Summer 2025

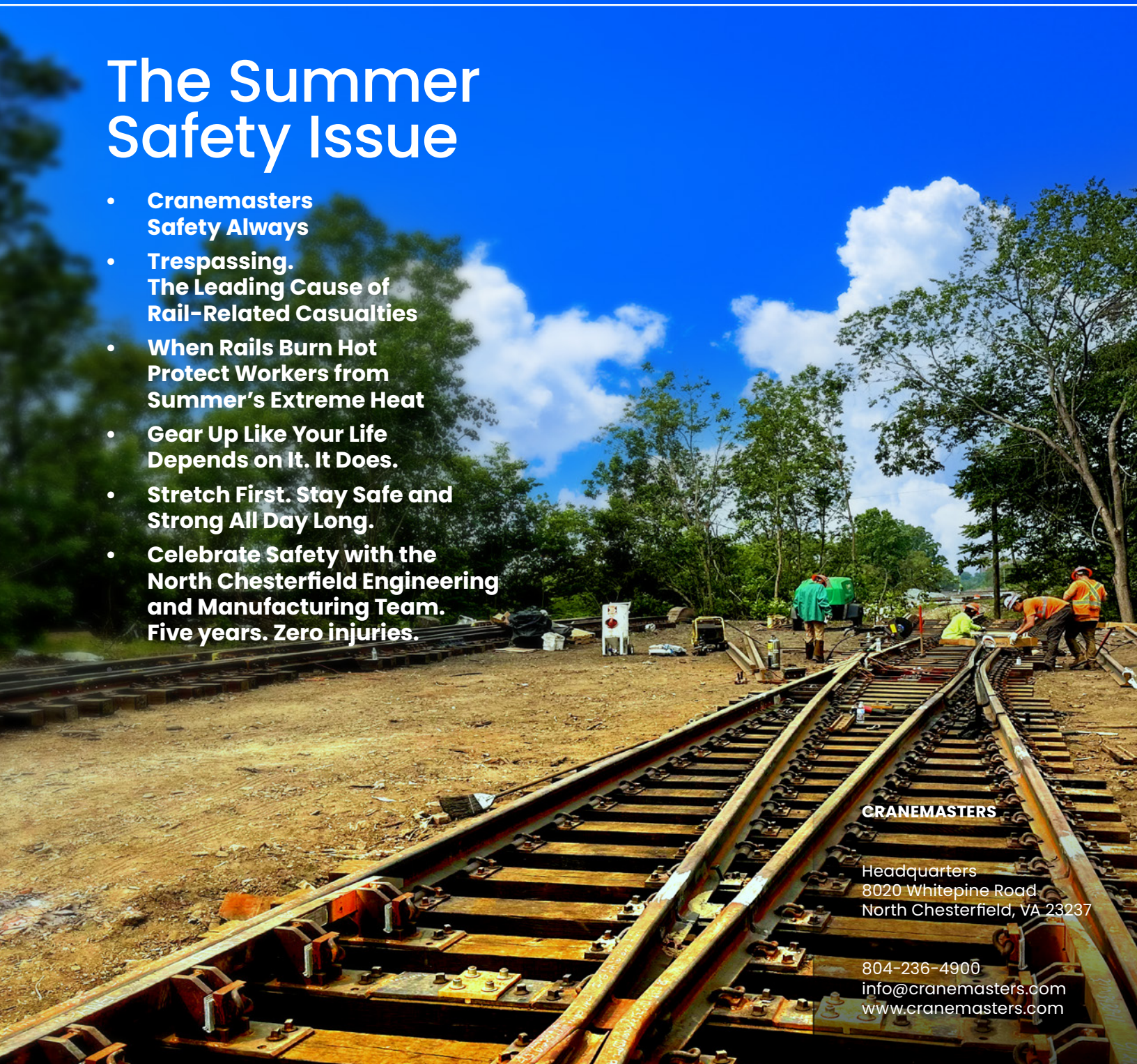
CRANEMASTERS®

# On The Rails

Rail Support Services News and Insights from Cranemasters

## The Summer Safety Issue

- **Cranemasters Safety Always**
- **Trespassing. The Leading Cause of Rail-Related Casualties**
- **When Rails Burn Hot Protect Workers from Summer's Extreme Heat**
- **Gear Up Like Your Life Depends on It. It Does.**
- **Stretch First. Stay Safe and Strong All Day Long.**
- **Celebrate Safety with the North Chesterfield Engineering and Manufacturing Team. Five years. Zero injuries.**



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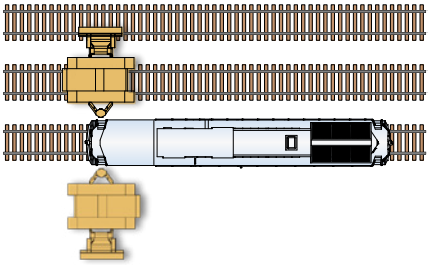
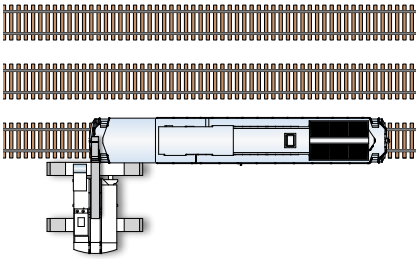


**Conventional booms attached to bulldozers need two sides to lift rail cars.**



**The Cranemasters 200 RS Super-Duty Crane lifts and carries from only one side.**


**The Cranemasters 200 RS Super-Duty Crane is carried to job sites on our highway-ready rig.**

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**Cranemasters is a full-service railroad contractor** uniquely equipped to work with all Class I, regional, and short-line railroads, and rail-connected private industrial siding operations. Since its inception, the company has charted a steady course of growth and innovation, offering expert railroad construction and emergency services. The company's success is rooted in a steadfast commitment to excellence, encapsulated in a "no shortcuts" philosophy that permeates throughout its talented and experienced employees. Cranemasters is the industry's leading manufacturer of purpose-built railroad heavy-lift equipment and developer of safe and efficient processes for the industry's toughest challenges.

LEADERSHIP POINT OF VIEW

# Cranemasters: Safety Always

Summer 2025

**In the railroad industry, safety is of the utmost importance. Workers must receive extensive and ongoing safety training and be fully compliant with FMCSA, OSHA, MSHA, and FRA regulations, as well as hold a valid Railroad Safety Certification. However, at Cranemasters, these requirements are just the beginning.**

In this article, David Brygider, MS, Assistant Vice President of Safety and Risk Management, shares his insights on how Cranemasters has consistently maintained an industry-leading safety record. He credits the company's success to the unwavering commitment of its founders, Brian and Barry Isringhausen, who established a culture of safety that is embraced by every employee.

**David Brygider, MS**
Assistant Vice President of Safety and Risk Management
Cranemasters, Inc.

*For starters, could you briefly describe your role and key responsibilities at Cranemasters?*

Yes. I serve as the Assistant Vice President of Safety and Risk Management at Cranemasters, where I'm responsible for leading the development, implementation, and oversight of the company's national safety strategy, including all of our Environment, Health, and Safety (EHS) policies, programs, and systems. Ultimately, my mission is to create a safe and healthy work environment for all stakeholders while reducing costs and risks for Cranemasters.

*Which safety risks are particularly challenging for Cranemasters, and are they different from those in the industry in general*?

Our work at Cranemasters is unique in its risk profile. We specialize in railroad emergency response, railcar recovery, and derailment remediation, often under unpredictable and high-pressure conditions. While we address standard industry risks, such as PPE compliance, line-of-fire exposure, and powered mobile equipment, we also face added complexity due to track protection requirements, confined workspaces, overhead hazards, inclement weather, and proximity to live rail.

Unlike many industrial environments, our teams often respond to dynamic, multi-agency incidents where rapid mobilization, railroad-specific protocols, and public safety coordination intersect.

Each railroad has its own rules and expectations, and we must train and operate accordingly, making our risk management practices broader and more adaptive than most.

*What's your philosophy of safety?*

My philosophy is simple. Safety is the highest form of respect we can offer to one another. It's not just about compliance; it's about protecting lives, empowering people, and creating a culture where every decision is made with safety in mind.

## Cranemasters Safety Firewall

*What's your strategy for creating a culture where safety is everyone's responsibility?*

We use what I call our "Safety Firewall" to build and reinforce a culture of shared responsibility. A safety colleague, Leo Grinsteiner, introduced me to the Firewall method, which I modified for Cranemasters.

First, we develop clear, data-informed policies reviewed by our internal Safety Committee. Second, we communicate these expectations through visual tools, including custom safety posters, digital dashboards, and accessible training documents. Finally, and most importantly, we ensure accountability through real-time field observations, direct leadership engagement, and structured job site interactions.

*What tactics does Cranemasters use to implement its strategy?*

We utilize platforms like Rail Life Services to track safety observations every week, and our SafetyCulture app for conducting field audits with detailed photos and scoring. These tools help us stay proactive and consistent in our execution. Our leadership—from ownership to front-line supervisors—actively participates in safety stand-downs, field tours, and milestone celebrations to reinforce the message that safety is everyone's job.

*Is Cranemasters required to provide safety training?*

Due to the specialized work we perform and our partnerships with railroads, we are held to a high standard of training. Employees are required to complete Roadway Worker Training (RWT) for each railroad they work under, as all Class 1's have unique programs. We also adhere to all safety requirements under 49 CFR 243 among many others. We are also OSHA, MSHA, and DOT compliant with our training schedule. Additional required training includes eRailSafe, System Safety, and MSHA Part 46 (24-hour initial and 8-hour refresher), Red Cross, Smith System defensive driving, and HAZWOPER when required. For those operating cranes, we certify through NCCCO or CIC.

We deliver this training through in-house instruction, online modules, and certified third-party providers. Our Salesforce/Rail Life Services platform tracks every certification

and alerts supervisors of upcoming renewals, ensuring no employee is out of compliance before entering a job site.

*Does Cranemasters continually train employees in safety from the moment they are hired?*

Yes. New hires receive a comprehensive orientation that includes general safety training, job-specific instruction, and all required railroad certifications. This typically involves 24-hour MSHA training, Red Cross First Aid/CPR training, Smith System training, PPE usage, and an introduction to our Safety Firewall framework.


From there, ongoing training is delivered through weekly toolbox talks, Monday safety meetings, and annual refresher courses for each railroad or regulatory body we work with. We also provide targeted, real-time training when new risks emerge or conditions change. For experienced employees, we offer operator certifications and leadership development opportunities to help them mentor newer team members.

*How does Cranemasters evaluate its overall safety policy and record, as well as individual worker safety performance?*

We track both leading and lagging indicators to measure success. Leading indicators include the volume and quality of field safety observations, timely completion of Job Safety Briefings (JSBs), and training compliance rates. Lagging indicators include Total Recordable Incident Rate (TRIR), Days Away/ Restricted or Transferred (DART), Lost Workday Case Rate (LWCR), and Experience Modification Rate (EMR).

I'm proud to say our TRIR, DART, and LWCR scores are consistently well below NAICS industry averages, and our current EMR is 0.75. At the individual level, we evaluate worker performance based on observed safety behavior, peer feedback, participation in briefings, and engagement in near-miss reporting or improvement suggestions. We present these findings weekly in our Monday Morning Meetings, giving complete visibility to leadership and the field.

*In addition to onsite safety briefings, does Cranemasters hold periodic company-wide safety meetings? What's discussed/reviewed?*

Yes, we hold mandatory company-wide safety meetings every Monday morning. These meetings begin with a leadership session from 7:00 to 7:30 AM and continue with employee breakout sessions from 7:30 to approximately 8:00 or 8:30 AM. During these meetings, we review observation trends, injury-free milestones, and any recent incidents or near misses. We also cover a weekly safety training topic, often tailored to railroad-specific risks or seasonal hazards.


These sessions serve as a pulse check for the entire organization. They are essential to maintaining effective communication

between divisions, reinforcing our policies, and ensuring alignment on what matters most, ultimately protecting our people.

*Are there any differences in Cranemasters' approach compared to basic compliance requirements?*

Yes, and I would argue those differences are precisely why we've been so successful. We don't approach safety as a compliance exercise. We treat it as a core operational strategy. We go beyond what's required by providing premium PPE, investing in continuous digital safety systems, and embedding ownership-level engagement across the business.


Our **"Safety Always" philosophy replaces the more passive mindset of "Safety First."** At Cranemasters, we make safety part of every task, every job plan, and every conversation. We respond to incidents with company-wide alerts, not just corrective actions. And we celebrate success through milestone events, company-branded gear, and formal recognition. All these steps keep morale high and standards even higher. We're not just compliant; we're committed.

*Is there anything else you would like to highlight regarding safety at Cranemasters?*

Our success hasn't happened by chance. The safety performance we've achieved, including multiple divisions with many years of injury-free operations, is the result of deliberate systems, leadership's daily involvement, and employee buy-in.

Safety is everyone's job at Cranemasters. From ownership to new hires, everyone plays a role in protecting each other. We've built a culture that values speaking up, stopping work when necessary, and learning from every mistake and success alike. That's what sets us apart. Safety isn't just something we manage. It's something we live.

> Safety is the highest form of respect we can offer to one another.

## About David Brygider

As Assistant Vice President of Safety and Risk Management, David Brygider oversees Cranemasters' national safety strategy and all EHS policies, programs, and systems. With over 10 years of professional experience in the industry, his educational background includes a Master of Science in Environmental Health and Safety Management from Rochester Institute of Technology, where he graduated with a 4.0 GPA, and a Bachelor's degree in Homeland Security and Emergency Preparedness from Virginia Commonwealth University. He holds a Lean Six Sigma Green Belt from Duke University's Continuing Education Program. He also has over 17 licenses and certifications related to occupational safety, risk control, workplace safety, and loss prevention.

SAFETY

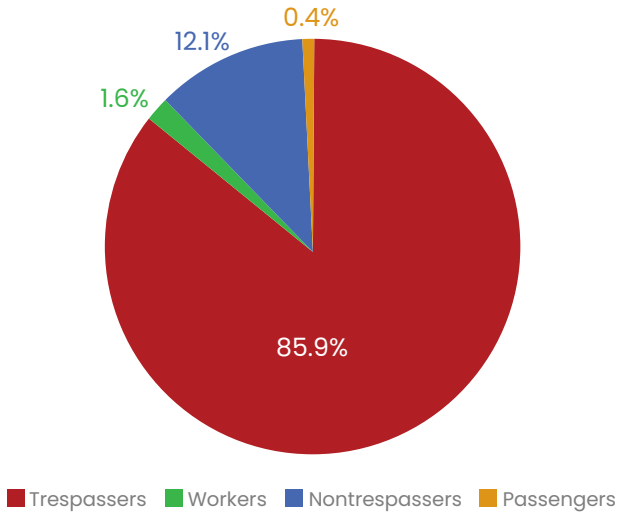
# Trespassing. The Leading Cause of Rail-Related Casualties

Summer 2025

**The U.S. railroad system is one of the safest modes of transportation, moving over 500 million passengers in 2024 and transporting an average of 1.5 billion tons of goods annually.[1,2,3]**

Derailments and collisions draw considerable attention, but in 2024, only two workers died and no passengers were killed due to train accidents. In contrast, 842 people were killed while trespassing on railroad property.[4]

Trespassing Accounted for 85.9% Rail-related Fatalities from 2020–2024




*Federal Railroad Administration database on trespassing fatalities and injuries. March 31, 2025. Does not include intentional incidents such as suicide.*

Trespassing is by far the leading cause of rail-related deaths in the U.S., accounting for more fatalities than derailments and collisions combined.

Railroad crossing accidents are the second leading cause of rail-related deaths in America. Together, 94 percent of all railroad fatalities and injuries are from trespassing and railroad crossing accidents combined, according to the FRA.[5]

The Federal Railroad Administration defines trespassers as "persons who are on the part of railroad property used in railroad operation and whose presence is prohibited, forbidden, or unlawful." Railroad property includes a railroad's right-of-way, tracks, rail yards, facilities, train cars, locomotives, bridges, and trestles. All railroad property is private property, and crossing tracks anywhere other than a designated public crossing with a crossbuck, flashing red lights, or a gate is illegal in all 50 states.

## A Glamorized Crime

Pop culture glamorizes trespassing by filming heart-pounding chases around moving rail cars. However, while movie stunt doubles can perform daredevil stunts on controlled sets, real people on real tracks get seriously injured and even die. Part of the challenge in preventing casualties is to dispel the movie-inspired notion of false bravado associated with trespassing along railroad rights-of-way and facilities.

## The Impact of Railroad Trespassing

In addition to the loss of life or injuries, there are many direct and indirect costs associated with such an incident. These include damage to equipment, delays, rerouting, supply chain effects, emergency responder costs, emissions costs, and railroad operations costs. All too often, assessments underestimate the costs of railroad incidents, a situation that can lead to reduced resources for improving railroad safety. By accurately assessing the costs of an incident, it's possible to make better decisions about how to allocate resources for curbing trespassing.

Nationally, 9,363 reported trespassing accidents from 2012 to 2016 cost society an estimated $43.2 billion in fatalities and injuries, according to the FRA—$41.2 billion for 4,291 deaths and $2.0 billion for 5,072 injuries.[6]

At the state level, North Carolina experienced 187 rail incidents between 2010 and 2019, resulting in an estimated $2.4 billion in costs to the state. Approximately $258.3 million was incurred in 2019, primarily due to the cost of casualties.[7]

**Costs Associated with 187 Incidents in N.C. (2019)**

| Component | Estimated cost | Percent of total ($258.3 M) |
|---|---|---|
| Casualties | $252,816,000 | 97.0% |
| Property Damage | $3,651,000 | 1.41% |
| Delay, rerouting, supply chain disruptions | $1,572,000 | 0.60% |
| Emissions | $131,000 | 0.05% |
| Operating costs | $73,000 | 0.03% |
| First responders | $60,000 | 0.02% |

*North Carolina Department of Transportation, Research and Development. The Comprehensive Cost of Rail Incidents in North Carolina. Technical Report No. FHWA/NA/2020-44.*

# Why People Risk Trespassing

### It's a convenient shortcut

Most pedestrian trespassers are taking a shortcut along the railroad tracks to their destination. Others are loitering or engaged in recreational activities, such as jogging, hunting, bicycling, or operating off-road, all-terrain vehicles.

Trespassers interviewed over a four-year period acknowledged that they knew they were trespassing and that it was against the law. They consciously decide to trespass because it is more convenient. In the same period, approximately 74 percent of trespassing casualties occurred within 1,000 feet—or less than a quarter of a mile—from a highway-rail grade crossing.[6] Trespassers will climb or crawl over fencing and through cars of stopped trains rather than wait or walk to a designated area to cross the tracks. In one instance, a school official with children from the school was trespassing on a railroad's right-of-way.

Because the number of reported close calls is much larger than the number of fatalities and injuries combined, the potential for additional casualties among trespassers is significant.

### They Don't Realize the Danger

Railroad employees receive extensive safety training and are aware of the inherent hazards associated with their work environment. Trespassers, on the other hand, do not. Nor are trespassers privy to the schedule of train movements, which can be in either direction at any time. They don't appreciate the hazards of walking alongside or on railroad tracks, crossing anywhere except an authorized roadway or pedestrian crossing, and the risk of climbing on or moving between stationary cars.

There is a common misconception among the general public that they can hear a train approaching in time to avoid it. But despite their size, trains are relatively quiet and do not always sound warning horns when approaching.

The speed and distance of an oncoming train are difficult to gauge, and a train traveling at 55 mph can take a mile to come to a complete stop. Since rail cars overhang tracks by three or more feet on either side, there's no room on a bridge, trestle, or in a tunnel for a trespasser to escape. Even if a train is idling at a complete stop, walking under, around, or between train cars is unsafe. The only sure way to avoid becoming a trespasser statistic is not to trespass.

# Common Trespasser Characteristics

Identifying the intended audience for education is not always straightforward. For example, drivers—especially young drivers—are an identifiable

**Railroad Fatalities**

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|
| All Fatalities | 748 | 760 | 813 | 794 | 849 | 729 | 849 | 906 | 967 | 954 |
| Trespasser Fatalities | 577 | 619 | 661 | 658 | 690 | 622 | 714 | 763 | 840 | 842 |
| Train Accident | 1 | 1 | 2 | 2 | 3 | 1 | 3 | 6 | 3 | 5 |
| Highway Rail Crossing | 127 | 151 | 156 | 158 | 160 | 116 | 136 | 162 | 150 | 179 |
| Not at Crossing | 449 | 467 | 503 | 498 | 527 | 505 | 575 | 595 | 687 | 658 |

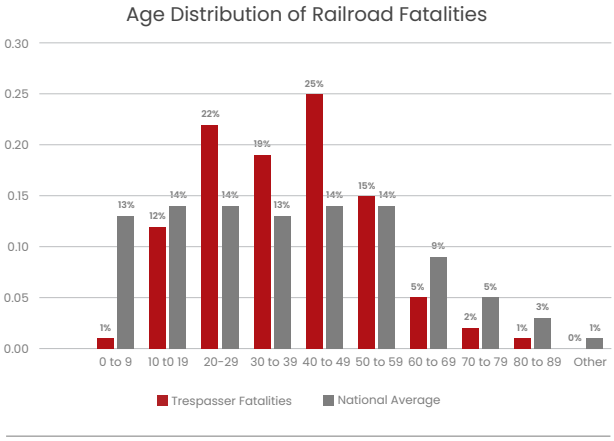
*Source: Federal Railroad Administration database on trespassing fatalities and injuries. March 31, 2025. Does not include intentional incidents such as suicide.*

audience for educating the general public about grade crossings. The locations of dedicated crossings are known. In contrast, trespassing can occur anywhere where there's a track.

By comparing the demographic profiles of decedents with those of the national population and identifying significant differences, the FRA profiled the following characteristics and risk factors associated with railroad trespasser incidents.[7, 8]

## Between 20 and 40 Years of Age

Trespassers who died in a railroad incident are much younger than the national average. The average age of death was 38 years, while the life expectancy at birth was 78.8 years. Two-thirds of trespassers were between 20 and 49 years of age at the time of death.[8]




*FRA. Rail Trespasser Fatalities Demographic and Behavioral Profiles. 2013*

## Predominantly Male

Railroad trespassers are likely to be male, who represented 82 percent of casualties compared to the national average of 49 percent. The proportion of their fatalities was highest between the ages of 20 and 49 years.[8]

In contrast, the 18 percent who were female were underrepresented compared to the national norm of 51 percent. However, when considering age for females, they had a higher proportion of fatalities under the age of 19 and over the age of 50 years.

Men are more likely to die from accidental causes than women. Nationally, men aged between 25 and 54 are 2½ times more likely than women to die from accidental causes. However, they were 4½ times more likely than women to be killed trespassing on railroad property. The high proportion of suicide-related railroad fatalities may account for some of the increased likelihood.

## Casualties Tend to be Caucasian

Compared to the national average, Whites and, to a lesser degree, African Americans were overrepresented among railroad trespasser casualties. Other races were at expected levels based on the national. Though males remain predominant among fatalities, the male-to-female ratios for Whites and African Americans have decreased somewhat from the 2008 Report.

**Demographics of Decedent Railroad Trespassers**

| | 2008 | 2013 | National Average |
|---|---|---|---|
| Male | 87% | 82% | 49% |
| Female | 13% | 18% | 51% |
| White | 78.2% | 81% | 72% |
| Hispanic | 18% | 16% | 16% |
| Black | 16% | 15% | 13% |
| Native American | 5% | 2% | 1% |
| Asian | 2% | 2% | 5% |
| Sources: FRA. Rail Trespasser Fatalities: Developing Demographic Profiles. 2008. FRA. Rail Trespasser Fatalities Demographic and Behavioral Profiles, June 2013 | | | |

## Employed with Low Income

Unemployment is not related to the occurrence of trespassing accidents. Most trespassing accidents occur in areas with unemployment rates similar to the national median rate.

That being said, married or unmarried, trespassers are more likely to have lower incomes and educational levels. Those who are overrepresented compared to the national average include younger renters in second-tier urban cities with railroads. Those with children are likely to be younger, typically in their twenties. A subset of trespassers are rural homeowners, who are often empty-nesters or couples with no children.

*Examples of second-tier cities include Austin, TX; Charlotte, NC; Denver, CO; Minneapolis, MN; Nashville, TN; Orlando, FL; Phoenix, AZ; Portland, OR; San Diego, CA; and Seattle, WA.*

## Alcohol and/or Drug Use Is Prevalent

Alcohol and drug use are significant factors in many casualties. Testing confirmed that 52.4% of non-suicide trespassers tested positive for alcohol and/or drugs, 44% for alcohol only, 19.1% for drugs only, and 10.7% for both.[8] Since 88 and 83 percent of 1,300 returned surveys from coroners and CMEs answered whether alcohol and drugs were involved, respectively, the actual rate of alcohol and drug use is suspected to be higher.

## Handheld Electronic Devices Are Distracting

As of 2014, the Department of Transportation reported an increase in trespasser accidents involving the use of headphones or other electronic devices. Trespassers are increasingly distracted by listening to music, talking or texting on their phones, or taking selfies, as the use of electronic devices has increased significantly over the past ten years.

## Pedestrian Trespassers Represent the Most Casualties

The types of incidents associated with railroad fatalities have mainly remained consistent over time. These included walking on, along, or across railroad lines, sleeping or sitting on the tracks, and using recreational vehicles.

**Pedestrians account for nearly 60% of trespasser fatalities**

| Activity | 2008 (n=935) | 2012 (n=1091) |
|---|---|---|
| Walking on or standing on the tracks | 23.3% | 22.8% |
| Walking or running across tracks | 6.6% | 8.5% |
| Walking or standing outside the track gauge | 2.1% | 3.8% |
| Sleeping or passed out, lying, reclining, lounging, or sitting on the track or inside the gauge | 20.0% | 21.5% |
| Riding or getting on or off a train | 4.9% | 2.8% |
| Being on a bridge or trestle (tunnels were not mentioned) | 1.4% | 1.9% |
| **Subtotal:** | **58.3%** | **61.3%** |
| | | |
| Vehicles were involved in 4.5% of instances | | |
| Recreational vehicles (ie, ATV, dirt bike, snowmobile) | 1.9% | 1.5% |
| Truck or automobile | 2.6% | 3.7% |
| **Subtotal:** | **4.5%** | **5.2%** |

Sources: FRA. Rail Trespasser Fatalities: Developing Demographic Profiles. March 2008. FRA. Rail Trespasser Fatalities Demographic and Behavioral Profiles, June 2013.

Slips, trips, and falls were common for trespassing casualties not at grade crossings, perhaps in part due to ballasted track over grade. The high incidence of fatalities that involve walking indicates that the majority of trespassing occurs in the vicinity of where they live. Overall, fatalities occurred in the decedent's home state 93 percent of the time, 78 percent in their county.[7]

## Suicides account for 20% to 25% more casualties

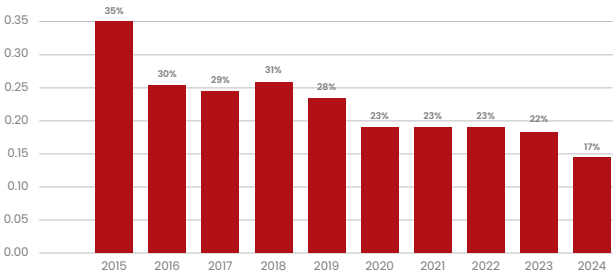
The Federal Railroad Administration (FRA) database on trespassing fatalities and injuries does not report suicides as casualties, per Title 49 Code of Federal Regulations, CFR Section 225.15. So, the following suicide data will inflate the number of trespasser casualties reported to the FRA. When suicides are included in the total for railroad fatalities, the 2008 and 2013 survey data suggest that approximately 25 to 30% of all railroad trespasser fatalities were the result of suicide.[6,8] In the past ten years, there appears to be a downward trend in reported suicides from a high of 35%. However, the number

**Total Trespass Suicides**

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Suicide: Suicides/Fatalities | 748 | 760 | 813 | 794 | 849 | 729 | 849 | 906 | 967 | 954 |
| Not At Crossing | 577 | 619 | 661 | 658 | 690 | 622 | 714 | 763 | 840 | 842 |
| At Crossing | 1 | 1 | 2 | 2 | 3 | 1 | 3 | 6 | 3 | 5 |

of total trespasser fatalities has been steadily increasing over the same period.

Suicide as a Cause of Trespasser Fatalities




*FRA. Suicide Incidents, Fatalities, and Injuries. Accessed June 18, 2025*

Fatalities for males 20 to 29 years old were disproportionately more likely to be suicides compared to the distribution of all male fatalities.[8] For females, the proportion of suicides steadily increases through ages 50–59, with older female fatalities much less likely to be suicides.[8]

Drugs and alcohol use among suicides is less than that of other railroad casualties. Drugs and/or alcohol were involved in fewer than 40 percent of suicides. Alcohol alone was involved in 28 percent of confirmed suicides.[8]

# Key Challenges

Train-pedestrian fatalities are concentrated in areas with a high population density and dense train traffic. Unsurprisingly, California, Texas, Florida, New York, Pennsylvania, Illinois, Ohio, and Georgia account for nearly 60 percent of all trespasser casualties during 2024. They represent the eight states with the highest population and six states with the highest number of rail miles.[9,10,11]

Of the approximately 3,100 counties across the U.S., ten with the highest number of trespasser casualties account for nearly 14 percent of trespasser casualties nationwide during the five years ending in October 2017.[6] Each of these ten counties experiences some of the limitations that are common among all jurisdictions where trespassing occurs.

**County Ranking by Railroad Trespasser Casualties**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Los Angeles | CA | | 6 | Palm Beach | FL |
| 2 | Cook (Chicago) | IL | | 7 | Fresno | CA |
| 3 | San Bernardino | CA | | 8 | Riverside | CA |
| 4 | Harris (Houston) | TX | | 9 | Contra Costa | CA |
| 5 | Broward | FL | | 10 | San Diego | CA |

*FRA National Strategy to Prevent Trespassing. 2018. Suicides not included.*

## Limited Resources

In the ten counties where trespassing is most common, trespass casualties account for less than two percent of their homicides, drug-related deaths, or highway fatalities. Understandably, communities focus their limited resources, including local law enforcement, where the need is greatest. Consequently, the amount of personnel and funding dedicated to addressing railroad trespassing is insufficient.

Congress provides funds each year for Operation Lifesaver, including $200 million from the Federal Highway Trust Fund for safety improvements at rail grade crossings.[12] However, there is no similar program for preventing rail trespassing.

## Lack of Enforcement

While statewide and county penalties for trespassing on railroad property vary, it's usually classified as a misdemeanor unless it causes an accident or poses a significant danger. Trespassers can be fined and arrested, but they are rarely prosecuted. For example, from 2013 to 2017, 1,080 railroad trespasser violations were filed in Cook County, with railroad police accounting for 1,034 of these. Yet, only 435 (40 percent) were prosecuted.[6] In Harris County, 228 trespassing violations were issued, but only one was

prosecuted.[6] Ultimately, the lack of enforcement reduces the perceived negative consequence of trespassing.


## Different Trespassing Laws

"Permissive use" or "frequent trespass" exceptions can make it challenging to enforce trespassing laws. With these exceptions, if a sizable number of people have been allowed to travel on a railroad track at a location for a considerable amount of time, the railroad may be liable for injuries that occur at these locations. Some jurisdictions require the person on railroad property without consent to know that it's railroad property to be charged with trespassing.

Other jurisdictions won't address trespassing on private property unless their police department receives written authorization from the property owner.

## Lack of Deterrents

Additionally, a lack of adequate physical deterrents—such as fencing and barriers that prevent trespassers from accessing a right-of-way—contributes to the ease of trespassing. Educational efforts on a local level have had limited success in changing the perception of trespassing on railroad property, evidenced by the upward trend in deaths and casualties.

## Lack of Planning

Finally, poor community planning has a role. A lack of grade crossings in large spans of track contributes to trespassing. Locating public bus stops closer to grade crossings could make the designated crossings more convenient for pedestrians.

It's also known that a lot of trespassing occurs near homeless encampments, shelters, food pantries, and schools. These are areas where a combination of efforts should be concentrated, including educational and directional signage, preventive fencing and barrier controls, monitoring and enforcement, and proximity to a safe crossing.

Ultimately, the goal is to allow pedestrians a safer, more convenient path to their desired location while creating significant deterrents to trespassing. Some railroads are having success using surveillance cameras mounted on locomotives or strategically located along a right-of-way to determine where to focus their efforts.

# Locations of Higher Risk

In addition to individual and community considerations, specific location attributes can contribute to the likelihood of trespassing. These can be categorized as ease of access to right-of-way, poor visibility, and the opportunity to take a convenient shortcut. Pedestrians will seek to travel the shortest distance between two points—sometimes to go from one side of the tracks to the other.

## Areas of Frequent Use Near Tracks

Trespassing "hot spots" include areas where people frequently visit that are near railroad tracks, especially apartment buildings, businesses, public buildings, or parks with parking lots separated by railroad tracks. There is often a "path" leading across the right-of-way.

## Crossing Points

Multiple tracks have proven to be especially dangerous since the sound of one train can mask that of another approaching on a different track. As a result, people may wait for the first train to pass but not notice a second train coming from the opposite direction. Also risky are crossings with no early train warning system. The absence of lights, horns, or other warnings can increase the risk of people trespassing while a train is approaching.

## Bridges & Trestles

Bridges and trestles are attractive to some trespassers. For example, if a pedestrian-accessible bridge isn't available, a railroad bridge can serve as a shorter path to cross a waterway or roadway. Thrill-seekers and youths have jumped off bridges and trestles to go swimming or bungee jumping. There have even been attempts to land on top of a moving train passing below. It's also not uncommon for trespassers to opt to walk across a railroad bridge with infrequent train traffic, rather than a parallel road that's busy with motor vehicle traffic.

## Tunnels

Tunnels may be attractive to certain trespassers, such as those seeking a shortcut or homeless individuals seeking shelter from the elements. People who trespass in tunnels and similar areas must go to greater lengths to bypass barriers, as these areas are generally well-protected with fencing and other deterrents. Tunnels often pose risks of electric shock and other hazards, in addition to the danger of being struck by an oncoming train.

## Stations

At or near stations, there are hot spots for trespassing activity, especially those on curves. The lack of visibility increases the risk for people who are unaware that they shouldn't be crossing the tracks. The proximity of stations to the right-of-way introduces a higher potential for accidents due to trespassing where they shouldn't cross. Accidents also occur when someone slips and falls from a platform or onto the tracks while trespassing or comes into contact with electrical wiring.

## Yards and Freight Terminals

A significant number of trespassing accidents occurred in railroad yards, rather than on the mainline track. Often, trespassers are drawn to yards to steal cargo, scrap metal, or other items. At times, fatalities from climbing cars and other equipment, passing between cars—sometimes when the train is moving—were discovered later by employees who hadn't realized an accident occurred.

## Schools

Elementary, middle, and high schools are potential locations for children to be involved in rail accidents. They may wander onto railroad tracks near their school or walk along the tracks to and from school. Recorded accidents involving children have occurred between 7 a.m. and 9 a.m. and 2 p.m. and 5 p.m. It only makes sense to install considerable protection to preempt trespassing by children.

## Summary

Trespassing affects all classes of freight railroads as well as public transportation, causing more deaths and serious injuries than any other type of railroad accident. While advancements have significantly improved the safety and reliability of

railroad operations, the incidence of railroad-related casualties among trespassers has continued to grow.

Trespassing involves a conscious decision to bypass the railroad's safety precautions in an unauthorized manner. Individual attitudes and behavior, along with social acceptance of trespassing, must be changed to decrease casualties from trespassing.

Education should focus on promoting behavior modification rather than merely raising awareness. Enforcement in jurisdictions with a trespassing problem can impose more serious consequences for those ticketed for railroad trespassing, much like authorities did to change perceptions about wearing a seatbelt. Railroads should continue to identify and invest in methods to monitor and deter trespassing. By developing coalitions to pool resources and combine these efforts, it may be possible to make trespassing a less appealing option for those who would otherwise consider it.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SAFETY

# When Rails Burn Hot

## Protect Workers from Summer's Extreme Heat

Summer 2025

**As summer temperatures climb, so do the risks for those who keep our nation's railroads running. Railroad workers face unique challenges when working outdoors in extreme heat—conditions that can quickly lead to dehydration, heat exhaustion, or even heat stroke if proper precautions aren't taken. With limited shade along stretches of track, the danger is more than just uncomfortable—it's life-threatening.**

This article explores how high heat impacts railroad workers, from the physical strain of laboring under a relentless sun to the increased risk of accidents due to fatigue or reduced concentration. We'll also cover the signs of heat-related illnesses, the importance of hydration, protective gear, and what both individuals and employers can do to stay safe. As climate patterns shift and summer heatwaves become more intense and frequent, understanding and mitigating these risks is more important than ever. For those working on the rails, safety isn't just about signals and switches—it's also about smart strategies for staying cool, alert, and protected in the heat.

## The Progression of Heat Stress

There are several stages the body goes through on its way to sustaining a serious heat injury.

As the body warms, blood vessels dilate, increasing circulation in the extremities and near the skin, releasing even more heat. Soon, we start to sweat. As sweat evaporates, it takes excess heat with it. However, it also takes the moisture from our bodies. Our blood volume decreases, and the heart must work harder to maintain blood pressure. Dehydration can occur very quickly, especially when sweating for an extended period. If we can't sweat, there is no evaporation, and the heat gets trapped inside our bodies.

One of the more minor signs that evaporation isn't working is heat rash. The irritation of the skin from excessive sweating, or sweat trapped beneath the skin, causes small, itchy bumps. Next are muscle cramps, typically occurring in the limbs or stomach. At this point, core body temperature is likely elevated. Cramps are a sign to take a break in a cool place, drink lots of fluids, and consume electrolytes.

As our core body temperature rises, so does the possibility of heat exhaustion. At this point, the body has lost too much fluid and/or electrolytes. The core body temperature is elevated, but still under 104°F.

### Signs of Heat Exhaustion

- Headache
- Profuse sweating
- Dizziness
- Nausea or vomiting
- Elevated heart rate
- Tiredness or weakness
- Pronounced thirst
- Fast but weak pulse
- Abnormally fast breathing
- Cool, clammy skin
- More muscle cramps

Heat exhaustion can quickly progress to heat stroke, so it is imperative to respond rapidly to symptoms if they appear. Anyone with signs of heat exhaustion should move to a cool, shaded area and take immediate measures to cool down, such as removing excess clothes, fanning themselves, applying ice packs or towels soaked in cool water, and drinking fluids, ideally with electrolytes. Emergency medical services are required if symptoms do not improve within an hour. It typically takes 1-2 days to recover from heat exhaustion.

A rare but serious heat-related injury that can occur around this stage is rhabdomyolysis (pronounced "rhab·do·my·ol·y·sis"). Rhabdomyolysis is the rupture, death, and breakdown of muscle tissue and requires prompt medical intervention. Symptoms include muscle pain and cramping, weakness, swelling, stiffness, extreme fatigue, confusion, headache, nausea or vomiting, dark urine, and prolonged or disproportionate muscle soreness lasting more than three days. If rhabdomyolysis is suspected, seek immediate medical attention as it can cause severe complications and even permanent disability.

Finally, we arrive at heat stroke—a severe condition that carries the risk of death or permanent injury. By now, the body has exhausted its ability to regulate its temperature. Our internal temperature has risen to 104°F or higher, where tissue death, alteration or loss of consciousness, organ damage, and shock will set in. Untreated, heat stroke can quickly lead to death.

## Heat Exhaustion vs. Heat Stroke—Know the Difference

Though heat stroke shares many symptoms of heat exhaustion (headache, nausea or vomiting, dizziness, weakness, elevated heart rate, and low blood pressure), there are some unique signs to look out for. Namely, brain-related symptoms—confusion, delirium, blurred vision, behavior changes, seizures, and slurred speech. Additionally, symptoms may include fainting, dry skin, rapid and shallow breathing, and significant changes in skin color (such as becoming pale or flushed).

If heat stroke is suspected, call emergency services and take immediate steps to cool the person down. Move the person into a cool or shaded environment, apply ice packs to armpits and/or neck, pour cool water over them, or rotate the use of cool or cold soaked towels. Additionally, do not give the person water while waiting for emergency services, as people with heat stroke often aspirate. Do not give fever reducers either, as they can worsen organ damage and will not lower the core body temperature of a person experiencing heat stroke. Depending on the severity and the promptness of treatment, recovery can take anywhere from a few days to over a year, with some individuals sustaining permanent damage to the brain or other organs.

## Staying Cool and Safe

To avoid heat stress and injury, follow these general recommendations: stay cool, stay hydrated, seek shade or well-ventilated areas, limit exertion, and wear loose, breathable clothing. All well and good, except for the fact that rail work is not exactly conducive to any of these things.

Outside, the sun is beating down, the temperature (and worse, the humidity) is high, and job sites often aren't exactly in the most convenient locations. Access to air conditioning may be nonexistent. Even "inside," cars are rarely, if ever, air conditioned—quickly becoming ovens on wheels. For safety, workers must often wear bulky protective gear that traps heat and prevents the body's natural cooling mechanisms from working correctly. Additionally, the work frequently involves strenuous physical activity. Most of the "risk factors" for heat stress are checked for rail workers by default. All things considered, following the general "best practices" seems almost impossible. But there are still plenty of things we can do to stay safe (and cool).

The first line of defense is heat stress training, which employers are required to provide for their workers. Numerous training courses are easily accessible online.

Next, workers need to stay hydrated, and that starts the night before. During work, employees should aim to drink 4 cups of water per hour, plus electrolytes. For an eight-hour workday, that's a minimum of two gallons per person. Keep coolers full of clean ice, fresh water, and sugar-free Gatorade.

On an individual level, workers should wear UV-protective clothing that is loose, lightweight, breathable, and moisture-wicking. Woven fabrics tend to drape better than knits, and a loose weave allows for good breathability, which is essential for heat dissipation. Moisture-wicking fabrics, such as those found in athletic wear, are designed to pull sweat away from the skin, which is particularly important in high-humidity conditions.

As for color, consider the fit. Light or reflective colors work best when worn close to the skin, as they reflect heat away from the body. However, when worn in a loose garment, they also reflect our body heat and trap it inside our clothes. Dark colors are better for loose-fitting clothes, as they can help conduct heat away from the body and even promote airflow. Take breaks away from active danger zones where you can remove your protective gear and allow for better cooling.

For more extreme conditions or when used under heavy protective gear, cooling vests or neck wraps that incorporate ice packs are beneficial. Although they can be expensive initially, they are reusable and allow for quick re-freezing. Instant cold packs are also helpful to have on hand, as they provide instant access to cold without relying on traditional cold storage methods (such as ice or refrigeration).

## Wet Bulb Globe Temperature (WBGT) Work/Rest Hydration Table

Quart of Water Intake Per Hour (QWH)

| Heat Risk | Acclimation | WBGT | Light Work | | Moderate Work | | Heavy Work | |
|---|---|---|---|---|---|---|---|---|
| | | | Work/Rest | QWH | Work/Rest | QWH | Work/Rest | QWH |
| No Risk | Unacclimated | 78 - 79.9° F | 50/10 Min | 1/2 | 40/20 Min | 3/4 | 30/30 Min | 3/4 |
| No Risk | Acclimated | 78 - 79.9° F | Continuous | 1/2 | Continuous | 3/4 | 50/10 Min | 3/4 |
| Low Risk | Unacclimated | 80 - 84.9° F | 40/20 Min | 1/2 | 30/30 Min | 3/4 | 20/40 Min | 1 |
| Low Risk | Acclimated | 80 - 84.9° F | Continuous | 1/2 | 50/10 Min | 3/4 | 40/20 Min | 1 |
| Moderate Risk | Unacclimated | 85 - 87.9° F | 30/30 Min | 3/4 | 20/40 Min | 3/4 | 10/50 Min | 1 |
| Moderate Risk | Acclimated | 85 - 87.9° F | Continuous | 3/4 | 40/20 Min | 3/4 | 30/30 Min | 1 |
| High Risk | Unacclimated | 88 - 90° F | 20/40 Min | 3/4 | 10/50 Min | 3/4 | Avoid | 1 |
| High Risk | Acclimated | 88 - 90° F | Continuous | 3/4 | 30/30 Min | 3/4 | 20/40 Min | 1 |
| Extreme Risk | Unacclimated | > 90° F | 10/50 Min | 1 | Avoid | 1 | Avoid | 1 |
| Extreme Risk | Acclimated | > 90° F | 50/10 Min | 1 | 20/40 Min | 1 | 10/50 Min | 1 |

Adapted from: 1) USGS Survey Manual, Management of Occupational Heat Stress, Chapter 45, Appendix A. 2) Manual of Naval Preventive Medicine, Chapter 3: Prevention of Heat and Cold Stress Injuries. 3) OSHA Technical Manual Section III: Chapter 4 Heat Stress. 4) National Weather Service Tulsa Forecast Office, Wet Bulb Globe Temperature. https://www.mesonet.org/images/site/WBGT_Handout.pdf

An adequate acclimation protocol for new or returning workers is also crucial. Over half of heat-related deaths happen on the first day, and 70% within the first week. OSHA recommends starting with 20% of the normal work duration on the first day and increasing by 20% each subsequent day until they reach their normal shift length. Schedule unacclimatized workers for shorter work periods and more frequent breaks (refer to the wet bulb temperature table below for recommended work and break times based on heat level, exertion, and acclimation).

Monitor workers closely throughout the day and encourage them to drink water and take breaks as needed. Always notify a supervisor at the first sign of trouble. Implementing a buddy system is an effective way to ensure worker safety without compromising efficiency. When evaluating a job site, take note of radiant heat, air movement, heat conduction, sun exposure, and relative humidity. Adjust accordingly. Battery-operated fans can help mitigate stagnant air, and portable shade options will also improve conditions and increase safe work duration.

One of the most important factors to consider is the Wet Bulb Globe Temperature—the lowest temperature that water evaporation can cool to. A wet bulb temperature of 80-85°F is considered low risk. 85-88°F is moderate risk, 88-90°F is high risk, and 90F and above is considered extreme risk. At a wet bulb temperature of 95°F, no amount of fans and shade is enough—sustained exposure will be fatal without air conditioning, without exception. While heat acclimation can dramatically increase how much an individual can tolerate, we are all bound by the limits of physics.

Another thing to note is that these considerations only include healthy adults. Additional risk factors to consider are age, level of fitness, pre-existing medical conditions, and some medications. Heat tolerance also varies between individuals. Some workers may need more frequent breaks or to avoid higher levels of heat exposure entirely.

Heat is nothing to mess with—but it can be managed with proper training, preventative measures, and a little planning. Establishing heat guidelines and a robust set of safety protocols is crucial to

the success and longevity of teams operating in extreme conditions. Not to mention, heat stress also negatively affects work speed and quality. Practices that help workers stay cool do more than just keep them safe—they also decrease accidents and can improve overall productivity and outcomes.

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# Gear Up Like Your Life Depends on It. It Does.

Summer 2025

**Ask any railroader, and they'll tell you that safety is the industry's number one priority. And for good reason. The railroad work environment is inherently hazardous, and working conditions are often challenging.**


*The **Cranemasters Safety Firewall** program includes posters such as this one for PPE throughout work areas.*

To safely perform tasks related to railroad construction, maintenance, or repair, workers receive extensive safety training and wear Personal Protection Equipment (PPE).

Innovations in heavy-lift equipment and safe practices have also contributed to the very low fatality rate among railroad employees, as well as a 60 percent drop in employee injuries over the past two decades.

PPE serves as the last line of defense against injury, and proper selection and use are essential for railroad workers. Railroad companies and contractors must follow Federal Railroad Administration (FRA) guidelines for providing workers with the correct PPE and training on its proper use. Workers must use PPE when required, and only as intended by the equipment. Anyone entering a designated area or working near others wearing PPE must also wear the necessary PPE.

The equipment needs to fit correctly, be maintained in good condition, and be replaced when necessary to ensure it can provide the intended protection. It shouldn't be altered or used if it has been changed. Overall, PPE is a crucial component in preventing injuries and protecting workers in challenging and hazardous environments.

## Top 12 Reasons to Wear PPE

Railroad construction can expose workers to a variety of hazards and risks that employers and workers need to consider when choosing and using personal protection equipment, including:

1. Movement of trains, heavy equipment, and vehicles on the track or site
2. Working at height over bridges, elevated tracks, or cargo cars
3. Falling objects, slippery surfaces, uneven ground, and tripping hazards
4. High-voltage electricity and working near overhead power lines or substations
5. Chemical burns and Hazmat exposure
6. Welding sparks and flying debris that can damage eyes
7. Loud noises that can damage hearing
8. Adverse weather conditions, such as high humidity, rain, snow, fog, or reduced visibility
9. Physical strain and musculoskeletal injuries from repetitive or stressful tasks
10. The risk of dehydration, heat exhaustion, stroke, or frostbite
11. Fatigue and impaired alertness from long hours or lack of sleep
12. Human error and lapses when operating equipment or following safety protocols

## Selecting PPE

When selecting PPE, wearer comfort, durability, and safety are important considerations. Meeting or exceeding regulatory standards is also critical to protecting workers' long-term health, well-being, and productivity. The following is a brief introduction to standard PPE for railroad workers.

### Head Protection

Whenever there is a risk of a head injury, workers must wear a safety helmet or hard hat. They protect wearers from falling objects from above, stationary objects, and lateral impacts, as well as potential head contact with high heat and electrical hazards, and from falls. Failing to provide a worker with a hard hat or permitting work without a hard hat when one is required is a violation.

Cranemasters uses the BUL-C33HOR hard hat, Type 1, 6 Point Rachet Suspension, Full Brim Hard Hat, Ratchet Knob, Hi Viz Orange, ANSI Z89.1-2014 compliant, Class E, G, and C.

According to OSHA standards for head protection, there are two types of hard hats based on their impact protection.

**Type 1** head protection shields from blows to the top of the head.

**Type 2** head protection defends from blows to the top and sides of the head.

Additionally, there are three classes of protection from electrical hazards.

**Class C (Conductive)** head protection is not designed to protect against contact with electrical hazards.

**Class G (General)** head protection is proof tested at 2,200 volts to protect against reduced exposure to low-voltage conductors.

**Class E (Electrical)** head protection is designed to reduce exposure to higher voltage conductors and is proof-tested at 20,000 volts, phase-to-ground.

Workers performing hot work like operations that involve producing heat, sparks, or open flames, need to wear a welding cap or bandanna underneath their hard hats to protect themselves from sparks.

Hard hats are not to be worn with baseball caps or similar caps or liners that interfere with their fit or function. People indoors, in vehicles, or in equipment that provides overhead protection are exempt from wearing a hard hat.

## Eye and Face Protection

When working in any construction environment, it's necessary to wear company-approved safety glasses or FDA-approved prescription safety eye-wear that covers the entire eye or coverall-type safety goggles. All Cranemasters' jobs require wearing ANSI Z87.1-compliant safety glasses with side shields. When performing hot work, personnel must wear protective eye-wear, such as welding helmets or face shields, that have the appropriate filter lenses to shield against infrared and ultraviolet radiation.

You should not wear contact lenses in the presence of wind, dust, or other foreign matter or when there's the potential of chemicals or welding materials to pose the risk of splashing, misting, fumes, or vapors.

Aside from being impact and scratch-resistant to protect against impacts and debris, the safety eye-wear lens should not alter the perception of red, yellow, and green signal colors. Peripheral visibility, 100% UV protection, anti-fog, and anti-static properties are also important.

## Hearing Protection

Between 70 and 80 decibels is considered the threshold separating sounds that are safe from those that are harmful to your hearing. Prolonged or repeated exposure to sound above 85 decibels can cause hearing loss. The higher the decibels, the shorter the exposure time before hearing damage may occur. Not only is working beside train tracks loud due to the passing trains, but also from the machinery and equipment used for the work. To avoid occupational hearing loss, there are times when railroad workers should wear earplugs with an appropriate Noise Reduction Rating (NRR), ear muffs, or both. For example, hearing protection should be worn when:

- 50 feet from a locomotive, retarders during operations, roadway or work equipment operating, jet blowers, or pile drivers.
- 15 feet from cutting or welding equipment, wheel grinders or sanders, chain saws, nail guns, power saws, equipment powered by air, combustion engine, electricity, hydraulic, pneumatic, and operating lift or transfer equipment

When the working environment impairs communication and, consequently, the safety of operations for workers, there are protective communication headsets that safeguard hearing while facilitating communication along with hand signals.

## Hand Protection

Comfort, fit, and dexterity are essential, especially when working with your hands for extended periods. Functionally, safety gloves provide a secure grip while protecting against cuts, lacerations, abrasions, and punctures. They also protect against high heat and chemical burns. Additionally, impact-resistant safety gloves absorb and redistribute energy away from the fingers and hands during impact.

There are different types of PPE gloves for railroad construction work, including standard gloves, thermal gloves, and welders' or electricians' gauntlets. The specific work indicates the type of protection required.

## Respiratory Protection

With many railroad construction projects, there may be welding fumes, gases, or particulates. Respiratory protection is always required when exposure exceeds Permissible Exposure Limits (PELs), a common occurrence in confined spaces. But even outside, respiratory protection may be necessary.

For example, microscopic particles of ballast dust released into the air are a significant hazard of railroad construction or maintenance, as exposure to them can result in workers inhaling silica particles. Exposure to silica can lead to long-term health problems. Typically, in the form of a mask with a filter, respiratory PPE protects the worker's lungs from exposure to harmful particles stirred up during the project.

In addition to users being clean-shaven, respirator use includes the following requirements:

- Proper respirators and cartridges must be selected to filter out the specific hazards that need to be addressed.
- A medical evaluation is required before being fitted for a respirator, even if it's to be used once for a short time.
- Training and properly putting on and taking off the respirator according to the manufacturer's instructions.
- An annual fit test is required to ensure that the respirator size and fit form a tight seal on the wearer's face.
- A seal check (also called a fit check) should be performed before every use to ensure a proper seal.

User seal tests are done with either positive or negative pressure, depending on the respirator and manufacturer. With positive pressure, the user gently exhales while blocking air from exiting the face-piece. With negative pressure, the user inhales sharply while blocking air from entering the face-piece. A good seal with positive pressure will cause the face-piece to pressurize slightly before increased pressure causes outward leakage. With negative pressure, the face-piece will collapse slightly.


## Clothing

Wearing high-visibility safety clothing is mandatory for railroad workers who operate in areas with moving trains and heavy machinery. They must wear a yellow or orange ANSI Class III vest or other outerwear with reflective striping—designed to provide 360° visibility in dark, hazardous conditions. It offers the most visibility of the three classes and three types of high-visibility clothing, as specified in the ANSI/ISEA-107 standard.

The following is a brief overview of ANSI/ISEA 107 classes and types. Always choose the higher-class product if you're unsure which to select, or confirm with OSHA which one is the appropriate choice.

**High-Visibility Clothing: ANSI / ISEA 107 Classes and Types**
(American National Standards Institute / International Safety Equipment Association)

| **Visibility** Need for Safety | **Type*** | **Environment** | **Reflective Strips and Background Material** |
|---|---|---|---|
| Lowest | O | Away from traffic | Background colors: Yellow-Green, Orange-Red, and Red† |
| Greater | R | Right-of-way and Construction | Type R has 72% more background material than Type P |
| | P | Those exposed to traffic <25 mph | Type P has wider reflective stripes than Type R. |
| | | | Fluorescent background colors:<br>• Orange-Red<br>• Yellow-Green<br>• Red (except for flaggers) |
| Highest | R | Flaggers, others in or near traffic exposed to traffic >50 mpg | Class 3 Types R and P have 60% more background material than Class 2 and are highly visible at night. |
| | P | Police, Firefighters, Emergency Responders | Fluorescent background colors†<br>• Orange-Red<br>• Yellow-Green |

*Type legend: O= Offroad; R= Roadside; P = Police
†Red has the lowest luminescence factor of the colors

In general, high-visibility vests and outerwear should be waterproof, metal-free, and feature reflective strips. Garments are specific to job requirements and may require protective and fire-resistant (FR) clothing such as cotton, wool, or leather to protect against sparks and heat; leather aprons, jackets, or sleeves for additional protection; fire-retardant chemically treated clothing; and/or flame-resistant gloves, depending upon the nature of the job.

Clothing can't interfere with vision, hearing, freedom of movement, or the use of hands or feet. Hooded sweatshirts and other clothing that can block peripheral vision are not allowed, nor is outerwear that can easily snag on something. Long pants are required, and when the entire body needs to be visible, high-visibility trousers are available.


## Fall Protection

Falls are the leading cause of injury at most worksites. To prevent injury, the FRA requires companies to provide workers with a fall arrest system or a safety net system whenever they are working twelve feet or more above the ground or water surface. The twelve-foot standard provides the necessary fall protection for railroad employees working at heights while allowing sufficient movement to complete the task.

A worker wears a full-body safety harness attached to a lanyard or self-retracting lifeline (SRL), which is secured to an anchor for support. Together, they form the ABCs of a fall arrest system.

Training on how to use fall arrest systems is essential, as they are an active form of protection.

Wearers need to use fall protection equipment properly, inspect it monthly and before each use, and be familiar with the safety procedures. A Fall Rescue Plan is required to equip employees with step-by-step procedures in the event of a rescue.

## The ABCs of Fall Protection

Anchorage, Body Support, and Connection. Meeting OSHA and ANSI safety standards.

### Anchorage

The anchorage is the attachment to an approved, stable surface that is strong enough to support a person, such as a bridge component. It must be independent of the means of work, located at a height that will not allow free fall greater than 6 feet, and positioned to minimize swing fall hazards. Finally, it must be capable of supporting 5,000 pounds per worker attached or be designed and approved by a Qualified Person per OSHA 29 CFR 1926.502(d)(15).

### Body Support

A full-body safety harness is the only approved option for those working in fall arrest. They must meet ANSI Z359.11 standards, distributing the fall throughout the body and suspending the person upright after a fall. They must limit the maximum arresting force to 1,800 pounds and include a keeper to control the ends of any dangling straps. Finally, they need to be properly adjusted for a snug, comfortable fit.

Safety belts are no longer acceptable because they concentrate the entire force onto one area of the body, and workers can slip out of them.

### Connectors

There are two key types of connections between the anchorage and full body harness—each used for different situations.

A safety lanyard is a set length of rope, wire rope, or webbing strap designed with an internal or external shock-absorbing feature that decelerates the worker to a stop in the event of a fall. Self-retracting lifelines (SRLs) retract automatically into a housing unit, eliminating slack in the line.

Cranemasters use an SLR with a minimum tensile load of 5,000 pounds per ANSI Z350.13 standards. Because SRLs are longer than lanyards, they offer greater mobility and are appropriate when the fall clearance varies. In the event of a fall, the fast-acting braking mechanism in the housing unit arrests the descent.

## Safety footwear

Workers on even surfaces and in all kinds of weather conditions depend on safety footwear to prevent slips, trips, and falls. Safety footwear designed for rough, outdoor environments features broad soles and deep treads for stability and protection, as well as waterproof materials, metal-free options, and reflective elements for visibility. Besides the correct size, lightweight and breathable materials with shock absorption can make safety footwear comfortable, even when you're on your feet all day.

Safety boots for the railroad industry must meet specific safety requirements, as defined by OSHA Standard 1910.136, ANSI Z41.2, ASTM F-2412-11, ASTM F-2413-11, and Standard Class #75 for safety toe footwear.

## Safety Toe Footwear Considerations:

- Must cover the ankle (no athletic designs)
  - Boot height should be at least 6 inches for men and 5.5 inches for women, measured from the floor to the top of the boot
  - The measurement of any part of the collar cannot be less than 4.5 inches

- Must also be laced up (no slip-on boots)
- Have a defined heel
- Have slip-resistant soles that provide good traction and are thick enough to withstand punctures
- Have corrosion-resistant steel toe caps or non-metallic toe caps for heat and chemical exposure
  - Drop test at 200 joules of test energy (20 kg from a height of approximately one meter)
  - Static pressure test at 15 kilonewtons (approximately 1,500 kg of pressure)
- Resistance, non-toxicity, and properties of the materials used in the sole and shoe upper

## Wear Your Gear. Your Crew is Counting on You.

Safety measures aim to prevent harm before we encounter hazards—by relocating or replacing dangers, isolating workers, or modifying the work environment to reduce risk. However, when these controls aren't enough, personal protective equipment (PPE) is the final barrier between you and injury. Consistent proper use of PPE is essential to keeping you and your team safe on the job.

SAFETY

# Stretch First.

## Stay Safe and Strong All Day Long.

Summer 2025 | Dr. Jack Brown, PT, DPT

**Rail work is hard work. One wrong move, and you're derailed with a strain, a pull, or worse. That's why Cranemasters' Stretch and Flex Program is how you stay on track. This work demands strength and endurance from our equipment and from us. You've got to prep the machine before you run it. Your body is no different.**

When external stress exceeds the threshold for what our body can withstand, we're prone to injury and pain. There are several actionable steps you can take immediately to start making a substantial difference in your physical resilience.

One of the most practical ways to prevent musculoskeletal injuries and enhance your overall flexibility is to stretch just like pro athletes do before every practice and every game.

The Cranemasters Stretch and Flex Program is about moving with purpose and thinking about making every movement count. It often reduces or eliminates nagging aches that can otherwise intensify the more you work.

Commit to 5 or 10 minutes before starting your shift, and at the end of the day. Start with 1 to 2 sets of 10 to 15 repetitions, holding each position for 20 to 30 seconds at the end. Later, you can increase to 2 to 3 sets with longer duration holds of 30 to 45 seconds. Just that small amount of time can significantly reduce the risk of injury and decrease work-related discomfort.

## Max Results

**Stretch and Activate –** After holding a stretch for a particular muscle group (while they are relaxed), actively recruit the muscles while they are still in the newly acquired range of motion. This action reinforces the increased range of motion you just attained, preserving the benefits of the stretch and prolonging the improvement in mobility.

**Challenging Stretches Are Good Stretches –** If you encounter a particular movement that is challenging, perform an additional set or hold the stretch for a longer duration. The movement should feel easier over time.

**Controlled Breathing –** Many people tend to hold their breath and brace when stretching. Holding your breath works against you because the nervous

# Stretch To Avoid Injuries

## Cranemasters Stretch and Flex Program

### Neck Stretch

Hold your hand on your head and gently pull down. Use your other hand behind your back as an anchor.

### Upper Back

Arms in front of your body with your fingers interlaced, reach up and out as far as comfortably possible.

### Full Body

Reach your hands up and over your head as far as comfortably possible.

### Lower Back

With your hands in the center of your lower back, gently push on your lower back.

### Shoulders

Roll your shoulders for 15 seconds. Roll them forward first, then roll them backward.

### Quads

Stand with one hand holding your foot to stretch your quadricep. Use a wall for balance.

### Calf Muscles

With your forward knee bent and your back leg straight, push your back heel downward.

### Hamstrings

Bend at your waist and reach down to your toes as far as comfortable.

### Forearms

With your palms together, gently push down until you feel your forearms stretching.

### Squat

With your arms straight out front, bend at your knees as far as comfortable.

### Ankle

Roll each of your ankles 15 times in each direction. Use a wall for balance if necessary.

### Fingers

With one arm held out straight, gently pull back on your fingers.

Don't overexert. Stretching should not painful.
Start and finish stretches in a relaxed position, standing tall with your feet shoulder-width apart.
Breathe naturally and move smoothly to get the most out of your stretch!

**For complete instructions please review the Stretch and Flex PowerPoint.**

Cranemasters Safety Firewall: Stretch and Flex Program

system will immediately initiate protective measures and minimize the effectiveness of the stretch. When stretching, it's essential to continue breathing normally throughout the stretch to allow your body to adapt to the extended muscles.

**Vary Your Stretches –** Be sure to vary your stretching and mobilizing routine, devoting enough time to each muscle group. A common mistake is to repeatedly perform the same stretches without also addressing other areas of the body. As a result, it creates an imbalance between mobile muscle groups and overly tight muscle groups.

**Consistency is Key –** Although movement preparation routines can be brief, consistency is crucial for improving and maintaining mobility. As stated previously, the body will adapt to the demands placed on it. The energy and time you invest in performing a mobility routine regularly will be rewarded with improved physical performance.

## Further Recommendations

As a practicing Doctor of Physical Therapy, my primary focus in practice is to address the root causes of injuries and physical limitations that may contribute to an individual's pain experience. I also teach exercises and intentional movements to avoid further pain and damage. However, other health factors can have a tremendous influence on your quality of life.

**Sleep –** Quality sleep is critical for recovery and quantity is just as important. Getting an adequate amount of quality sleep within a 24-hour timeframe can yield significant improvements in physical function and performance. Even if you're working irregular hours or long shifts, getting enough uninterrupted sleep is essential.

**Stress Management –** Over time, chronic stress can trigger other reactions in the body, including the intensification of pain associated with past or present injuries. Relaxation is necessary to be as productive as possible. Enjoyable activities that provide an outlet from the continuous stress of work and life can be highly beneficial, physically and psychologically.

**Diet –** Food is fuel for your body's engine. It takes the right fuel to optimize performance. Ensuring a balanced intake of the primary nutrients (proteins, carbohydrates, and fats) is essential for maximum physical function. The United States Department of Agriculture (USDA) developed a comprehensive resource at MyPlate.gov, containing all the information needed to eat healthy.

It can be challenging to adopt and successfully implement lifestyle changes. I challenge you to start by choosing one domain of health to focus on. It does not have to be an all-or-nothing process. Start small and build on the little wins, recognizing that there will be lapses or inconsistencies that occur. Let the momentum from successes (no matter how small) propel you to additional change, maybe within the same domain or to another realm of health and wellness.

**Dr. Jack Brown, PT, DPT**
Direct Performance Physical Therapy, LLC

*Located in Virginia Beach, VA, Direct Performance Physical Therapy specializes in comprehensive movement analysis to help eliminate pain, prevent injury, and enhance athletic performance.*

SAFETY

# Hundreds of Builds. Five Years. Zero Injuries.

Summer 2025

**Cranemasters is proud to announce that on June 9th, its North Chesterfield division reached a significant milestone—five years of injury-free operations. This is the Cranemasters' engineering and manufacturing facility. Over the past 2 ½ years, Cranemasters has completed 55 point-of-sale orders, 27 large builds or rebuilds of cranes, trucks, and other major components for customers, and 299 internal jobs for its use.**

The North Chesterfield Engineering and Manufacturing Team with a new Hi-Rail Recovery Crane they just built.

North Chesterfield Engineering and Manufacturing custom designs and builds heavy-lift equipment. It's also Cranemasters' corporate headquarters, where executive management and key managerial and support staff are located.

In addition to roughly 40 employees in corporate, the North Chesterfield division has six engineers who design and produce technical specifications, and approximately 20 highly skilled mechanics and tradesmen who manufacture. The fact that they've been able to do so much work without incident or injury is an accomplishment worth celebrating. They're not more or less on call or exposed to emergency railroad work. Yet, they are loading raw materials, cutting steel up to two inches thick, welding, grinding, fabricating, assembling and joining mechanicals, installing electrical and hydraulics, and painting. Each project and every task has the potential for an injury, all of which have been entirely mitigated by the North Chesterfield division for five consecutive years.

The Cranemasters North Chesterfield state-of-the-art plant is expansive. It houses tools, equipment, and machinery, including forklifts, three overhead cranes, a large plasma table, and a painting booth large enough for a semi-truck.

## How One Team Builds a "Safety Always" Workplace

When asked how the Engineering and Manufacturing staff contribute to safe operations, Aubrey Amadeo, COO, (shown here with the plasma cutter) credits preparation and floor leadership.

"I cannot say enough good things about the foremen and lead engineers that we have. They are experienced, talented leaders whom people listen to and can rely on. And they are good at planning things out for efficiency and productivity while always considering where there are risks."


### Pre-work Plan

Typically, the foremen develop a day's work plan one or more days in advance. Every workday begins with the 6 a.m. Job Safety Briefing led by our foremen, including stretching exercises, an accounting of work to be done, and safety hazards to avoid—all broken down for each person. As a result, everyone knows their assignment for the day, which tools they'll use, what PPE they'll need, and which safety hazards to avoid. And everyone is looking out for one another, especially new hires, making sure they're aware of the hazards and how to avoid them.

# We never compromise on safety.

## Welding, working heavy steel, and lifting crane assemblies is risky business. We depend on each other and the Cranemasters safety program so we leave with the same number of fingers and toes as when we showed up for work.

The foremen concur, "We all agree that we need to have a plan and work that plan. If something new is introduced, a change in the process or new criteria, anything like that, then you change the plan, but you still have a plan and you still work the plan."

### Worker Input

Occasionally, changes are made to the shop's layout for efficiency and safety, or to make room for new equipment.

For example, storage locations for parts and equipment were moved to increase floor space. That changed where workers needed flash curtains for protection. To solve the issue, the crew hung a line across the shop with an extendable and retractable flash curtain.

Often, the people doing the work are the ones coming up with solutions for a more efficient and safer workplace. And our people are always talking with and listening to one another, so the best ideas tend to surface.


### Post-work Review

Every day at 4:15 p.m., a group of leaders, including foremen, managers, and lead engineers, walk through the building looking for any hazards. The objective is to identify any issues that require attention in the next day's plan, including housekeeping matters, risks, or changes that have occurred over the last 24 hours. Perhaps it's equipment that has been moved, creating a tripping hazard or worn wiring on an electric tool. Then, work can stop at about 4:30 p.m. Between starting the day off right and ending the day with a review, the team eliminates preventable hazards.

## Cranemasters Celebrates Safety Accomplishments

Cranemasters is celebrating with all 65 employees from North Chesterfield in honor of their achievement. We've rented a pavilion at the stadium during a Richmond Flying Squirrels Baseball game, where they'll be serving food for everyone and passing out gifts during the game. Our incredible employees will have a good time creating lasting memories as part of our Cranemasters family.

# Cranemasters Railroad Emergency and Construction Services

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