

Texas Commission on Fire Protection

Injury Report

January 1, 2017 to December 31, 2017



TEXAS COMMISSION ON FIRE PROTECTION

Table of Contents

Table of Contents.....	i
Executive Summary.....	1
Abstract	2
Mission.....	3
Why we are collecting injury data.....	3
Information the commission collects.....	3
How this will help the fire service.....	3
Reports, Information and Data Collection.....	3
Fire Protection Personnel Injuries.....	4
Table 1: Injuries by Activity and Severity, 2017.....	4
Figure 1: Total Injuries by Activity, 2017.....	4
Minor and Serious Injuries by Activity.....	5
Table 2: Minor Injury Activities, 2013 - 2017.....	5
Table 3: Serious Injury Activities, 2013 - 2017.....	5
Emergency vs. Non-Emergency Injuries.....	6
Table 4: Injuries by Emergency Activity and Severity, 2017.....	6
Table 5: Injuries by Non-Emergency Activity and Severity, 2017.....	6
Figure 2: Percent of Injuries in Emergency and Non-Emergency Activities, 2017.....	6
Injuries by Type.....	7
Table 6: Types of Injury, 2013-2017 (Note: ordered by 2017, descending).....	7
Figure 3: Types of Injury, 2017.....	7
Task at Time of Injury.....	8
Table 7: Top 15 Tasks at Time of Injury, 2013-2017 (ordered by 2017, descending).....	8
Figure 4: Top 15 Tasks at Time of Injury, 2013-2017.....	8
Injuries by Body Part.....	9
Table 8: Injuries by Body Part, 2013 - 2017 (ordered by 2017, descending).....	9
Injuries by Age Group.....	10
Table 9: Injuries by Age Group, 2013 - 2017.....	10
Figure 5: Injury Percentages by Age Group, 2013- 2017.....	10
Injury Activities Resulting in Lost Time.....	11
Table 10: Injury Activities Resulting in Lost Time, Totals, 2017.....	11
Table 11: Activities Resulting in Lost Time, 2017, between 1 and 30 Days.....	11

Injury Activities Resulting in Lost Time (continued)	12
Table 12: Activities Resulting in Lost Time, 2017, between 31 and 90 Days	12
Table 13: Activities Resulting in Lost Time, 2017, 91+ Days	12
Types of Injuries with Lost Time	13
Table 14: Types of Injuries Resulting in Lost Time, 2017	13
Figure 6: Types of Injuries Resulting in Lost Time, 2017	13
Burn Injuries.....	14
Table 15: All Burns, 2013 - 2017.....	14
Table 16: Burns with Lost Time by Burn Type, 2017.....	14
Table 17: Burns by Body Part, 2013 – 2017 (ordered by 2017, descending)	14
Burn Injuries (continued).....	15
Table 18: Burns by Emergency Activity, 2017	15
Table 19: Burns by Non-Emergency Activity, 2017	15
Figure 7: Burns by Activity, 2017	15
Exposures	16
Table 20: Routes of Exposure, 2013-2017 (ordered by 2017, descending)	16
Figure 8: Exposure Routes, 2013 – 2017.....	16
Exposures (continued).....	17
Table 21: Exposure description, 2013-2017 (ordered by 2017, descending)	17
Exposures (continued).....	18
Table 22: Chemical/Mineral Exposures, 2017	18
Table 23: Other Exposures, 2017.....	18
Table 24: Biological Exposures, 2017	18
Table 25: Poisonous Plants Exposures, 2017	18
Table 26: Animal/Wildlife Exposures, 2017	18
Cancer reports	19
SOP Issues.....	20
Table 27: Injuries Attributed to SOP Issues, 2017.....	20
Fatalities.....	20
Close-up: wellness/fitness injuries.....	21
Table 28: Identified fitness activities resulting in injury, 2017	21
Figure 9: Identified fitness/wellness activities resulting in injuries, 2017.....	21
Close-up: skills training injuries.....	22
Table 29: Identified skills training activities resulting in injury, 2017.....	22

Figure 10: Identified skills training activities resulting in injuries, 2017.....	22
Comparison between the State of Texas (2017) and National Fire Protection Association (NFPA), U.S. Firefighter Injuries – 2016	23
Table 30: Comparison of Texas 2017 and NFPA 2016.....	23
Figure 11: Injuries by Activity Percentages - Comparing Texas 2017 and NFPA 2016	23
2017 Findings/Recommendations.....	24
Commission-adopted standards	24

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 2017, 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 2016.

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 4,090 injuries to the Texas Commission on Fire Protection in calendar year 2017. Of these, 827 occurred during fire suppression activities, representing 20 percent of the total reported injuries. This represents a six percent decrease in the ratio of fire suppression injuries to the total, which in 2016 accounted for 26 percent of injuries. Of the 827 fire suppression injuries, 157, or 19 percent of the fire suppression-related injuries, were serious injuries that resulted in lost time. (Note: The commission defines a serious injury as one which results in the employee missing one or more full duty shifts)

Injuries from emergency medical services (EMS) activities surpassed injuries from fire suppression activities in 2017. EMS activities accounted for 1,079 of the 4,090 total reported injuries, or 26 percent of the total injuries. This represents nearly the same ratio of EMS injuries to total injuries in 2016, in which 1,041 of 4,097 total injuries, or 25 percent, occurred during EMS activities.

After EMS and fire suppression, the next highest number of injuries reported in 2017 occurred in the performance of station duties, with 668, or 16 percent, of the total injuries. This is nearly the same result as in 2016, when 610, or 15 percent, of the total reported injuries occurred in the station.

Skills training and wellness/fitness again rounded out the top five activities resulting in injuries, with 412 skills training injuries (10 percent of the total) and 384 fitness/wellness injuries (9 percent).

The total number of injuries reported in station duties, skills training, and wellness/fitness activities (which are all non-emergency activities) represented just over a third (37 percent) of the total injuries. This was the same ratio of non-emergency to emergency activities as in 2016.

Mission

The commission shall gather and evaluate data on fire protection personnel injuries and develop recommendations for reducing 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 2017 was the seventh full year of reporting.

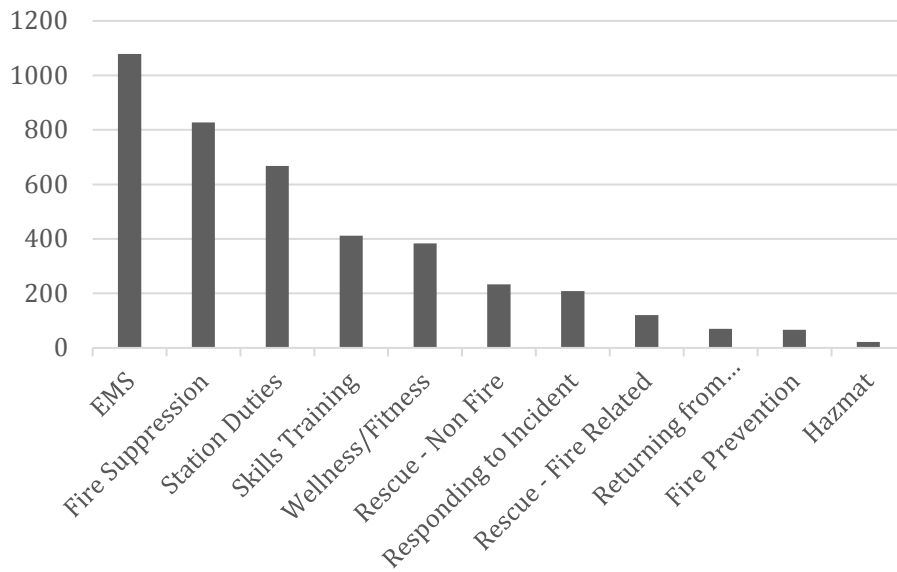
Of the approximately 544 commission-regulated fire departments included in this report, 488, or 90 percent, either submitted an injury report or a “no injury” report for months in which their personnel did not have any injuries. The commission stresses the need for participation and provides reminders to regulated entities of the statutory requirement to report.

Fire Protection Personnel Injuries

Table 1: Injuries by Activity and Severity, 2017

Activity	Minor	Serious	Critical	Fatal	Total
EMS	929	147	3		1079
Fire Suppression	662	157	7	1	827
Station Duties	481	185	2		668
Skills Training	291	120	1		412
Wellness/Fitness	254	129	1		384
Rescue - Non Fire	206	27			233
Responding to Incident	156	53			209
Rescue - Fire Related	113	7			120
Returning from Incident	42	28			70
Fire Prevention	50	15	1		66
Hazmat	21	1			22
Total	3205	869	15	1	4090

Figure 1: Total Injuries by Activity, 2017



Minor and Serious Injuries by Activity

EMS activities resulted in the highest number of minor injuries for 2017. The total number of serious fire suppression injuries is down, compared to 2015 and 2016. (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, 2013 - 2017

Activity	2013		2014		2015		2016		2017	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
EMS	934	30.28%	900	28.03%	792	28.25%	882	27.89%	929	28.99%
Fire Suppression	619	20.06%	808	25.16%	618	22.04%	866	27.39%	662	20.66%
Station Duties	452	14.65%	465	14.48%	396	14.12%	434	13.73%	481	15.01%
Skills Training	317	10.28%	365	11.37%	288	10.27%	311	9.84%	291	9.08%
Wellness/Fitness	285	9.24%	254	7.91%	278	9.88%	252	7.97%	254	7.93%
Rescue - Non Fire	243	7.88%	206	6.42%	204	7.28%	161	5.09%	206	6.43%
Responding to Incident	70	2.27%	105	3.27%	122	4.35%	117	3.70%	156	4.87%
Rescue - Fire Related	18	0.58%	11	0.34%	22	0.78%	20	0.63%	113	3.53%
Fire Prevention	66	2.14%	43	1.34%	41	1.46%	47	1.49%	50	1.56%
Returning from Incident	37	1.20%	42	1.31%	33	1.18%	37	1.17%	42	1.31%
Hazmat	44	1.43%	12	0.37%	11	0.39%	35	1.11%	21	0.66%
Total	3085	100%	3211	100%	2805	100%	3162	100%	3205	100%

Table 3: Serious Injury Activities, 2013 - 2017

Activity	2013		2014		2015		2016		2017	
	Count	Percent	Count	Count	Count	Percent	Count	Percent	Count	Percent
Station Duties	201	21.36%	160	19.42%	174	19.31%	172	18.76%	185	21.29%
Fire Suppression	206	21.89%	177	21.48%	160	17.76%	179	19.52%	157	18.07%
EMS	179	19.02%	164	19.90%	185	20.53%	158	17.23%	147	16.92%
Wellness/Fitness	122	12.96%	127	15.41%	125	13.87%	146	15.92%	129	14.84%
Skills Training	99	10.52%	104	12.62%	126	13.98%	141	15.38%	120	13.81%
Responding to Incident	42	4.46%	16	1.94%	44	4.88%	36	3.93%	53	6.10%
Rescue - Non Fire	46	4.89%	38	4.61%	46	5.11%	52	5.67%	27	3.11%
Returning from Incident	18	1.91%	19	2.31%	13	1.44%	18	1.96%	28	3.22%
Fire Prevention	17	1.81%	11	1.33%	12	1.33%	11	1.20%	15	1.73%
Rescue - Fire Related	11	1.17%	3	0.36%	12	1.33%	3	0.33%	7	0.81%
Hazmat	0	0	5	0.61%	4	0.44%	1	0.11%	1	0.12%
Total	941	100%	824	100%	901	100%	917	100	869	100%

Emergency vs. Non-Emergency Injuries

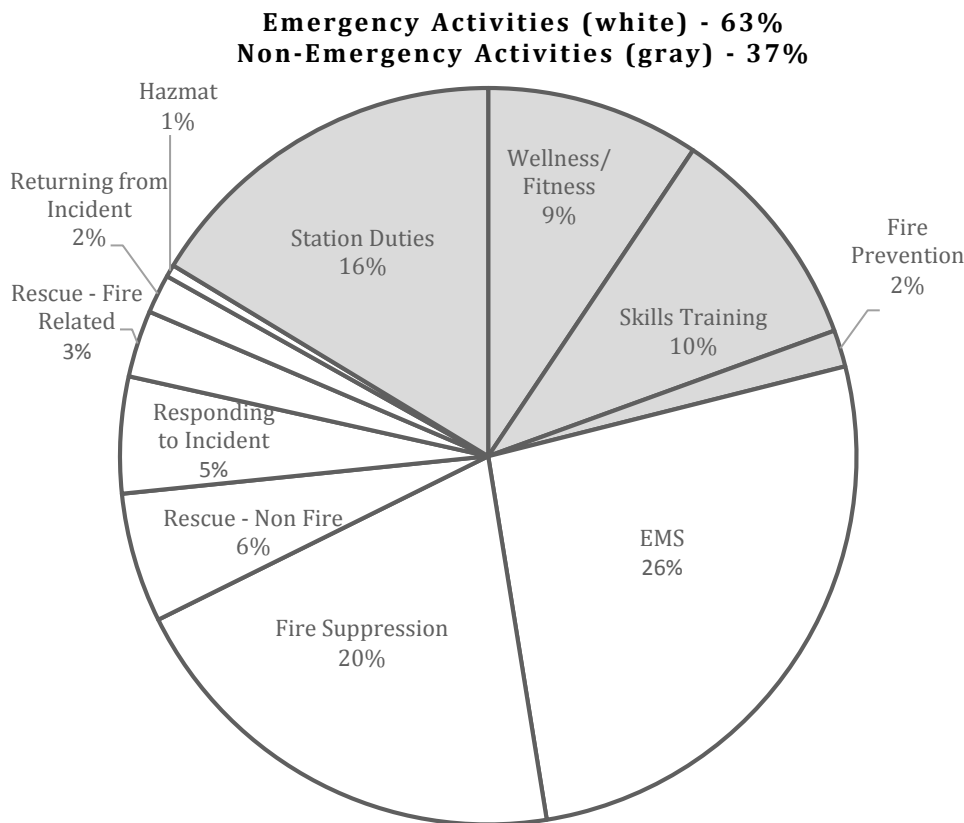
Table 4: Injuries by Emergency Activity and Severity, 2017

Activity	Minor	Serious	Critical	Fatal	Total
EMS	929	147	3		1079
Fire Suppression	662	157	7	1	827
Rescue - Non Fire	206	27			233
Responding to Incident	156	53			209
Rescue - Fire Related	113	7			120
Returning from Incident	42	28			70
Hazmat	21	1			22
Total	2129	420	10	1	2560

Table 5: Injuries by Non-Emergency Activity and Severity, 2017

Activity	Minor	Serious	Critical	Total
Station Duties	481	185	2	668
Skills Training	291	120	1	412
Wellness/Fitness	254	129	1	384
Fire Prevention	50	15	1	66
Total	1076	449	5	1530

Figure 2: Percent of Injuries in Emergency and Non-Emergency Activities, 2017

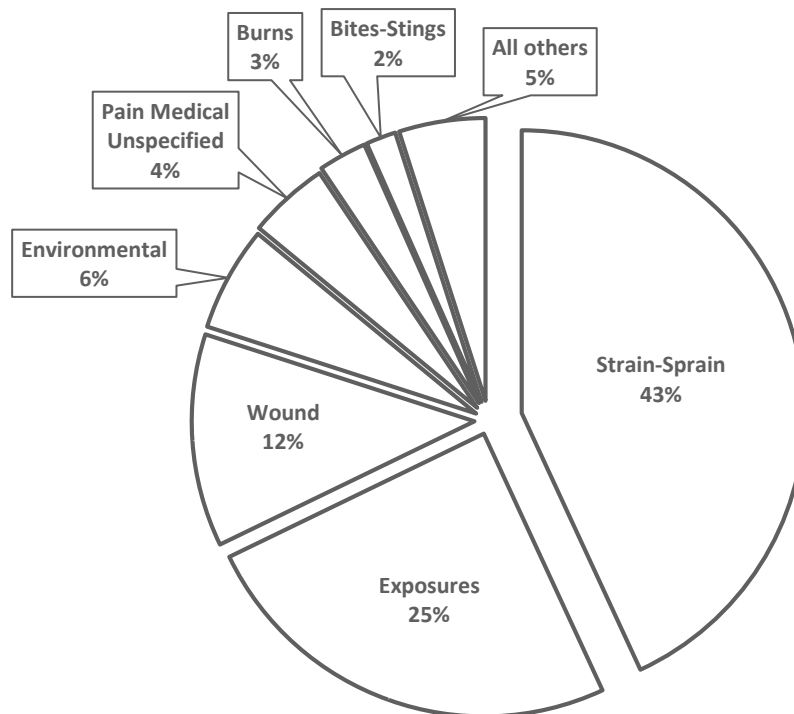


Injuries by Type

Table 6: Types of Injury, 2013-2017 (Note: ordered by 2017, descending)

Type of Injury	2013		2014		2015		2016		2017	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Strain-Sprain	2118	52.28%	1917	47.27%	1839	49.42%	1842	44.96%	1763	43.32%
Exposures	786	19.40%	1117	27.55%	868	23.33%	1092	26.65%	1011	24.84%
Wound	548	13.53%	483	11.91%	491	13.20%	492	12.01%	497	12.21%
Environmental	106	2.62%	101	2.49%	142	3.82%	191	4.66%	245	6.02%
Pain Medical Unspecified	62	1.53%	79	1.95%	66	1.77%	94	2.29%	189	4.64%
Burns	166	4.10%	113	2.79%	95	2.55%	113	2.76%	113	2.78%
Bites-Stings	87	2.15%	79	1.95%	69	1.85%	83	2.03%	70	1.72%
Chest Pains-Cardiac	50	1.23%	46	1.13%	37	0.99%	49	1.20%	51	1.25%
Fractures	59	1.46%	39	0.96%	40	1.07%	41	1.00%	40	0.98%
Debris/Penetrating	38	0.94%	38	0.94%	34	0.91%	35	0.85%	32	0.79%
Hearing Loss - Chronic	2	0.05%	4	0.10%	7	0.19%	35	0.85%	28	0.69%
Hearing Loss - Acute	14	0.35%	21	0.52%	19	0.51%	17	0.41%	23	0.57%
Electrocution	12	0.30%	12	0.30%	9	0.24%	9	0.22%	7	0.17%
Heart Attack	2	0.05%	1	0.02%	3	0.08%	1	0.02%	1	0.02%
Stroke	0	0.00%	1	0.02%	0	0.00%	2	0.05%	0	0.00%
Broken Spine-Neck	1	0.02%	4	0.10%	2	0.05%	1	0.02%	0	0.00%
Total	4051	100%	4055	100%	3721	100%	4097	100%	4070	100%

Figure 3: Types of Injury, 2017



Task at Time of Injury

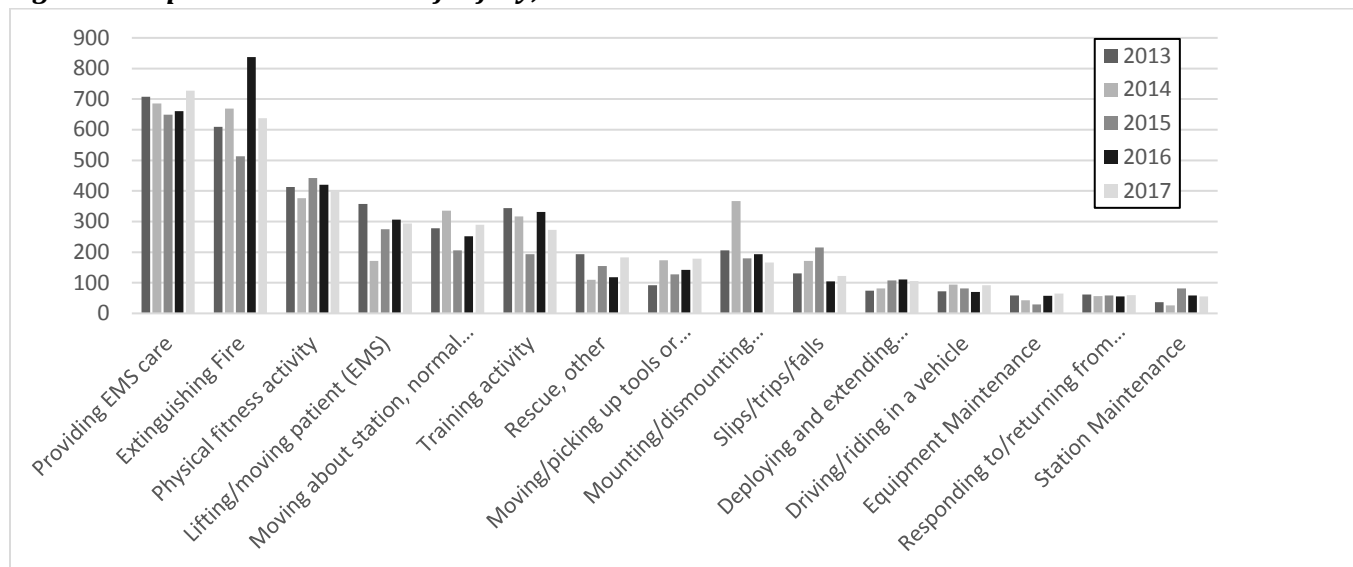
(The commission began gathering task information in mid-2012.)

Table 7: Top 15 Tasks at Time of Injury, 2013-2017 (ordered by 2017, descending)

Task	2013	2014	2015	2016	2017
Providing EMS care	708	686	649	661	728
Extinguishing Fire	609	669	513	837	638
Physical fitness activity	413	376	442	420	401
Lifting/moving patient (EMS)	357	171	275	306	294
Moving about station, normal activity	278	335	206	252	289
Training activity	344	317	193	331	273
Rescue, other	193	110	155	118	183
Moving/picking up tools or equipment	92	173	128	142	179
Mounting/dismounting apparatus	206	367	180	193	166
Slips/trips/falls	131	171	215	105	122
Deploying and extending hoseline	74	82	108	111	106
Driving/riding in a vehicle	72	94	82	70	92
Equipment Maintenance	59	43	29	57	65
Responding to/returning from incident	62	56	59	55	60
Station Maintenance	37	26	81	59	55
All others*	416	379	406	380	440
Total	4051	4055	3721	4097	4090

*All other, 2017: Other: Description: 48; Equipment Maintenance: 43; Extrication: 39; Forcible Entry: 38; Overhaul: 34; Ascending/descending stairs: 32; Operating manual tool: 29; Incident Investigation: 28; Moving about station, alarm sounding: 25; Non-Fire Incidents: 25; Ascending/descending ladder: 22; Inspection Activity: 22; Operating power tool: 11; Manually moving item to gain access: 10; Operating in low/no visibility: 6; Crawling in a confined or otherwise hazardous area: 5; Raising/lowering ladder: 5; Removing equipment from/returning equipment to apparatus: 5; Salvage: 5; Operating nozzle: 3; Carrying/dragging a person (rescue): 2.

Figure 4: Top 15 Tasks at Time of Injury, 2013-2017



Injuries by Body Part

Table 8: Injuries by Body Part, 2013 – 2017 (ordered by 2017, descending)

Body Part	2013	2014	2015	2016	2017
Multiple body parts, whole body	595	901	659	1007	1064
Hand and fingers	403	345	328	359	365
Knee	407	367	369	376	315
Hip, lower back, or buttocks	91	244	316	283	292
Back, except spine	588	372	207	244	248
Shoulder	293	230	241	238	221
Ankle	207	177	202	192	179
Multiple Parts	62	160	180	124	151
Face	128	118	140	116	127
Arm, lower, not including elbow or wrist	84	94	84	109	121
Leg, lower	108	86	117	132	113
Foot and toes	105	79	71	85	87
Head	94	73	69	82	78
Ear	54	52	60	74	76
Chest	66	64	40	82	76
Eye	100	98	75	70	73
Multiple body parts, upper body	57	27	52	61	73
Elbow	68	66	51	47	72
Wrist	79	68	48	74	56
Other body parts injured	381	265	500	342	303
Total	3970	3886	3809	4097	4090

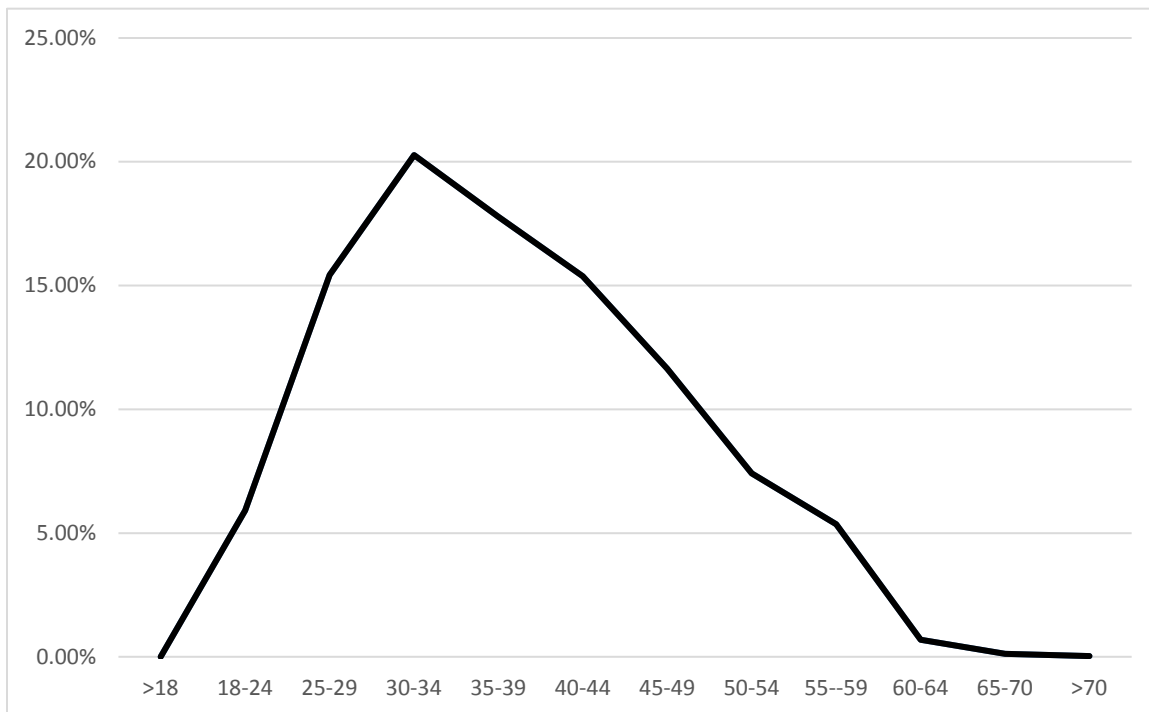
* **Other body parts injured, 2017, in descending order:** Neck: 41; Arm, upper, not including elbow or shoulder: 39; Pelvis or groin: 38; Abdomen: 36; Upper extremities: 28; Leg, upper: 21; Trachea and lungs: 20; Multiple body parts, lower body: 15; Mouth, included are lips, teeth, and interior: 14; Lower Extremities: 13; Neck and Shoulders: 10; Nose: 6; Unidentified: 6; Throat: 5; None: 4; Internal: 3; Thorax: 3; Genito-urinary: 1.

Injuries by Age Group

Table 9: Injuries by Age Group, 2013 - 2017

Age Group	2013		2014		2015		2016		2017	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
>18	0	0.00%	1	0.02%	0	0.00%	0	0.00%	0	0.00%
18-24	219	5.41%	178	4.39%	187	5.03%	213	5.20%	242	5.92%
25-29	584	14.42%	573	14.13%	543	14.59%	570	13.91%	631	15.43%
30-34	799	19.72%	749	18.47%	791	21.26%	812	19.82%	829	20.27%
35-39	729	18.00%	833	20.54%	682	18.33%	792	19.33%	727	17.78%
40-44	620	15.30%	674	16.62%	582	15.64%	634	15.47%	629	15.38%
45-49	443	10.94%	438	10.80%	405	10.88%	513	12.52%	476	11.64%
50-54	402	9.92%	380	9.37%	323	8.68%	313	7.64%	303	7.41%
55--59	198	4.89%	173	4.27%	181	4.86%	196	4.78%	219	5.35%
60-64	51	1.26%	49	1.21%	20	0.54%	50	1.22%	28	0.68%
65-70	6	0.15%	6	0.15%	5	0.13%	4	0.10%	5	0.12%
>70	0	0.00%	1	0.02%	2	0.05%	0	0.00%	1	0.02%
Totals	4051	100.00%	4055	100.00%	3721	100.00%	4097	100.00%	4090	100.00%

Figure 5: Injury Percentages by Age Group, 2013- 2017



Injury Activities Resulting in Lost Time

Table 10: Injury Activities Resulting in Lost Time, Totals, 2017

Activity	Count	Days Missed	
		Average	Sum
Station Duties	154	39	5977
Fire Suppression	134	49	6428
EMS	128	57	7274
Wellness/Fitness	115	36	4183
Skills Training	90	46	4132
Responding to Incident	43	31	1338
Rescue - Non Fire	20	27	546
Returning from Incident	24	37	878
Fire Prevention	15	80	1194
Rescue - Fire Related	5	10	51
Hazmat	1	2	2
Total	729	44	32003

Table 11: Activities Resulting in Lost Time, 2017, between 1 and 30 Days

Activity	Count	Days Missed	
		Average	Sum
Station Duties	100	10	1003
Fire Suppression	84	12	1007
Wellness/Fitness	76	11	859
EMS	64	10	656
Skills Training	54	10	547
Responding to Incident	32	9	273
Rescue - Non Fire	14	10	143
Returning from Incident	15	14	209
Fire Prevention	8	17	134
Rescue - Fire Related	5	10	51
Hazmat	1	2	2
Total, Between 1 and 30 Days	453	11	4884

Injury Activities Resulting in Lost Time (continued)

Table 12: Activities Resulting in Lost Time, 2017, between 31 and 90 Days

Activity	Count	Days Missed	
		Average	Sum
EMS	36	58	2099
Station Duties	34	52	1760
Fire Suppression	27	53	1430
Wellness/Fitness	28	60	1688
Skills Training	23	54	1253
Responding to Incident	6	65	390
Rescue - Non Fire	4	35	141
Returning from Incident	6	52	310
Fire Prevention	3	55	166
Total, Between 31 and 90 Days	167	55	9237

Table 13: Activities Resulting in Lost Time, 2017, 91+ Days

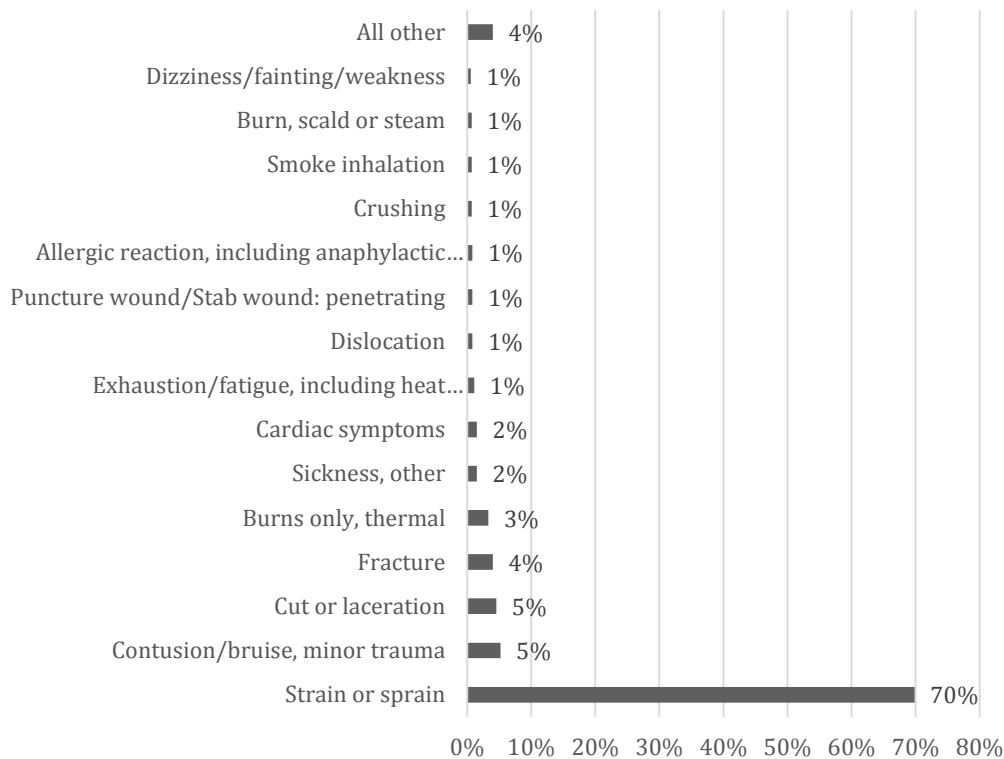
Activity	Count	Days Missed	
		Average	Sum
Fire Suppression	22	181	3991
EMS	28	161	4519
Station Duties	20	161	3214
Skills Training	13	179	2332
Responding to Incident	3	120	675
Wellness/Fitness	11	149	1636
Rescue - Non Fire	2	131	262
Fire Prevention	4	224	894
Returning from Incident	3	120	359
Total, 91+ Days Missed	108	166	17882

Types of Injuries with Lost Time

Table 14: Types of Injuries Resulting in Lost Time, 2017

Type of Injury	Count	Average Days Out
Strain or sprain	509	49
Contusion/bruise, minor trauma	38	39
Cut or laceration	33	14
Burns only, thermal	24	26
Fracture	29	56
Sickness, other	11	57
Cardiac symptoms	11	12
Exhaustion/fatigue, including heat exhaustion	8	14
Dislocation	6	62
Allergic reaction, including anaphylactic shock	6	5
Burn, scald or steam	5	36
Puncture wound/Stab wound: penetrating	6	81
Crushing	5	15
Smoke inhalation	5	17
Dizziness/fainting/weakness	4	8
All other	29	25
Total	729	44

Figure 6: Types of Injuries Resulting in Lost Time, 2017



Burn Injuries

Table 15: All Burns, 2013 - 2017

All Burns - Types	2013	2014	2015	2016	2017
Thermal	92	76	85	92	96
Scald or steam	71	33	10	9	13
Electric	2	2	0	2	0
Chemical	0	2	0	3	4
Total	165	113	95	106	113

Table 16: Burns with Lost Time by Burn Type, 2017

Burns with Lost Time	Count	Average Days Missed	Total Days Missed
Scald or steam	5	36	182
Thermal	24	26	628
Total	29	31	810

Table 17: Burns by Body Part, 2013 - 2017 (ordered by 2017, descending)

Body Part	2013	2014	2015	2016	2017
Hand and fingers	35	18	14	27	22
Ear	29	13	22	14	16
Arm, lower, not including elbow or wrist	12	9	3	2	12
Multiple parts	16	16	8	4	12
Face	14	13	12	16	9
Neck	9	9	6	4	7
Wrist	10	5	4	9	7
Shoulder	13	5	5	3	6
Multiple body parts, upper body	3	4	5	8	4
Leg, lower	4	1	6	3	3
Undetermined	0	0	0	3	2
Arm, upper, not including elbow or shoulder	1	2	2	1	2
Back, except spine	0	2	0	0	2
Pelvis or groin	0	0	0	0	2
Knee	1	0	0	1	2
Elbow	1	0	0	0	1
Head	5	3	4	2	1
Neck and shoulders	1	1	0	0	1
Chest	1	0	0	1	1
Foot and toes	5	2	1	3	1
Eye	0	1	0	0	0
Throat	1	0	0	0	0
Hip, lower back, or buttocks	0	1	0	1	0
Lower extremities	5	2	1	2	0
Upper extremities	0	6	2	2	0
Total	166	113	95	106	113

Burn Injuries (continued)

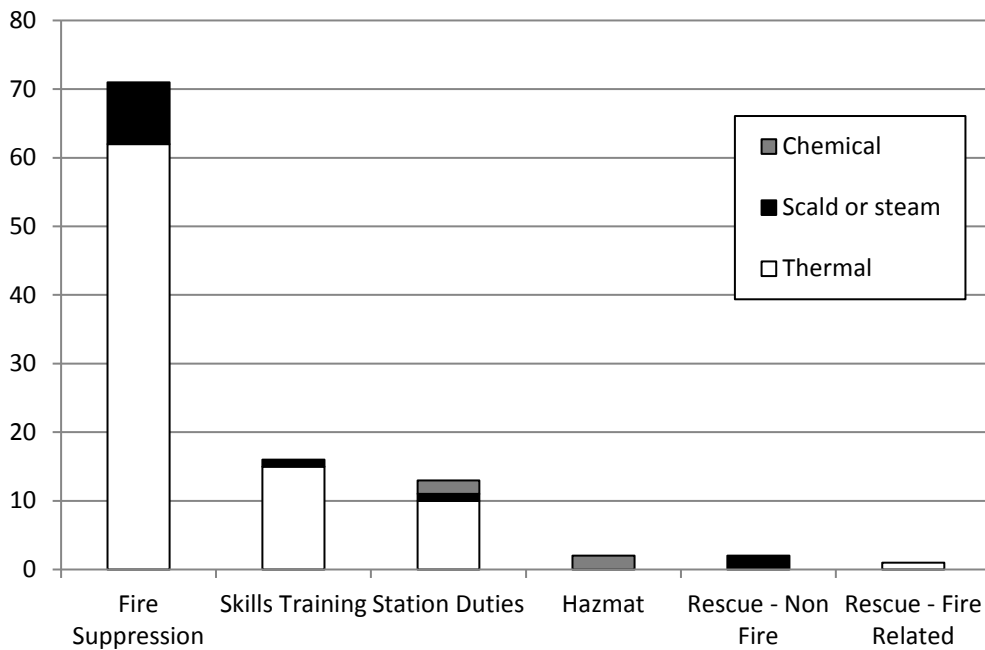
Table 18: Burns by Emergency Activity, 2017

<u>Emergency Activities</u>				
Type	Fire Suppression	Hazmat	Rescue - Non Fire	Rescue - Fire Related
Thermal	68			2
Scald or Steam	9		2	
Chemical		2		
Total	77	2	2	2

Table 19: Burns by Non-Emergency Activity, 2017

<u>Non-Emergency Activities</u>		
Type	Station Duties	Skills Training
Thermal	11	15
Scald or Steam	1	1
Chemical	2	
Total	14	16

Figure 7: Burns by Activity, 2017

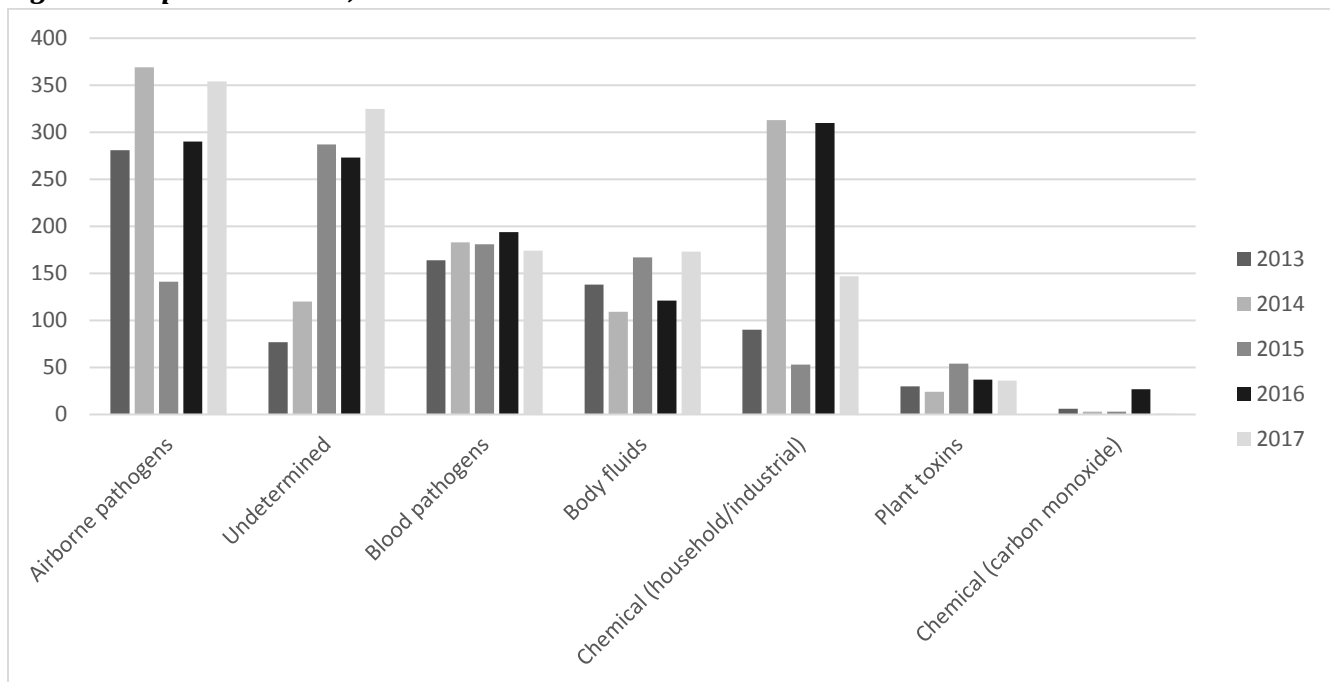


Exposures

Table 20: Routes of Exposure, 2013-2017 (ordered by 2017, descending)

Exposure Routes	2013	2014	2015	2016	2017
Airborne pathogens	281	369	141	290	354
Undetermined	77	120	287	273	325
Blood pathogens	164	183	181	194	174
Body fluids	138	109	167	121	173
Chemical (household/industrial)	90	313	53	310	147
Plant toxins	30	24	54	37	36
Chemical (carbon monoxide)	6	3	3	27	1
Total	786	1121	886	1252	1210

Figure 8: Exposure Routes, 2013 - 2017



Exposures (continued)

Table 21. Exposure description, 2013-2017 (ordered by 2017, descending)

Exposure description	2013	2014	2015	2016	2017
Unknown	51	103	256	148	290
Blood	159	177	167	161	153
Chemicals/household/industrial	89	89	36	310	122
Asbestos	5	384	51	51	112
Tuberculosis	94	93	73	128	109
Body fluids	96	109	92	91	101
Meningitis	129	65	91	62	104
Animals or wildlife	29	63	75	90	58
Sickness, other	5	60	21	24	49
Poison plants	30	24	61	37	37
Vomit	33	16	19	14	17
Chlorine	0	0	4	1	14
Mold	2	0	4	26	10
Airborne, Other	37	15	7	40	7
Staph	1	0	3	0	7
Carbon monoxide	5	6	8	26	5
HIV	4	0	11	4	4
Scabies	8	9	4	21	4
Hepatitis C	8	6	10	14	3
MRSA	16	4	0	14	3
Bacterial pneumonia	0	0	1	0	1
Explosive residue	8	0	0	0	0
Influenza	0	8	0	0	0
Lice	2	0	0	0	0
Strep	0	0	0	1	0
Total	811	1231	984	1263	1210

Note: The commission received 127 exposure reports related directly to Hurricane Harvey; the majority of these exposures were direct exposures to floodwater and/or chemical exposures.

Table 22: Chemical/Mineral Exposures, 2017

Chemical / mineral	Count
Carcinogens, unspecified	144
Asbestos	112
Heavy metals	19
Chlorine	17
Sodium bromide	17
Smoke	15
Unknown chemicals	13
Phosphine gas	9
Oil	8
Solvents	8
Lithium ion batteries	4
Battery acid	4
Carbon monoxide	4
Benzene	3
Firefighting foam	3
Cleaning fluid	3
Ammonia	3
Petroleum byproducts	2
IV fluid	2
Methamphetamine	2
Insecticide / pesticide	1
Sodium hydroxide	1
Personal protective equipment	1
Gasoline	1
Fiberglass	1
Potassium acetate	1
Antifreeze	1
Hydraulic fluid	1
Total	400

Table 23: Other Exposures, 2017

Other	Count
Ricin	6
UV / radiation exposure	5
Mercury	3
Fentanyl	1
Other, unknown puncture	1
Total	16

Table 24: Biological Exposures, 2017

Biological	Count
Blood	174
Contaminated water or sewage	111
TB	108
Meningitis	108
Bodily fluids	89
Vomit	23
Chicken pox / shingles	16
Pertussis / whooping cough	15
Undetermined	12
Mold	10
MRSA / Staph	10
Ebola	7
Hepatitis	4
HIV	4
C. Diff	3
Conjunctivitis	2
Malaria	2
Total	698

Table 25: Poisonous Plants Exposures, 2017

Poisonous plants	Count
Poison plants	36

Table 26: Animal/Wildlife Exposures, 2017

Animals / wildlife	Count
Bees	13
Dog bite	12
Unidentified insect	11
Cat bite	9
Wasps	5
Scabies	4
Spider bite	3
Ants	1
Bedbugs	1
Ticks	1
Total	60

Cancer reports

The commission received ten reports of cancer diagnoses from fire departments in 2017:

Prostate – 3
(Males, 50, 54, 54)

Leukemia – 1
(Male, 60)

Oropharyngeal – 1
(Male, 58)

Colon – 1
(Male, 46)

Cervix – 1
(Female, 53)

Liver – 1
(Male, 42)

Unidentified – 2
(Males, 47, 55)

The commission encourages 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.

SOP Issues

In 2017 there were 28 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 27: Injuries Attributed to SOP Issues, 2017

Activity	Minor	Serious	Critical	Total
Fire Suppression	5	3	1	9
EMS	4	3		7
Responding to Incident	2	1		3
Skills Training	2			2
Station Duties	1	3		4
Wellness/Fitness		1		1
Fire Prevention			1	1
Rescue – Non Fire		1		1
Total	14	12	2	28

Fatalities

The commission's 2017 injury report includes one fatality. Fatalities listed in this report include only those reported to the Texas Commission on Fire Protection (TCFP) by the entities it regulates.

Two other fatalities were recognized and communicated to TCFP, however, they were not reported as LODD in the injury reporting system. One LODD resulted from LODIs received in 2013, and the second was a cancer-related fatality.

The State Fire Marshal's Office investigated four Texas fire fighter LODDs in 2017. (Comprehensive information regarding Texas fire service deaths is included in the State Fire Marshal's Annual Report and on its website at <http://www.tdi.texas.gov/fire/fmloddindividuals.html>.)

Close-up: wellness/fitness injuries

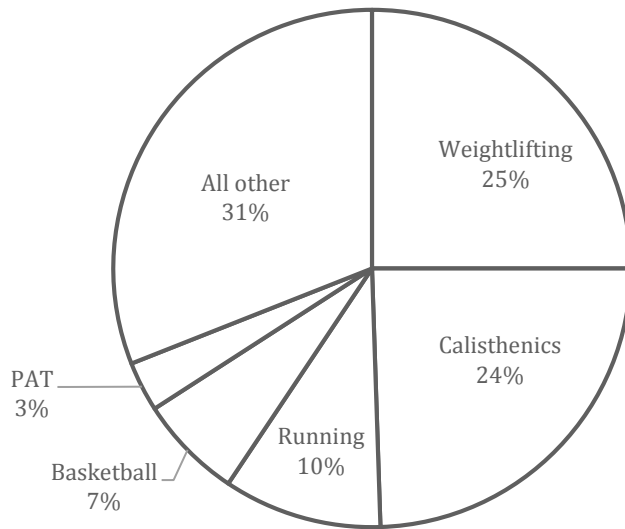
384 wellness/fitness injuries were reported in 2017. The most frequent types of activities that resulted in injury are reported below.

Table 28: Identified fitness activities resulting in injury, 2017

Fitness activity	Count	Percent
Weightlifting	96	25%
Calisthenics	94	24%
Running	38	10%
Basketball	25	7%
PAT/fitness test	12	3%
All other*	119	31%
Total	384	100%

*Other fitness/wellness activities that resulted in injury include a wide variety of activities, such as football, sit ups, push-ups, box jumps, tire flips, squats, burpees, etc.

Figure 9: Identified fitness/wellness activities resulting in injuries, 2017



Close-up: skills training injuries

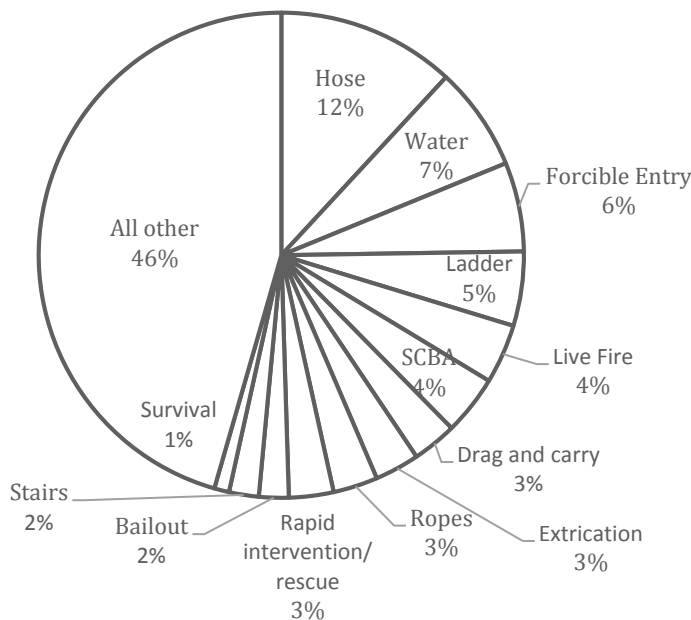
412 skills training injuries were reported in 2017. The most frequent types of activities that resulted in injury are reported below.

Table 29: Identified skills training activities resulting in injury, 2017

Skills training activity	Count	Percent
Deploying/extending hose	49	12%
Water rescue	29	7%
Forcible entry	23	6%
Ladders	21	5%
Live Fire	17	4%
SCBA	17	4%
Drag and carry	14	3%
Extrication	13	3%
Rapid intervention/rescue	13	3%
Ropes	11	3%
Bailout	7	2%
Stairs	7	2%
Survival	3	1%
All other*	188	46%
Total	412	100%

**Other skills training activities that resulted in injury include a wide variety of activities, such as marching, crawling, lifting, high angle, ventilation, wildland, etc.*

Figure 10: Identified skills training activities resulting in injuries, 2017



Comparison between the State of Texas (2017) and National Fire Protection Association (NFPA), U.S. Firefighter Injuries – 2016

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.

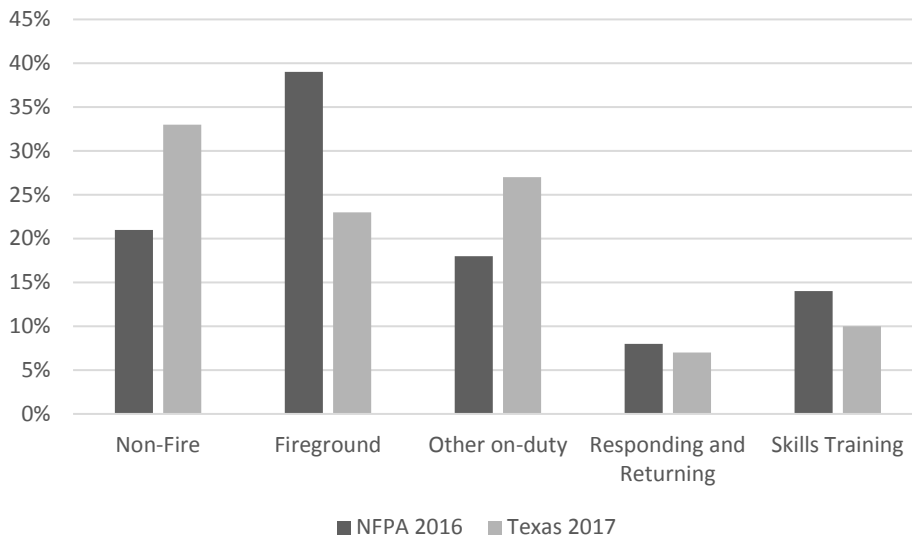
The NFPA’s “Responding and Returning” and “Training” categories appear to correspond closely to the commission’s categories. (The NFPA numbers include Texas statistics, although the reporting populations may not be the same.)

Table 30: Comparison of Texas 2017 and NFPA 2016

Category	Texas 2017		NFPA 2016*	
	Count	Percent	Count	Percent
Fireground	947	23%	24325	39%
Non-Fire	1334	33%	12780	21%
Other On-Duty	1118	27%	11300	18%
Training	412	10%	8480	14%
Responding and Returning	279	7%	5200	8%
Total	4090	100%	62085	100%

* NFPA data is from [U.S. Firefighter Injuries - 2016](#), copyright© 2017 National Fire Protection Association, Quincy, MA.

Figure 11: Injuries by Activity Percentages – Comparing Texas 2017 and NFPA 2016



2017 Findings/Recommendations

The commission would like to thank Texas fire departments for their ongoing participation in reporting fire protection personnel injuries. This report would not be possible without their efforts.

The commission strongly encourages fire departments to continue reporting exposures and further encourages departments to report cancer diagnoses; the commission recognizes that the number of job-related cancers reported during this time period represents only a small fraction of the cases that Texas fire departments are currently managing. There is a growing awareness of the impact that cancer is having on fire protection personnel nationwide, and the commission urges departments to use this reporting tool to help contribute to the education and awareness of the issue in Texas.

Recommendations

Based on their review of the data contained within this report, the commission offers the following recommendations to the Texas fire service:

- ◇ Improve awareness and distribution of the annual injury report by notifying fire department administrators when this and future reports are published and provide a link to the report in the notifications.
- ◇ Enhance program features and “usability” by providing better explanations, descriptions and definitions of terms in both the reporting module and in the annual report.
- ◇ Provide the Texas fire service with injury updates, perhaps on a quarterly basis, targeting trends or other issues noted during the year. This could be accomplished via postings on the agency’s website, social media platforms, or by other means.
- ◇ Explore options for incorporating injury data into annual continuing education opportunities for fire personnel.

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

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