What did the Kansas Fire Service do in 2014?

Kansas Fire Incident Reporting System Annual Report

CDW

On the cover

El Dorado Fire Department firefighters work a structure fire.

In This Issue

Eudora Fire Department celebrates the opening of its new station in 2014.

Many fire departments contributed quotes and pictures for this report. Thank you! We hope you enjoy the new format of our annual report.

Tweet us @KSFireMarshal to share your pictures for the 2015 report!

New Highlights

Two Birds, One Stone

The Kansas Forest Service now receives all KFIRS data for vegetation fires. Technically, a fire department should create a 209-form and submit it to the KFS for vegetation fires of certain sizes. Now both datasets are cross referenced for maximum data collection. Since the KFIRS report collects the same information as a 209-form, pairing the data is straightforward and better represents Kansas.

Map of the Year

Are you curious where grass fires happen? Visit the KFIRS Vegetation Fires and Kansas Green Report map created through a partnership with the Kansas Department of Emergency Management. KDEM created the map using KFIRS data and other data sources. Each county even has phone number information for residents to contact prior to burning pastures. Click here to see the map.

NFIRS Ops

The Office of the State Fire Marshal offered a new KFIRS-related class on fire data analysis in 2014. This 4-hour class helps fire departments get inside their data, crunch numbers, and work with data-driven decisions.

Visualize Kansas Fire Safety

Following Campus Fire Safety Month in September, the Office of the State Fire Marshal launched a new contest open to Kansas residents enrolled in a university or college. Participants were challenged to create an infographic featuring fire safety information, using raw KFIRS data. Freshman Isaiah Cardona submitted the winning infographic which you can view by clicking here.

2014: The Strongest Year Yet

More fire departments participated than ever before in the Kansas Fire Incident Reporting System.

When the 2013 Annual Report was published, 486 fire departments had submitted reports. Only 31% of those participating departments submitted every month. This year, participation has risen to 513 departments. More impressively, 75% of those departments submitted reports every month. You can see the 3-year reporting history for all fire departments in Kansas by clicking here.

Reports increased by almost 21,000 incidents during 2014. When comparing yearly statistics, it is important to remember that any increase could be an indication of trends or better reporting. Local trends are more easily spotted using the 2014 KFIRS Regional Stats Packages found on the same website above.

Kansas does not maintain a central repository for reports. Instead, reports are submitted directly to the National Fire Incident Reporting System (NFIRS) housed in the National Fire Data Center (NFDC) at the U.S. Fire Administration (USFA).

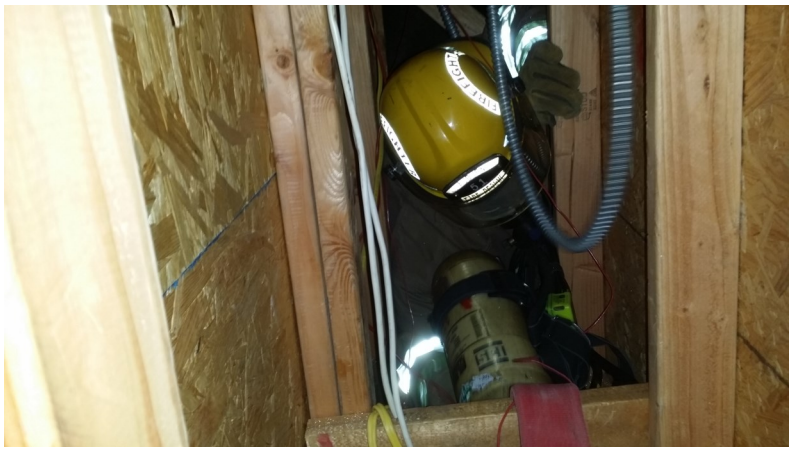
Reporting to the Kansas Fire Incident Reporting System is a requirement for all Kansas fire departments under K.A.R. 22-5-1. Since 1996, any response a fire department makes is required to have a standard report submitted to the Office of the State Fire Marshal. This applies to all call types, not just fires.

	2014	2013	2012
Reporting FDs	513	486	469
FDs reporting each month	384	247	224
Total Reports (including NA's)	258,778	237,793	234,271
Fire Reports	21,566	15,435	22,076
EMS Reports	163,703	154,668	148,510
Other Reports	73,509	67,327	63,180

KFIRS is growing quickly, with more reports and participating departments each year. The numbers in this table include all submitted reports, valid or invalid. Invalid reports were removed from all other statistics throughout this report.

2014 State Reporting Status from the U.S. Fire Administration current 7/6/2015

			Fire Reports		EMS Reports		Other Reports		Invalid Reports		No Activity	
State	FDs	Incidents	No.	%	No.	%	No.	%	No.	%	No.	%
AK	173	60,806	2,989	4.92%	39,885	65.59%	17,932	29.49%	0	0%	167	0.27%
AL	350	225,239	14,798	6.57%	147,936	65.68%	62,505	27.75%	3,243	1.44%	37	0.02%
AR	777	206,039	22,568	10.95%	125,514	60.92%	57,957	28.13%	700	0.34%	1,012	0.49%
AZ	94	459,101	14,712	3.2%	330,151	71.91%	114,238	24.88%	9,170	2%	9	0%
CA	505	2,174,707	77,403	3.56%	1,490,748	68.55%	606,556	27.89%	12,075	0.56%	0	0%
CO	229	522,661	12,257	2.35%	343,852	65.79%	166,552	31.87%	3,990	0.76%	98	0.02%
CT	225	306,334	12,028	3.93%	186,937	61.02%	107,369	35.05%	1,654	0.54%	0	0%
DC	1	78,664	1,246	1.58%	66,128	84.06%	11,290	14.35%	239	0.3%	0	0%
DD	470	267,896	8,084	3.02%	76,324	28.49%	183,488	68.49%	53	0.02%	428	0.16%
DE	60	51,125	4,675	9.14%	26,928	52.67%	19,522	38.18%	912	1.78%	0	0%
FL	437	2,725,247	54,316	1.99%	2,050,284	75.23%	620,647	22.77%	0	0%	202	0.01%
GA	341	832,532	40,076	4.81%	512,336	61.54%	280,120	33.65%	3,560	0.43%	42	0.01%
HI	4	89,459	2,740	3.06%	57,734	64.54%	28,985	32.4%	45	0.05%	0	0%
IA	624	181,312	13,338	7.36%	117,413	64.76%	50,561	27.89%	5,510	3.04%	0	0%
ID	166	107,412	6,043	5.63%	67,002	62.38%	34,367	32%	232	0.22%	180	0.17%
IL	1,083	1,289,001	54,819	4.25%	841,902	65.31%	392,280	30.43%	1,877	0.15%	577	0.04%
IN	422	73,677	5,508	7.48%	44,851	60.88%	23,318	31.65%	1,648	2.24%	75	0.1%
KS	513	258,788	21,566	8.34%	163,703	63.26%	73,509	28.41%	734	0.28%	957	0.37%
KY	614	168,445	19,384	11.51%	79,386	47.13%	69,675	41.36%	1,685	1%	74	0.04%
LA	400	300,432	23,084	7.68%	174,874	58.21%	102,474	34.11%	1,569	0.52%	144	0.05%
MA	352	765,975	29,456	3.85%	444,928	58.09%	291,591	38.07%	0	0%	143	0.02%
MD	273	546,608	19,933	3.65%	356,162	65.16%	170,513	31.19%	8,021	1.47%	1	0%
ME	186	107,477	5,112	4.76%	70,076	65.2%	32,289	30.04%	132	0.12%	0	0%
MI	789	522,178	31,728	6.08%	323,678	61.99%	166,772	31.94%	2,960	0.57%	250	0.05%
MN	758	260,671	15,467	5.93%	163,328	62.66%	81,876	31.41%	0	0%	0	0%
MO	477	453,276	29,516	6.51%	285,510	62.99%	138,250	30.5%	3,739	0.82%	53	0.01%
MS	638	145,694	20,912	14.35%	89,414	61.37%	35,368	24.28%	3,968	2.72%	395	0.27%
MT	182	61,574	3,475	5.64%	38,333	62.26%	19,766	32.1%	690	1.12%	142	0.23%
NA	4	3,978	277	6.96%	2,824	70.99%	877	22.05%	3	0.08%	0	0%
NC	1,111	802,389	52,398	6.53%	471,568	58.77%	278,423	34.7%	14,259	1.78%	82	0.01%
ND	169	21,761	2,073	9.53%	11,270	51.79%	8,418	38.68%	288	1.32%	142	0.65%
NE	184	92,736	5,272	5.68%	55,925	60.31%	31,539	34.01%	355	0.38%	143	0.15%
NH	198	164,539	5,910	3.59%	99,783	60.64%	58,846	35.76%	1,147	0.7%	2	0%
NJ	650	414,006	35,867	8.66%	120,981	29.22%	257,158	62.11%	14,029	3.39%	9	0%
NM	371	185,403	10,136	5.47%	127,604	68.83%	47,663	25.71%	177	0.1%	1,170	0.63%
NV	48	391,275	9,325	2.38%	313,881	80.22%	68,069	17.4%	1,856	0.47%	15	0%
NY	1,650	1,175,929	68,805	5.85%	588,844	50.07%	518,280	44.07%	38,785	3.3%	1	0%
OH	1,194	929,893	52,235	5.62%	589,628	63.41%	288,030	30.97%	155	0.02%	474	0.05%
OK	403	284,191	23,346	8.21%	176,140	61.98%	84,705	29.81%	19,139	6.73%	13	0%
OR	258	278,853	11,634	4.17%	190,904	68.46%	76,315	27.37%	0	0%	0	0%
PA	879	503,157	33,602	6.68%	287,270	57.09%	182,285	36.23%	7,800	1.55%	0	0%
RI	43	105,303	2,632	2.5%	71,089	67.51%	31,582	29.99%	799	0.76%	0	0%
SC	402	348,124	28,654	8.23%	197,935	56.86%	121,535	34.91%	2,762	0.79%	84	0.02%
SD	207	31,920	2,614	8.19%	19,513	61.13%	9,793	30.68%	1,228	3.85%	0	0%
TN	635	419,631	31,694	7.55%	250,647	59.73%	137,290	32.72%	17,331	4.13%	304	0.07%
TX	963	1,922,302	84,262	4.38%	1,240,307	64.52%	597,733	31.09%	951	0.05%	136	0.01%
UT	141	130,940	6,449	4.93%	83,309	63.62%	41,182	31.45%	11	0.01%	56	0.04%
VA	516	836,579	30,254	3.62%	577,677	69.05%	228,648	27.33%	10,417	1.25%	203	0.02%
VT	196	46,594	3,486	7.48%	23,831	51.15%	19,277	41.37%	1,086	2.33%	12	0.03%
WA	258	531,155	20,032	3.77%	371,298	69.9%	139,825	26.32%	1,316	0.25%	9	0%
WI	766	253,897	17,560	6.92%	160,303	63.14%	76,034	29.95%	12,725	5.01%	353	0.14%
WV	443	131,011	13,074	9.98%	63,386	48.38%	54,551	41.64%	2,671	2.04%	101	0.08%
WY	75	25,245	1,331	5.27%	16,225	64.27%	7,689	30.46%	0	0%	0	0%
U.S.	22,907	23,273,138	1,120,162	4.81%	14,827,459	63.71%	7,325,517	31.48%	217,696	0.94%	8,295	0.04%



Numbers You Won't See

Personnel spend hours learning, teaching, practicing, and serving their communities in more ways than KFIRS can show.

The Kansas Fire Incident Reporting System collects information about emergency responses only. It doesn't capture information and statistics about local inspections, public education development and presentations, daycare walk-throughs, training, preparing for training, equipment maintenance, gear inspections, truck checks, pump tests, or other non-call related activities. The work involved in emergencies requires personnel who have knowledge, skills, and experience armed with working, adequate equipment.

Fire service personnel are quietly working behind the scenes every day. In honor of the time the Kansas Fire Service spends off calls keeping Kansans safe, the next several pages illustrate the behind-the-scenes work put in by departments and personnel all over the state.

Tweet us @KSFireMarshal to share your behind-the-scenes look at the Fire Service!

Opposite Page

Far left: FF Trent Julius with the Mulvane Fire Department works during Hose Testing to makes sure that water supply is safe on calls. It's a lot of work hauling hundreds of feet of hose, filling it with water, and painstakingly looking over every last inch.

Top: Bonner Springs Fire Department knows it's fun to tear up something once in a while, especially when learning important extrication skills. Extrication drills are vital to preparing first responders for vehicle accidents.

Lower: Volunteers at Shawnee County Fire District #2 in Auburn, KS built a specialized training apparatus called a confined space confidence prop for a special kind of drill. Firefighters crawl in full gear through a simulated attic space with snag points to learn about entrapment. It's a psychologically draining exercise but provides a safe environment to learn coping and calming strategies. The goal is for firefighters to learn how to untangle themselves when trapped.

This Page

Top Right: Salina residents love to see their firefighters from the Salina Fire Department Honor Guard looking sharp and leading a local community parade.

Lower Right: Chanute Fire Department personnel ring the bell at exactly 8:46am in honor of the firefighters who lost their lives on 9/11. Pictured from left to right are FF Tim Vietti, Lt. Dale Lowry, Lt. Chad Small, and FF Jeff Mitchell.

Bottom: A truck doesn't fix itself. Great Bend Fire & EMS Department personnel are providing maintenance to an apparatus. Good working equipment is vital to success on any type of call. Many fire departments have a volunteer mechanic who might not fight fires on-site but fights fires by keeping equipment running.

Bonner Springs Fire Department introduces cadets to live fire conditions utilizing the University of Kansas Interior Firefighting Simulator. It's a long day in hot conditions wearing full gear. You'll be sweaty, that's for sure.

Left: The movies may not depict reality with cars blowing up left and right, but vehicle fires do occur (2,245 reported in 2014) and they present unique dangers. Eudora Fire Department practices extinguishing a fully involved car prop.

Right: Netawaka Fire & Rescue cover pumping during a Driver/Operator training. Pumping skills are essential and ensure firefighters have an adequate water supply on a fireground.

> "Educated and trained aggression in fire attack statistically leads to more lives and property saved. Blind aggression in fire attack leads to becoming a statistic. Get educated and trained!"
>
> Chief Jay Hawks, Parsons Fire Department

Bonner Springs Fire Department recruits the next generation of firefighters. The firefighter stays nearby to make sure the fun stays safe for this special young resident. A charged hoseline is no joke to hang onto.

Above Left: FF Gary Kunc with Mulvane Fire Department plays with fire for a good cause. Lt. Fred Heersche helps a Villa Maria staff member with fire extinguisher training. Practicing in a safe controlled environment will give the staff the experience to react appropriately.

Above Right: Salina Fire Department trains for the pit crew CPR code blue call management team. The pit crew style response to cardiac incidents has increased positive outcomes for their residents.

Middle Right: A no-nonsense message from Shawnee County Fire District #2, showing a strong culture of training right on the training props as they train late into the night on roof ventilation drills.

Below: Many fire departments are using social media to provide more information and announcements to their communities. Soldier Township Fire Department faced large scale construction knocking on their front door in 2014. They used social media to keep their public informed during the project. Construction can adversely affect any fire department without plans.

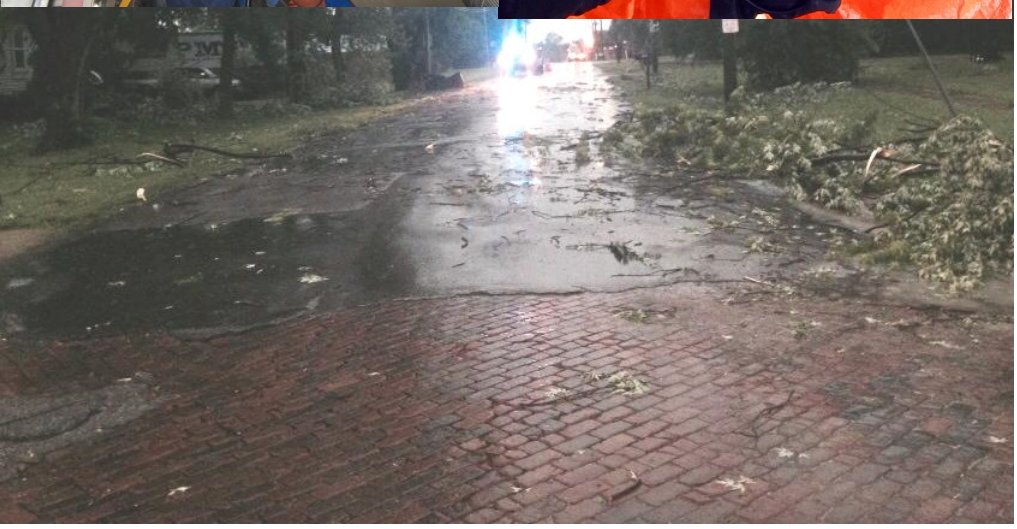
What's in a name?

It's an All-Hazards kind of Service.

Reports per Call Type	
EMS/Rescue	163,581
Good Intent	29,156
Fire	20,870
Service	16,744
False Alarm	15,244
Hazardous Condition	8,931
"Other"	1,523
Explosion	446
Weather	402

Members of the Fire Service are critical to the All-Hazards approach to emergencies. Despite fire department names, the majority of calls throughout Kansas are not related to fires. EMS/Rescue calls continue to dominate the call load with 64% of responses. The switch from fires to EMS isn't all that's changed since the original fire departments envisioned by Benjamin Franklin. Many departments now participate in regional task forces that specialize in calls like HazMat, Search & Rescue, and Structural Collapse.

Each fire department is unique in its call load. There are fire departments in Kansas that still limit call responses to fires. Some fire departments cover territories under contract with private ambulance companies which boosts the ratio of fires to EMS calls. Other areas of Kansas with large populations have much higher EMS call ratios to fires. To see local fire department call loads visit our website.



Top: Pittsburg Fire Department's patient doesn't complain about the service during vehicle extrication training.

Left: Crews from Hays Fire Department practice in Confined Space Training, removing a practice dummy from tight quarters to safety. Hard hats required.

Right: There are 11 regional HazMat teams supported by the Office of the State Fire Marshal. Our office regularly participates in mock accidents with multiple departments.

Bottom: Wellsville Fire Department snapped this picture of storm damage in Wellsville, KS. Many fire departments react to severe weather by providing shelters, assessing damage, rescuing stranded residents, and even sleeping in fire stations to ensure they can make it to the station in case of a call. Many personnel are also storm spotters.

Reno-Kingman Fire District #1 gets some hands-on practice with a volunteer patient during this vehicle extrication drill.

Tough Tools for Special Skills

Saws, chisels, wenches, rams, and axes can be lifesaving tools, especially on the 583 reported vehicle extrications during 2014

Training for the worst at Shawnee County Fire District #2 in Auburn means training to use extrication tools when a vehicle is in a precarious position.

Just as most Kansans are heading to work, the Fire Service is going to work in a different way. At 7am the roadways fill with commuters, sparking the first of three distinct peaks during the day for vehicle accidents. The 2nd peak comes at noon when workers hit the streets in search of lunch. Finally, when schools begin to empty, the roadways are once again filled with commuters and accidents. The last peak, however, lasts several hours through the trip home from day shift workers. Accidents finally drop at 7pm.

Not every vehicle accident requires the fire department so we reached out to the Kansas Department of Transportation (KDOT) which receives an accident report from law enforcement agencies. KDOT provided our Office with a total of 58,826 reports from 2014, five times the amount of reports from fire departments (11,297 reports).

While the hours when accidents occur held true between fire department and KDOT reports, there were stark differences in busy months. Fire departments were less busy in the colder months, reporting accidents mainly during May through October. KDOT reports provide a different picture of increases beginning in October and lasting through February.

Hays Fire Department flips a car completely over and practices patient removal out the back during an extrication training.

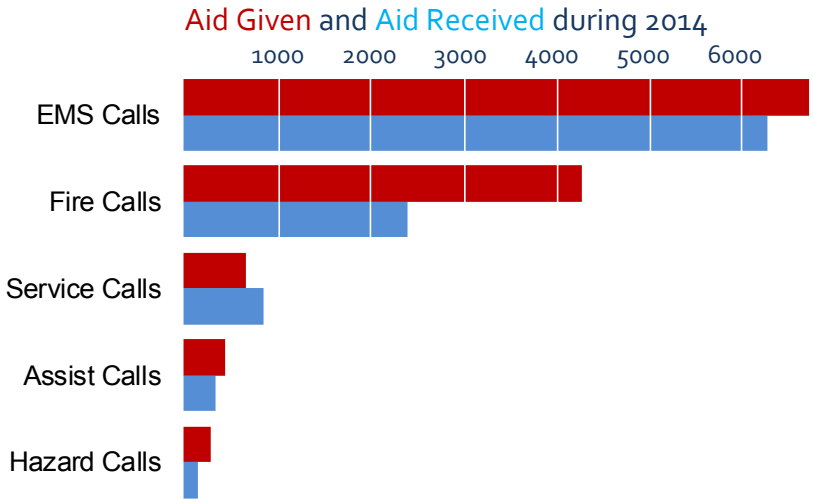
Vehicles wreck at all angles. Stabilization struts are applied to both sides of an overturned car during this drill at the Olathe Fire Department.

Pooling Resources

Cooperation between fire departments is alive and well in Kansas with 437 departments giving or receiving aid.

Many fire service personnel would tell you they joined to help their neighbors. When fire departments need help they call their neighbors too. Nearby departments often keep agreements, either mutual aid or automatic aid, to call on other fire departments in times of need.

Mutual aid often extends to training and specialized regional teams such as Search & Rescue or HazMat Response crews. Centralized equipment serves a greater population through these agreements.



Water supply can be a large problem for rural departments so it is not uncommon to have Automatic Tender agreements for structure fires. When one department receives a call for structure fires, partnering departments automatically send a tender apparatus to provide additional water supply to the scene. There were 1,425 reports of aid given for building fires during 2014, but grass fires are the number one fire type for aid given with 1,490 reports. The top three call types for receiving aid were EMS calls excluding vehicle accidents with 4,408 reports , grass fires at 2,237 reports, and building fires with 2,171 reports.

Manhattan Fire Department snapped this photo of the Crane Operations course during the 2014 Technical Rescue Conference in Salina. Cooperation between departments happens off the call, too.

A Dirty Secret

This misconception could burn your house down.

Thank you, Camrose Fire Department in Camrose, AB, Canada for providing photos from a local fire caused by cigarette butts into a potted plant. Photos were not available for the Kansas fires.

Is dirt flammable?

Most would say no but in the case of potting soil it can easily catch fire. Potting soil has a preconceived image that it's mostly dirt with some added nutrients. In reality, commercial potting soils often contain peat moss, coir fiber (coconut fiber), and composted pine bark. All three ingredients are flammable. Potted plants are especially vulnerable to fire when the soil dries out. Add in a plant that has dried or died from lack of water and the ignition probability increases quickly.

With dry conditions just waiting for a spark or ember, the last thing that should be added to the mix are cigarettes. Unfortunately, that's exactly what people add.

KFIRS does not contain specific ignition codes for potting soil combined with smoking, but a narrative search for "potting soil" and "potted plant" located 18 fires started by putting cigarettes into potted plants. A reported 125 apartments and 6 houses were damaged. Fires are probably much more prevalent than stated here because narratives are not required and only 44% of fire reports included a narrative.

Don't take a chance. Get a real ash tray.

Tweet us @KSFireMarshal to share the craziest thing you've seen catch fire!

Service Casualties

A year without fire service fatalities marked by exhaustion, severity, and increased fireground injuries.

Heavy call loads beat up members of the Fire Service in 2014, especially in March. Back-to-back calls brought reduced resources and overexertion . March alone accounted for 44 fire service injuries, up from 24 the previous March. All told, there were 265 fire service injuries. Fire calls beat out EMS calls for injuries, 148 to 104. Historically, EMS calls result in more injuries merely because there are roughly seven EMS calls for each fire call.

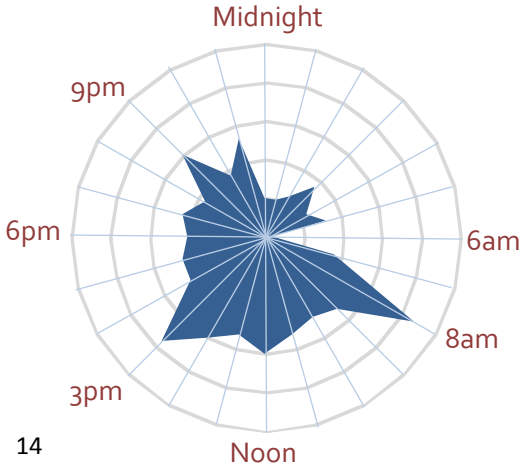
The switch from EMS to fires wasn't the only change. Injuries during fires have been twice as prevalent during interior attack on structure fires in the past. However, outside fireground activities at structure fires accounted for almost as many injuries at structure fires. The likely culprit was fatigue, reported in at least 1 in 4 fire service injuries for any call type. [Note: Prior condition is not required information on KFIRS reports. Fatigue could have played a role in over half of all injuries and up to 75% of fire call injuries.]

Injuries occurring on EMS calls remained roughly the same from the previous year. Strains/overexertion (lifting) accounted for the most injuries, followed by slipping/tripping, and exposure to biological hazard.

Training injuries decreased slightly, along with a drastic 50% drop in injuries occurring while providing direct EMS care. Handling charged hoselines remained the same, as did station activities, exiting vehicles, laying hose, and venting with hand tools. In an ironic twist, no firefighters were injured catching hydrants during a call (down from two the previous year), but two injuries were related to training to catch hydrants.

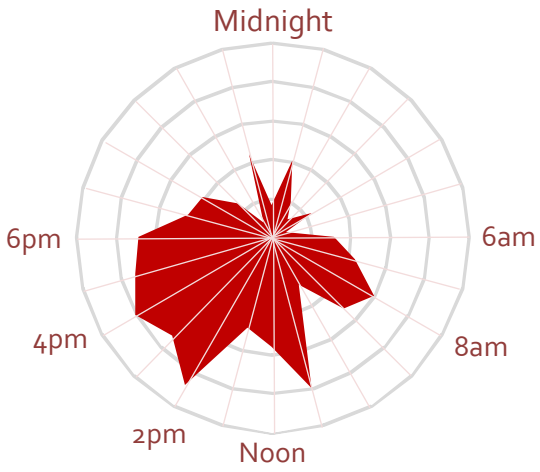
Training injuries are normally less severe than injuries on an active call, mainly causing minor sprains and bruises. Injuries around the station or exiting vehicles cause moderately severe injuries. A major increase in crushing-related incidents occurred in 2014, with at least one involving a fire department vehicle. Smoke inhalation injuries significantly increased from one injury in 2013 to nine in 2014. Fractures dropped from five to two injuries. The ratio of male-to-female injuries also dropped slightly to one female injury per 12 male injuries. There are no available estimates of total women and men in the Kansas Fire Service.

2013 Hour of Fire Service Injuries



During 2013, injuries were most prevalent from 8-9am. This could have been due to volunteers rushing to finish the call before work. 2014 saw a less concentrated distribution. Injuries remained fairly steady from afternoon through evening, with smaller spikes late at night around 11pm and 1am.

2014 Hour of Fire Service Injuries



Blue Township Fire Department firefighters prepare for the absolute worst in a Mayday Drill. Blindfolded firefighters must follow a hose through several obstacles simulating the inside of a house. It's a strenuous drill but it doesn't stop there.

Eventually, firefighters in Blue Township Fire Department's Mayday drill are forced to call a Mayday, after suffering a simulated fall and entrapment (someone lies on top of the participant). This practice is essential to establish early reporting of a Mayday and relaying the correct radio traffic for help. Firefighters must be able to communicate enough information to be found. The National Fire Academy offers a free online class providing vital information. Sign up for Firefighter Safety: Calling the Mayday by going to https://apps.usfa.fema.gov/nfacourses/catalog/details/517.

Getting lost in a fire is extremely dangerous, accounting for 38 injuries in 2014. "Smooth, bump, bump to the pump" is a common learning mnemonic. If a firefighter runs a hand along the hose coupling and feels the pattern of smooth, bump, bump, by continuing to follow the hose in that direction they will be headed towards the truck. The reverse pattern of bump, bump, smooth indicates a firefighter is moving further away from the truck. Practice with gloves on to get a feel for the couplings. Pictured prop is from Spotsylvania County, Virginia.

Garnett Fire Department finished a grass fire only to be called to this structure fire on the way back to the station. During 2014, 54 of the injured firefighters across the state had previous responses prior to being injured. Two firefighters injured in March had responded to 7 calls within 24 hours, before being injured on the 8th call. Thankfully, these two were minor injuries. Note: The pictured fire did not involve any injuries.

Burning Land

Photo by Chad Wittenberg

Broken records, strained resources, and 195,000 acres of burned Kansas land.

Every Spring a new season descends on the Fire Service of Kansas. Instead of green shoots growing towards the sun, this particular season is characterized by plumes of smoke drifting upwards from burning land. Last year may not have been the busiest year in history for vegetation fires, but it was #4, with 8,483 vegetation-related fires. Vegetation fires include grass fires, brush fires, crop fires, and mixtures of grass, brush, and crop. This does not include land management burns unless the burn became out of control. The current record is held by 2006 with 10,801 fires.

Flying embers, sparks, and ash continue to be the top cause of vegetation fires. Unattended children continue to start 6% of the fires. Storms are responsible for starting 8% of the fires, which is also a historically steady amount. Over 60% of the fires occur in the Northeast and South Central regions of Kansas. The Northwest region has had the lowest number of vegetation fires for over 14 years. Each year, more than 80% of vegetation fires do not have information regarding the type of material first ignited.

Opposite Page Top: El Dorado firefighters respond to grass fires. Vision is severely hampered by the heavy smoke across the road.

Opposite Page Bottom: El Dorado Fire Department personnel FF Caleb Fistler drives a brush truck with Capt. Tony Yaghjian as the nozzleman. Brush trucks are not just water-haulers, and can be instrumental in providing safe platforms and means of escape.

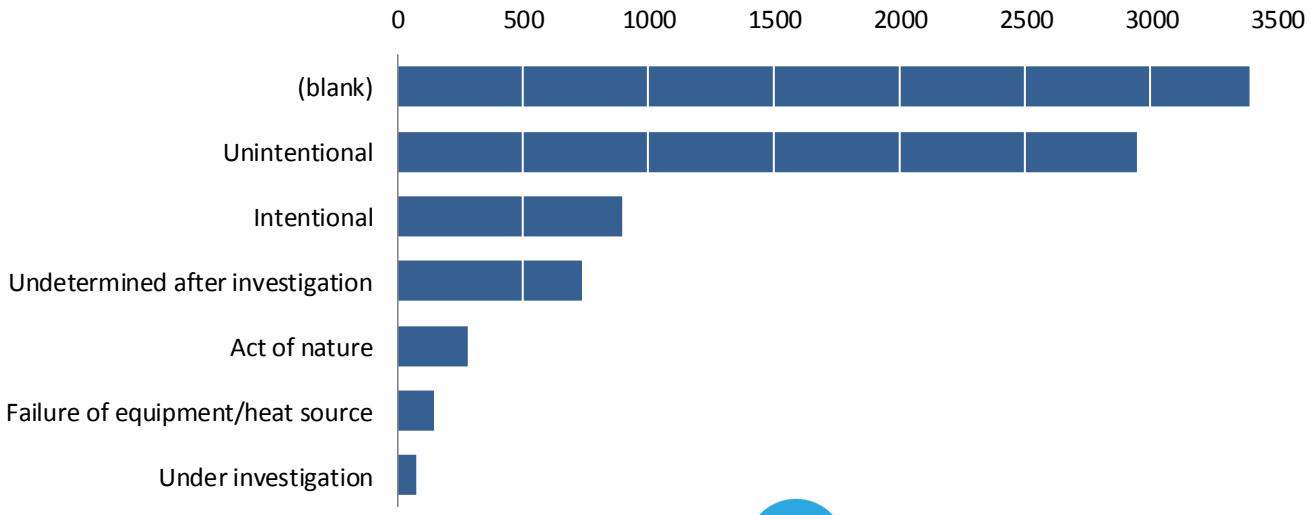
This page right: Wellsville Fire Department personnel work to extinguish a March brush/grass fire, dragging small diameter hose from a brush truck in addition to working with hand tools, turning the land for signs of fire.

Sunday became the frontrunner for busiest day of the week. Historically, Saturday has held that title. Many of the 2014 fires were rekindles of controlled grass fires. The controlled fire would be performed on Saturday without issue but hot embers would blow up the next day, requiring fire department intervention.

The hours from 2-4pm accounted for 40% of the vegetation fires. Since the KS Fire Service is estimated at 84% volunteer, this is a vulnerable time for the staffing regardless of call type. During 2014, there were 1,500 more fires that occurred during those hours than in 2013.

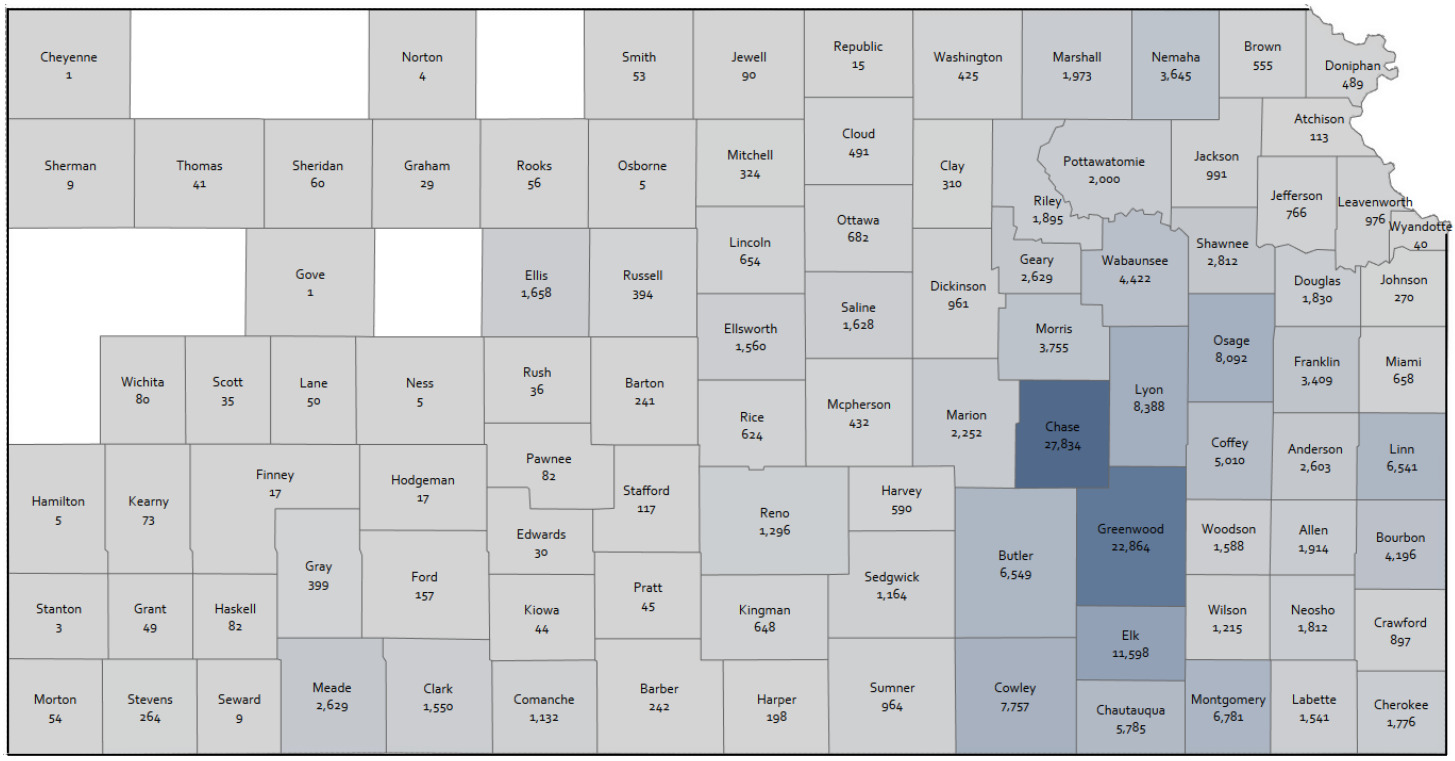
Fires caused specifically from open, outdoor fires saw a drastic increase, up from 231 to 816 vegetation fires. Outdoor fires could be controlled burns spreading embers, land owners burning piles of dead brush, and even recreational burn pits in backyards. Fires started by fireworks fell from 175 to 50. There were 896 vegetation fires marked as arson, however it is currently difficult to provide accurate numbers for arson. KFIRS defines the cause code of Intentional to mean arson and/or malicious intent but the cause code is often mistakenly applied to landowners setting a controlled burn unrelated to arson or malice.

Reported Cause Category for 2014 Vegetation Fires

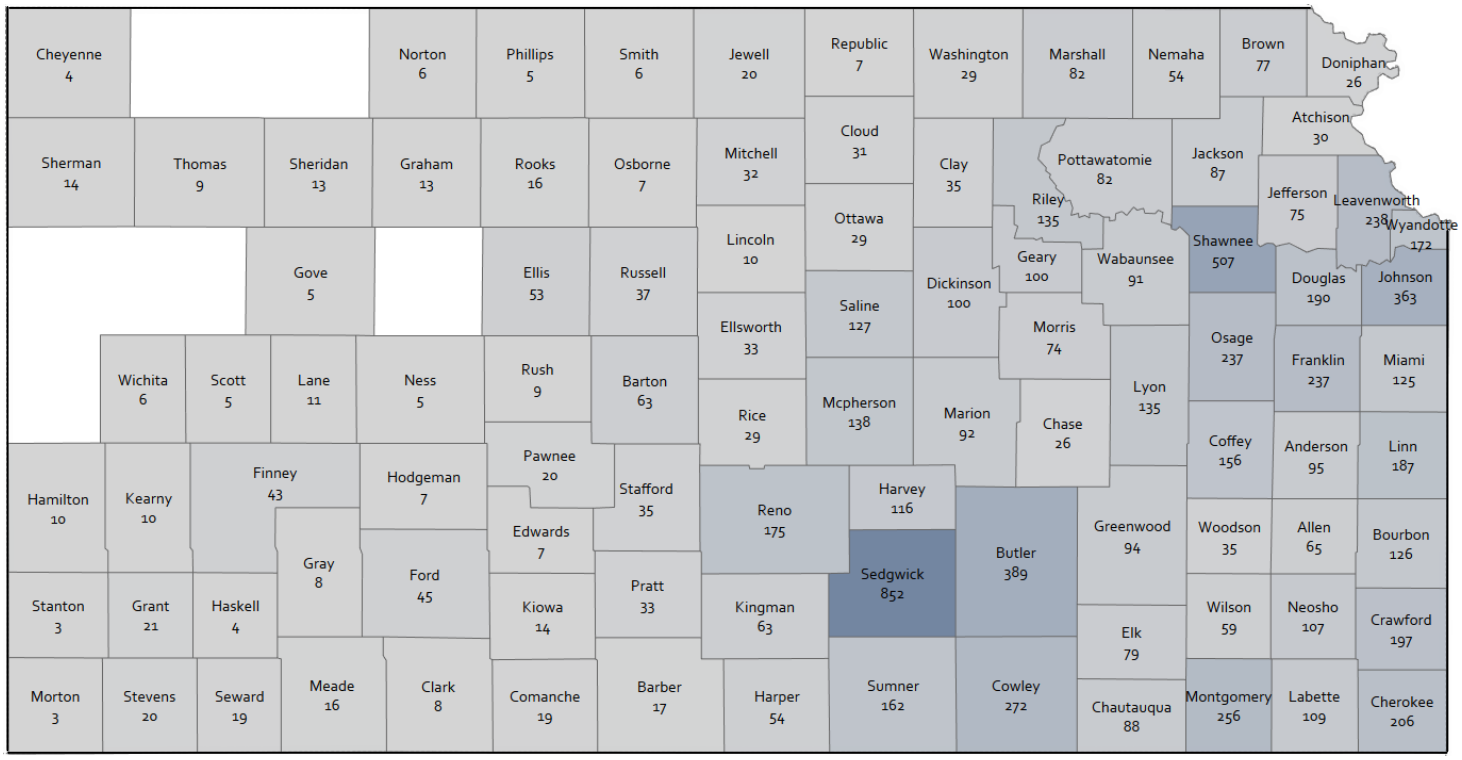


Tweet us @KSFireMarshal to share a picture of your fire break or preparation prior to controlled burning!

2014 Total Acres Burned per County



2014 Total Vegetation Fires per County



March fires the last 14 years

Year	Fires	Acres Burned	Aid Given	Vegetation Fires	Firefighter Injuries
2014	3,995	110,000	1,321	2,927	28
2013	1,081	3,526	252	502	8
2012	1,782	25,203	407	996	13
2011	1,878	68,063	495	1,142	8
2010	1,233	12,511	285	586	4
2009	2,346	27,567	675	1,430	13
2008	1,923	23,795	448	1,081	16
2007	2,130	12,364	480	1,215	13
2006	2,902	91,490	726	1,783	17
2005	2,734	48,095	701	1,730	22
2004	1,685	7,340	308	804	6
2003	1,837	21,468	368	917	9
2002	2,883	48,961	608	1,840	12
2001	1,556	2,928	254	684	22

Smashing Records

An aggressive fire season slammed the Fire Service during March, becoming the largest month in reported KFIRS history (1996-present). The previous record was held by July 2012 with 3,500 fires.

Of the nearly 4,000 reported March 2014 fires, 73% of all fires were vegetation related.

March wasn't just the highest in terms of sheer number of fires. It also became the biggest single month for burning acres with at least 110,000 total burned acres. That's roughly 172 square miles burned in a single month. For reference, Wyandotte County is 151 square miles. There were fewer acres burned in entire years: 2001 (22,590 acres), 2002 (108,270 acres), 2003 (74,675 acres), 2004 (46,758 acres), 2007 (42,735 acres), 2008 (90,839 acres), 2009 (80,701 acres), 2010 (64,849 acres), and 2013 (22,696 acres).

March accounted for the highest number of hours spent on fire calls with 5,810 hours, setting a new record in KFIRS for hours spent on fire calls during a single month. April 2006 previously held the record with 3,780 hours, fully 2,030 fewer hours.

In a perfect illustration of the strain on resources, the 1,500 acre fire pictured at left occurred on 3/30/2014 in Silver Lake (Shawnee County). A dozen fire departments responded to the fire, protecting structures. At one point, four additional fires burned unchecked with no available crews in Shawnee County left to respond. The Silver Lake fire rekindled the next day but was extinguished quickly. Aerial photo captured by Investigator Wally Roberts from the Office of the State Fire Marshal. [Note: the reports for this fire were not submitted to KFIRS. The acres and damage cannot be included in the State statistics. Total acres burned in the above left table are at least 1,500 acres too low, as are the total acres for Shawnee County in the map opposite.]

A Perfect Pairing

by Christopher "Chip" Redmond from Kansas State University Weather Data Library

What do you get when you add grass fire data to weather data? Answer: A beautiful marriage of information.

The Setup: Creating a tinderbox

To understand what happened in 2014, we have to go all the way back to 2012, which was the 15th driest year on record for Kansas. The drought continued into Spring and Summer 2013 which stunted the vegetation growth but by Winter 2013/2014, the remaining fine fuels were bone dry. Unfortunately, so were all the leftover now-dead 100/1,000 hour fuels which cured in the drought. Spring 2014 (Jan-May) continued the drought, leaving us with the second driest Spring on record with only 5.04 in of precipitation. The statewide Spring average is 9.61 in. Spring is traditionally the burning season, and Kansas wasn't ready for it.

Term	Description	Interesting Point to Know
Fuel Loading	Amount of fuel in an acre that could burn under extreme conditions	Remains constant on a yearly basis
Available Fuel	Amount of fuel in an acre that will burn under current conditions	Rapidly changes based on moisture and weather
Fine Fuel	Fuels that dry readily and are rapidly consumed by fire	Plants with rosins or waxes that can react the same way
1-hour fuel	Plants less than 0.25" in diameter	Rapidly loses moisture to the atmosphere
10-hour fuel	Plants in diameter from 0.25"-1"	Compacted/piled fuels take longer to dry out and ignite
100-hour fuel	Plants in diameter from 1"-3"	Flatter plants will dry out faster, even with thick
1,000 hour fuel	Plants in diameter from 3"-8"	Loosely arranged fuels will dry out faster

March & April 2014: High Impact Days

The Spring burning season is normally 61 days long. During 29 of those days, more than 1,000 acres were burned statewide each day. These high impact days stretched a nearly continuous period from March 9 to April 21. While several different weather patterns affected critical fire behavior development, the main driver of fire weather in 2014 were dry, cold frontal passages after a day or two of warm, drier air.

Left: A Mulvane Fire Department firefighter extinguishes a grass fire on 1/19/2014.

Right: Soldier Township Fire Department in Shawnee County uses heavy equipment to tear apart burning bales, ignited by a grass fire on 3/27/2014.

Misplaced Security

There were 31 high impact days during 2014 where more than 1,000 acres were burned in a single fire or statewide. All but six of these high impact days were associated with a cold front within 24 hour of the fire(s) starting. The majority of acres were burned within 24 hours of a frontal passage, but typically burned before the frontal passage was within 100 miles. This pattern indicates that land managers tried to burn controlled grass fires ahead of the front during optimal conditions, but the fires were not totally extinguished before the front passed. The passing cold fronts reignited or created new fires. Post-frontal conditions are typically dry with very breezy winds, further increasing the fire behavior.

Weather Environment	Description	High Impact Days	Total Fires	Total Acres Burned	Fire burning +1k acres
Frontal Passage	At/along frontal boundary	2	296	9,375	2
Pre-frontal	100 miles or less ahead of frontal boundary	6	836	36,231	10
Post-frontal	100 miles or less behind frontal boundary	4	331	15,661	6
No frontal boundary at time of fire	No frontal boundary within 100 miles but within 24 hours	13	1,545	72,546	12
No frontal boundary	No boundary within 24 hours before/after time of fire	6	703	22,785	2

April Showers Bring May Flowers

After a five day peak ending April 2, a strong storm system brought much needed rain to portions of Kansas. Widespread thunderstorms crossed much of the Flint Hills, and April 3rd brought some rain and snow for northwest Kansas which quieted fires. No significant fires occurred after April.

A second weather system briefly heightened the fire danger during April 9-12, but as the system matured, widespread storms developed across the Flint Hills again, leading to moisture recovery in grasses and other fine fuels. These two rains initiated a widespread green-up of vegetation. May was much calmer, possibly attributed to the green-up of vegetation and numerous Red Flag Warnings that prevented prescribed burning. Even dry, windy days remained relatively quiet.

3/20/2014: 17,000 acres up in smoke

Despite Red Flag Warnings, this day burned the most acres of any day, largely due to a single fire in Chase County burning 11,500 acres. Wichita recorded a temperature of 69F with a relative humidity of 10% and southerly winds at 15mph. The day was characterized by an active upper level pattern with a large trough over eastern US and an associated deepening surface low over the Great Lakes.

A strong cold front crossed the state two days prior, dragging an air mass of much cooler/drier air from western Canada. On the 20th, high pressure centered over Louisiana brought Southwest desert air into Kansas. A strengthening pressure gradient developed gusty southerly winds across eastern Kansas.

A **trough** is an elongated area of low atmospheric pressure that can occur either at the Earth's surface or at higher altitudes, commonly associated with cooler than normal temperatures.

Upper-level troughs influence many surface weather features, including the formation and movement of surface low pressure areas and the locations of clouds and precipitation.

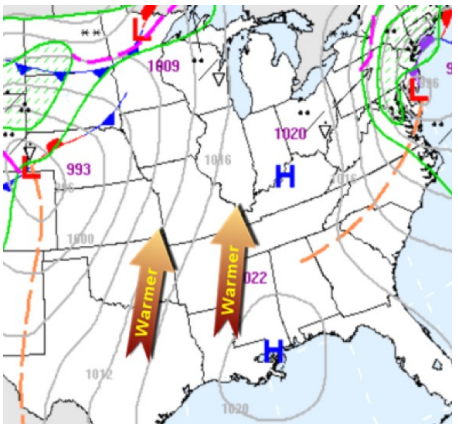
3/29/2014-3/30/2014: 1st and 2nd Busiest Days

The most wildfires of any day within 2014 occurred on the 29th with 310 fires. The 30th was the second busiest day with 308 fires. A 3,000 acre fire in Elk County occurred on the 29th. Greenwood and Coffey counties each had a fire over 1,000 acres on the 30th. Red Flag Warnings were issued for the 30th.

In a very similar scenario to 3/20/14, another strong trough and associated low cold front over the Great Lakes had crossed Kansas two days prior. This time the high pressure was oriented from east Texas, centered over Missouri, and moved northeastward into Quebec. This was once again helping to bring in dry air from the southwestern US into Kansas.

On the 30th, a second trough deepening across western US began ejecting over the Rockies with cyclogenesis occurring in the western Nebraska Panhandle. This developing low enhanced the pressure gradient across Kansas with high pressure still entrenched from Louisiana to Quebec, creating strong southerly winds across the southern Plains. Dry conditions combined with very warm temperatures 10-15F above normal, low relative humidity 15-20%, and south/southeasterly winds 20-25mph, fueling wildfires.

Warmer air movement 3/29/2014 from TX.



Cyclogenesis is the development or strengthening of cyclonic circulation in the atmosphere (a low pressure area).

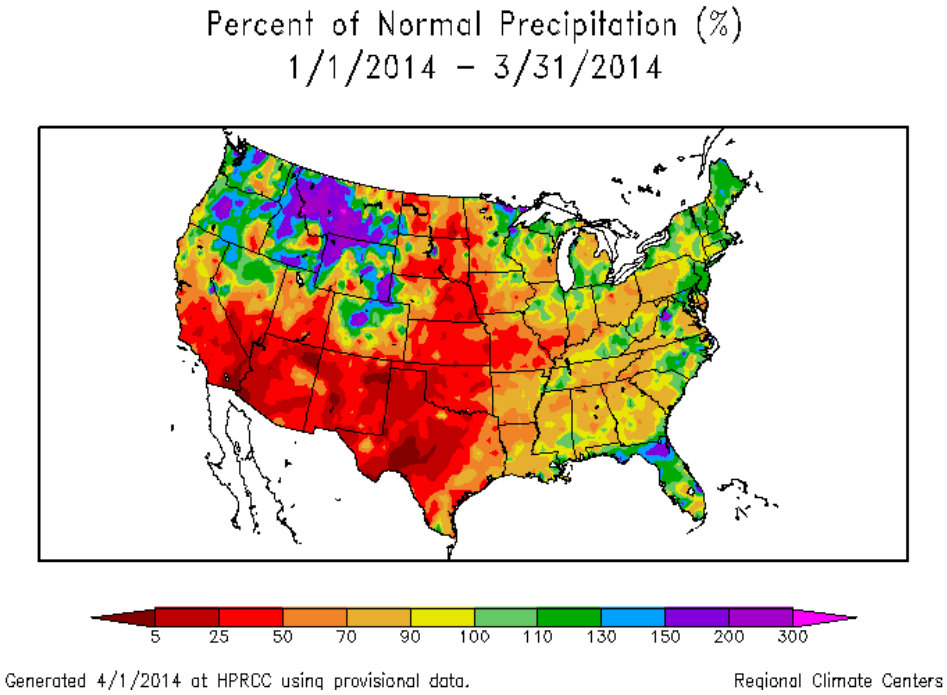
Pressure gradient is a physical quantity that describes which direction and at what rate the pressure changes the most rapidly around a particular location.

3/31/2014:4,528 acres in one county

Four 1,000+ acre fires occurred on this day. Two were located in Montgomery County, one in Coffey County, and another in Wabaunsee County.

The previous low pressure over the Nebraska Panhandle shifted northeastward deepening substantially as the trough strengthened and became negatively tilted. The associated cold front swept across Kansas during the day dropping temperatures and shifting winds out of the northwest at 20-25mph. These critical conditions were exemplified by low relative humidity in the middle teens as well as very poor overnight recovery preceding the event in the middle 50% range.

The atmosphere is most unstable with a **negatively tilted trough**. Cold air moves above warm air, creating stronger winds with increased chances for severe weather.



Early Winter 2014

Fires burning more than 1,000 acres occurred during March and April, with the exception of two occurring on January 26 and another on February 19. Prior to each fire, above-normal temperatures and low relative humidity led to a day or more of heating and drying fuels. Lower moisture is typical in winter across the Plains. Adding in the higher temperatures led to quickly drying fine fuels. Warmups typically only last one to two days before a cold front pushes through. Strong winds accompany the fronts, encouraging extreme fire behavior on January 26. However, the February 19 fire wasn't proceeded by a cold front. Instead, the event was characterized by abnormally strong southeasterly winds, more typical of early spring.

Conclusion

Weather data was analyzed for the area of the highest acre-to-fire ratio for each high impact day. Average conditions for all days with 1,000+ acres burned statewide were: temperature of 64F, relative humidity of 29%, and southerly winds of 12mph. These conditions do not meet criteria to issue a Red Flag Warning from the National Weather Service for eastern Kansas where the majority of high impact days occurred. This implies that suppressing wildland fires in Kansas grasslands is very difficult, even outside of Red Flag Warnings. Small scale influences like light winds could contribute to erratic and/or unpredictable fire movement. This is aided by the time of the year and cured, dead fuels available. Very dry conditions from the start of 2014 made containing any fire (planned or not) troublesome, even when prescribed fires were lit in optimal conditions.

Weather Environment	Days	Avg Wind (mph)	Avg Temp (F)	Avg Relative Humidity
Frontal passage	2	19.6	56	37%
Pre-frontal	6	11.8	70	36%
Post-frontal	4	13.9	70	19%
No frontal boundary at time of fire	13	11.3	71	28%
No frontal boundary	6	8.9	62	34%
NWS Red Flag Criteria (Topeka)		>15		<20%

Toasty Kitchens

Despite decades of educational efforts, kitchens remain the top area for fire origin.

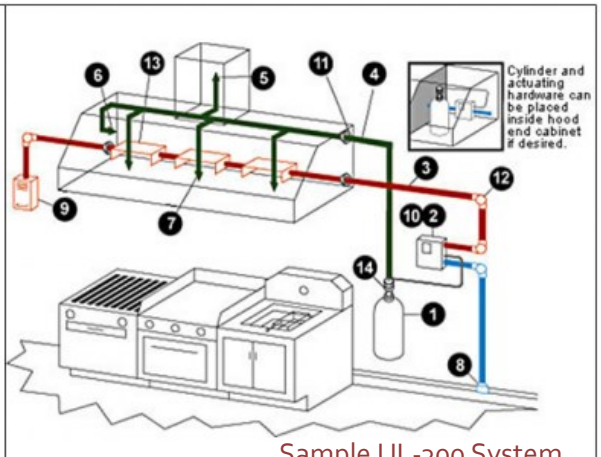
Ask any firefighter who's been around a few years if they've worked a kitchen fire. Chances are they'll say yes. That's because during the last 14 years in Kansas, at least 20% of all residential fires have started in the kitchen each year. There hasn't been a year yet that kitchens weren't the top area for fire origin in residential fires.

In 2014, 28% of structure fires started in the kitchen with a reported $4,263,469 in damage, 3 deaths, and 28 civilian injuries. [Note: Reporting a monetary damage is not required for KFIRS. True damage is likely much higher than reported.] There were a total of 810 fires in commercial and residential structures specifically caused by cooking or malfunctions of appliances during the cooking process.

Kansas requires a UL-300 suppression system for commercial food services more suited to today's vegetable oil-based cooking and insulated energy efficient appliances. The Office of the State Fire Marshal licenses approved vendors to both install and service units. Units require servicing every six months. Field inspectors can cite dirty units, too. There were only 11 reported cooking fires in a restaurant during 2014.

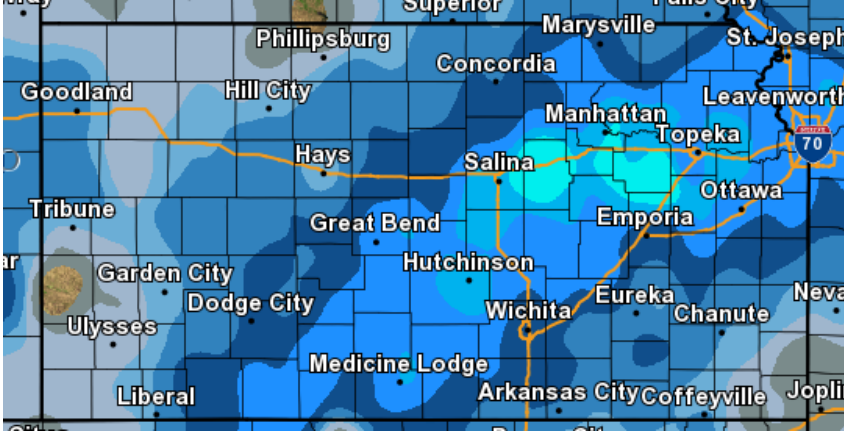
Legend

1. System Cylinder with Mounting Bracket
2. A+ Control Head or Mechanical Control Head
3. Detection Line Enclosed in Conduit
4. System Discharge Piping
5. Nozzle Protecting Duct
6. Nozzle Protecting Plenum
7. Appliance Nozzle (stationary or swivel)
8. Automatic Gas Shutoff (electrical or mechanical)
9. Remote Manual (Optional) recessed or surface
10. Electric Micro Switches (Optional)
11. Liquid Seal Device for Hood & Duct Penetrations
12. Corner Pulley for Change in Directions
13. Detector with Fusible Element
14. Pneumatic Control Head

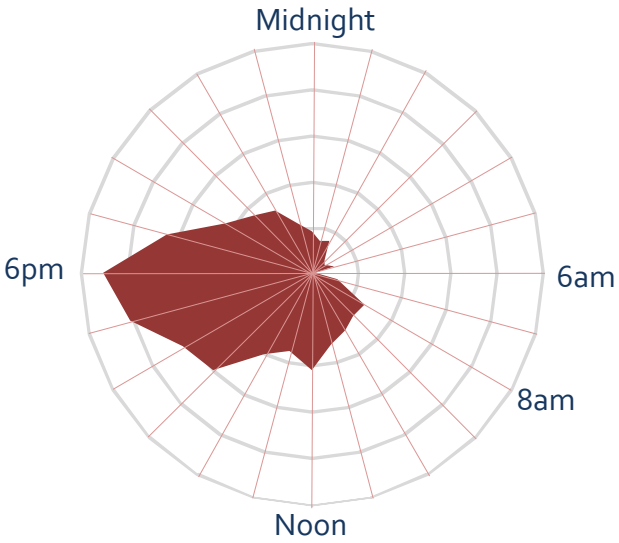


Sample UL-300 System

Left: Cooking fires have the highest rate of injuries, mostly caused by trying to extinguish a fire. Pittsburg Fire Department demonstrates what happens when 2 tablespoons of water are added to just 1 cup of oil on fire. ABC combination extinguishers can handle grease fires but a Class K extinguisher is rated specifically for kitchens. Don't use water.



Cooking Fires by Hour in 24-hour Format



Predictably, cooking fires occur mostly around dinner, peaking from 6-7pm. Inversely, 6-7am is the quietest hour indicating breakfast might be simple, cold food or "grab and go" food. This trend remains the same for every day, even Saturday and Sunday.

February 4, 2014 topped the year for cooking fires. A massive ice and snow storm pummeled much of Kansas for 72 hours, pictured above, and could be the reason for abnormally high fires.

Thanksgiving Day was the second busiest cooking fire day in 2014. The last time Thanksgiving was the 2nd busiest day was 2008. The holiday ranks surprisingly low for cooking fires, rarely cracking the Top 30.

There were never more than three consecutive days throughout the year without a cooking-related fire.

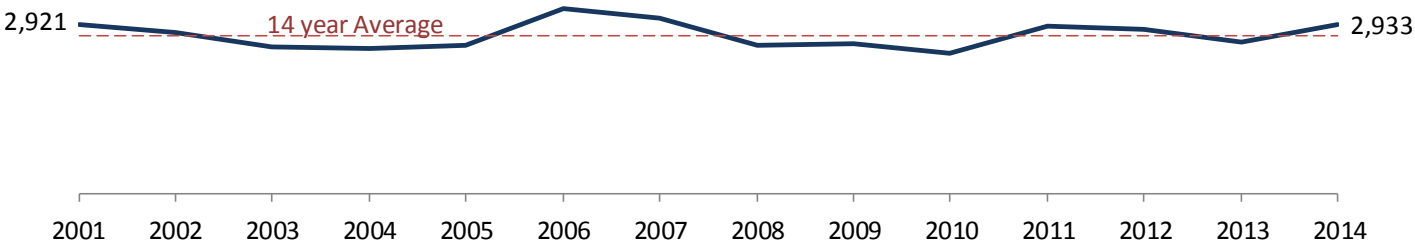
Why do you think breakfast is the least flammable meal? Tweet us @KSFireMarshal!

Investigator Wally Roberts from the Office of the State Fire Marshal shows kitchen fires aren't always related to cooking. Here, cloth items on a stove caught fire when the stove turned on.

Evening may be the most common time for residential fires, but night fires from 11pm-6am were the most deadly in 2014, with 11 deaths. Photo courtesy Eudora Fire Department. Note: the pictured fire was not fatal.

Homes Under Fire

The number of residential structure fires has remained fairly constant over the last 14 years.

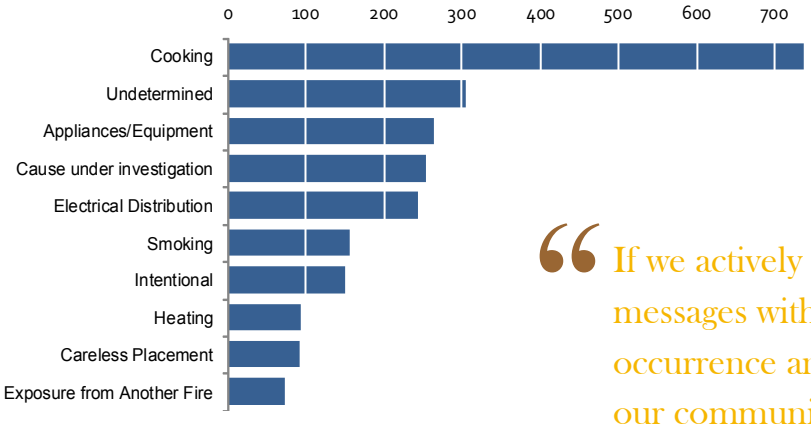


2014 had a small increase in home fires from the previous year, but each year has been roughly the same number of fires. A total estimated loss of $58 million was reported for 2014, yet fire departments saved over $532 million in structure and contents.

One in 32 residential structure fires resulted in at least one civilian injury. One in 135 residential structure fires resulted in at least one civilian death. One in 43 residential fires injured a firefighter.

Think cold, wet conditions reduce fire risk? Think again. Residential structure fires dominate during the winter, with 40% of all fires occurring in just 4 months from November through February. Photo courtesy Soldier Fire Department.

Top 10 Residential Structure Fire Causes



> "If we actively and regularly share our fire prevention messages with our customers, we can help reduce the occurrence and subsequent loss of life and property in our communities."
>
> Mike Hall, Olathe Fire Department & Fire Education Association of Kansas (FEAK)

The busiest day for residential structure fires was 2/4/2014 (See *Toasty Kitchens* for the ice storm information). In addition to numerous cooking fires, there were several smoking fires, a few electrical fires, and a candle fire on that date. Some "cooking" fires might have actually been caused by residents using the oven to provide heat. Keeping the oven door open for heat is not only a fire hazard but poses a significant burn risk, especially to young children who might fall into the door or touch the oven out of curiosity.

January 2014 had the most reported fires relating to heating, electrical failures, smoking, appliances, and combustibles placed too closely to a heat source. Failing to clear the area around furnaces, stoves, and fireplaces all lead to increased residential fires in January. Surprisingly, candle fires are most often relegated to summer months like July and August, likely during storms with power outages.

Carefully clearing the area around heat sources is a great prevention measure but it's equally important to keep heat sources away from walls. Loose items like newspapers, magazines, and clothing are surprisingly low ranking for items first ignited. Interior walls are the top ignition point, followed by cooking materials, exterior walls/siding, and electrical wires. Of course, fires do happen by putting loose flammable materials too close to heat sources, but it appears that residences may underestimate the flammability of the structure itself. Exterior siding is especially vulnerable to grills and cigarettes thrown into flower/mulch beds against the house.

Pittsburg Fire Department knows not all cooking fires start in the kitchen. Proper grill placement is crucial to protecting homes.

FF Scott Reeves from Caney Fire Department moves feet first between interior studs, practicing Secondary Exit Training.

Look closely. These items are in the *Toys or Lighters?* display. Even adults have difficulty spotting the lighters. Spoiler alert: all three here are lighters.

Home fires with human factors in ignition	
Unattended or unsupervised person	206
Sleeping (unattended heat source)	86
Possible alcohol or drugs	44
Age of person	28
Multiple persons involved	28
Possibly mentally disabled	15
Physically disabled	6

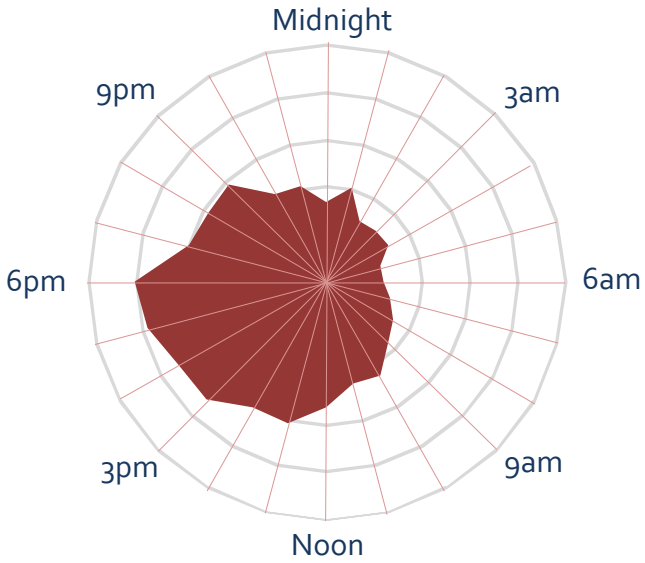
Kitchens may be the most common room where a fire starts, but bedrooms are #2, with 188 fires, 13 injuries, and three fatalities. Bedrooms also happen to be the most common room where children start fires.

Imagine a young child has discovered a new "toy", say a lighter. It makes sense that a child would examine the new toy in his/her own bedroom, safely out of the way in a quiet area of the house. Exploration is normal for children. Even some fire curiosity is normal, although very dangerous. Young children often have no concrete understanding of the real dangers of playing with fires. When curiosity goes too far, concerned parents and caregivers can access readily available information online about juvenile firesetters. There are currently two juvenile firesetting coalitions in Kansas that specifically offer pamphlets and materials. The Fire and Burn Safety Alliance of South Central Kansas is located in Wichita, and the Youth Fire Intervention Team (YFIT) is located in Johnson County.

Shawnee Fire Department conducts search and rescue training using an acquired structure. Full PPE is used with heavy smoke-like conditions. It's not easy getting around a house you've never been in when you can barely see your own hands.

Captain Douglas Reeves from Hutchinson Fire Department practices roof cuts. HFD quite literally lifts its firefighters up, especially when training at The Tower.

Residential Structure Fires by Hour of Day



Mutual aid is most requested from 2pm-5pm for residential structure fires. This might be due to the mostly volunteer-based fire service in Kansas. An estimated 84% of firefighters in Kansas are volunteers. Requests for mutual aid start decreasing right after 5pm and fall to the lowest point at 7pm.

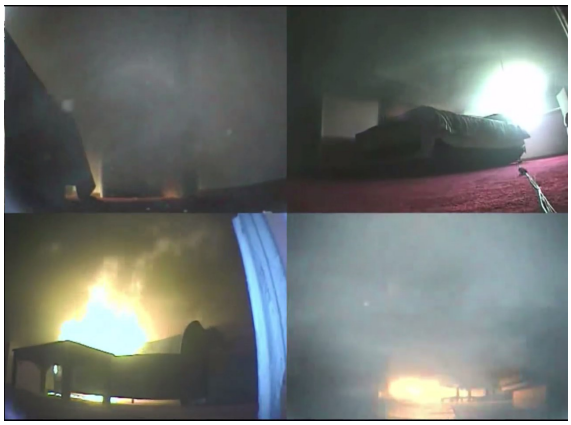
Residential fires are most common in the evenings, peaking at 6pm mostly due to cooking fires. Roughly 66% of fatalities occurred from 11pm-8am last year. Fires occurring between 4-5am were the deadliest, accounting for 20% of residential fatalities. That same hour accounted for the most injuries.

Residential structure fires by month and hour of day

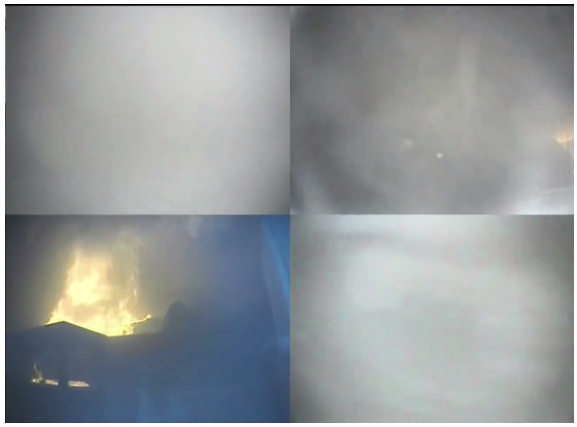
	Midnight										Noon													
	12am	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
Jan	6	9	8	8	7	7	6	6	9	6	14	18	21	21	23	23	22	19	23	23	21	15	16	13
Feb	4	10	6	4	3	4	12	8	10	3	14	8	10	11	9	19	17	15	15	18	9	18	10	14
Mar	11	9	7	7	3	9	4	9	6	10	13	13	13	22	14	19	17	25	24	16	11	13	9	8
Apr	9	13	5	5	5	4	3	3	8	9	10	8	15	17	15	19	20	14	23	11	9	8	6	11
May	4	7	4	5	10	3	5	5	6	8	8	2	4	6	6	15	10	13	14	10	7	12	9	5
Jun	4	8	7	3	7	6	4	3	6	7	8	5	5	8	10	6	10	15	7	8	11	12	11	4
Jul	7	9	6	7	5	3	3	6	4	6	11	9	14	13	9	16	11	11	15	18	10	14	13	10
Aug	6	3	6	5	7	3	2	4	6	11	3	4	9	8	7	7	15	17	15	9	7	12	5	7
Sep	7	9	5	8	5	7	7	7	3	5	4	10	4	10	12	11	13	12	16	10	12	7	6	7
Oct	5	5	6	4	3	5	4	6	10	5	6	8	9	10	14	13	14	15	13	7	8	8	7	4
Nov	14	10	5	6	9	6	9	9	8	12	15	15	15	13	16	19	15	20	20	11	19	14	11	7
Dec	6	10	7	12	11	2	1	3	6	10	8	12	13	16	19	10	13	17	16	7	18	10	3	13

NIST & UL Research on Fire Behavior: To view the entire video with more tests click here.

The setup: 2-story duplex with closed windows and doors. Upstairs bedrooms pictured top left and right. The couch downstairs (lower left) is ignited in the living room. The kitchen downstairs is pictured lower right.



2 minutes after ignition: Smoke is in every room, on both floors. Upper left bedroom is nearly filled with smoke. Upper right bedroom is halfway filled. Kitchen is completely smoke-filled.



3.5 minutes after ignition: The living room is 200F on the floor and 800F at 7ft. Smoke fills the structure from floor to ceiling. There is no safe air left to breathe.

Fire Burns. Smoke Kills.

Red Cross polled Americans and found that many adults have unrealistic views of fire safety. The majority of adults surveyed by Red Cross believed they have at least 5 minutes to escape a burning home. In reality, residents have as little as 2 minutes. When homes were filled with solid wood furniture and natural fibers, residents really did have more time. However, today's homes are stuffed with modern furnishings which burn much faster and pose greater risks.

The primal fear of fire is getting burned, but in reality burns are not what primarily kill residents. Reporting a primary injury type is not required for fire casualties and only 11 fatality reports included that information. Ten of the 11 fatalities were inhalation/breathing related. The last was cardiac arrest. Burning modern furnishings shed toxic gases loaded with particles and vapors, effectively poisoning any person inhaling them. If a person is sleeping, with every breath the toxins put the resident into a deeper sleep. The false belief that a person couldn't possibly sleep through a fire literally kills. For fatal fires occurring at night in 2014, all but two were reportedly lacking working smoke detectors. The remaining two fatal fires reported the presence of smoke alarms but it was undetermined if the smoke detectors operated.

Saving Lives of Kansans, One Home at a Time

In August 2014 the Office of the State Fire Marshal kicked off our first smoke alarm installation program. The program is designed to provide homeowners with 10-year sealed lithium battery powered smoke alarms and their installation. Along with the installation of the alarms, the homeowner will also get a brief education on the importance of residential fire safety.

Our office provides participating fire departments across the state with the alarms and in return they offer this service in their communities.

We have dispersed 1,370 smoke alarms to fire departments across the state, and 264 of those alarms have been installed.

Great Bend Fire Department C-Shift firefighter Khris Staton installs a smoke alarm in a hallway. Residents often take down smoke alarms to paint and repair walls. Keeping smoke alarms free from paint is a great way to ensure they continue working but put them back up as soon as possible, especially before going to bed.

Derby Fire Department was one of the first departments to join our smoke alarm program. Firefighters make sure to test installed smoke alarms before leaving.

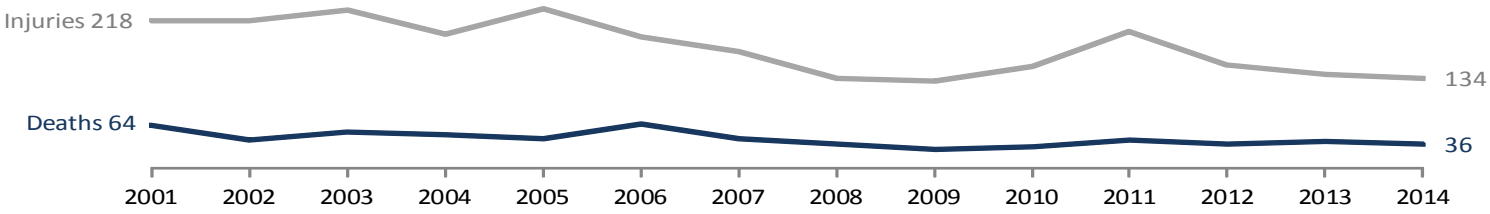
> "Working smoke alarms reduce your chances of dying in a fire by 50%. Participating fire departments are working diligently to place these alarms in Kansas homes. Our smoke alarm program would not be possible without their continued support."
>
> Mende Barnett, Public Education Consultant
> Office of the State Fire Marshal in Kansas

El Dorado Fire Department firefighters Chris McGathy and Sam Wheeler work to keep their citizens safe by checking a smoke alarm for a resident. Proper maintenance is crucial but can be difficult for older people. A visit from firefighters may mean the difference in casualties or survivors.

Shawnee Fire Department FF Mark Lopez screws in the smoke alarm plate with assistance from FF Jim Giffen. This particular smoke alarm came from the HOA Fire Chiefs. Many fire departments keep smoke alarms on hand to cover requests from the public.

Fire's Casualties

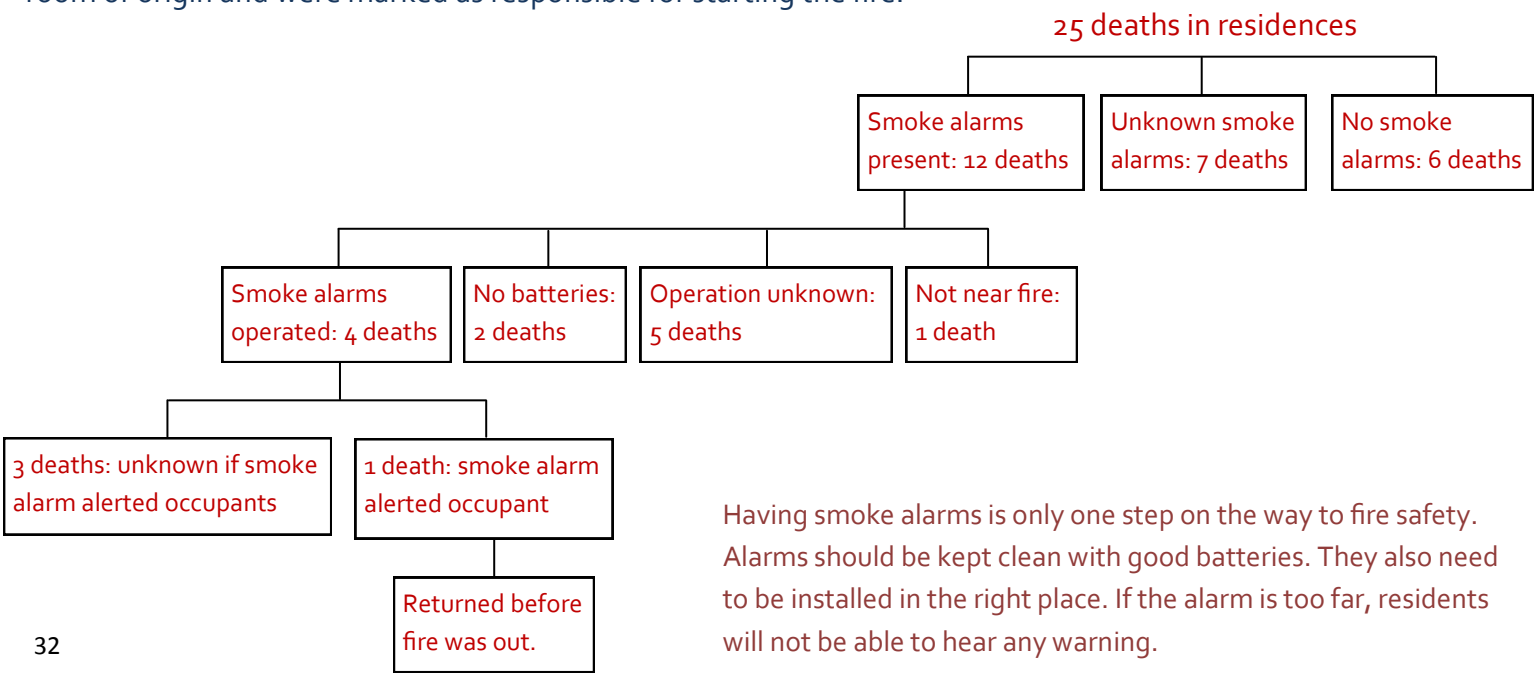
Bad news: civilians are still dying in fires.
Good news: both deaths and injuries are down in Kansas.



Building fires are responsible for the most injuries and deaths with 109 injuries and 30 deaths. Vehicle fires cause the 2nd most with 15 injuries and 4 deaths. Five people were injured while burning their trash and four people were injured during grass fires. A fire caused by a pyrotechnics accident caused one death and one injury in an outside storage facility. The remaining death was a homicide.

Smoking remains the top fire cause for fatal fires, and cooking remains the top fire cause for injury fires. Ten people died in the same room that the fire started. Fire is often underestimated and people believe they can control fires. While small fires can be extinguished successfully with proper techniques, attempting to control fires injures the most people every year. Since the majority of fires only kill one person, it can be difficult to pin down exactly what happened. The activity of the resident could not be determined for nine of the deaths such as sleeping, trying to escape, or doing something else.

Fires beginning in the living room were the most deadly, causing six deaths. The majority of these fatal living room fires were late at night, indicating the residents may not have even been aware of the fire. Four people were killed in fires that started because they fell asleep and left a heat source unattended. Three people were killed when a fire started while they were impaired by drugs or alcohol. Nine people were killed in the room of origin and were marked as responsible for starting the fire.



Having smoke alarms is only one step on the way to fire safety. Alarms should be kept clean with good batteries. They also need to be installed in the right place. If the alarm is too far, residents will not be able to hear any warning.

Easy Talking Points for Home Safety

Be Rabbit Ready

Walk through the house with your child and help them find two ways out of every room.

Calm the fear

Explain to children that they should never hide in closets and that firefighters are there to help. If possible, let your child see a firefighter in full gear. Even firefighters known to a child will look and sound different.

Have a spot

Set a designated meeting spot that is easy to find like a mailbox, driveway, or neighbor's house.

Get low and go

Practice crawling on hands and knees to keep under the smoke.

Tweet us @KSFireMarshal to share how you start the conversation for Fire Safety!

Shut the door

Give children a backup plan. Teach them to shut the door if they can't get out. Stuff blankets and clothing around the door. This will also help stop the spread of the fire, giving you precious minutes of safety.

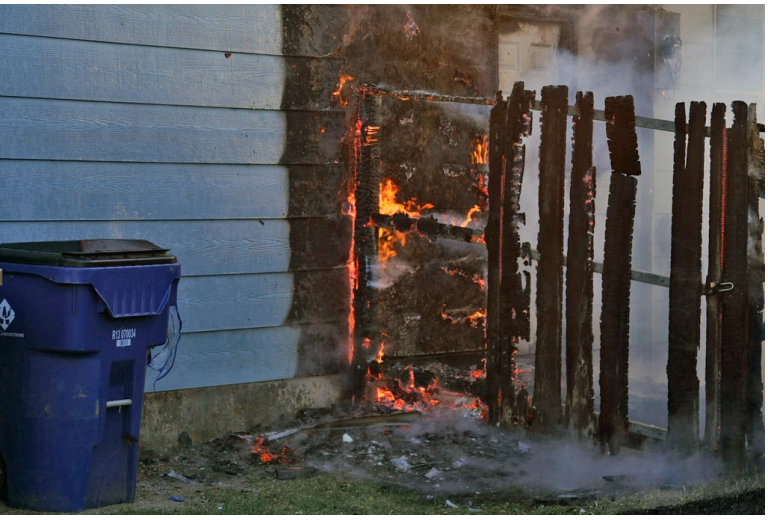
Left: Osage County Fire District #2 in Osage City shows a class what a firefighter in full gear looks like. That mask can be scary! Fire department appearances at schools provide a crucial platform in fire education.

Right: Pittsburg Fire Department has a special superhero that alerts the fire department to trouble. Detector Man visits schools to chase Professor Smoke out. Detector Man has one weakness: his batteries. The kids help the fire department check his batteries to keep him going.

Different Fires, Different Times

Grass fires have a distinct primary season. Structure fires are most common in the evenings. Vehicle fires are all over the board. Explore each category of fire represented in the following tables, shaded from light blue to dark. Darker blue indicates a higher call volume at that particular time.

Knowing when fires occur helps fire departments plan training topics and equipment maintenance. Some parts of Kansas have higher call volumes than others during specific times. You can find numbers for your specific area of Kansas by clicking here.



Above: Mulvane Fire Department responds to a fence fire between two houses. Outside fires like this are more common during grass fire season when flying embers spread.

Below: A rental truck fire in May gets hot on I-70 around 7pm worked by firefighters from Dickinson County Fire District #1 in Enterprise. Unlike heating fires which have distinct peaks, vehicle fires are the most random type of fire and do not occur within a set season. This is mostly due to the conditions for ignition factors (mechanical failure, collisions) being equally present every month throughout the year.

All Fires

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	2760	2330	3623	2672	2622	3246	2418	3149	2518	2434	3016	2421
Monday	2832	2593	3834	2598	2606	3261	2804	2791	3422	2702	2572	3278
Tuesday	2667	2543	2794	3448	2646	2643	3488	2633	3361	2557	2476	3033
Wednesday	3255	2597	2678	3493	2714	2677	3156	2769	2655	3416	2672	3299
Thursday	3245	2716	2979	2548	3115	2772	3393	2677	2617	3380	2575	2490
Friday	3449	2587	2982	2983	3511	2725	2803	3441	2712	3269	2646	2536
Saturday	2571	2519	4007	3106	3366	2811	2679	3408	2666	2797	3327	2454

Outside Fires

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	29	12	58	39	39	27	23	22	31	14	30	14
Monday	17	20	48	26	34	25	26	20	20	26	15	20
Tuesday	16	11	34	38	32	15	31	22	33	10	19	13
Wednesday	28	25	42	47	40	17	34	22	12	21	16	15
Thursday	27	19	32	26	35	12	37	11	22	22	20	12
Friday	19	15	43	34	39	25	51	16	7	21	25	17
Saturday	32	17	55	42	48	17	52	34	20	17	34	6

Structure Fires

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	77	36	92	60	31	47	34	41	33	44	63	32
Monday	57	48	75	40	41	41	43	41	56	32	43	45
Tuesday	55	59	47	65	31	26	38	34	42	29	52	64
Wednesday	84	60	39	58	33	25	46	31	35	43	59	57
Thursday	73	58	62	50	52	31	48	31	32	40	57	45
Friday	61	32	50	38	41	32	51	33	39	36	58	41
Saturday	58	48	70	51	48	34	49	43	31	34	51	43

Vegetation Fires

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	241	52	580	137	106	38	44	69	31	32	52	12
Monday	92	68	471	97	50	26	57	46	39	19	50	40
Tuesday	78	66	252	275	69	14	47	39	55	35	37	31
Wednesday	120	55	218	304	58	18	67	33	26	36	39	42
Thursday	78	63	327	126	52	16	45	37	35	31	36	39
Friday	71	63	309	305	70	26	102	47	32	18	66	13
Saturday	91	102	653	338	97	26	63	68	27	27	100	13

Vehicle Fires

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	12	20	27	17	18	23	31	21	23	38	21	11
Monday	20	21	36	12	18	27	37	30	21	30	20	26
Tuesday	18	29	25	28	22	21	32	25	23	25	20	26
Wednesday	27	18	14	25	28	35	22	21	21	37	30	17
Thursday	25	25	28	14	24	28	25	24	20	25	25	14
Friday	22	25	32	16	24	23	29	29	11	27	23	24
Saturday	9	23	23	30	32	17	31	38	28	28	27	18

All Fires

	Midnight												Noon											
	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
January	623	505	486	459	393	435	529	729	908	1048	1134	1284	1186	1238	1289	1342	1284	1276	1303	1133	1034	905	809	649
February	478	466	394	379	352	393	444	676	885	886	1009	1026	983	1094	1092	1059	1127	1047	1070	1006	877	794	708	571
March	611	550	484	440	415	441	531	713	891	963	1136	1286	1470	1537	1639	1644	1669	1660	1449	1382	1312	1112	916	728
April	556	493	400	394	362	394	506	714	862	964	1101	1229	1189	1369	1298	1388	1433	1435	1226	1150	1161	1023	844	685
May	570	504	499	397	392	417	489	725	909	1027	1070	1148	1133	1182	1236	1215	1302	1306	1172	1116	1103	1004	947	681
June	593	535	473	433	415	442	499	653	869	997	1092	1190	1059	1163	1096	1133	1182	1161	1145	1077	1099	1018	885	755
July	664	548	541	428	381	428	461	682	809	972	1087	1170	1112	1242	1210	1161	1217	1212	1122	1073	1118	1096	1082	854
August	639	534	519	418	400	394	510	729	828	1070	1114	1139	1197	1222	1229	1238	1271	1320	1168	1129	1146	1018	930	692
September	600	543	491	368	387	403	474	718	952	1057	1027	1081	1118	1142	1183	1193	1146	1225	1297	1137	1041	854	798	631
October	552	515	454	401	342	402	510	756	923	1072	1124	1145	1148	1228	1290	1226	1169	1223	1361	1232	1054	897	745	686
November	554	534	437	342	359	427	511	704	902	972	1087	1148	1141	1122	1214	1188	1186	1222	1179	1026	907	785	705	552
December	547	484	472	460	412	422	551	737	853	1096	1108	1041	1085	1132	1093	1132	1161	1186	1163	1024	909	912	771	639

Outside Fires

	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
January	6	2	2	1	0	2	3	2	5	6	7	5	10	10	18	19	12	11	10	14	9	7	5	2
February	3	2	0	2	0	2	0	4	4	5	6	7	3	11	8	6	5	9	10	11	11	3	4	3
March	5	7	8	2	2	8	4	2	4	9	5	7	19	27	30	24	23	27	21	24	21	19	7	7
April	9	2	4	3	2	8	5	7	7	2	7	7	17	17	20	14	17	15	11	22	24	12	15	5
May	10	4	4	4	5	3	6	5	4	10	8	9	12	10	16	18	19	22	19	22	17	14	18	8
June	3	3	1	2	0	8	4	3	2	10	6	6	6	6	5	7	8	7	7	14	8	8	10	4
July	16	12	6	4	5	4	7	1	1	9	10	6	10	11	14	11	12	12	5	11	17	18	27	25
August	3	1	3	2	0	4	8	3	3	3	3	8	11	5	8	10	8	9	8	9	17	10	7	4
September	9	5	6	4	2	1	2	3	2	5	5	5	11	6	3	8	7	9	15	15	10	6	3	3
October	5	2	1	0	2	2	2	3	4	3	2	7	5	9	5	11	8	12	9	13	11	5	5	5
November	5	2	1	4	0	0	5	5	6	10	7	12	10	5	10	14	11	15	12	8	10	3	0	4
December	2	0	1	1	1	2	2	3	1	3	4	1	7	3	10	4	5	10	8	7	6	10	3	3

Structure Fires

	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
January	10	11	11	11	9	9	10	6	12	12	20	28	29	31	34	31	28	29	29	26	26	20	19	14
February	5	13	9	9	3	7	16	8	10	7	19	12	16	15	14	28	23	18	21	22	15	25	11	15
March	14	13	8	7	4	11	6	11	11	14	20	23	22	32	25	25	36	35	32	25	18	16	17	10
April	11	18	9	11	6	8	5	11	12	11	15	13	17	26	21	25	25	21	36	16	13	12	6	14
May	7	9	7	8	16	4	6	10	11	14	15	4	7	15	17	20	19	14	16	15	10	13	11	9
June	6	9	10	3	9	10	5	6	12	8	12	6	7	10	12	10	12	17	11	13	15	15	13	5
July	8	11	9	9	5	5	4	9	4	11	12	13	16	18	14	20	12	19	21	22	17	20	19	11
August	6	4	7	8	8	7	3	6	10	16	10	5	11	11	12	9	21	24	21	10	13	13	5	14
September	10	12	6	10	6	9	9	10	4	7	6	13	10	14	17	14	15	17	24	10	18	11	7	9
October	6	7	8	5	7	6	6	8	14	9	9	10	11	16	22	16	17	16	19	9	11	9	10	7
November	18	11	5	8	10	7	11	12	12	15	22	18	20	22	21	26	21	22	20	19	25	15	13	10
December	11	15	9	13	13	3	3	5	7	19	11	16	17	22	24	18	13	20	19	11	23	14	5	16

Vegetation Fires

	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
January	20	8	7	3	2	6	6	6	21	17	28	56	52	72	75	87	75	44	50	46	34	25	22	9
February	3	4	3	3	4	3	5	3	5	6	20	36	48	61	58	57	51	33	19	16	12	8	6	5
March	28	21	34	13	12	15	15	24	23	22	58	139	216	267	298	303	339	300	195	165	133	78	60	52
April	18	13	11	10	4	8	10	10	11	25	46	75	118	154	180	171	165	145	96	76	89	72	38	37
May	13	6	2	3	2	2	3	7	7	9	21	24	21	47	53	63	56	47	24	21	27	20	17	7
June	9	4	4	1	0	2	1	1	4	3	7	8	9	8	13	12	14	16	18	7	12	7	3	1
July	4	5	3	0	1	4	2	2	5	5	8	16	23	41	54	30	46	36	27	21	18	29	33	12
August	2	0	2	4	1	0	1	5	3	5	13	17	24	29	39	49	33	34	18	15	25	8	11	1
September	3	4	2	1	4	2	4	4	9	5	4	12	16	23	29	32	21	20	17	11	8	10	1	3
October	1	1	0	1	0	1	5	2	1	2	1	10	11	19	30	21	27	21	16	12	8	3	2	3
November	2	9	2	4	1	8	5	3	9	15	15	33	39	42	42	37	24	26	18	13	7	9	10	7
December	3	1	1	0	2	5	2	2	4	5	11	7	24	20	22	18	10	15	9	8	10	4	4	3

Vehicle Fires

	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
January	2	1	3	3	2	0	2	8	7	7	6	3	5	6	12	16	9	16	8	6	4	2	3	2
February	4	7	6	3	1	2	1	10	6	6	11	4	9	5	17	11	10	10	7	10	11	3	4	3
March	5	3	4	3	7	3	6	7	8	5	7	13	6	13	8	12	17	13	7	12	14	6	5	1
April	1	2	2	1	3	2	2	4	3	3	9	4	14	14	9	11	18	8	6	6	5	8	4	3
May	1	1	5	1	3	3	8	4	7	7	7	11	10	9	10	10	10	13	8	11	9	8	7	3
June	5	3	8	3	4	4	3	5	3	6	7	8	4	9	14	12	20	12	12	6	12	6	4	4
July	5	7	4	5	4	4	4	7	3	4	8	11	10	10	21	17	21	11	13	12	10	6	6	4
August	4	8	1	2	5	2	1	6	8	1	10	12	13	9	20	14	15	10	11	15	8	6	1	6
September	1	7	2	1	5	3	3	5	2	5	5	6	4	4	12	5	11	13	13	10	11	7	10	2
October	6	5	4	5	8	3	4	7	3	6	5	19	16	11	20	11	18	13	12	9	6	7	6	6
November	5	2	2	2	2	7	2	5	6	6	16	15	6	8	13	11	11	8	6	9	8	10	3	3
December	0	6	5	4	3	1	3	6	2	4	4	12	3	11	8	8	12	12	9	5	7	3	2	6

0 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11
Midnight Noon

When Calls Occur

Since fires are such a small percentage of the overall Fire Service workload, it's important to know when other call types are occurring. Below are tables for each category, shaded independently. Darker blue indicates higher call volume. The first table combines all calls into one, where it is easy to see how March fires have warped the call load into a small timeline.

	Midnight												Noon											
All Calls	12	1am	2	3	4	5	6	7	8	9	10	11	12	1pm	2	3	4	5	6	7	8	9	10	11
January	623	505	486	459	393	435	529	729	908	1048	1134	1284	1186	1238	1289	1342	1284	1276	1303	1133	1034	905	809	649
February	478	466	394	379	352	393	444	676	885	886	1009	1026	983	1094	1092	1059	1127	1047	1070	1006	877	794	708	571
March	611	550	484	440	415	441	531	713	891	963	1136	1286	1470	1537	1639	1644	1669	1660	1449	1382	1312	1112	916	728
April	556	493	400	394	362	394	506	714	862	964	1101	1229	1189	1369	1298	1388	1433	1435	1226	1150	1161	1023	844	685
May	570	504	499	397	392	417	489	725	909	1027	1070	1148	1133	1182	1236	1215	1302	1306	1172	1116	1103	1004	947	681
June	593	535	473	433	415	442	499	653	869	997	1092	1190	1059	1163	1096	1133	1182	1161	1145	1077	1099	1018	885	755
July	664	548	541	428	381	428	461	682	809	972	1087	1170	1112	1242	1210	1161	1217	1212	1122	1073	1118	1096	1082	854
August	639	534	519	418	400	394	510	729	828	1070	1114	1139	1197	1222	1229	1238	1271	1320	1168	1129	1146	1018	930	692
September	600	543	491	368	387	403	474	718	952	1057	1027	1081	1118	1142	1183	1193	1146	1225	1297	1137	1041	854	798	631
October	552	515	454	401	342	402	510	756	923	1072	1124	1145	1148	1228	1290	1226	1169	1223	1361	1232	1054	897	745	686
November	554	534	437	342	359	427	511	704	902	972	1087	1148	1141	1122	1214	1188	1186	1222	1179	1026	907	785	705	552
December	547	484	472	460	412	422	551	737	853	1096	1108	1041	1085	1132	1093	1132	1161	1186	1163	1024	909	912	771	639
Assist																								
January	75	56	48	46	43	41	54	97	93	105	110	138	118	144	152	168	135	162	175	145	109	116	79	68
February	45	48	34	39	32	39	41	72	82	77	111	102	112	117	113	136	126	131	135	101	92	104	81	58
March	73	73	53	56	41	43	55	83	108	138	153	154	158	183	200	217	204	178	192	182	225	156	120	96
April	64	58	32	37	36	38	54	84	104	118	140	145	115	163	148	164	159	193	148	140	168	156	111	71
May	67	61	41	41	30	38	46	74	102	126	136	123	123	132	135	119	154	154	149	156	140	135	104	72
June	80	62	57	37	39	44	49	66	88	113	126	117	108	115	118	105	132	126	131	116	134	113	117	82
July	79	56	60	48	32	46	42	69	84	113	127	124	112	143	139	158	122	121	121	125	137	135	150	84
August	72	64	59	41	30	34	48	73	98	110	115	137	114	132	113	156	135	155	118	127	148	138	98	84
September	77	54	39	34	32	39	43	77	113	107	118	106	131	107	151	140	115	138	134	154	132	109	95	79
October	70	49	54	42	31	33	56	88	88	129	133	121	140	138	131	127	121	145	191	160	150	111	77	100
November	56	52	49	32	31	51	52	71	107	93	115	114	136	119	143	128	150	191	156	138	104	82	73	46
December	52	60	50	40	36	36	51	78	72	103	101	118	100	124	126	143	154	145	148	125	102	98	83	62
EMS																								
January	407	332	330	325	251	277	346	460	600	695	748	793	737	703	733	785	791	767	721	650	646	565	528	421
February	338	321	290	263	247	251	298	458	611	604	663	680	627	699	694	627	698	667	684	654	558	504	503	400
March	398	341	304	293	276	259	348	476	580	622	660	687	731	658	682	686	697	744	695	714	667	617	539	430
April	362	322	285	271	254	261	339	463	547	634	673	743	722	748	648	734	771	778	672	684	623	581	526	444
May	381	355	367	278	262	304	328	487	587	668	664	747	782	759	820	773	829	833	745	700	711	630	612	480
June	396	364	299	288	285	278	336	440	543	645	703	779	744	803	735	754	804	798	721	718	716	685	568	516
July	422	365	360	295	272	266	336	446	557	618	698	777	733	800	750	693	790	808	738	694	690	648	635	513
August	449	381	367	285	294	258	343	480	513	697	743	744	818	795	771	790	831	816	758	717	726	647	619	459
September	415	378	361	268	256	266	320	474	609	681	678	741	766	783	754	758	777	796	870	733	667	567	549	430
October	399	388	320	280	230	299	336	519	593	669	714	728	747	774	845	831	776	797	865	773	674	616	507	473
November	363	365	301	236	256	293	323	481	572	651	707	731	718	717	761	741	731	768	731	643	584	519	492	395
December	394	346	335	338	315	313	386	533	600	756	790	701	766	764	696	750	795	756	768	708	627	653	554	444

	Midnight												Noon											
Fire	12	1am	2	3	4	5	6	7	8	9	10	11	12	1pm	2	3	4	5	6	7	8	9	10	11
January	47	30	36	24	17	23	35	30	60	55	75	132	147	191	183	199	151	121	133	137	95	69	63	40
February	17	40	22	30	11	20	33	29	30	35	81	73	104	117	117	134	123	86	73	70	60	53	30	33
March	65	61	62	38	33	46	43	51	60	65	127	245	380	455	531	543	553	520	345	279	238	152	128	90
April	54	45	36	33	21	35	34	41	37	47	95	127	196	265	306	296	302	257	185	145	153	123	76	69
May	33	22	23	21	31	13	27	33	30	52	59	57	65	95	108	135	123	116	83	81	80	65	68	29
June	26	20	29	13	16	26	17	19	33	34	41	38	29	43	49	51	64	66	60	49	56	42	33	23
July	42	45	25	26	20	18	20	27	14	31	48	53	69	92	117	106	119	91	74	85	82	86	93	67
August	18	18	22	21	23	14	15	24	30	32	46	49	67	72	101	107	98	93	82	63	80	47	35	34
September	25	29	22	17	23	18	21	33	21	24	25	47	49	63	78	85	71	77	81	56	51	41	24	25
October	21	15	20	12	20	12	18	24	26	28	30	58	54	64	91	75	82	69	65	50	44	30	25	25
November	47	40	16	22	18	26	28	31	43	48	71	97	97	96	116	120	95	79	67	59	59	48	34	29
December	21	36	23	23	24	20	12	19	19	40	37	46	62	71	83	64	47	66	52	42	53	32	20	39
False Calls																								
January	42	47	29	23	41	35	45	61	59	69	88	93	81	81	90	75	87	85	88	61	74	54	50	44
February	34	28	20	23	24	27	27	42	41	67	51	56	51	56	64	60	65	66	67	58	67	50	23	37
March	26	19	27	20	26	26	27	40	53	53	75	58	85	83	79	59	67	68	70	58	58	45	40	37
April	29	27	22	22	24	21	31	44	50	53	69	73	47	57	58	57	64	61	69	64	60	37	35	40
May	31	14	25	28	29	22	38	43	53	72	72	65	52	49	58	52	76	65	62	59	59	38	46	37
June	27	32	34	43	30	30	38	55	72	79	78	75	73	57	65	91	67	60	85	70	57	61	52	49
July	26	31	50	26	26	34	22	56	46	65	78	67	71	64	62	58	58	57	58	55	56	49	50	41
August	49	36	27	34	20	29	41	64	66	86	70	80	71	66	73	74	77	91	66	63	56	68	57	45
September	37	42	18	19	36	31	38	48	79	83	76	54	67	73	88	91	56	74	67	61	64	45	45	40
October	24	27	27	39	28	22	35	42	64	83	89	85	86	74	87	63	63	74	75	82	69	54	48	34
November	41	31	35	27	27	27	39	55	57	68	82	78	70	69	72	68	69	66	86	74	60	62	40	34
December	26	15	29	13	12	21	30	46	57	80	62	78	62	53	66	63	58	73	61	62	53	36	47	39
Hazard																								
January	15	11	9	12	13	14	15	21	29	43	38	29	40	44	37	43	38	41	74	53	43	36	24	24
February	13	10	8	5	10	7	14	23	43	44	32	33	30	33	37	25	32	38	31	40	34	28	23	12
March	11	18	9	6	8	9	13	20	27	34	39	42	43	42	53	43	51	40	38	46	38	54	32	20
April	13	11	8	5	3	9	12	23	29	29	32	36	40	53	44	48	46	41	57	31	45	28	29	24
May	13	10	9	9	12	9	12	23	27	30	49	41	40	45	46	45	31	40	36	39	32	42	38	19
June	24	19	21	20	16	12	20	29	49	39	62	63	39	56	43	50	35	42	62	45	55	39	42	29
July	33	20	16	5	10	5	19	29	39	39	48	53	53	43	66	45	43	40	40	38	37	43	57	76
August	19	9	10	16	9	5	20	24	40	41	50	35	47	50	61	43	48	56	50	57	50	48	50	22
September	25	14	9	10	11	9	13	27	41	52	46	37	38	30	43	46	43	49	41	40	49	28	28	18
October	8	16	10	8	11	8	15	20	34	47	53	53	47	46	44	36	45	44	55	52	34	28	29	10
November	15	11	14	5	10	9	15	12	36	37	36	37	34	39	32	42	51	43	48	52	32	34	19	12
December	11	8	8	12	8	5	21	15	35	37	35	28	31	44	29	32	27	60	41	27	26	32	22	14
Service	12	1am	2	3	4	5	6	7	8	9	10	11	12	1pm	2	3	4	5	6	7	8	9	10	11
January	35	26	33	27	26	45	33	53	59	71	68	89	60	66	89	68	72	91	101	83	65	62	64	47
February	29	16	19	18	26	47	30	50	62	49	59	70	55	68	59	70	77	53	72	76	60	52	40	28
March	38	36	29	26	29	56	43	34	56	41	68	93	67	101	85	87	86	100	98	96	81	82	50	51
April	30	30	16	23	23	29	32	44	73	76	85	91	59	64	75	79	80	80	72	71	100	85	60	34
May	38	38	33	17	28	29	36	44	85	60	65	100	64	86	59	75	77	91	70	67	74	85	67	38
June	34	32	28	30	29	49	37	34	58	64	68	100	58	71	69	73	62	65	73	64	62	65	54	51
July	56	27	29	25	20	58	20	46	50	84	80	84	68	85	65	82	74	80	79	65	96	107	63	53
August	31	23	31	21	24	53	41	51	69	90	72	81	66	95	91	61	69	99	79	78	76	66	66	41
September	16	24	40	18	25	39	36	52	78	95	69	89	60	70	58	68	77	79	93	79	74	59	52	36
October	29	16	23	18	22	27	47	58	108	100	83	91	66	109	75	72	70	84	97	100	77	48	50	42
November	27	31	20	19	17	20	50	48	77	66	68	79	77	76	79	83	77	69	87	53	65	36	41	35
December	40	18	26	31	16	24	49	43	58	76	70	61	57	67	78	69	72	82	85	52	45	55	43	41