

# **Texas Commission on Fire Protection**

## **Injury Report**

**January 1, 2015 to December 31, 2015**



**TEXAS COMMISSION ON FIRE PROTECTION**



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## **Executive Summary**

This report includes the abstract, mission, reports, information and data collected by the Texas Commission on Fire Protection's injury reporting program. The report includes fire fighter injuries reported to the Texas Commission on Fire Protection in 2015, with charts and graphs depicting the collected information. The report also compares Texas fire fighter injury statistics with statistics gathered by the National Fire Protection Association (NFPA) in 2014.

Under Texas Government Code §419.048, the Texas Commission on Fire Protection is charged with developing and establishing criteria to receive and analyze injury information pertaining to Texas fire fighters. The commission reviews this information to develop recommendations to help reduce fire protection personnel injuries. The commission provides this information to the State Fire Marshal's Office (SFMO) by September 1 of each year for inclusion in the SFMO's annual Firefighter Fatality Investigations Report. The commission has enacted rules about reporting injuries in the Texas Administrative Code (TAC) Title 37, Chapter 435, and has established the criteria and policies for reporting and analyzing the information.

The commission built the data systems necessary to gather this information in 2010. Development is ongoing as we receive feedback from stakeholders on the efficiency of the system. The reporting process is accomplished online. Fire departments regulated by the commission have been notified of the requirement to report. Several volunteer departments, which are not regulated by the commission, are also participating voluntarily.

This report concludes with recommendations from the commission to help reduce the number of fire fighter injuries in Texas and to improve the injury reporting program.

## **Abstract**

Texas fire departments reported 3,721 injuries to the Texas Commission on Fire Protection in calendar year 2015. Of these, 783 occurred during fire suppression activities, representing 21 percent of the total reported injuries. This represents a 3.5 percent decrease in the ratio of fire suppression injuries to the total, which in 2014 accounted for 24.5 percent of injuries.

As in previous years, the largest number of reported injuries occurred during the performance of emergency medical services (EMS) activities: 979 of the 3,721 total reported injuries, or 26.3 percent. This represents the same ratio of EMS injuries to total injuries in 2014, in which 1,065 of 4,055 total injuries, or 26.2 percent, occurred during EMS activities. 160 of the 783 fire suppression injuries were serious (20 percent), and 185 of the 979 EMS injuries were serious (19 percent). (Note: The commission defines a serious injury as one that results in missed work.)

After EMS and fire suppression, the next highest number of injuries reported in 2015 occurred in the performance of station duties, with 573, or 15.4 percent, of the total injuries. This is nearly the same as in 2014, when 631, or 15.5 percent, of the total reported injuries occurred in the station.

Wellness/fitness activities and skills training again rounded out the top five activities resulting in injuries, with 417 (11.2 percent) and 405 (10.9 percent), respectively.

The total number of injuries reported in station duties, skills training, and wellness/fitness activities (which are all non-emergency activities) represented over a third (39 percent) of the total injuries. This represents a slight increase in the ratio of non-emergency to emergency activities; in 2014, 36 percent of injuries occurred during non-emergency activities.

## **Mission**

*The commission shall gather and evaluate data on fire protection personnel injuries and develop recommendations for reducing injuries.*

The commission's educational and outreach programs provide information on the various educational resources available through TCFP's Ernest A. Emerson Fire Protection Resource Library, associated references linked to this subject, TCFP outreach programs and the adoption of the "Courage to be Safe" and Federal Highway Administration Traffic Incident Management Program programs.

### ***Building a community of safety***

The goal of the Texas Commission on Fire Protection's injury reporting program is to help the fire service community identify common injuries and learn how to avoid risk and prevent injuries.

### ***Why we are collecting injury data***

Under Texas Government Code §419.048, the Texas Legislature charged the commission with gathering and evaluating data on injuries. The rules requiring regulated entities to report injuries to the commission are in Texas Administrative Code §435.23. The commission encourages volunteer entities to report injuries so that it can gain as accurate a picture as possible concerning injury trends in the Texas fire service. The injury reporting program began in March 2010.

### ***Information the commission collects***

- Minor, serious, critical and fatal injuries
- Activities where fire personnel are injured
- Types of injuries (burns, strain-sprains, wounds, etc.)
- Body parts being injured
- Tasks performed at the time of injury
- Missed time
- Work assignment after injury
- Malfunctions/failures of personal protective equipment (PPE), self-contained breathing apparatus (SCBA), personal alert safety systems (PASS devices) and standard operating procedures (SOPs)

### ***How this will help the fire service***

- Identify common injuries
- Identify trends in injuries
- Identify needed training
- Evaluate and find improvements in procedures
- Track lost time injuries (requested by user community)

## Reports, Information and Data Collection

This report contains data submitted by regulated and non-regulated entities. The data collected in 2015 was the fifth full year of reporting.

Of the approximately 567 commission-regulated fire departments included in this report, 523, or 92 percent, either submitted an injury report or a “no injury” report for months in which their personnel did not have any injuries. (An additional 103 regulated entities that are not fire departments, however, did not report. The agency will continue to reach out to all regulated entities to communicate the need to report and the types of information needed.) The commission stresses the need for participation and provides reminders to regulated entities of the statutory requirement to report.

As in previous years, the commission continues to receive feedback from stakeholders on challenges they have experienced and changes they would like to see in the injury reporting program.

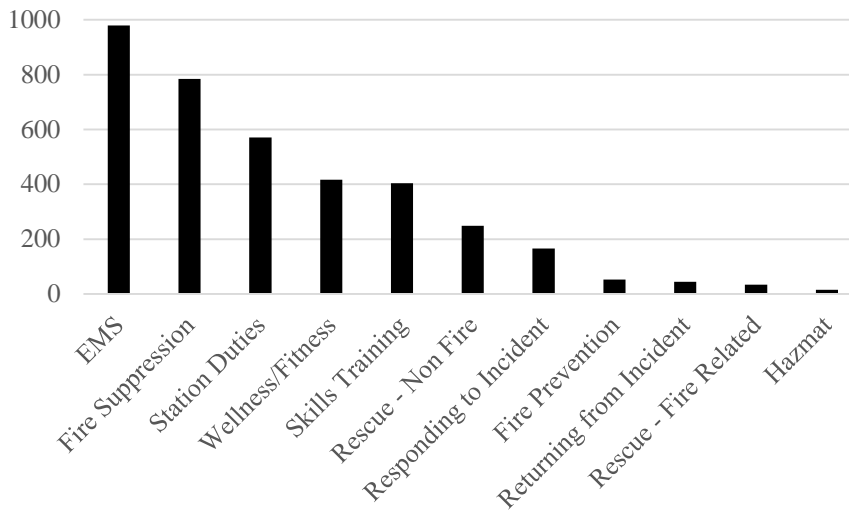


# Fire Protection Personnel Injuries

**Table 1: Injuries by Activity and Severity, 2015**

Activity	Minor	Serious	Critical	Fatal	Total
EMS	792	185	1	1	979
Fire Suppression	618	160	4	1	783
Station Duties	396	174	2	1	573
Wellness/Fitness	288	125	4		417
Skills Training	278	126	1		405
Rescue - Non Fire	204	46			250
Responding to Incident	122	44			166
Fire Prevention	41	12			53
Returning from Incident	33	13			46
Rescue - Fire Related	22	12			34
Hazmat	11	4			15
<b>Total</b>	<b>2804</b>	<b>898</b>	<b>12</b>	<b>3</b>	<b>3721</b>

**Figure 1: Total Injuries by Activity, 2015**



## Minor and Serious Injuries by Activity

EMS activities resulted in the highest number of both minor and serious injuries this year. In 2014, fire suppression activities resulted in the highest number of serious injuries, but in 2015 there were more serious injuries in EMS and station duties than in fire suppression. We note that there has been a steady decline in serious fire suppression injuries in the past four years. (See Table 3. The commission defines a serious injury as one which results in the employee missing one or more full duty shifts.)

**Table 2: Minor Injury Activities, 2012 - 2015**

Activity	2012		2013		2014		2015	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
EMS	1042	32.41%	934	30.28%	900	28.03%	792	28.25%
Fire Suppression	654	20.43%	619	20.06%	808	25.16%	618	22.04%
Station Duties	508	15.80%	452	14.65%	465	14.48%	396	14.12%
Skills Training	367	11.42%	317	10.28%	365	11.37%	288	10.27%
Wellness/Fitness	294	9.14%	285	9.24%	254	7.91%	278	9.88%
Rescue - Non Fire	147	4.57%	243	7.88%	206	6.42%	204	7.28%
Responding to Incident	90	2.80%	70	2.27%	105	3.27%	122	4.35%
Fire Prevention	45	1.40%	66	2.14%	43	1.34%	41	1.46%
Returning from Incident	30	0.93%	37	1.20%	42	1.31%	33	1.18%
Rescue - Fire Related	14	0.44%	18	0.58%	11	0.34%	22	0.78%
Hazmat	24	0.75%	44	1.43%	12	0.37%	11	0.39%
<b>Total</b>	<b>3215</b>	<b>100.00%</b>	<b>3085</b>	<b>100.00%</b>	<b>3211</b>	<b>100.00%</b>	<b>2805</b>	<b>100.00%</b>

**Table 3: Serious Injury Activities, 2012 - 2015**

Activity	2012		2013		2014		2015	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
EMS	196	18.97%	179	19.02%	164	19.90%	185	20.60%
Station Duties	233	22.56%	201	21.36%	160	19.42%	174	19.27%
Fire Suppression	231	22.36%	206	21.89%	177	21.48%	160	17.82%
Skills Training	113	10.94%	99	10.52%	104	12.62%	126	13.92%
Wellness/Fitness	134	12.97%	122	12.96%	127	15.41%	125	14.03%
Rescue - Non Fire	34	3.29%	46	4.89%	38	4.61%	46	5.01%
Responding to Incident	43	4.16%	42	4.46%	16	1.94%	44	4.90%
Returning from Incident	24	2.32%	18	1.91%	19	2.31%	13	1.34%
Fire Prevention	18	1.74%	17	1.81%	11	1.33%	12	1.34%
Rescue - Fire Related	7	0.68%	11	1.17%	3	0.36%	12	1.34%
Hazmat	0	0	0	0	5	0.61%	4	0.45%
<b>Total</b>	<b>1033</b>	<b>100.00%</b>	<b>941</b>	<b>100.00%</b>	<b>824</b>	<b>100.00%</b>	<b>901</b>	<b>100.00%</b>

# Emergency vs. Non-Emergency Injuries

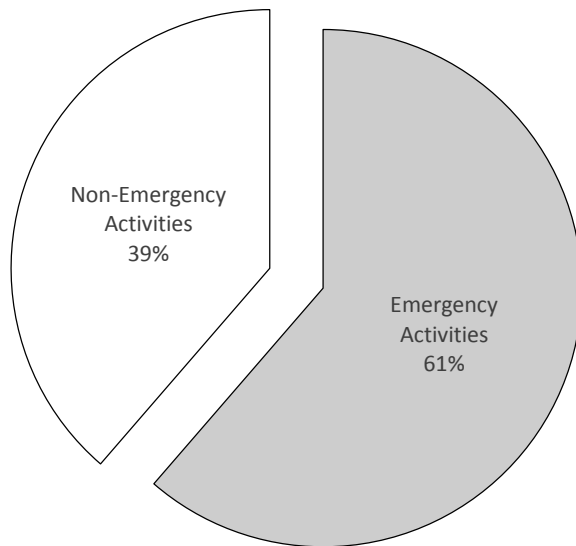
**Table 4: Injuries by Emergency Activity and Severity, 2015**

Activity	Minor	Serious	Critical	Fatal	Total
EMS	792	185	1	1	979
Fire Suppression	618	160	4	1	783
Rescue - Non Fire	204	46			250
Responding to Incident	122	44			166
Returning from Incident	33	13			46
Rescue - Fire Related	22	12			34
Hazmat	11	4			15
<b>Total</b>	<b>1802</b>	<b>462</b>	<b>5</b>	<b>2</b>	<b>2273</b>

**Table 5: Injuries by Non-Emergency Activity and Severity, 2015**

Activity	Minor	Serious	Critical	Fatal	Total
Station Duties	396	174	2	1	573
Wellness/Fitness	288	125	4		417
Skills Training	278	126	1		405
Fire Prevention	41	12			53
<b>Total</b>	<b>1003</b>	<b>437</b>	<b>7</b>	<b>1</b>	<b>1448</b>

**Figure 2: Percent of Total Injuries in Emergency and Non-Emergency Activities, 2015**

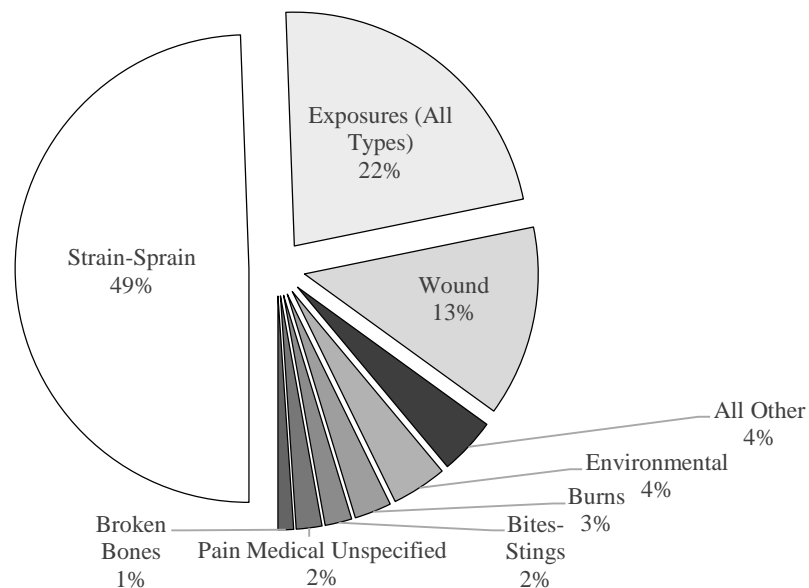


# Injuries by Type

**Table 6: Types of Injury, 2012-2015** (Note: ordered by 2015, descending)

Type of Injury	2012		2013		2014		2015	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Strain-Sprain	2140	50.19%	2118	52.30%	1917	47.27%	1839	49.42%
Wound	631	14.80%	548	13.53%	483	11.91%	491	13.20%
Exposure-Undetermined	23	0.54%	77	1.90%	120	2.96%	287	7.71%
Exposure Blood Pathogens	160	3.75%	164	4.05%	183	4.51%	181	4.86%
Exposure - Body Fluids	124	2.91%	138	3.41%	109	2.69%	167	4.49%
Environmental	133	3.12%	106	2.62%	101	2.49%	142	3.82%
Exposure Airborne Pathogens	404	9.47%	281	6.94%	369	9.10%	141	3.79%
Burns	176	4.13%	166	4.07%	113	2.79%	95	2.55%
Bites-Stings	93	2.18%	87	2.15%	79	1.95%	69	1.85%
Pain Medical Unspecified	49	1.15%	62	1.53%	79	1.95%	66	1.77%
Exposure-Chemical	128	3.00%	90	2.22%	313	7.72%	53	1.42%
Broken Bones	46	1.08%	59	1.46%	39	0.96%	40	1.07%
Chest Pains-Cardiac	40	0.94%	50	1.23%	46	1.13%	37	0.99%
Smoke-Gas Inhalation	22	0.52%	30	0.74%	20	0.49%	35	0.94%
Debris/Penetrating	51	1.20%	38	0.94%	38	0.94%	34	0.91%
Hearing Loss - Acute	18	0.42%	14	0.35%	21	0.52%	19	0.51%
Electrocution	11	0.26%	12	0.30%	12	0.30%	9	0.24%
Hearing Loss - Chronic	7	0.16%	2	0.05%	4	0.10%	7	0.19%
Exposure-Chemical-CO	1	0.02%	6	0.15%	3	0.07%	3	0.08%
Heart Attack	2	0.05%	2	0.05%	1	0.02%	3	0.08%
Broken Spine-Neck	4	0.09%	1	0.02%	4	0.10%	2	0.05%
Smoke Inhalation	0	0.00%	0	0.00%	0	0.00%	1	0.03%
Stroke	1	0.02%	0	0.00%	1	0.02%	0	0.00%
<b>Total</b>	<b>4264</b>	<b>100.00%</b>	<b>4051</b>	<b>100.00%</b>	<b>4055</b>	<b>100.00%</b>	<b>3721</b>	<b>100.00%</b>

**Figure 3: Types of Injury, 2015**



# Task at Time of Injury

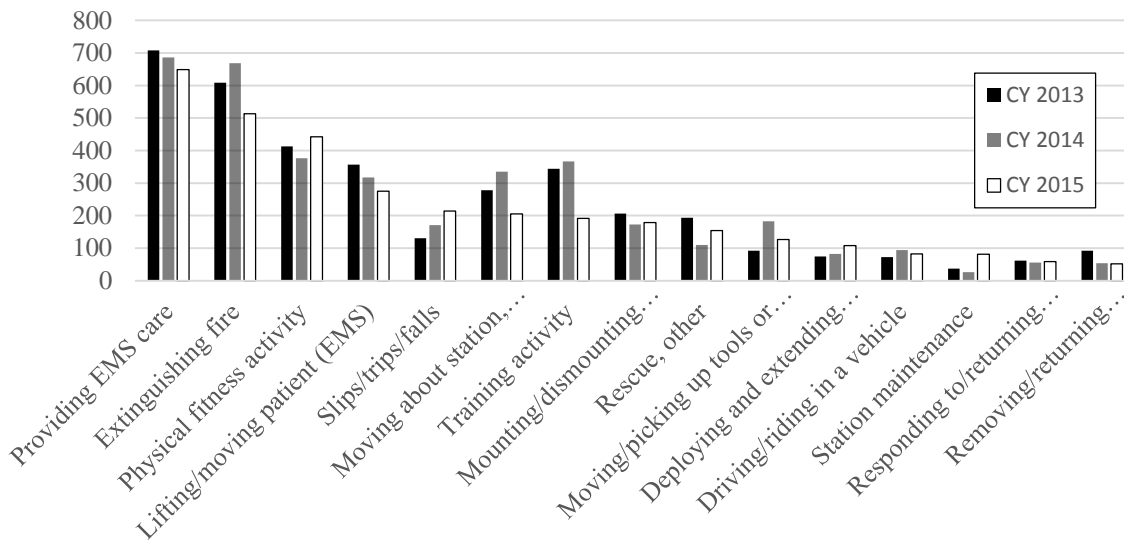
(The commission began gathering task information in mid-2012.)

**Table 7: Top 15 Tasks at Time of Injury, 2013-2015** (ordered by 2015, descending)

Task	2013	2014	2015
Providing EMS care	708	686	649
Extinguishing fire or neutralizing incident	609	669	513
Physical fitness activity	413	376	442
Lifting/moving patient (EMS)	357	317	275
Slips/trips/falls	131	171	215
Moving about station, normal activity	278	335	206
Training activity	344	367	193
Mounting/dismounting apparatus	206	173	180
Rescue, other	193	110	155
Moving/picking up tools or equipment	92	183	128
Deploying and extending hoseline	74	82	108
Driving/riding in a vehicle	72	94	82
Station maintenance	37	26	81
Responding to/returning from incident	62	56	59
Removing equipment from/returning equipment to apparatus	92	54	52
All other*	383	356	383*
<b>Total</b>	<b>4051</b>	<b>4055</b>	<b>3721</b>

\* All other, 2015, in descending order: Overhaul (47), Vehicle maintenance (38), Operating manual tool (33), Ascending/descending stairs (31), Equipment maintenance (29), Extrication (28), Ascending/descending ladder (24), Forcible entry (23), Moving about station, alarm sounding (20), Other: description (17), Non-fire incidents (13), Operating power tool (13), Raising/lowering ladder (13), Inspection activity (10), Crawling in a confined or otherwise hazardous area (8), Manually moving item to gain access (6), Operating in low/no visibility (6), Unidentified (5), Carrying/dragging a person (rescue) (5), Incident Investigation (5), Administrative Work (4), Operating Fire Department Apparatus (2), Salvage (2), Operating nozzle (1)

**Figure 4: Top 15 Tasks at Time of Injury, 2013-2015**



# Injuries by Body Part

**Table 8: Injuries by Body Part, 2012 - 2015**

Body Part	2012	2013	2014	2015
Multiple body parts, whole body	760	595	901	659
Knee	419	407	367	369
Hand and fingers	453	403	345	328
Hip, lower back, or buttocks	35	91	244	316
Shoulder	272	293	230	241
Back, except spine	686	588	372	207
Ankle	213	207	177	202
Multiple Parts	5	62	160	180
Face	95	128	118	140
Leg, lower	105	108	86	117
Arm, lower, not including elbow or wrist	89	84	94	84
Eye	106	100	98	75
Foot and toes	132	105	79	71
Head	96	94	73	69
Ear	72	54	52	60
Multiple body parts, upper body	22	57	27	52
Elbow	98	68	66	51
Other body parts injured	357	381	265	500*
<b>Total</b>	<b>4264</b>	<b>4051</b>	<b>4055</b>	<b>3721</b>

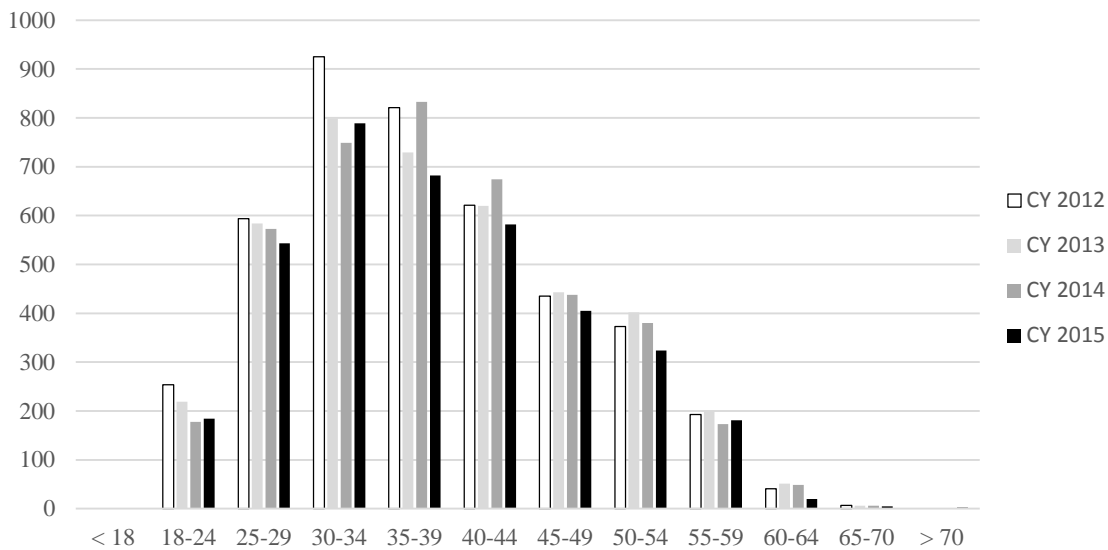
\* **Other body parts injured, 2015, in descending order:** Wrist (48), Upper extremities (46), Neck (45), Pelvis or groin (42), Chest (40), Abdomen (38), Lower Extremities (36), Trachea and lungs (33), Arm, upper, not including elbow or shoulder (31), Leg, upper (29), Mouth, included are lips, teeth, and interior (26), Neck and Shoulders (22), Heart (19), Multiple body parts, lower body (10), Abdominal area (7), Unidentified (5), Nose (5), Throat (5), Internal, other (3), Spine (3), Part of body, other (2), Undetermined (2), Head, other (1), Internal (1), Thorax (1)

# Injuries by Age Group

**Table 9: Injuries by Age Group, 2012 - 2015**

Age group	2012		2013		2014		2015	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
< 18	0	0.00%	0	0.00%	1	0.02%	0	0.00%
18-24	254	5.96%	219	5.41%	178	4.39%	187	5.03%
25-29	594	13.93%	584	14.42%	573	14.13%	543	14.59%
30-34	925	21.69%	799	19.73%	749	18.47%	791	21.26%
35-39	821	19.25%	729	18.00%	833	20.54%	682	18.33%
40-44	621	14.56%	620	15.31%	674	16.62%	582	15.64%
45-49	435	10.20%	443	10.94%	438	10.80%	405	10.88%
50-54	373	8.75%	402	9.90%	380	9.37%	323	8.68%
55-59	193	4.53%	198	4.89%	173	4.27%	181	4.86%
60-64	41	0.96%	51	1.26%	49	1.21%	20	0.54%
65-70	7	0.16%	6	0.15%	6	0.15%	5	0.13%
> 70	0	0.00%	0	0.00%	1	0.02%	2	0.05%
<b>Totals</b>	<b>4264</b>	<b>100.00%</b>	<b>4051</b>	<b>100.00%</b>	<b>4055</b>	<b>100.00%</b>	<b>3721</b>	<b>100.00%</b>

**Figure 5: Injury Count by Age Group, 2012 - 2015**



# Injury Activities Resulting in Lost Time

**Table 10: Injury Activities Resulting in Lost Time, 2015**

Activity	Count	Days Missed	
		Average	Total
EMS	144	41	5973
Station Duties	136	34	4644
Fire Suppression	132	35	4592
Wellness/Fitness	105	37	3850
Skills Training	93	40	3694
Rescue - Non Fire	33	26	871
Responding to Incident	33	22	714
Returning from Incident	10	29	285
Fire Prevention	9	33	298
Rescue - Fire Related	7	9	65
Hazmat	3	22	67
<b>Total</b>	<b>705</b>	<b>36</b>	<b>25053</b>

**Table 11: Activities Resulting in Lost Time, 2015, between 1 and 30 Days**

Activity	Count	Days Missed	
		Average	Total
Fire Suppression	101	10	1002
Station Duties	93	13	1169
EMS	86	12	1031
Wellness/Fitness	70	11	790
Skills Training	62	10	636
Responding to Incident	27	12	314
Rescue - Non Fire	26	14	356
Rescue - Fire Related	7	9	65
Returning from Incident	7	10	68
Fire Prevention	6	11	63
Hazmat	2	16	31
<b>Total, Between 1 and 30 Days</b>	<b>487</b>	<b>11</b>	<b>5525</b>



## Injury Activities Resulting in Lost Time (continued)

**Table 12: Activities Resulting in Lost Time, 2015, between 31 and 90 Days**

Activity	Count	Days Missed	
		Average	Total
EMS	43	52	2248
Station Duties	29	53	1523
Wellness/Fitness	25	58	1442
Skills Training	18	56	999
Fire Suppression	15	57	857
Rescue - Non Fire	6	51	308
Responding to Incident	6	67	400
Fire Prevention	2	55	110
Returning from Incident	2	52	103
Hazmat	1	36	36
<b>Total,</b> <b>Between 31 and 90 Days</b>	<b>147</b>	<b>55</b>	<b>8026</b>

**Table 13: Activities Resulting in Lost Time, 2015, 91+ Days**

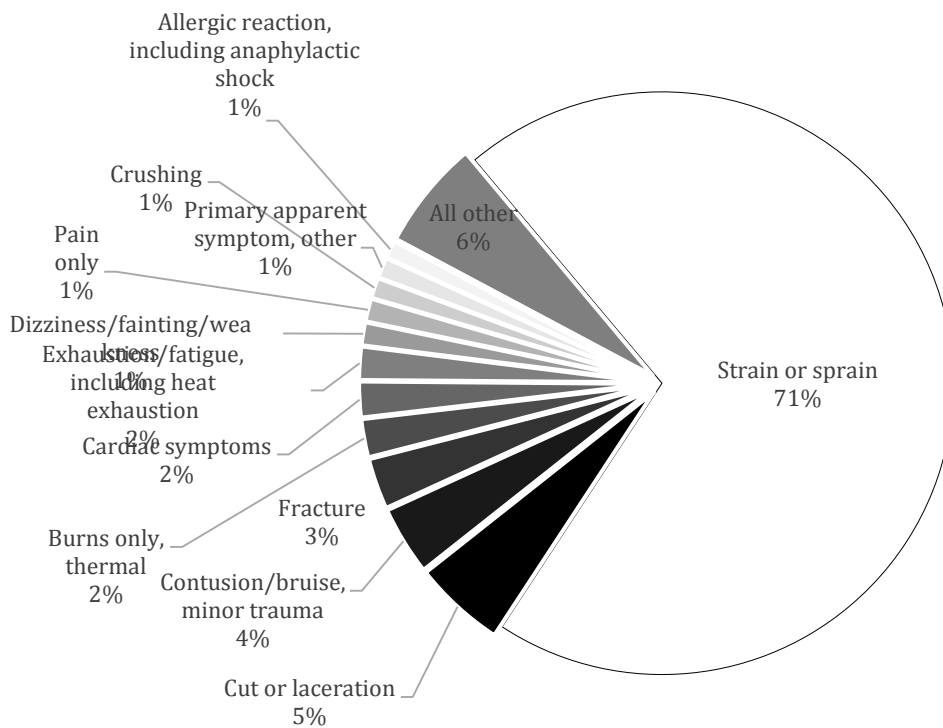
Activity	Count	Days Missed	
		Average	Total
Fire Suppression	16	171	2733
EMS	15	180	2694
Station Duties	14	139	1952
Skills Training	13	158	2059
Wellness/Fitness	10	162	1618
Fire Prevention	1	125	125
Rescue - Non Fire	1	207	207
Returning from Incident	1	114	114
<b>Total,</b> <b>91+ Days Missed</b>	<b>71</b>	<b>162</b>	<b>11502</b>

# Types of Injuries with Lost Time

**Table 14: Types of Injuries Resulting in Lost Time, 2015**

Type of Injury	Count	Average Days Out
Strain or sprain	496	41
Cut or laceration	36	9
Contusion/bruise, minor trauma	27	21
Fracture	20	70
Burns only, thermal	15	15
Cardiac symptoms	14	17
Exhaustion/fatigue, including heat exhaustion	13	6
Dizziness/fainting/weakness	9	9
Pain only	9	16
Crushing	8	22
Primary apparent symptom, other	8	57
Allergic reaction, including anaphylactic shock	7	9
All other	43	17
<b>Total</b>	<b>705</b>	<b>36</b>

**Figure 6: Types of Injuries Resulting in Lost Time, 2015**



## Burn Injuries

**Table 15: All Burns, 2013 - 2015**

All Burns - Types	2013	2014	2015
Thermal	92	76	85
Scald or steam	71	33	10
Chemical	0	2	0
Electric	2	2	0
<b>Total</b>	<b>165</b>	<b>113</b>	<b>95</b>

**Table 16: Burns with Lost Time by Burn Type, 2015**

Burns with Lost Time	Count	Average Days Missed	Total Days Missed
Thermal	15	15	226
Scald or steam	3	10	30
<b>Total</b>	<b>18</b>	<b>14</b>	<b>256</b>

**Table 17: Burns by Body Part, 2013 - 2015**

Body Part	2013	2014	2015
Ear	29	13	22
Hand and fingers	35	18	14
Face	14	13	12
Multiple parts	16	16	8
Neck	9	9	6
Leg, lower	4	1	6
Shoulder	13	5	5
Multiple body parts, upper body	3	4	5
Wrist	10	5	4
Head	5	3	4
Arm, lower, not including elbow or wrist	12	9	3
Upper extremities	0	6	2
Arm, upper, not including elbow or shoulder	1	2	2
Foot and toes	5	2	1
Lower extremities	5	2	1
Back, except spine	0	2	0
Hip, lower back or buttocks	0	1	0
Eye	0	1	0
Neck and shoulders	1	1	0
Chest	1	0	0
Elbow	1	0	0
Knee	1	0	0
Throat	1	0	0
<b>Total</b>	<b>166</b>	<b>113</b>	<b>95</b>

# Burn Injuries (continued)

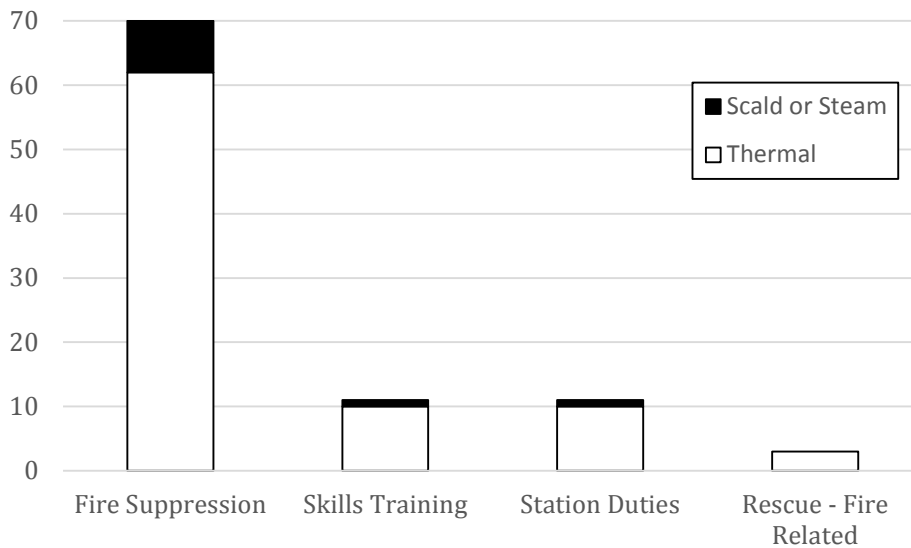
**Table 18: Burns by Emergency Activity, 2015**

Type	Emergency Activities	
	Fire Suppression	Rescue-Fire Related
Thermal	62	3
Scald or Steam	8	
<b>Total</b>	<b>70</b>	<b>3</b>

**Table 19: Burns by Non-Emergency Activity, 2015**

Type	Non-Emergency Activities	
	Skills Training	Station Duties
Thermal	10	10
Scald or Steam	1	1
<b>Total</b>	<b>11</b>	<b>11</b>

**Figure 7: Burns by Activity, 2015**



## Exposures

Agency staff has proposed modifying the commission's injury report form to include separate, specific categories of exposure/illness reporting:

- Exposure with injury
- Exposure with no injury
- Illness

The staff has been working to incorporate these categories into a redesigned injury report form; we hope to begin using the new data entry form at the beginning of the 2017 reporting year.

Fire protection personnel are routinely exposed to a variety of harmful agents. We currently categorize exposures primarily by "types" that illustrate the routes of exposure, including airborne pathogens, blood pathogens, body fluids, chemicals, plant toxins and undetermined. We have found, however, that these types often overlap or are not easily distinguishable. An example would be when a group of first responders provide care to a vehicle accident victim who is later discovered to have meningitis: meningitis can be bacterial, fungal, viral, parasitic, or systemic, and the department may not be able to determine immediately whether the greatest risk in providing care resulted from exposure to airborne droplets (from sneezing or coughing, for example), or from direct/dermal contact with the patient's body fluids or blood. Another common example would be a team of fire fighters exposed at a fire incident to potentially toxic smoke; it can be difficult for departments to determine whether to report the exposures as airborne pathogens, chemicals, etc., especially if the toxic agent is unknown.

In reviewing exposure reports, however, the staff has found that exposure agents can be grouped in a manner that may better characterize the hazards to which fire fighters are exposed. This "re-grouping" was based primarily on the types of agents, rather than on the routes of exposure. In the following pages these "groups" are broken down into biological agents, chemical/mineral agents, animals/wildlife, poison plants and undetermined. We have also included several additional "types" in this analysis to better capture potential exposures; as an example, we reviewed all the injuries entered as "wounds" and found 21 injuries which could have been categorized either as wounds or as exposures. (These were primarily puncture wounds from nails, lancets and needles.)

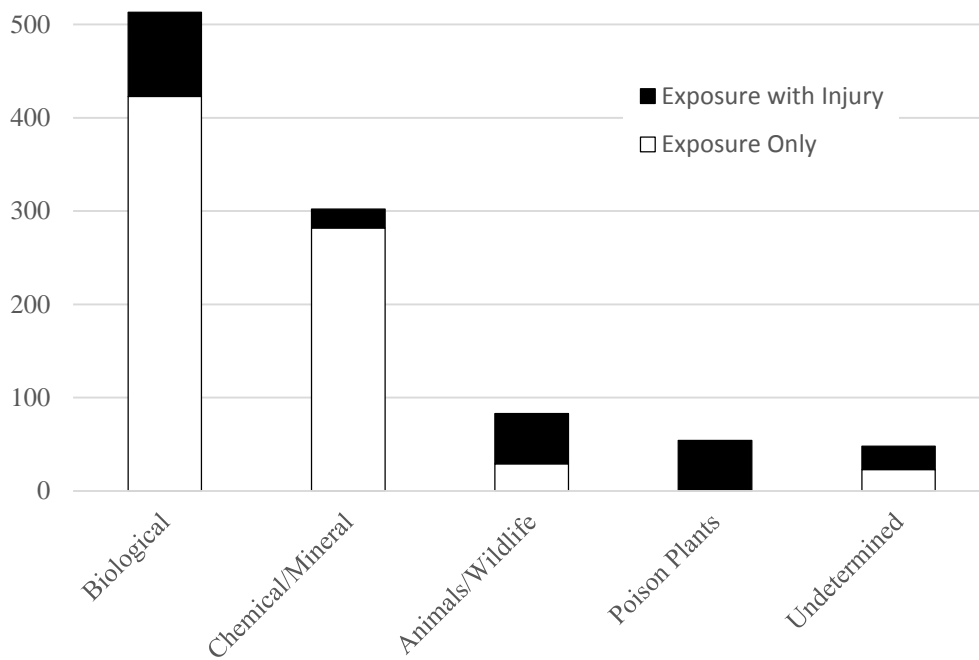
In 2015, the agency received 837 reports from fire departments in the report form's current exposure categories (see Table 6, Types of Injuries). In our review, we found 163 other injuries that could also have been reported as exposures, from the categories of wounds, smoke/gas inhalation, bites/stings, and environmental injuries, bringing the total to 1,000 exposures. Staff has further evaluated these reports to determine whether an injury resulted from or in conjunction with the exposure.

## Exposures (continued)

**Table 20: Exposures by "Group," With and Without Injury, 2015**

<b>Group</b>	<b>Exposure Only</b>	<b>Exposure with Injury</b>	<b>Total</b>
Biological	423	90	513
Chemical/Mineral	282	20	302
Animals/Wildlife	29	54	83
Poison Plants	0	54	54
Undetermined	23	25	48
<b>Grand Total</b>	<b>757</b>	<b>243</b>	<b>1000</b>

**Figure 8: Exposures by "Group," With and Without Injury, 2015**



## Exposures (continued)

**Table 21: Exposures by “Group” and Agent, 2015**

<b>Group/Agent</b>	<b>Count</b>	<b>Group/Agent</b>	<b>Count</b>
<b>Chemical/Mineral</b>		<b>Biological</b>	
Smoke	161	Blood	186
Asbestos	50	Body Fluids	105
Water	41	Meningitis	87
Marijuana Smoke	12	TB	73
Carbon monoxide	8	Hepatitis C	9
Insecticide	7	Tetanus	9
Diesel fuel	6	Undetermined	8
Chlorine gas	4	HIV and Hepatitis	5
Calcium carbide/acetylene	2	C-Diff	4
Undetermined	1	Hepatitis C and C-Diff	4
Abrasive compound	1	Mold	4
Battery acide	1	Staph	4
Gasoline	1	Adenovirus	3
Hydraulic fluid	1	Herpes	2
Hydrogen sulfide	1	HIV	2
Lacquer thinner	1	HIV and TB	2
Micro-Blaze	1	Meningitis or encephalitis	2
Natural gas	1	TB and meningitis	2
Novec 1230	1	Meningitis and pneumonia	1
<b>Total, Chemical/Mineral</b>	<b>302</b>	Pneumonia	1
		<b>Total, Biological</b>	<b>513</b>
<b>Animals/Wildlife</b>		<b>Undetermined</b>	
Bed Bugs	186	Undetermined	40
Dog	105	Unidentified carcinogen	8
Spider	87	<b>Total, Undetermined</b>	<b>48</b>
Scabies	73		
Wasp	9		
Cat	9		
Bee	8		
Insect, unidentified	5		
Ants	4		
Bees	4		
<b>Total, Animals/Wildlife</b>	<b>833</b>	<b>Grand Total</b>	<b>1000</b>
<b>Poison Plants</b>			
Poison ivy	49		
Poison ivy/poison oak	3		
Poison oak	1		
Undetermined	1		
<b>Total, Poison Plants</b>	<b>53</b>		

## Cancer reports

The commission received 14 reports of cancer diagnoses from fire departments in 2015. The commission encourage departments to report these illnesses to help the Texas fire service gain a better understanding of long-term illnesses from which fire protection personnel are suffering:

Male, 58

*Long-term exposure to carcinogens*

Male, 48

*Occupational illness due to unknown exposure. It is known that he is a cancer patient.*

Male, 32

*Employee developed a cancer growth. The squamous cell carcinoma is on the back of his head where the ratchet is to tighten his helmet.*

Male, 59

*Report of injury for informational purposes only of a recent diagnosis of prostate cancer.*

Male, 59

*Firefighter was ill and was diagnosed with colon cancer. He has been a firefighter for 29 years.*

Male, 51

*Firefighter was treated for basal cell carcinoma skin cancers.*

Male, 57

*Firefighter was recently diagnosed with B-cell Non-Hodgkin's Lymphoma.*

Male, 51

*Diagnosed with squamous cell carcinoma on left cheek where mask and hood contact face.*

Male 34

*Firefighter has been diagnosed and treated periodically with melanoma, basal cell carcinoma, and cytologic atypia.*

Male, 50

*This individual has been diagnosed with cancer.*

Male, 56

*Individual has been diagnosed with cancer.*

Male, 46

*Employee is suffering from T-cell lymphoma due to prolonged exposure to carcinogens. Cancer spread to the spleen, skeletal system, liver and lungs.*

Male, 42

*Invasive ductal carcinoma diagnosed in left breast.*

Male, 35

*The firefighter reported to his Captain on this date that he had testicular cancer.*



## SOP Issues

In 2015 there were 33 injuries attributed to failures of fire protection personnel to follow their departments' standard operating procedures (SOPs). All but a few were instances where the individuals were not wearing their provided PPE/SCBA gear in an environment or situation in which they should have been.

In its compliance inspections, the Texas Commission on Fire Protection verifies that fire departments have written SOPs that cover the appropriate subject matter.

**Table 22: Injuries Attributed to SOP Issues, 2015**

Activity	Minor	Serious	Total
EMS	10	2	12
Fire Suppression	3	3	6
Rescue - Non Fire	5	1	6
Station Duties	0	4	4
Wellness/Fitness	1	2	3
Responding to Incident	1	0	1
Skills Training	0	1	1
<b>Total</b>	<b>21</b>	<b>12</b>	<b>33</b>

## Fatalities

The commission's 2015 injury report includes three fatalities. The fatalities listed in this report include only those reported to the Texas Commission on Fire Protection (TCFP) by the entities it regulates. (The commission has no statutory authority to require reporting by departments it does not regulate.)

More comprehensive information regarding Texas fire service Line of Duty Deaths is included in the State Fire Marshal's Annual Report.

# Example Injury Narratives

## Burn injuries

The body part most frequently burned on the fireground in 2015 were ears; five of these injuries resulted in lost time. These narratives illustrate scenarios in which fire fighters suffered burns to the ears:

### Fire suppression – minor - ear

*During a response to a house fire, while fighting fire inside the house, the firefighter suffered a second degree burn to his right ear. After interviewing the firefighter, it was discovered that his protective hood was accidentally pushed back while donning his helmet and SCBA mask, thereby exposing the right ear.*

### Fire suppression – minor- ear

*Firefighter made entry. Approximately 10 feet into the structure firefighter began retreating due to intense heat. Firefighter's ears were blistered.*

### Fire suppression – serious - ear

*While working a structure fire, the individual was on the initial entry team with his Captain. He made his way to the rear of the mobile home with 1.5-inch charged hose line while wearing full PPE. He was told by his Captain that it was getting hot so he began cooling off the area. It appears that the firefighter was steamed burned while doing so.*

The second-highest number of fireground burn injuries were to the face:

### Fire suppression – minor - face

*Firefighter reports while operating at a structure fire he suffered thermal burns to the right side of his forehead and temple area. The member was wearing PPE.*

### Fire suppression – minor – face

*Firefighter was riding up as acting officer on Engine. Firefighter and his crew were assigned to make an offensive fire attack. There was heavy smoke coming from a single story with no active flames. The firefighter made entry into the structure; firefighter gave a reading of 600 degrees from his thermal imaging camera. Firefighter stated he felt a lot of heat on around his neck and ears and exited the structure immediately. The division chief checked conditions and determined the mode of operation should be switched to defensive. The injured firefighter began firefighting the fire from outside the structure as the Incident Commander changed modes to defensive. The injured firefighter continued to work until he got low on air. The injured firefighter then went to rehab and it was discovered he had two blisters on his face. One blister was on his forehead and the other on his left cheek. The firefighter melted the rubber exterior brim lining on his helmet and melted the rubber on his radio lapel mic. No other injuries were reported on the firefighter. He was immediately assessed by EMS and was transported as precautionary to a clinic for evaluation. The injured firefighter was given a tetanus shot and burns were cleaned. Firefighter was released and returned to full duty and finished out the remaining shift.*

## Example Injury Narratives (continued)

Although several fire fighters suffered burns to their hands on the fireground, the commission in 2015 received an equal number of reports of burns to the hands suffered during station duties:

### Fire suppression – minor – hand

*The individual was on a handline at a two-alarm structure fire performing exposure protection. He and his officer were between a house and fence when he felt a burning sensation to his right hand. He was on air and in full PPE. When he went to rehab, he removed his glove and noted redness and two blisters near his index and middle knuckles on his right hand. He continued on at the scene and finished his shift.*

### Fire suppression – serious – hand

*While deploying hose to the front door and before he donned his gloves, the firefighter received a burn to the back of his right hand. He was sent to hospital for treatment, and will be off for approximately seven days.*

### Station duties – minor – hand

*Firefighter was carrying a hot burning pot of grease out of oven and into backyard. Grease spilled out over sides burning a small spot on fifth digit of left hand and second digit of right hand. No medical attention sought.*

Fire fighters were also burned on their necks and shoulders during fireground operations, most often as the result of pulling ceiling, advancing hoselines, or during rescues:

### Fire suppression – serious – neck

*Firefighter was pulling ceiling in a structure fire. Firefighter grabbed a piece of sheetrock that was hanging in the doorway of his escape route and pulled down on it with his hands. This dislodged a section of hot debris. It landed on him between his shoulders and helmet while he was in a bent over position. When he stood up the embers got trapped between his collar and hood. This is where he received his burns.*

A small number of fire fighters suffered burn injuries to multiple parts, most often due to extremely hot or otherwise catastrophic conditions:

### Fire suppression – serious – multiple parts, upper body

*The firefighter was on the initial attack hoseline at a house fire and was attempting to make a push inside near where heavy fire involvement was. He sustained second degree burns on his hands and forearms, and first degree burns (sunburn-looking) to his shoulders. He also received minor second degree burns to his cheek. His turnout coat was removed from service due to thermal damage through the shell and into his liner. His gloves were removed from service as well. His SCBA mask was sent to be tested at our SCBA station and was removed from service by personnel who noticed some distortion of the mask from heat. All items have been isolated for further evaluation. The employee was treated at the [city clinic] and sent home. He remains off with restrictions for duty.*

### Fire suppression – serious – multiple parts, upper body

*During primary search of second floor [at a residential structure fire], the fireplace collapsed. Firefighter fell from second to first floor, trapped in rubble. Burns to torso and bilateral extremities.*

# Comparison between the State of Texas (2015) and National Fire Protection Association (NFPA), U.S. Firefighter Injuries – 2014

For the purposes of comparison, the commission has mapped its categories to the NFPA categories as follows:

- “Fireground” includes the commission’s Fire Suppression and Rescue – Fire Related.
- “Non-Fire” includes Rescue Non-Fire, EMS and Hazmat.
- “Other On-Duty” includes Fire Prevention, Station Duties and Wellness/Fitness.

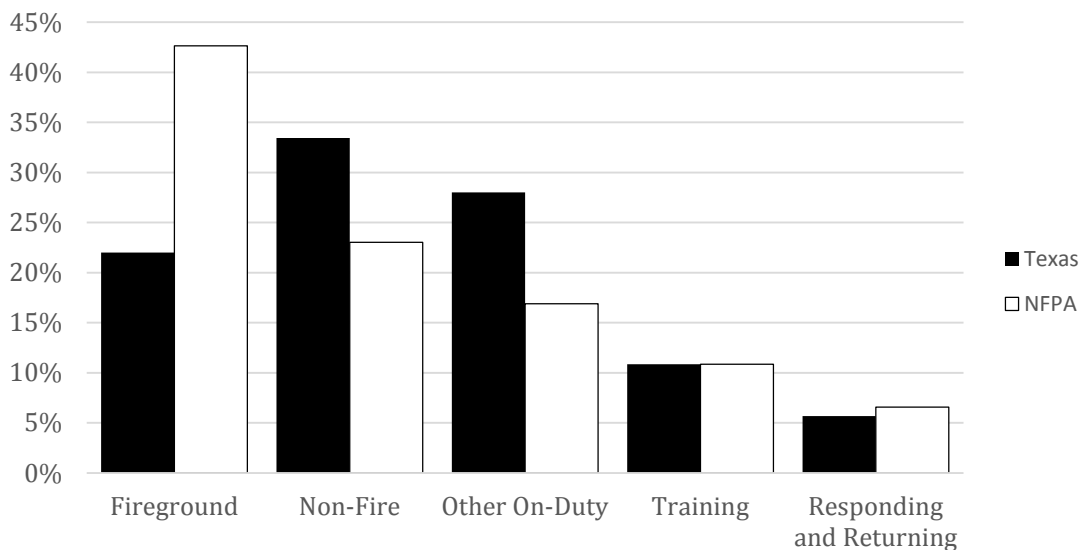
The NFPA’s “Responding and Returning” and “Training” categories appear to correspond closely to the commission’s categories. (The NFPA numbers include Texas statistics, although the reporting populations may not be the same.)

**Table 23: Comparison of Texas 2015 and NFPA 2014**

Category	Texas 2015		NFPA 2014*	
	Count	Percent	Count	Percent
Fireground	817	22%	27015	43%
Non-Fire	1244	33%	14595	23%
Other On-Duty	1043	28%	10695	17%
Training	405	11%	6880	11%
Responding and Returning	212	6%	4165	7%
<b>Total</b>	<b>3721</b>	<b>100%</b>	<b>63350</b>	<b>100%</b>

\* NFPA data is from [U.S. Firefighter Injuries – 2014](#), copyright© 2015, National Fire Protection Association, Quincy, MA.

**Figure 9: Injuries by Activity Percentages – Comparing Texas 2015 and NFPA 2014**



## 2015 Findings/Recommendations

The agency staff has been challenged by the fire fighter advisory committee to increase the percent of reporting departments. Staff will continue to reach out to all regulated entities that did not file any injury reports or “non-injury” reports in an effort to increase this percentage.

The advisory committee also charged staff with analyzing the relationship of call volume to the number of injuries reported. Staff will review existing state and federal resources to determine whether any conclusions can be drawn related to call volume. (It may prove difficult to compare the number of incidents statewide to injuries reported by commission-regulated entities, which comprise only a portion of the state’s fire service.) The agency, however, encourages departments to compare local call volumes with their own reported injury statistics, and stands ready to provide any assistance required. (The agency can, for example, prepare charts, graphs or statistical tables similar to those found in this report, filtered for individual departments.)

The commission further encourages departments to report cancer diagnoses and exposures. There is a great deal of awareness growing throughout the fire service community about the long-term health consequences of the profession; the commission’s injury reporting is uniquely positioned to gather this information in order to help state leaders gain a better understanding of these challenges statewide.

### ***Commission-adopted standards***

The commission has adopted several NFPA and other nationally recognized standards to help keep Texas fire protection personnel safe. This list summarizes the relationships between some of the Texas laws and national standards and is not intended to be all-inclusive:

#### **Texas Government Code**

[§419.040, Protective Clothing](#)

[§419.041, Self-Contained Breathing Apparatus](#)

[§419.042, Personal Alert Safety Systems](#)

[§419.043, Applicable National Fire Protection Association Standard](#)

[§419.044, Incident Management System](#)

[§419.045, Personnel Accountability System](#)

[§419.046, Fire Protection Personnel Operating at Emergency Incidents](#)

[§419.047, Commission Enforcement](#)

#### **Texas Administrative Code**

[CHAPTER 425 FIRE SERVICE INSTRUCTORS](#)

[§443.9 National Fire Protection Association Standard](#)

CHAPTER 435 FIRE FIGHTER SAFETY

§435.21 Fire Service Joint Labor Management Wellness-Fitness Initiative

§435.23 Fire Fighter Injuries

§435.25 Courage to be Safe So Everyone Goes Home Program

§435.27 Live Fire Training Structure Evolutions

CHAPTER 451 FIRE OFFICER

CHAPTER 457 INCIDENT SAFETY OFFICER CERTIFICATION

**Other resources**

See also the commission's web page: [NFPA Standards adopted by the commission.](#)