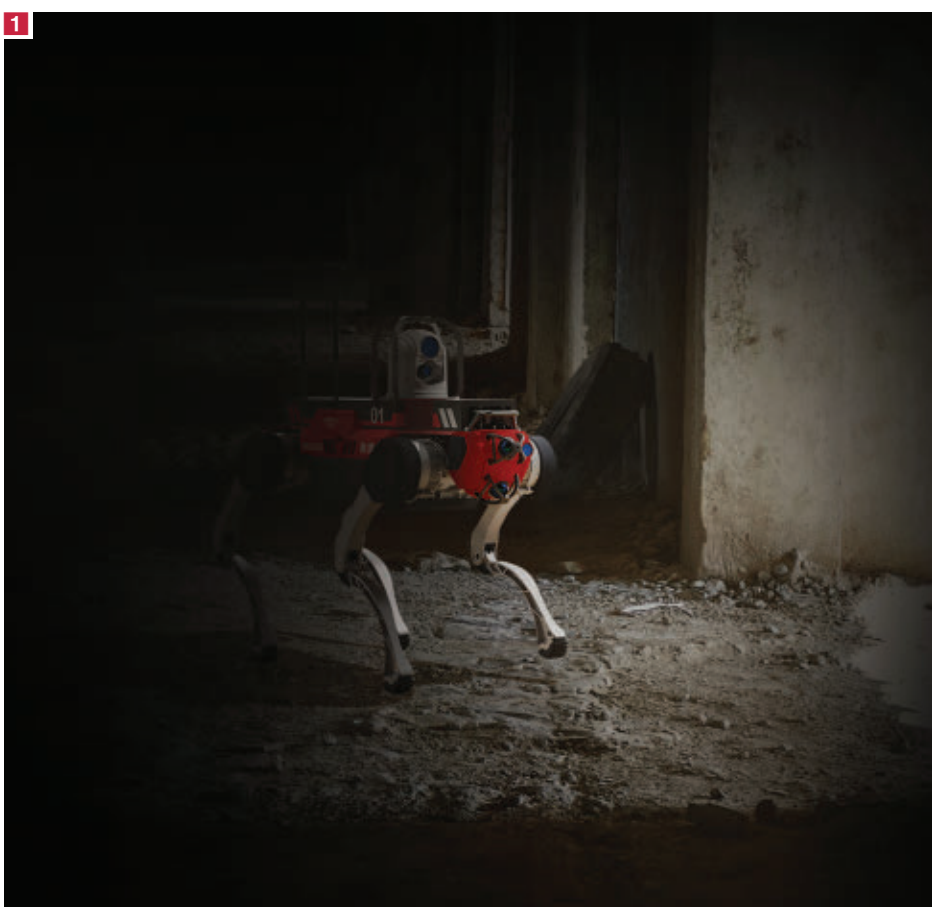
Thanks to their structure, robotic dogs often boast superior mobility, capable of jumping over gaps, jogging across rugged terrain, and climbing over piles of rubble. Equipped with numerous sensors and cameras, they relay real-time video footage from fire scenes, aiding decision making in fire extinguishing efforts. Reconnaissance at fire scenes, particularly risk analysis, is often the first step in firefighting and rescue operations.

Fire scenes are frequently filled with toxic gases. Robot dogs equipped with gas sensors can measure the concentration of toxic gases in the air in real time, transmitting data to command centers for early fire assessment and containment of toxic gas leaks. Moreover, firefighters can operate these robots from a safe distance, collecting and analyzing critical data and information.

In addition to detecting toxic gas concentrations, the thermal imaging sensors attached to the backs of robot dogs are designed to collect temperature data from the fire scene, aiding in planning the best evacuation routes.

DEEP Robotics, a robot company headquartered in Eastern China's tech hub Hangzhou, produces industry-grade robot dogs. Company representatives say the firm has seen a growing role over the past few years for these machines in modern firefighting, emergency response, and rescue scenarios.

"Beyond battling fires alongside firefighters, these quadruped robots can carry equipment weighing dozens of kilograms. They are also built to replace firefighters in high-risk areas to perform tasks like detection and search for survivors," says Qian Xiaoyu, brand manager at DEEP Robotics.



1 In recent years, robot dogs have proved to be more practical helpers in fire and emergency response. Their maneuverability in rugged terrain and dim environments helps to relieve the burden and reduce hazards for firefighters. *(Photos courtesy of DEEP Robotics.)*

2 Robot dogs equipped with gas sensors can measure the concentration of toxic gases in the air in real time, transmitting data to command posts for early fire assessment and containment of toxic gas leaks.

The company's large robotic dog, X30, has participated in numerous fire rescue drills in China and beyond. Recently, it has been deployed in Singapore and South Korea, among other countries, to assist local fire departments in rescue operations.

The scope of robot dogs' applications is not just limited to firefighting. In the aftermath of disasters like earthquakes, rescuing survivors trapped inside buildings or buried under rubble can be challenging.

Quakes often trigger power outages, leaving hallways pitch dark. In some cases, thick smoke caused by fires can impair visibility, making it difficult to locate and identify victims accurately.

This is where robot dogs shine. Equipped with a dual-light gimbal projecting beams of natural and infrared light, they can zoom in on video footage for detailed scrutiny and detect vital signs. "With lidar and proprietary fusion perception capabilities, our X30 can navigate pitch darkness or dimly lit environments, autonomously planning the best route to find survivors," Qian explains. He adds that the company's robot dogs could also carry oxygen cylinders.

Despite their growing use, significant challenges remain, such as operating in fire scenes, where temperatures can exceed 500°C. Currently, no robot dog in the world can withstand such extreme heat.

Qian acknowledges this limitation but notes that researchers and tech companies are working hard to develop next-generation robot dogs that can enter post-fire buildings for detection and reconnaissance immediately after a fire has been extinguished. In situations where seconds matter for saving lives, fast deployment and the ability to withstand super-hot temperatures without breaking down in action will become hallmarks of robot dogs of the future, he says.

For example, DEEP Robotics has partnered with Zhejiang University in eastern China on a firefighting robot project. Researchers set their sights on creating a robot that can enter buildings shortly after a fire for detection and reconnaissance. "We will continue to push the boundaries to explore cutting-edge applications of quadruped robots in firefighting and emergency rescue," Qian concludes. "Our ultimate goal is to roll out legged robots to entirely replace firefighters in high-risk scenarios, reducing or even eliminating risks and hazards to them."

NI TAO is a business analyst focusing on intelligent industrial equipment.

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APPARATUS: THE SHOPS MICHAEL HUBER

Choosing a Fire Apparatus Mechanic or Service Center

The cost of fire apparatus represents a substantial challenge for both career and volunteer fire departments. Effectively addressing these challenges necessitates strategic planning, the pursuit of diverse funding sources, and exploring cost-saving measures such as shared purchasing agreements (HGAC, NOVA, Sourcewell) or acquiring used equipment.

Given the increasing costs associated with fire apparatus, it is crucial to prioritize maintaining existing equipment to extend its operational lifespan and ensure continued readiness.

Selecting a fire apparatus dealer as a repair facility or a technician is a crucial decision, as it impacts the quality, reliability, and support of your emergency response equipment. Here are some key factors to consider:

1. **Research and recommendations**: Start by asking for recommendations from friends or colleagues who have experience with apparatus technicians. Check with surrounding departments.
2. **Customer service**: Evaluate a facility's responsiveness to your inquiries and its willingness to provide detailed information. Ascertain through references how it handles post repair support.
3. **Check certifications**: Look for technicians who are certified by reputable organizations, such as the National Institute for Automotive Service Excellence (ASE) or Emergency Vehicle Technician (EVT) Certification Commission. This ensures they have the necessary skills and knowledge.
4. **Experience with your apparatus**: Ensure the technician has experience with the specific make and model of your apparatus. All apparatus have unique systems and parts, so experience with your make of vehicle is important.
5. **Visit the shop**: Visit the repair facility to assess its cleanliness, organization, and equipment. A well-maintained shop often reflects the quality of work.
6. **Geographic location**: Consider the dealer's location relative to your department. A local facility may offer quicker service and support.
7. **Ask questions**: Inquire about the technicians' experience, specialties,

1 Photo by author.

and the types of repairs they handle. Discuss any specific issues your apparatus has, to see how they approach diagnosis and repair.

8. **Check warranties**: Ask about warranties on parts and labor. A good dealer and mechanic should stand by their work and offer some form of warranty.
9. **Communication**: Choose a dealer or technician who communicates clearly and keeps you informed about the status of repairs. Good communication helps build trust and ensures you're aware of what's being done to your apparatus.
10. **Trust your instincts**: If you're uncomfortable or feel pressured, it's okay to seek out another dealership or technician.
11. **Trial run**: If possible, start with a smaller job or maintenance task to test the technicians' service quality before entrusting them with more significant repairs.
12. **Discuss emergency repairs**: Since fire apparatus are critical in emergencies, ask about a shop's/technician's ability to handle urgent repairs and turnaround times for critical issues. Check if the dealer/technician offers 24/7 support or emergency assistance.
13. **Long-term relationship**: Think about the potential for a long-term partnership with the dealer. A good dealer/technician will be a trusted partner in your emergency response efforts.
14. **Network and partnerships**: Dealers with strong industry connections and partnerships can offer better insights, support, and resources.

> All apparatus have unique systems and parts, so experience with your make of vehicle is important.

Regardless of the amount of research you perform, conflicts regarding fire apparatus repairs can arise for several reasons, often stemming from communication issues, contractual misunderstandings, or technical problems. Here's how to identify and potentially address common conflicts:

1. **Clear communication**: Establish and maintain clear, written communication with repair services to ensure all parties understand the scope, cost, and expectations.
2. **Detailed contracts**: Use detailed contracts or service agreements that outline the work to be done, costs, timelines, and warranty terms.
3. **Regular maintenance**: Implement a routine maintenance schedule to catch potential issues early and reduce the need for major repairs.
4. **Regular inspections**: Schedule regular inspections to address minor issues before they become major problems.
5. **Feedback and review**: After repairs, provide feedback and reviews on the service. This helps improve future interactions and provides valuable information to other departments.

By addressing these potential conflict areas proactively and maintaining thorough documentation and communication, you can manage fire apparatus repairs more effectively and minimize disruptions to your department's operations.

Finding a reputable fire apparatus dealer or technician involves a combination of research, checking credentials, and personal judgment. Ensuring that the dealer/technician is experienced with fire apparatus and provides excellent service is key to keeping your apparatus in optimal working condition.

As we all know, effective fire apparatus maintenance is vital for ensuring the safety, reliability, and longevity of this critical equipment. As fire departments face mounting financial pressures and rising costs, a proactive approach to maintenance not only maximizes the value of existing assets but also enhances operational readiness and safety. By investing in routine maintenance, embracing strategic planning, and exploring cost-effective solutions, departments can better navigate the challenges of fire apparatus management and continue to provide essential services to their communities.

MICHAEL HUBER is a fire apparatus driver/operator and fire apparatus fleet manager for the Baltimore County (MD) Fire Department.

APPARATUS IDEAS BOB VACCARO

Increased Storage Needs Lead to New Rig for Maryland Rescue Company

In 1977, recognizing the need to provide emergency medical services (EMS) to the community of Walkersville, Maryland, a group of dedicated community leaders organized an ambulance service that would be independent from the Walkersville Fire Department.

After numerous donations, the ambulance company put several used ambulances in service and began serving the community in a space that was part of the community's town hall.

In 1979, the department outgrew its space, and a new building was constructed with new equipment added each year, adding its first heavy rescue in 2001. The new squad was the company's third squad apparatus. "While the rescue company operates as a separate entity from two different buildings, the fire department also shares numerous members and work together," states Chief Topper Cramer.

"Presently we respond to 1,800 EMS calls with the squad responding to about 150 yearly responses for extrication work and RIT. Our response district covers 20 square miles for a first-due response and covers the City of Frederick, Maryland, which has a population of 20,000," says Cramer. "We are like most response areas in the country, with strip shopping centers, single-family dwellings, four schools, two nursery schools, and apartments." The organization has one paid crew in house 24/7, according to Cramer, mainly for the ambulances but can respond with the squad.

Its old squad was a 2001 Pierce Quantum, and the rescue company was looking for more compartment space and better technology, which a new unit would provide. "Our truck committee started work in 2020 on specs for a new unit," says Cramer. "We went out to bid and were happy that Pierce won the bid since we were familiar with its products and were also happy with the local dealer, Atlantic Emergency Solutions, which was great to deal with."

Funding for the new squad came from EMS billing and members performing fund raising throughout the year, which Cramer says also helps a great deal with the rescue company's operating efforts. "The new squad has mostly all battery-powered tools, hand tools, and extrication tools," Cramer says. "Onboard, we have eight battery-powered AMKUS tools, lazy Susan mounted; a full complement of Paratech rescue struts; a man vs. machine kit; and DeWalt battery-powered hand tools, blowers, and chain saws." The rig also carries several gas-powered K12 saws, forcible entry tools, RIT packs, and a full cascade system with eight

Pierce HDR Velocity Rescue Chassis

- 84-foot cab with 20-inch raised roof
- Seating for five
- 43-foot overall length
- 11-foot 11-inch overall height
- 24,000-pound Oshkosh TAK-4 nondrive front axle
- 44,000-pound Oskosh TAK-4 T3 Rear Steer rear axle
- Cummins X15 605-hp engine
- Allison 6th generation 4500 EVS automatic transmission
- 26-inch extended front bumper
- Waterous CPK-2 250-gpm pump
- 300-gallon polypropylene water tank
- Pierce LED compartment lights
- LED backlit handrails
- HiViz LED lighting
- Akron 8000 series valves
- Warn 16,500-pound fixed front winch
- Harrison 20-kW hydraulic generator
- Two Akron eductors
- Single-agent foam system
- Side roll and frontal impact protection
- Twenty 200-to 500-pound fixed/adjustable slide-out trays

1 The Walkersville (MD) Volunteer Rescue Company's Pierce Velocity walk-around heavy rescue. *(Photos 1-2 by Mike Sanders.)* 2 The rescue truck has twin Roto-Rays, a Federal Q, two electronic siren speakers, twin air horns, and a set of train horns. 3 The new rig's booster line, pump panel, and controls for lighting masts. *(Photos 3-8 courtesy of First Due Apparatus Solutions.)* 4 The rescue truck carries AMKUS extrication tools mounted on lazy Susan mounts and DeWalt battery chargers.

5 The squad's battery-powered blowers and saws. 6 The Walkerville rescue's cribbing compartment. 7 These slide-outs carry the rig's Paratech rescue struts.

6,000-pound-per-square-inch (psi) bottles that can handle refilling numerous self-contained breathing apparatus (SCBA) cylinders at the scene of an emergency. "To also fulfill other obligations that we may encounter, we have a 25-gallon foam tank with two foam eductors, a 250-gallon-per-minute (gpm) pump, and a 300-gallon polypropylene tank with 200 feet of 1¾-inch handline," adds Cramer. "If needed, we could handle a car fire at the scene of an auto accident if called upon by the fire department or handle a hazmat incident."

The organization also added Pierce's All-Steer, enabling the rig to maneuver around the response areas with ease. "The truck is longer than we are used to, and we have numerous tight areas and streets that we need to operate around," says Cramer. "This option gives us more mobility for our drivers."

Walkersville Apparatus

- 2009 Chevy Kodiak PL Custom ambulance
- 2014 medium duty Navistar PL Custom ambulance
- 2019 medium duty Navistar PL Custom ambulance
- ATV 2012 Polaris 6×6
- Special Ops trailer
- 2007 Chevy Suburban chief vehicle
- 2015 Chevy Silverado utility vehicle
- 2024 Pierce Velocity Squad

8 The top of the body features coffin compartments.

A great deal of planning went into the design of the Walkersville Volunteer Rescue Company's new heavy rescue apparatus. The squad was designed with all new current technology, rescue tools, and equipment. While the company had an older large unit, this new squad made great use of tool mounting and increases in compartment space. The rescue company took advantage of the increased use of battery-powered extrication tools, hand tools, saws, and blowers. It also added a cascade system that could aid the fire department in filling SCBA bottles at the scene of a fire or hazmat incident.

Taking advantage of another Pierce option, All-Steer, the company's drivers are able to better maneuver the vehicle around its response district. Proactive thinking gave this rescue company a great all-round apparatus with room for future use.

BOB VACCARO has 50 years of fire service experience. He is a former chief of the Deer Park (NY) Fire Department. Vaccaro has also worked for the Insurance Services Office, the New York Fire Patrol, and several major commercial insurance companies as a senior loss-control consultant. He is a life member of the IAFC.

The Hidden Benefits of a Bolted Apparatus Body

BY BILL BIRD AND SCOTT MASCHING

When it comes to constructing fire apparatus, firefighters and municipalities are presented with myriad options.

Aluminum, stainless steel, plastics, and composite materials each offer their own set of advantages. However, regardless of the material or style chosen, the primary objectives remain the same—durability, efficiency, and the protection of those who operate this essential equipment. One construction style that has often been overlooked is the bolted body.

HIGH DURABILITY

Fire apparatus endure harsh conditions and rigorous use. Therefore, durability is paramount. Bolted apparatus bodies have a level of endurance that is hard to match. Over time, bolted bodies maintain their structural integrity.

Many bolted bodies built by Toyne, for example, still look new after 25 to 30 years of service. This longevity not only ensures the safety of firefighters but also provides a reliable return on investment for municipalities. The premise of a bolted body is to defy the wear and tear of decades of use.

CUSTOMIZATION

Every fire department has unique needs and preferences when it comes to its apparatus. Bolted bodies provide opportunities for customization. The modular nature of a bolted body allows departments to tailor the design to their exact specifications, ensuring that every tool, compartment, and feature is perfectly positioned for optimal efficiency.

This flexibility is particularly beneficial for departments that need to adapt to evolving operational requirements. Whether it's adding new equipment or reconfiguring the layout, bolted bodies can be easily modified to meet changing needs. This level of customization ensures that firefighters have exactly what they need, right where they need it.

WARRANTY AND SERVICE

One of the standout benefits of bolted bodies is the ease of maintenance and repair. If a part of the body is damaged, a bolted panel can be replaced without the need to overhaul the entire structure. This approach allows for the quick manufacture and dispatch of replacement parts, significantly reducing downtime as well as overall cost.

1 An example of a Toyne bolted body. *(Photo courtesy of Toyne.)*

For instance, instead of waiting months for a welded body to be repaired, a bolted body can be serviced in a matter of days or weeks. This rapid turnaround is critical for fire departments that cannot afford to have apparatus out of service for extended periods. The ability to quickly swap out damaged components not only saves time but also ensures continuous operational readiness for communities in need.

In fire apparatus construction, the bolted body stands out as a leading choice. Its high durability, extensive customization options, and ease of maintenance make it a suitable solution for fire departments looking to enhance their operational capabilities and ensure the safety of their personnel.

BILL BIRD, product support coordinator for Toyne, has been with the company for 20 years.

SCOTT MASCHING, sales/marketing coordinator for Toyne, has been with the company for nine years.

KEEPING IT SAFE ROBERT TUTTEROW

Review of Firefighter LODDs

The National Fire Protection Association (NFPA) released its annual report on the 2023 fatal firefighter injuries this past June. There were 89 reported line-of-duty deaths (LODDs), which is fewer than the 98 reported in 2022. However, it was the second highest number in the past 10 years.

It is important to note that the report does not include cancer deaths. Of the 89 LODDs, 48 were volunteer firefighters (which includes paid part-time) and 30 were career firefighters. The other 11 were either wildland or military.

While many (especially nonfire service personnel) might suspect that well over 90 percent of deaths occurred on the fireground, the percentage was 36 percent. The second highest percentage, based on type of duty, was responding to/returning from a call at 21 percent. The other double-digit percentages for type of duty were nonfire emergencies and training with each at 11 percent. Station duties comprised 8 percent, while EMS was at 6 percent. Maintenance and other on-duty were each at 3 percent.

The NFPA started tracking LODDs in 1977 when there were more than 150 reported. In fact, in the second year of its reporting in 1978, there were 174 firefighters who lost their lives. Through the mid 1980s, the average was around 125 annually. From the mid 1980s to 2000, the average was around 90. I think it is no coincidence that it was in the mid 1980s that the fire service started talking about firefighter safety and the first edition of NFPA 1500, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, was published. A huge amount of gratitude must be extended to those pioneers who led the firefighter health and safety initiatives during this time, especially the late Phoenix (AZ) Fire Department Chief Alan Brunacini. The first 10 years of the new millennium saw a rise to just under 100 LODDs annually. In retrospect, I think a bit of complacency set in after the initial impact of NFPA 1500. From around 2010 to 2020, the average number dipped to around 70, with 2019 being the lowest at 48. The 2020s have seen another uptick with an average of above 80. Is it time for a renewed focus on firefighter safety? (Please note that these numbers do not reflect the 343 firefighters lost in the World Trade Center.)

In examining the type of duty deaths, the responding/returning category of 21 percent is totally unacceptable. Many of these are single-vehicle accidents, and if not, very few are the fault of the other driver. Is the issue driver training? Or, adrenaline induced? Or, competition with other responding apparatus? Or, pure driver/occupant negligence—i.e., failure to be buckled in? I suspect the answer to each of those is "yes."

I do not recall any of the events being mechanical failure of the apparatus, even though there are some poorly maintained, aging rigs making responses. Regardless, it is highly recommended that all fire departments focus on ways to minimize the risks associated with responding to and returning from incidents. A pet peeve of mine is seeing so many departments putting so much black on their apparatus—especially the retroreflective striping. It is the most inconspicuous color, and it shows the world that your department values the "trendy appearance" of the apparatus over the safety of its members. The European fire service has decades of experience (and data) proving the validity of having conspicuous apparatus as a component of its safety programs.

Other key points of the report show that sudden cardiac arrest was the cause of 40 percent of the deaths. This was followed by trauma/crushing at 35 percent. Of note is that 3 percent were from burns. When comparing the cardiac events to the burn events, perhaps the question we should explore is one about our personal protective equipment (PPE) causing more heat-stress-related deaths than necessary. Are we overprotected? Would reducing the thermal protective performance (TPP) of our gear result in an adverse impact on burn injury and fatalities? These are debatable questions that need further study and examination.

It is so important to keep this type of LODD in mind as we continue the needed focus on cancer risk reduction and behavioral health issues—i.e., suicide. When cancer deaths and suicides are factored into the LODD numbers tracked by the NFPA, we have a problem. In the mid 1980s, the focus was on safety. For the past few years, the focus has been on health. We must address both.

ROBERT TUTTEROW retired as safety coordinator for the Charlotte (NC) Fire Department and is a member of the *Fire Apparatus & Emergency Equipment* Editorial Advisory Board. His 44-year career includes 10 as a volunteer. He has been very active in the National Fire Protection Association through service on the Fire Service Section Executive Board and technical committees involved with safety, apparatus, and personal protective equipment. He is a founding member and president of the Fire Industry Education Resource Organization (F.I.E.R.O.).

PPV Fan Standard Stays Current with Battery Technology

BY CHRIS Mc LOONE

Thirty-one years ago, my fire company was running two engines and a rescue truck. The two pumpers had generators, one cord reel each, and a smoke ejector on each.

This was before positive pressure ventilation (PPV) really took off. After a room-and-contents fire, one of us would bring one of the smoke ejectors inside, put it in the window of the affected room (facing the right way, of course), and turn it on for a while to clear out the smoke. If there was a bit more smoke to clear, we'd set up a gas-powered PPV fan at the front door and use that method.

The rescue truck had two large electric smoke ejectors and the gas-powered PPV fan. The two large smoke ejectors could really move some air, and when you stacked them, you would basically have a wind tunnel. Subsequent engines had generators and cord reels, and while the rescue would still carry at least one smoke ejector, most of our fans had been switched over to electric PPV fans. With our most recent engine purchases, we don't have generators or cord reels, and now we've got battery-powered PPV fans. We've come a long way in 30 years.

Along with the units themselves evolving over time, so has the standard that outlines the performance requirements and test methods for firefighting PPV fans: AMCA 240.

AMCA 240-22

Zach Allen, vice president, Euramco Group and voting member of the AMCA 240-22 Review Committee, explains that AMCA 240 is a standard by the Air Movement and Control Association (AMCA) International. It has been in place since the early 1990s. The purpose of AMCA 240-22, according to Mehdi Achour, international sales engineer at SuperVac, is to establish a uniform method of laboratory testing to demonstrate the performance of a PPV fan in terms of airflow rate, air density, pressure, rpm, and battery runtime (the length of time a battery PPV fan operates at maximum speed before automatically shutting off for the first time).

"The 2022 revision follows the five revisions before it with some basic updates to keep up with the evolving pace of technology, but the fundamental test procedures to determine volumetric airflow remain unchanged," says Allen. "AMCA 240 has always had several requirements that manufacturers must note along with airflow—this is the test configuration including setback from the door and tilt angle of the fan, both of which significantly affect airflow volume through the structure."

Achour adds that AMCA 240-22 is a laboratory method for testing positive pressure ventilators for aerodynamic performance rating.

Allen explains that the -22 revision adds the requirement to note nominal voltage and battery model used on all test reports and also implements new procedures for battery-powered PPV fans to be tested on DC power, simulating battery use as intended by firefighters. "After standard AMCA 240 volume tests are completed on the test stand, a check test for runtime using the specified batteries is done using test fan configuration," he says. He adds that prior to -22, how to power electric fans was ambiguous, assuming they would be plugged into AC power. He also notes that batteries cannot be used during flow testing because the AMCA 240 flow test requires 15 to 25 minutes to gather accurate data through the zero-pressure test stand. "Portable batteries are limited in capacity," he says. "And because battery voltage continuously drops as soon as fan operations begin, fan rpm can reduce over time, resulting in skewed flow measurements." For that reason, AMCA standardized on using a constant-voltage DC power supply to simulate nominal voltage, which is the battery industry standard for rating lithium cells at their average voltage, midway between fully charged and fully discharged states.

1 A Super Vac DeWalt-battery-powered PPV fan. *(Photo courtesy of Super Vac.)*

2 A Euramco RAMFAN battery-powered PPV fan powered with a lithium-ion battery. *(Photo courtesy of Euramco Group.)*

IMPORTANCE

Allen states that the fire service needs to be aware of AMCA 240-22 because it establishes that battery-powered PPV fans should be tested under DC power conditions. Achour adds that compliance with the standard will provide realistic, tested, and certified airflow and runtime numbers to fire departments, since this is the first time battery runtimes have been added to the standard. He also cautions that certified fans need to be retested every three years to ensure they still provide the same performance. "Failing to comply will result in termination of the certificate," he says.

Why is this important to the fire service? According to Allen, it expands an already well-known, longstanding performance comparison tool in the firefighting industry into battery PPV fans—which is now the most popular category, at least in North America. "All product categories should strive to maintain a reasonable level of standardization to give buyers a trustable tool with which to compare options," he says.

The main changes in the -22 version of the standard are how to power battery fans during the test, according to Allen. He adds that complying with AMCA 240-22 does not fundamentally change AMCA 240 airflow testing. The flow testing procedures remain unchanged. So, in that way, the impact to the fire service when complying with AMCA 240-22 is not significant. "PPV fans that have been consistently tested to AMCA 240 standards over the years are still the same trusted options for fire departments," he says. "AMCA 240 is the world's only third-party standardization test procedure that is accessible to all manufacturers of PPV fans."

Achour explains that buying a fan or comparing its performance is always a difficult decision, and buyers do not always know the origin of the values that appear in brochures or the methods for testing. "Performance of a PPV is crucial for firefighters, pushing smoke and toxic gases out to clear visibility inside, making it easier to locate and rescue victims," he says. "The AMCA standard is often put forward as it is a third-party certifying laboratory that brings together all manufacturers who want to test their products in a transparent and uniform way." Allen concurs. "At the end of the day, AMCA 240 is a shopping tool," he says. "Without a standard test method, firefighters have no way to compare one fan to another without blind trust in the marketing sheets, which is a dangerous gamble."

Allen also suggests that departments should always insist on third-party standardized testing when procuring PPV fans "as the only way to truly and fairly compare fan performance in intended use—the way firefighters

deploy fans in the real world, albeit in a controlled test environment to maintain comparability from fan to fan, year to year."

One impact -22 does have on the fire service, according to Allen, is that it defines the methodology for powering battery fans during tests. Until now, this has been different from manufacturer to manufacturer, with most testing on AC power, which he says could produce different results than what firefighters would see in actual deployment.

THE HORIZON

Most, if not all, standards have a regular revision cycle, and for AMCA 240, that cycle is every five years, although Allen says it was delayed during COVID. In some ways, the technology behind the battery-powered fans and performance factors will likely influence the next edition. "We're already reaching the limits of performance that can be squeezed from PPV fans using small, portable battery packs," he says. "The standard is *almost* outdated already." He explains that the average battery fan today is at about 50% less performance than its gas counterparts. To address the power limitations, he says, higher-voltage packs will be necessary to reduce current draw. "But," he adds, "simple battery size/capacity needs to grow significantly to get PPV fans back to where they were before battery fans. That's not a good evolution for firefighters, tactically speaking, despite being cleaner in emissions." Allen suggests that PPV fans in the future will most likely remain electric, but he says it is already trending back toward plug-in electric models. These models, however, are much lighter because of recent developments in brushless technology as demand for greater performance continues to grow. "The standard for high-performance plug-in electric fans has existed for more than two decades," he says.

> Buying a fan or comparing its performance is always a difficult decision, and buyers do not always know the origin of the values that appear in brochures or the methods for testing.

When we buy a fire apparatus, we ensure it complies with the standard that establishes safety parameters for the rig. We do the same thing with our personal protective equipment. In these cases, we are complying with National Fire Protection Association (NFPA) standards. These standards help ensure that the products we are purchasing meet a baseline standard and help us choose what manufacturer to use. AMCA 240 is no different. "As in any product category, be it washing machines or fire apparatus turntable ladders, standardized testing procedures are critical in building customers' confidence in their equipment procurement decisions," says Allen. "AMCA 240 does that for PPV fans. That being said, AMCA only tests airflow under controlled conditions in a lab. This is not a comprehensive standard for build quality or safety like the NFPA. More critical needs for standard development are becoming apparent as we get deeper into this new tech-focused phase of the industry."

Allen cites fan safety features, such as embedded accelerometers to automatically shut down if a fan falls over, common in power tools for a couple of years, are now being added to PPV fans. "This should be a basic requirement, at least in procurement specs, to protect firefighters from injury," he says. "Standards tend to lag behind industry by at least five years. This standard is covering technology that was introduced in the 2010s. New discussions should be had to address the amazing pace of tech that is in the market now."

CHRIS Mc LOONE, editor in chief of *Fire Apparatus & Emergency Equipment*, is a 31-year veteran of the fire service currently serving as a safety officer and is a former assistant chief with Weldon Fire Company (Glenside, PA). He has served on past apparatus and equipment purchasing committees. He has also held engineering officer positions, where he was responsible for apparatus maintenance and inspection. He has been a writer and an editor for more than 30 years.

MANUFACTURER SPOTLIGHT CHRIS McLOONE

Mercedes Textiles

I caught up with Jamie Emblem, co-owner and northeast regional sales for Mercedes Textiles, and Lydia Jackson, director of marketing for Mercedes Textiles, to discuss the origins of the company, its product lines (it is more than a hose manufacturer), and its "Know Your Hose" program.

1

CM: *Give a brief history of Mercedes Textiles.*

JE: We started off manufacturing Polyflex®, which is a cabinet hose for interior fire protection. They found a patent on the way they uniquely line our fire hoses. It's trademarked under the name Mertex®. From there, they expanded into wildland/forestry hoses and then eventually into attack hoses that I'm sure most of the U.S. fire service knows us best for. We were really founded on cutting edge technology with different innovations that had huge advantages in the fire service—less friction loss, for example. We have a fused-in liner system that does not delaminate, which was a huge problem.

We've really put a focus on double-jacket attack hose and have come out with some very lightweight, kink-resistant, high-flowing hose. We say they're lightweight, but that doesn't mean we sacrificed any raw materials. That's actually because we're using better raw materials.

LJ: We were founded in 1978 and, at that point, we really only made two different types of hoses. We had about nine looms at the time. A few years later, we created the Mertex lining, and we moved our offices from Ontario to Quebec. In the 1990s, we expanded again and realized we needed to really push ourselves to create more variety in municipal lines, and that's about the time that Bob Richardson, our current president, came onboard. His focus was taking our municipal lines to another level and working on how we solve the problems of municipal hose, creating lighter hose and hose that doesn't delaminate. We now have over 60 patents to our name.

2

CM: *As you said, many in the United States know Mercedes Textiles for your hose products, but you actually do more than that. Would you go over your other product lines?*

JE: We have the fire hose division, which you know. We also have a very large wildland division—in fact, we're one of the world's largest forestry hose manufacturers thanks to our patented weeping hose that is used by nearly all of Canada and many other countries.

Beyond hose, we also manufacture the full line of WICK® portable pumps from ultra-lightweight 3.5 hp to high-power 23 hp, as well as inline accessories. We like to say we go "from the foot valve to the nozzle" on the forestry side, including gated wyes, water thieves, hose stranglers, and more.

Our industrial division includes hoses for other uses like cleanup, snowmaking, and the cabinet hose Mercedes was founded on. We make everything for our hose in house. We're the only shop in North America that manufactures both the coupling and hose under one roof.

3

CM: *What makes Mercedes Textiles fire hose unique?*

JE: Basically we start with the Mertex lining technology. It totally encapsulates the weave, and it creates a very smooth surface. It is inseparable. Like I said before: zero delamination. It has a huge advantage in cold weather flexibility. About five years ago, National Fire Protection Association (NFPA) 1961, *Standard on Fire Hose*, released a new standard for radiant and counductive heat testing. Because of the lining, these hoses do not catastrophically fail; they start weeping, self protecting. Despite being lighter, we actually put more raw material and use higher quality materials to make a premium attack hose with exceptional durability, kink resistance, and friction loss—which is especially important in long-distance wildland applications.

LJ: What makes Mercedes hose unique starts with the process we use—the Mertex lining. It creates the smoothest waterway, which provides better flow, more flexibility, and better packability. We manufacture our couplings, which allows us to engineer couplings that also create less friction and allow for better flow. Our WAYOUT® arrows are an important safety feature.

Also, we focus on making sure that our products are tested to the latest standard, and we really go that extra mile to get UL approval for all of our premium lines like our KrackenEXO®.

4

CM: *Talk about the "Know Your Hose" program.*

LJ: When I came onboard, I had to immerse myself in fire service culture because it wasn't what I came from. During my first year, we launched KrakenEXO Super II™, which was a huge innovation for us. It was game changing in a lot of ways—for example, allowing you to flow the same amount of water with 30% less weight. I kept getting asked questions about all the stats and all the specs, and I learned why people needed to know them. The longer I did this job, the more I realized just how important really knowing that information can be for the front line—being able to not only assess and evaluate different hose depending on what your company needs and wants, but also once you have decided on a hose, being able to test it properly, being able to know what it's capable of, and to understand its performance were integral to using hose effectively.

I pushed really hard for us to make the information more accessible. I wanted it to be easy for people to get whatever they might need. I was already using #knowyourhose on social as a way to educate around our products and the importance of knowing your hose.

It turned into an idea to create a Web site dedicated to hose gurus. We wanted them to have everything they might need to satisfy their appetite for knowledge.

So, the goal for the "Know Your Hose" program is to provide those hose specs we have for our entire lineup. It also provides a friction loss calculator. We also work hard on creating resources and content. My end goal is to create this as an ongoing community and ongoing exchange of information. I often reach out to firefighters or instructors for their insights or their input on topics that are relevant to the front line. For example, one of the firefighters on our demo crew wrote a three-part series on right sizing water supply packages. I think that's where my end game is on that program: using it as an exchange of information. We'll also be launching a shop eventually because people ask me for our hoodies all the time!

And as much as I'd love to take credit for pushing transparency, it is actually now part of the new NFPA standard that manufacturers are required to publish certain information that they haven't been required to in the past. We were just ahead of the curve on that.

5

CM: *What keeps you awake at night?*

JE: Well, you know, Lydia and I were talking about this. I love the question. Mercedes is always on my mind. We're all working all day long, and we've got great people and great products. A lot of these products have been developed because of a lack of something or to fix something, and I get some of my best product innovations when I'm in bed. We're always trying to think of, you know, the next best mousetrap, if you will. And with the firefighter in mind, keeping our firefighters safe.

LJ: From my perspective, everything Mercedes innovates is about the safety of the people on the front line. We want the highest quality and the best product because that keeps not only you safe as a firefighter, but it also keeps the people you're saving safe. I have a lot of really great relationships with firefighters who I care deeply about, and their safety matters to me. The phrase "because you're on the line, and that matters" is what it boils down to for me. And, safety includes both physical and mental health. We want to make sure we are doing what we can to support our fire family. I feel a great responsibility to this community because we have platforms; we have relationships; and we have a level of responsibility, in my mind, to make sure that we're always working for the betterment of the fire service.

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DON'T GET LEFT BEHIND

SPECIAL DELIVERY ALAN M. PETRILLO

Durham (NC) Fire Department Sutphen Pumpers Run Idle Control Systems

The Durham Fire Department has a carbon neutrality plan that attempts to reduce the amount of diesel fuel its fleet apparatus use and reduce the emissions they produce.

The department did its homework on systems that reduce emissions and fuel consumption and decided to purchase custom pumpers with idle control systems from Sutphen Corporation.

John Ferguson, assistant director of fleet management for Durham Fire, says the department has 31 frontline apparatus operating out of 19 stations, meaning a lot of emissions are produced and a lot of diesel fuel is consumed during its annual 30,000 calls. Ferguson says the department reviewed its carbon neutrality plan and while it didn't want to go the electric fire vehicle route yet, it still wanted to cut down on emissions as well as maintenance and diesel fuel costs.

"After a lot of investigation, we chose to go with Sutphen custom pumpers that have an idle control system and an integrated battery," Ferguson says. "We now have seven of those Sutphen engines in service, four more in production, and three more on order. We've learned that we have had a reduction of 7.5% in diesel fuel consumption over the past 1½ years due to the use of the idle control systems."

Dillon Naylor, senior sales territory manager for Sutphen, says the seven Durham pumpers are identical units, each built on a Sutphen Monarch heavy duty custom chassis with a 62-inch extended cab and a 10-inch half-raised roof with seating for five firefighters, four of them in H.O. Bostrom self-contained breathing apparatus (SCBA) seats, and two emergency medical services (EMS) cabinets in the crew cab. He notes the pumpers have 10-inch double Domex frame rails rated to 50,000

1

2

3

1 Sutphen Corporation built seven engines with Harrison Hydra-Gen 2B1C 275-amp-hour idle control systems for the Durham (NC) Fire Department. *(Photos 1-2 courtesy of Sutphen Corporation.)* 2 Each Durham pumper has a Hale Qmax 1,500-gpm single-stage pump and a 500-gallon water tank. 3 Durham Fire's pumpers have 5-inch front intakes and 150 feet of 1.88-inch hose in covered compartments in the extended front bumpers. *[Photos 3-5 courtesy of the Durham (NC) Fire Department.]*

department

Durham (NC) Fire Department

STRENGTH: More than 400 full-time paid firefighters/EMTs/AEMTs; 19 stations.

SERVICE AREA: The Durham Fire Department provides fire, rescue, high-angle technical rescue, swift water rescue, hazardous materials response, and EMS to 120 square miles of the city of Durham with a population of 605,000 residents.

OTHER APPARATUS: 16 Type 1 engines; eight aerial ladders; seven rescue trucks, brush trucks, and specialty trucks; several ambulances and EMS response vehicles.

4 One of the requirements that Durham Fire had in its pumper specs was low hosebeds. **5** Most of the hoselines on Durham's Sutphen pumpers come off the rear of the vehicle, as shown here at a working fire scene.

specs

Sutphen Heavy-Duty Custom Pumpers

- Sutphen Monarch heavy-duty custom chassis with 62-inch extended cabs and 10-inch half raised roofs
- Seating for five firefighters, four in H.O. Bostrom SCBA seats
- 450-hp Cummins L9 engines
- Allison 3000 EVS Gen 5 automatic transmissions
- 420-amp Leece Neville alternators
- Hale Qmax 1,500-gpm single-stage pumps
- 500-gallon water tanks
- Harrison 2B1C hPower 275-amp hour idle reduction systems with integrated batteries

pounds per square inch (psi), 18,000-pound Hendrickson STEERTEK™ NXT front axles and suspensions, and 27,000-pound Hendrickson air ride rear axles and suspensions.

Naylor points out the Durham pumpers are powered by 450-horsepower (hp) Cummins L9 engines and Allison 3000 EVS Gen 5 automatic transmissions and have 420-amp Leece Neville alternators. Wheelbase on the pumpers is 176½ inches, overall length is 30 feet 3 inches, and overall height is 9 feet 9 inches. The rigs carry Hale Qmax 1,500-gallon per minute (gpm) single-stage pumps, 500-gallon water tanks, and Harrison Hydra-Gen hPower 2B1C 275-amp-hour idle reduction systems with integrated lithium-ion battery systems.

The idle reduction system will automatically take over powering the electrical needs of a pumper once the rig is set in park with the brake on, Naylor notes, and can be overridden if the operator wants to run the chassis diesel engine. "As the batteries get depleted to 20% of their capacity, the the idle reduction system battery management system turns the chassis diesel engine back on for power to the vehicle and also to power an inverter and recharge the idle reduction system batteries," he says. "Once the batteries reach an adequate charge, the chassis engine shuts down and the idle reduction system again runs the lights, heating and air conditioning, and other electrical needs of the vehicle."

Kirt Redburn, Durham's fire maintenance operations supervisor, says the pumpers are the first ones fully designed by a truck committee. "We got a low hosebed on these pumpers, and they are our first attempt to do most of our work off the rear of the vehicle." While the pumpers carry side-mount pumps, almost all of the discharges are off the rear of the rigs. The hose loads in the pumpers' hosebeds, from left to right, have two sections of 200 feet each of preconnected 1.88-inch hose, two sections each of 550 feet of preconnected 2½-inch, sections for 200 feet of preconnected 2½-inch hose, sections for 400 feet of 1.88-inch dead lay, and sections for 800 feet of 5-inch large-diameter hose (LDH).

The rigs also have a combination of hinged and roll-up compartment doors, more than 220 cubic feet of compartment space, grille-mounted Federal Signal Q2B sirens, FRC InView™ TrueSight three-camera systems, and five-position David Clark intercom systems.

Redburn adds that the rigs also carry 5-inch front suctions, Elkhart Brass 8297 ground-based monitors, 150 feet of 1.88-inch hose in covered compartments in the extended front bumpers, and 200 feet of one-inch booster line on Hannay electric reels in the dunnage areas on the officer side of the rigs. With the Sutphen pumpers, Redburn notes that the department also moved away from electric ladder racks to traditional side-mounted racks on the officer side for the pumpers' two-section 24-foot Duo-Safety extension ladders, 14-foot roof ladders, 10-foot folding ladders, and two New York roof hooks.

Lighting on the pumpers includes Whelen LED M9 and L31 emergency lighting, 72-inch Whelen LED Freedom IV lightbars, Whelen 600 LED red Rota-Beam lights, Whelen TAL85 Traffic Advisors at the rear, HiViz FireTech 12-volt LED three-piece brow lights, and six HiViz FireTech Guardian LED 12-volt scene lights.

ALAN M. PETRILLO is a Tucson, Arizona-based journalist, the author of three novels and five nonfiction books, and a member of the *Fire Apparatus & Emergency Equipment* Editorial Advisory Board. He served 22 years with the Verdoy (NY) Fire Department, including in the position of chief.

Fire Chief Considerations: Benchmarking the Fleet Division

BY JOSEPH MURRAY

Whether it has been as a result of a recession, the loss of a millage, or a reduction in state revenue sharing, all fire chiefs at some point in their tenure will have to convince those in control of the city's budget to purchase a new fire apparatus, approve the creation of a new position, or even just continue funding a vital service division.

With tightening budgets and costs at an all-time high, it isn't much of a surprise that city officials across the United States are demanding more data, more justifications, and more performance measurements from their fire chiefs. Using benchmarks is a key component of a quality performance measurement system. Benchmarks that are well vetted, clearly defined, and contribute to the overall mission of the organization can greatly assist the fire chief in making the argument for adequate funding toward fleet services.

DEFINING BENCHMARKING

Benchmarking can be defined as the process of measuring and comparing performance and processes against a predetermined standard. Benchmarks are reference points that allow fire chiefs to compare their fleet division against the performance of other fire departments, industry standards, or even their own internal trends.

BENEFITS OF BENCHMARKING THE FLEET DIVISION

Benchmarking allows fire chiefs to assess their fleet divisions' strengths and weaknesses in terms of workflow, processes, and outputs. When measured against actual performance, properly established benchmarks can provide fire chiefs with valuable insights and data, which aid in the decision-making process. Data-driven decisions can often lead to improved customer satisfaction, reduced costs, improved quality of service, increased efficiencies, and hazard reduction. Benchmarking also helps drive accountability when an organization has a clearly defined set of performance metrics and goals. Achieving benchmarks can increase collaboration and lead to a more collective effort, which can further lead to higher levels of investment among personnel. Benchmarking can also play a role in creating a culture of continuous improvement within the fleet division, and it can assist in the fleet division's strategic planning efforts.

FIVE COMMON CATEGORIES OF BENCHMARKS

A quick Internet search will reveal numerous descriptions, groupings, and labeling of the many benchmarks. For the fleet manager attempting to institute a new performance measurement system, trying to decipher the best benchmarks to use from hundreds of various sources can be somewhat daunting. Fortunately, there are a few general categories that many commonly used benchmarks fall into that can be good starting points. Typical types of benchmarks used within fire department fleet services include the following:

1. **Internal benchmarks**: Internal benchmarks are comparisons against your organization's prior performances. For example, an internal benchmark might be a comparison of time spent on preventive maintenance from one year to another. Averages of the data collected over the course of a few years can themselves become the benchmark. Deviation from the averages could be an indicator of an underlying performance problem.
2. **External benchmarks**: External benchmarks often include comparisons against other similar fire departments with comparable fleet divisions. Additional external benchmarks can be found in comparisons with other fleet programs within your municipality, private entities that perform fleet services, or well-established industry standards.
3. **Functional benchmarks**: Functional benchmarking can be used to identify industry trends and compare results across different types of industries or disciplines by using similarities in functional capacities. For example, a fleet division attempting to incentivize employees or improve recruitment may look to a successful employee incentive

program at a regional hospital to garner ideas. Although hospital operations are vastly different than fire department operations, key functional components of the incentive program may be transferable.

4. **Operational benchmarks**: Operational benchmarks are performance indicators that relate to recent performance. Operational benchmarks can be used to assess what's happening within the fleet division on a daily, weekly, or monthly basis.
5. **Strategic benchmarks**: Strategic benchmarks are longer-term performance indicators that typically would fall within your strategic plan. Strategic benchmarks help guide executive decision making and link fleet division operations to the department's desired future state. They focus more on the long-term strategical impacts rather than on operational results.

BENCHMARKING PROCESS

Step one for benchmarking is planning the process. To begin formulating the division's benchmarks, it is necessary to identify areas or subjects of focus. These subjects should comprise issues critical to the fleet division's success and the fire department's as a whole. Once you have defined an area you wish to benchmark, form a team of stakeholders and seek input on the proposed benchmarks from stakeholders, administrators, or elected officials. During the planning phase, the fire chiefs will also want to reach out to and collaborate with other fire departments that already have a quality performance measurement system in place for their input and guidance.

Step two is to collect data and information. Fire chiefs will want to collect as much relevant information and data as possible related to the subjects they desire to benchmark. In this step, fire chiefs should collect internal data from the fleet division, external data from similar organizations, and industry-recognized best practices or standards. Information collected should include quantifiable data and can be collected through methods such as site visits to other organizations, reference resources, or using surveys.

The third step of benchmarking involves choosing meaningful measurements. Using the information collected in step two, the benchmarking team must determine the benchmarks it will use as comparative measurements. The objective of step three is to clearly define reliable benchmarks that are representative of industry best practices or goals set by the fire department.

Step four includes analyzing the fleet division's internal data compared with the identified benchmarks. The benchmarking team should determine where gaps exist between the division's actual performance and the internal and external benchmarks identified in step three. Also during step four, the team must determine what insufficient processes or practices may have led to the disparities from the benchmark. During this process, fire chiefs will want to determine where the fleet division might be underperforming and identify potential opportunities for improvement.

The next step in the benchmarking process is to set goals and develop plans to improve performance and close the gaps. Fire chiefs should work with their fleet divisions to develop plans to address deficiencies. These plans may include altering a process, changing a manufacturer, investing in new technology, changing schedules, or bringing in additional training.

The final step of the benchmarking process is executing the improvement plan and monitoring the impact it has on performance and meeting benchmarks. Fire chiefs, in conjunction with their fleet managers, should regularly assess the progress of their improvement plan implementation and adapt as necessary to meet the previously defined goals. When a plan is deemed ineffective or if its progress becomes stalled, it should be reevaluated to identify the failure points and either be readjusted or replaced.

Benchmarking is a valuable tool that establishes a standard by which fire chiefs can measure the fleet division's performance. Incorporating benchmarks into the fleet division's operations can result in many benefits. They provide fire chiefs with an understanding of fleet divisions' performance levels through comparisons with internal data, external organizations, or recognized industry standards. Information gleaned from these comparisons can lead to targeted improvement strategies, improved effectiveness, increased productivity, and increased efficiency. When used effectively, benchmarking can lead to improved operations, largely as a result of measurable data-driven decision making. The ability to quantify performance measurements through benchmarking can greatly assist fire chiefs when competing for limited financial resources. Clearly defined benchmarks further encourage a culture of continuous improvement within the fleet division.

JOSEPH MURRAY, Ph.D., is chief and emergency management coordinator for the Dearborn (MI) Fire Department.

Apparatus Showcase

COMPILED BY RON HEAL

delivery of the month

KME—Vandalia (IL) Fire Department pumper-tanker. Predator MFD 100-inch-wide cab and chassis; Cummins L9 450-hp engine; Hale DSD 1,250-gpm pump; UPF Poly 2,500-gallon water tank; three Newton stainless steel 10-inch electric dump valves with controls in the cab and at the rear of the body. Dealer: Merle Adermann, Mac's Fire & Safety, Litchfield, IL.

ROSENBAUER—Glen Carbon (IL) Fire Protection District pumper. Commander 7011 cab and chassis; Cummins L9 450-hp engine; Hale Qmax 1,500-gpm pump; Pro Poly 750-gallon polypropylene water tank; Duo-Safety ground ladders; Command Light KL409D-H4-red strobe light tower; IDEX SAM pump control system. Dealer: Steve Williams, Sentinel Emergency Solutions, St. Louis, MO.

FERRARA—Budd Lake Fire Department, Mt. Olive Township, NJ, pumper. Cinder cab and chassis; Cummins L9 450-hp engine; Waterous CSU 1,500-gpm pump; Waterous Eclipse 200 cfm CAFS; Waterous Aquis 3.0 single-agent foam system; 750-gallon polypropylene water tank; 40-gallon foam cell; Harrison 8-kW generator; Alco-Lite ground ladders. Dealer: Jonathon Van Norman, Firefighter One Apparatus, Sparta, NJ.

PIERCE—Dickinson (ND) Fire Department 100-foot heavy duty steal aerial platform. Velocity cab and chassis; Cummins X15 605-hp engine; Waterous CSU 2,000-gpm pump; UPF Poly 300-gallon water tank; 20-gallon foam cell; Husky 3 single-agent foam system; Duo-Safety ground ladders. Dealer: Scott Berge, MacQueen Emergency, Apple Valley, MN.

SPARTAN EMERGENCY RESPONSE—Reliance Fire Company, Woodstown, NJ, rescue-pumper. Spartan Metro Star long cab and chassis; Cummins L9 450-hp engine; Waterous CSU 1,500-gpm pump; Pro Poly 750-gallon polypropylene water tank; Will-Burt Night Scan Chief 120 V with four Whelen Pioneer Plus™ Model PFP2ASF light heads; Harrison 15-kW generator. Dealer: Ryan Bailey, Campbell Supply Company, South Brunswick, NJ. *(Photo by Dennis Sharpe.)*

US FIRE APPARATUS—Lower Burrell Volunteer Fire Company, South New Kensington, PA, pumper. HME 1871 cab and chassis; Cummins L9 450-hp engine; Waterous CSU 1,500-gpm pump; UPF Poly 750-gallon water tank; 30-gallon foam cell; FoamPro 2001 single-agent foam cell; Will-Burt Night Scan NS2.3 light tower; marine grade aluminum extruded body. Dealer: JD Ferrante, US Fire Apparatus, Holden, LA.

E-ONE—Columbus (IN) Fire Department pumper. Typhoon cab and chassis; Cummins L9 450-hp engine; Waterous CSU 1,000-gpm pump; 1,000-gallon polypropylene water tank; 10-gallon foam cell; FoamPro 1600 single-agent foam system. Dealer: Dave Thomas, Fire Service Inc., St. John, IN.

ALEXIS—Abingdon (IL) Fire Protection District pumper. Spartan FC-94 MFD cab and chassis with 10-inch raised roof; Cummins L9 450-hp engine; Hale DSD 1,500-gpm pump; Pro Poly 1,000-gallon polypropylene water tank; Duo-Safety ground ladders; TFT Crossfire XFC-52 deck gun with 18-inch Extend-A-Gun; four upper storage compartments. Dealer: Greg Landon, Legacy Fire Apparatus, Shorewood, IL.

SMEAL—Grimsby Fire Department, Ontario, Canada, 100-foot aerial platform quint. Spartan Gladiator MFD cab and chassis; Cummins X12 500-hp engine; Waterous CSUC20 1,750-gpm pump; 300-gallon polypropylene water tank. Dealer: Sean Montague, Safetek Profire, Mississauga, Ontario, Canada.

SUTPHEN—Port Huron (MI) Fire Department pumper. Monarch cab and chassis; Cummins L9 380-hp engine; Hale Qmax 1,500-gpm pump; UPF Poly 750-gallon water tank; 20-gallon foam cell; Hale Smart Foam 3.3 single-agent foam system. Dealer: David R. Desrochers, Apollo Fire Apparatus Sales and Service, Romeo, MI. *(Photo by author.)*

LADDER TOWER—Surprise (AZ) Fire Medical Department platform aerial. Spartan Gladiator MFD cab and chassis with 10-inch raised roof with Advanced Occupant Protection System cab and chassis; Cummins X15 605-hp engine; Ladder Tower five-section steel aerial ladder with 1,000-pound platform rating; TFT Monsoon monitor; formed aluminum body; Harrison 8-kW generator; Duo-Safety ground ladders. Dealer: Tim Burkhart, Spartan ER, Brandon, SD.

SEAGRAVE—Greenwood (IN) Fire Department pumper. Marauder stainless steel tilt cab and chassis; Cummins X12 500-hp engine; Waterous CMU 1,250-gpm pump; 750-gallon polypropylene water tank; Harrison Stinger 6-kW generator; Duo-Safety ground ladders. Dealer: Kyle Koons, 911 Fleet and Fire Equipment, Worthington, IN. *(Photo by Kent Parish.)*

FOUTS FIRE—Lafayette Fire Department, Lafayette Township, NJ, FB-94 rescue-pumper. Spartan FC-94 cab and chassis; Cummins L9 380-hp engine; Hale Qmax 1,500-gpm pump; UPF Poly 1,000-gallon water tank; Alco-Lite ground ladders. Dealer: Fred Reader, Firefighter One Apparatus, Sparta, NJ.

MIDWEST FIRE—Dover-Foxcroft (ME) Fire Department pumper-tanker. Freightliner 114SD cab and chassis; Cummins X12 500-hp engine; Waterous CSU 1,250-gpm pump; APR polypropylene 3,000-gallon water tank; three Newton 10-inch stainless steel dump valves with telescoping chutes; All-Poly™ construction; "Sweep Out" style compartments. Dealer: Newt Johnson, Midwest Fire, Luverne, MN.

TOYNE—Fort Meade (FL) Fire Department pumper-tanker. Spartan FC-94 cab and chassis with 10-inch raised roof; Cummins L9 450-hp engine; stainless steel body; Hale Qmax-XS 1,250-gpm pump; UPF Poly 1,800-gallon water tank; 30-gallon foam cell; FoamPro 1600 Class A foam system; Akron Apollo Hi-Riser monitor; Syntex 2,100-gallon portable tank; Zico hydraulic Porta-Tank rack; Duo-Safety ground ladders. Dealer: Royce Holton, Tactical Fire, Winder, GA.

SVI TRUCKS—Sugar Loaf Fire Protection District, Boulder, CO, light rescue. Ford F-550 four-door cab and 4×4 chassis; 6.7L Power Stroke V8 Turbo 475-hp diesel engine; 9-foot walk-around rescue body; Command Light Knight KL415D-W2, 4 Whelen Pioneer Plus PFH2S light tower; OnScene Solutions transverse heavy-duty cargo slides; Ramsey RE-1200R heavy-duty winch. Dealer: Jason Kline, SVI Trucks, Fort Collins, CO.

FIROVAC—Mifflin Township Fire Department, Ashland, OH, pumper-tanker. Freightliner 108SD cab and chassis; Cummins L9 400-hp engine; Darley PSP 1,500-gpm pump; 3,000-gallon aluminum water tank; Eagle body; Firovac power swing down portable tank bracket holding two 3,000-gallon Husky portable water tanks. Dealer: Larry Reber and Brian Stoffer, Fireovac Power Systems, Apple Creek, OH.

SPENCER MANUFACTURING—Brown County Volunteer Fire Department, Nashville, IN, pumper. Spartan Metro Star MFD cab and chassis; Cummins L9 450-hp engine; Hale Qmax 1,500-gpm pump; UPF Poly 1,000-gallon water tank; Smart Power 8-kW generator; Alco-Lite ground ladders. Dealer: Shane Scott, The Fire Department Connection, Shelbyville, IN.

FIRE MASTER—Beggs (OK) Fire Department pumper-tanker. Freightliner M2 106 cab and chassis; Cummins L9 350-hp engine; Hale Qflo 1,250-gpm pump; Pro Poly 3,000-gallon polypropylene water tank. Dealer: Steve Loftin, Fire Master, Tulsa, OK.

MARION—Summerville (GA) Fire Department pumper. Spartan Metro Star cab and chassis; Cummins X12 500-hp engine; Waterous CSU 1,500-gpm pump; UPF Poly 1,000-gallon water tank. Dealer: Chuck Miller, Fearless Flames Inc., Canton, GA.

WEIS FIRE AND SAFETY EQUIPMENT—Lexington County (SC) Fire & Rescue two Quick Attack units. Ford F-550 Super Cabs and chassis; 6.7L 500-hp diesel engines; Darley 2BE-with 24K Kubota engines; 300-gpm @ 75-psi pumps; UPF Poly 400-gallon water tanks; 12-gallon foam cells; rear pump controls; TFT Tornado front monitors; Trident Foamate model 31 Class A foam systems; front ground sweeps. Dealer: Weis Fire and Safety Equipment, Salina, KS.

CUSTOMFIRE—Blue River (WI) Fire & Rescue pumper. Spartan FC-94 cab and chassis; Cummins L9 450-hp engine; Waterous S-100D 1,500-gpm pump; UPF Poly 1,780-gallon polypropylene water tank; 20-gallon foam cell; FoamPro 1600 Class A foam system; pull-out tool boards with locking mechanism; front bumper storage well. Dealer: Wayde Kirvida, CustomFIRE Apparatus, Osceola, WI.

RECENT APPARATUS ORDERS

COMPILED BY RON HEAL

CALIFORNIA

DANKO—Lakeside Fire Protection District wildland unit. Ford F-550 Crew cab and chassis; Power Stroke 6.7L 4VB OHV V8 Turbo Diesel engine; Hale AP 300-gpm PTO pump; UPF Poly 3,000-gallon water tank; 12-gallon foam cell; Scotty 4171 single-agent foam system. Sold by Scott Beck, Fire Apparatus Solutions, Rialto, CA. *Delivery in August 2025.*

FLORIDA

SUTPHEN—Boca Raton Fire Rescue pumper. Monarch cab and chassis; Cummins X10 450-hp engine; Hale Qmax XS 2,000-gpm pump; UPF Poly 750-gallon water tank. Sold by David Stonitsch, South Florida Emergency Vehicles, Fort Myers, FL. *Delivery in January 2028.*

SUTPHEN—Boca Raton Fire Rescue SL 75 midmount aerial ladder quint. Monarch cab and chassis; Cummins X12 500-hp engine; Hale Qmax 2,000-gpm pump; UPF Poly 620-gallon water tank; 75-foot aerial ladder; Smart Power 10-kW generator. Sold by David Stonitsch. South Florida Emergency Vehicles, Fort Myers, FL. *Delivery in November 2026.*

SUTPHEN—Cape Coral Fire Department SL 100 midmount aerial ladder quint. Monarch cab and chassis; Cummins X12 500-hp engine; Hale Qmax 2,000-gallon pump; UPF Poly 370-gallon water tank; Harrison 10-kW generator. Sold by Clark Green, South Florida Emergency Vehicles, Fort Myers, FL. *Delivery in December 2026.*

SUTPHEN—Cape Coral Fire Department pumper. Monarch cab and chassis; Cummins X10 450-hp engine; Hale Qmax 1,500-gpm pump. UPF Poly 1,000-gallon water tank. Sold by Clark Green, South Florida Emergency Vehicles, Fort Myers, FL. *Delivery in February 2028.*

SUTPHEN—Iona McGregor Fire District, Fort Myers, pumper. Monarch cab and chassis; Cummins X10 450-hp engine; Hale Qmax 1,500-gpm pump; UPF Poly 750-gallon water tank. Sold by Clark Green, South Florida Emergency Vehicles, Fort Myers, FL. *Delivery in October 2027.*

SUTPHEN—Lake City Fire Department SPH 100 midmount aerial platform quint. Monarch cab and chassis; Cummins X12 500-hp engine; Hale Qmax 2,000-gpm pump; UPF Poly 400-gallon water tank; 100-foot aerial platform. Sold by Mark Oakes, South Florida Emergency Vehicles, Fort Myers, FL. *Delivery in February 2025.*

TOYNE—Gulf County BOCC, Port St. Joe, topmount pumper. Freightliner M2 106 four-door cab and chassis; Cummins L9 360-hp engine; Waterous CSU 1,250-gpm pump; UPF Poly 1,000-gallon water tank; stainless steel body. Sold by Royce Holton, Tactical Fire, Winder, GA. *Delivery in June 2026.*

SUTPHEN—Rockledge Fire Department SL 75 midmount aerial ladder quint. Monarch cab and chassis; Cummins L9 450-hp engine; 75-foot aerial ladder; Hale Qmax 1,500-gpm pump; UPF Poly 480-gallon water tank. Sold by Guy Lombardo, South Florida Emergency Vehicles, Fort Myers, FL. *Delivery in March 2026.*

ILLINOIS

PIERCE—Downers Grove Fire Department pumper. Impel cab and chassis; Cummins X10 450-hp engine; Waterous CSU 1,500-gpm pump; UPF Poly 750-gallon water tank; low hosebed design. Sold by John Kenna, MacQueen Emergency, Aurora, IL. *Delivery in August 2026.*

PIERCE—Elwood Fire Protection District aerial platform quint. Velocity cab and chassis; Paccar MX13 510-hp engine; UPF Poly 500-gallon water tank; 100-foot steel aerial platform. Sold by Vince Baudek, MacQueen Emergency, Aurora, IL. *Delivery in June 2026.*

PIERCE—Grayslake Fire Protection District pumper-tanker. Enforcer cab and chassis; Paccar MX13 510-hp engine; Waterous CSU 1,500-gpm pump; UPF Poly 2,000-gallon water tank. Sold by Dan Rudnicki, MacQueen Emergency, Aurora, IL. *Delivery in June 2026.*

TOYNE—Kirkland Community Fire District pumper. Spartan Metro Star MFD cab and chassis with 10-inch raised roof; Cummins L9 450-hp engine; Hale Qmax 1,500-gpm pump; UPF Poly 1,000-gallon water tank; stainless steel body. Sold by Orin Snodgrass, Dinges Fire Company, Amboy, IL. *Delivery in June 2026.*

INDIANA

PIERCE—Evansville Fire Department aerial ladder quint. Enforcer cab and chassis; Paccar MX13 510-hp engine; Waterous CSU 2,000-gpm pump; UPF Poly 500-gallon water tank; Smart Power 10-kW generator; 105-foot steel aerial ladder. Sold by Tim Learned, MacQueen Emergency, Whitestown, IN. *Delivery in May 2026.*

PIERCE—Evansville Fire Department two pumpers. Enforcer cabs and chassis; Paccar MX13 510-hp engines; Waterous CSU 1,500-gpm pumps; UPF Poly 500-gallon water tanks. Sold by Tim Learned, MacQueen Emergency, Whitestown, IN. *Delivery in May 2026.*

IOWA

TOYNE—Edgewood Fire Department pumper. Freightliner M2 106 four-door cab and chassis; Cummins L9 360-hp engine; Waterous CSU 1,250-gpm pump; UPF Poly 1,200-gallon water tank; two 25-gallon foam cells; FoamPro 2001 Class A and B foam system; stainless steel body. Sold by John Nepple, Toyne Inc., Breda, IA. *Delivery in June 2026.*

TOYNE—McCallsburg Fire Department topmount pumper. Freightliner M2 106+ four-door cab and chassis; Cummins L9 360-hp engine; Hale Qmax 1,500-gpm pump; UPF Poly 1,000-gallon water tank; 25-gallon foam cell; FoamPro 1600 Class A foam system; stainless steel body. Sold by John Nepple, Toyne Inc, Breda, IA. *Delivery in July 2026.*

KANSAS

DANKO—Miami County Fire District #1, Paola, pumper-tanker. Freightliner M2 106 cab and chassis; Cummins L9 360-hp engine; Hale Sidekick 1,000-gallon pump; UPF Poly 2,000-gallon water tank; Zico 2,100-gallon hydraulic folding tank carrier; Fol-Da-Tank FDTA-2100 collapsible folding tank. Sold by Brent Barton, Danko Emergency Equipment, Snyder, NE. *Delivery in October 2025.*

TOYNE—Whitewater River Consolidated Fire District pumper-tanker. Freightliner SD114 two-door 6×4 cab and chassis; Cummins X12 455-hp engine; Hale Qmax 1,250-gpm pump; UPF Poly 3,000-gallon water tank; stainless steel body. Sold by Mike Weis, Weis Fire & Safety Equipment, Salina, KS. *Delivery in June 2026.*

KENTUCKY

TOYNE—Union County Fiscal Court-Sullivan Fire Department, Morganfield, pumper. Freightliner M2 106+ two-door cab and chassis; Cummins L9 360-hp engine; Hale Qmax 1,250-gpm pump; UPF Poly 1,250-gallon water tank; stainless steel body. Sold by James Riddle, High Tech Rescue, Shelbyville, KY. *Delivery in June 2026.*

TOYNE—Henshaw Fire Department, Sturgis, pumper. Freightliner M2 106+ two-door cab and chassis; Cummins L9 360-hp engine; Hale Qmax 1,250-gpm pump; UPF Poly 1,250-gallon water tank; stainless steel body; slide-in ladder storage. Sold by James Riddle, High Tech Rescue, Shelbyville, KY. *Delivery in June 2026.*

MINNESOTA

PIERCE—Dayton Fire Department PUC pumper-tanker. Velocity cab and chassis; Paccar MX13 510-hp engine; Pierce PUC-NG 1,500-gpm pump; UPF Poly 2,500-gallon water tank; 20-gallon foam cell; Pierce Husky 3 Class A foam system. Sold by Patrick Sandon, MacQueen Emergency, Apple Valley, MN. *Delivery in November 2027.*

PIERCE—Dayton Fire Department Ascendant aerial platform quint. Velocity cab and chassis; Paccar MX13 510-hp engine; Waterous S100 2,000-gpm pump; UPF Poly 300-gallon water tank; 100-foot steel mid-mount platform. Sold by Patrick Sandon, MacQueen Emergency, Apple Valley, MN. *Delivery in May 2028.*

PIERCE—Inner Grove Heights Fire Department pumper. Enforcer cab and chassis; Paccar MX13 510-hp engine; Waterous CSU 1,500-gpm pump; UPF Poly 500-gallon water tank; 30-gallon foam cell; Pierce Husky 3 Class A foam system; Will-Burt Night Scan Chief NS2.3-600 4 lightheads 12-V light tower. Sold by Brad White, MacQueen Emergency, Apple Valley, MN. *Delivery in May 2026.*

MISSOURI

TOYNE—Springfield Fire Department two pumpers. Spartan Metro star MFD cabs and chassis with 10-inch raised roofs; Cummins L9 400-hp engines; Waterous CSU 1,250-gpm pumps; UPF Poly 750-gallon water tanks; two 25-gallon foam cells; Waterous Aquis 6 Class A and B foam systems; Whelen PCH2-PBAPED telescoping scene lights. Sold by Jeff Kahler, Weis Fire & Safety Equipment, Salina, KS. *Delivery in June 2026.*

NEVADA

MIDWEST FIRE—Grass Valley Volunteer Fire Department, Winnemucca, pumper-tanker. Freightliner M2 112 cab and chassis; Cummins L9 450-hp engine; Darley LSP 1,000-gpm PTO pump; APR polypropylene 4,000-gallon water tank; three Newton 10-inch square stainless steel dump valves; All-Poly™ construction; Elkhart Vulcan deck gun with stack tips. Sold by Scott Boll, Midwest Fire, Luverne, MN. *Delivery in April 2026.*

NEW HAMPSHIRE

TOYNE—Newfields Fire Department pumper. Spartan Metro Star LFD cab and chassis with 10-inch raised roof; Cummins L9 450-hp engine; Waterous CSU 1,500-gpm pump; UPF Poly 1,000-gallon water tank; 30-gallon foam cell; Waterous Aquis 3.0 Class A foam system; Kussmaul 30-kW generator. Sold by Jerry McKay, Eastern Fire Apparatus, Milton, NH. *Delivery in July 2026.*

NEW JERSEY

E-ONE—Basking Ridge Fire Company No. 1 Metro 100 aerial ladder quint. Typhoon cab and chassis; Cummins X12 500-hp engine; Waterous CSU 2,000-gpm pump; 400-gallon polypropylene water tank; 100-foot aerial ladder; SideStacker hosebed. Sold by Tony Amoroso, Absolute Fire Protection, Plainfield, NJ. *Delivery in July 2027.*

FOUTS FIRE—Denville Fire Department FB-94 pumper. Spartan FC-94 medium cab with 10-inch raised roof cab and chassis; Cummins L9 450-hp engine; Hale Qmax 1,500-gpm pump; UPF Poly 1,000-gallon water tank; heavy duty 3/16-inch-thick aluminum body. Sold by Firefighter One, Spartan NJ. *Delivery in December 2024.*

NEW YORK

TOYNE—Village of Waddington Volunteer Fire Department pumper-tanker. Freightliner M2 106+ two-door cab and chassis; Cummins L9 360-hp engine; Hale Qmax 1,250-gpm pump; UPF Poly 1,800-gallon water tank; 25-gallon foam cell; FoamPro 2001 Class A foam system; stainless steel body. Sold by Nate Shakerley, Shakerley Fire Truck Sales, Round Lake, NY. *Delivery in July 2026.*

FERRARA—Wantagh Fire Department 85-foot midmount platform. Inferno cab and chassis; Cummins X15 605-hp engine. Sold by Brian Kuhn, Hendrickson Fire Rescue Equipment, Islandia, NY. *Delivery in May 2026.*

NORTH CAROLINA

SMEAL—Pine Level Fire Department 107-foot aerial ladder quint. Spartan Gladiator MFD cab and chassis; Cumins X15 565-hp engine; Waterous CSU 1,500-gpm pump; 500-gallon polypropylene water tank; front bumper hydraulic tool storage; HiViz FireTech stabilizer lights; 750-pound tip load in any position. Sold by David English, Atlantic Coast Fire Trucks, Denver, NC. *Delivery in May 2026.*

PENNSYLVANIA

TOYNE—Lock #4 Volunteer Fire Company, Charlerot, mini rescue. Ford F-550 four-door 4×4 cab and chassis; Power Stroke 6.7L 330-hp engine; stainless steel body; Will-Burt Night Scan 2.3-64EVOL light tower. Sold by Randy Smalley, Tri State Fire, Monongahela, PA. *Delivery in June 2026.*

SOUTH DAKOTA

DANKO—Watertown Fire Rescue wildland unit. Ford F-550 cab and chassis; 7.3L 2V DEVCT NA PFI V8 gas engine; Waterous 2515LE 75-gpm pump with B&S 23-hp engine; UPF Poly 400-gallon water tank; 12-gallon foam cell; Scotty 4171 single-agent foam system; rear underbed compartment. Sold by Jeff Horn, Danko Emergency Equipment, Snyder, NE. *Delivery in June 2025.*

TEXAS

SPARTAN EMERGENCY RESPONSE—Colleyville Fire Department pumper. Metro Star LFD cab and chassis with 10-inch raised roof; Cummins X10 450-hp engine; Waterous CSU 1,500-gpm pump; 500-gallon polypropylene water tank. Sold by Metro Fire Apparatus Specialists, Houston, TX. *Delivery in May 2027.*

TOYNE—Denver City Volunteer Fire Department pumper. Freightliner M2 106 four-door cab and chassis; Cummins L9 360-hp engine; Hale Qmax 1,500-gpm pump; UPF Poly 1,000-gallon water tank; stainless steel body. Sold by Jason Reddin, First In Public Safety, Sulphur Springs, TX. *Delivery in August 2026.*

SVI TRUCKS—Waco Fire Department hazmat unit. Spartan Gladiator ELFD cab and chassis with 24-inch raised roof; Cummins X12 525-hp engine; 24-foot walk-in hazmat aluminum body; cab/body walk-through connection; SMART Board 6055 interactive flat panel 65-inch LED LCD flat screen monitor. Sold by Brian Cudaback, Metro Fire Apparatus Specialists, Houston, TX. *Delivery in July 2025.*

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IN THE NEWS

The Victoria (BC) Fire Department has placed into service its first electric fire truck, a **ROSENBAUER** RTX. With a target to electrify or renewably power 80 percent of its vehicles by 2040, the city has already placed an order for a second

unit. The RTX is expected to handle more than 95 percent of its calls in full-electric mode, operating with zero emissions and virtually no noise. However, if extended operations are required, an onboard diesel engine will automatically engage when the battery drops below 20 percent, ensuring uninterrupted service.

PIERCE MANUFACTURING INC., in partnership with the **INTERNATIONAL ASSOCIATION OF FIRE CHIEFS (IAFC)**, has announced the 2024 IAFC Fire Chief of the Year honorees. Volunteer Fire Chief C. Reid Vaughan of the Cuba (AL) Fire Department and Career Fire Chief Randy Royal of the Colorado Springs (CO) Fire Department have been named this year's recipients. Vaughan has served as the volunteer fire chief since 1994. He also serves as the section chief over regional services at the Alabama Fire College. Vaughan also serves as the National Volunteer Fire Council Director for Alabama and the fire service representative to FirstNet.

Since joining the Colorado Springs Fire Department (CSFD) in 1987, Royal has consistently demonstrated his "mission first, people always" ethos. Under his leadership, the CSFD earned its third consecutive accreditation status from the Commission on Fire Accreditation International (CFAI) and added new fire stations, personnel, and resources. Royalhas also adopted new EMS documentation systems, regional training programs, and enhanced apparatus and equipment.

Pierce and MAXIMETAL also announced a fleet purchase by the Township of Langley (BC) Fire Department (TLFD). The order combines stock and new-build apparatus, Pierce and MAXIMETAL products, and both custom and commercial chassis. The fleet purchase includes a mix of stock and custom apparatus to meet TLFD's diverse needs, including three stock MAXI Saber® pumpers, three custom MAXI Saber pumpers, one Pierce stock Enforcer™ nonwalk-in heavy-duty rescue, one Enforcer Ascendant® 100-foot heavy-duty tower, one Enforcer Ascendant 107-foot heavy-duty ladder, and two MAXIMETAL Ford F-550 minipumpers.

SMEAL HOLDING, LLC is commemorating that its 1,000th 105-foot aerial apparatus has been completed at its facility in Snyder, Nebraska. The aerial was built for

the City of Wilmer (TX) Fire Department and is the first Smeal fire apparatus the department has ordered. The aerial has a unique cutout with illuminated ladder signs. In 1964, Smeal Holding, LLC, built its first aerial apparatus, a 52-foot ladder on an IH 1600 chassis with an extended cab for the Snyder (NE) Rural Fire District to support fighting grain elevator and chimney fires.

CONGRESSMAN BILL PASCRELL, who authored the original legislation that

created the Assistance to Firefighters Grant Program, recently passed away at age 87. A co-chair of the Congressional Fire Services Caucus and a staunch supporter of fire and emergency services, Pascrell introduced legislation in 1999 to authorize a federal grant program for the fire service. Known as the Firefighter Investment and Response Enhance (FIRE) Act, the measure was signed into law in 2000. Three years later, Congress expanded the program by creating the Staffing for Adequate Fire and Emergency Response (SAFER) grant program. In addition to the grant programs, Pascrell was a tireless leader in fighting to support fire sprinklers in commercial and residential buildings, creating the National Firefighter Registry for cancer, and expanding the Public Safety Officers' Benefits (PSOB) program to cover occupational cancers, among others.

PRODUCT NEWS

ROAD RESCUE® has announced that its easy-to-spec, preconfigured RediMedic™ ambulance is available to order. The RediMedic offers a design that delivers optimal prehospital care with an array of features and benefits

including the **EMS-Inspired Design, CurveForce™ formed corners**, the **MaxForce mounting system**, and the **Per4Max** multipoint restraint system. *—www.roadrescue.com*

FIRE-DEX has launched its RescuePro Package, a bundle designed to provide the right gear for nonstructural calls. The RescuePro Package includes TECGEN51 fatigues, Dex-Rescue gloves, and FDXL90 boots. By bundling these essential garments, Fire-Dex is offering

up to a 30% discount per firefighter. With the RescuePro Package, firefighters now have access to NFPA 1951-compliant alternative PPE that is suitable for a range of scenarios, including flash fires, natural disasters, search and rescue operations, confined space rescues, gas leaks, civilian assistance, rope rescues, electrical emergencies, and motor vehicle accidents.*—www.firedex.com*

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Kenworth T480 Standard 2 Door Chassis, 450 HP Engine, 1500 Gallon Water Tank, 1500 Hale QMAX Pump, 3/16” Extruded Aluminum Body

STARTING AT **$491,000**

COMMERCIAL TANKER

Freightliner FLM2-106 Chassis, 360 HP Engine, 3000 Gallon Water Tank, 1500 GPM Hale QMAX Pump, 3/16 Extruded Aluminum Body

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