14. **Discussion and possible action on proposed recommendations on fire fighter injury data collected for 2012 for inclusion in the annual report to be sent to the State Fire Marshal's Office.**

Appendix

Texas Commission on Fire Protection

Preliminary Injury Report

January 1, 2012 to December 31, 2012

DRAFT

Executive Summary

This report details the abstract, the mission, the reports, information and data collected, as well as user-community input. The report goes on to include firefighter injuries in 2012 with charts and graphs depicting the collected information. The report also compares with National Fire Protection Association (NFPA) U.S. Firefighter Injuries - 2011.

The commission has enacted rules pertaining to the reporting of injuries in Texas Administrative Code (TAC) Title 37, Chapter 435, and has established the criteria and policies for reporting and analyzing the information. The commission finished implementation of the data systems necessary to gather this information in May 2010. Development is ongoing as we receive feedback from stakeholders on the efficiency of the system. The entire process is currently accomplished online through the commission's website. Every fire department regulated by the commission has been notified of the requirement to report. Several volunteer departments, which are not regulated by the commission, are also participating voluntarily.

The commission's report includes two fatalities. The fatalities listed in this report are only those reported to the Texas Commission on Fire Protection (TCFP). These fatalities are not the only fire service-related deaths that occurred in Texas during the reporting period, but the commission has no statutory authority to require reporting by departments it does not regulate. The same is true for the gathering of injury data. The commission relies on the fire service to submit complete injury data so that comprehensive reports can be produced.

Under §419.048, the Texas Commission on Fire Protection is charged with developing and establishing criteria to receive and analyze injury information pertaining to Texas firefighters. The commission reviews this information to develop recommendations to 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*.

This report concludes with recommendations from the commission.

DRAFT

Abstract

Texas Commission on Fire Protection received 4,264 reported injuries in calendar year 2012; 889 injuries were reported in Fire Suppression. This is 20.85 percent of the total injuries reported. An even larger number of reported injuries were in Emergency Medical Services (EMS), at 1, 242 (29 percent). The next biggest group was Station Duties, with 741 (17 percent). The last two groups are Skills Training and Wellness/Fitness with 486 (11.4 percent) and 429 (10 percent) respectively. Leading causes of injury in Fire Suppression are strains and sprains, followed by burns and exposures. The leading causes of injury in EMS are strains and sprains, followed by exposures to airborne, chemical and blood pathogens.

In 2012, the commission moved EMS from Rescue Non-Fire (swift water, confined space, trench, extrication and other rescues) into its own category in order to better track these incidents and injuries. In August 2012 the commission also began collecting more information about the tasks that the individuals were performing when the injuries occurred.

Mission

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

The commission supports the continuation of the agency's educational and outreach programs. These programs are designed to 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 staff clearinghouse and outreach programs such as the "Avoid Injury!" blog and newsletters; and the adoption of the "Courage to be Safe" program.

<u>Building a Community of Safety</u>

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.

<u>Why we are collecting injury data</u>

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

<u>What information do we collect?</u>

- Minor, serious, critical and fatal injuries
- Activities where fire personnel are injured
- Types of injuries (burns, strain-sprains, wounds, etc.)
- Body parts being injured
- What task firefighter was doing at time of injury

DRAFT

- Missed time
- Work assignment after injury
- Malfunctions/failures of PPE, SCBA, PASS devices and SOPs

How this will help you

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

Learn more and get help

Information from reported injuries is being provided to the fire service community via our website, our "Avoid Injury!" blog, our Facebook page and the year-end report to the State Fire Marshal's Office. (A link to the 2011 year-end report was also published in the *Texas Daily Dispatch*.)

Reports, Information and Data Collection

This report contains data submitted by regulated and non-regulated entities. The data collected in 2012 was the second full year of reporting. We anticipate it will take five years of reporting to provide more substantive and accurate data for trending and analysis. Of the approximately 619 regulated and voluntarily reporting departments, 89 percent reported injuries or a report of no injury, and 11 percent of regulated entities did not respond.

We continually reach out to all the entities to communicate the need to report, the types of information needed, and how to respond to requests for information and investigations. Commission staff members attended and presented at Texas Fire Chiefs Association regional meetings, local chiefs' meetings, Southwest Fire Rescue, and State Firemen's and Fire Marshals' Association conferences to communicate information we have gathered from injury reporting, to stress the need for participation, and to remind them of the statutory requirement to report.

The commission's "Avoid Injury!" blog provides information on current statistics, as well as information about resources available through the Ernest A. Emerson Fire Protection Resource Library. Statistics are updated semi-monthly on a rolling calendar cycle. New blog posts are being provided by the fire service on the "Courage to be Safe" program's "16 Life Safety Initiatives" and how the initiatives have impacted their departments or the fire service. This information is also posted on the commission's Facebook page.

Throughout the year we received feedback from stakeholders on challenges they have experienced and changes they would like to see. The agency hosted a face-to-face meeting with its user community to gather additional data. Eight individuals from across the state participated, and the information we received was invaluable.

DRAFT

In order to gather information regarding what ***tasks*** fire personnel were completing when they were injured, changes were needed from the reporting entities in the narrative portion of the report. This format was provided by the user group:

When you enter text into the incident description field, please provide answers to the following questions:

- *What specific action was the individual performing at the time of the injury (e.g., lifting, walking, advancing hose, pulling ceiling)?*
- *What PPE was the individual wearing or using at the time of the injury (e.g., bunker gear, gloves, back belt, SCBA)?*
- *What body part was injured (e.g., back, neck, shoulder)?*
- *If known, what were the causes or contributing factors leading to this injury (e.g., improper use of PPE, poor fitting PPE, poor lifting technique, environment too hot, flash over)? This will help us determine what areas may need more training for the fire service as a whole.*
- *What was the FF exposed to (if known)?*

Additionally, a monthly "No Injury" report function was added to the system. This helps the staff in the following areas:

- The commission must show the legislature that the fire service is complying with the law.
- The monthly reports help track how many entities are reporting.
- Entities that are not having injuries could help us understand what they are doing to prevent them.

DRAFT

Fire Personnel Injuries 2012

The numbers reflect reported injuries for January 1, 2012 to December 31, 2012. We are also comparing the Texas numbers with the NFPA's ***U.S. Firefighter Injuries - 2011*** report issued in October 2012.

The number of reported injuries in 2012 was 4,264.

Chart 1
Injury by Activity and Severity

Activity	Minor	Serious	Critical	Fatal	Grand Total
Fire Prevention	45	18			63
Fire Suppression	654	231	3	1	889
Hazmat	24				24
Rescue - Fire Related	14	7			21
Rescue - Non Fire	147	34	1		182
EMS	1042	196	4		1242
Responding to Incident	90	43			133
Returning from Incident	30	24			54
Skills Training	367	113	5	1	486
Station Duties	508	233			741
Wellness/Fitness	294	134	1		429
Grand Total	3215	1033	14	2	4264

Minor injuries are injuries that result in the firefighter missing less than one full duty period.

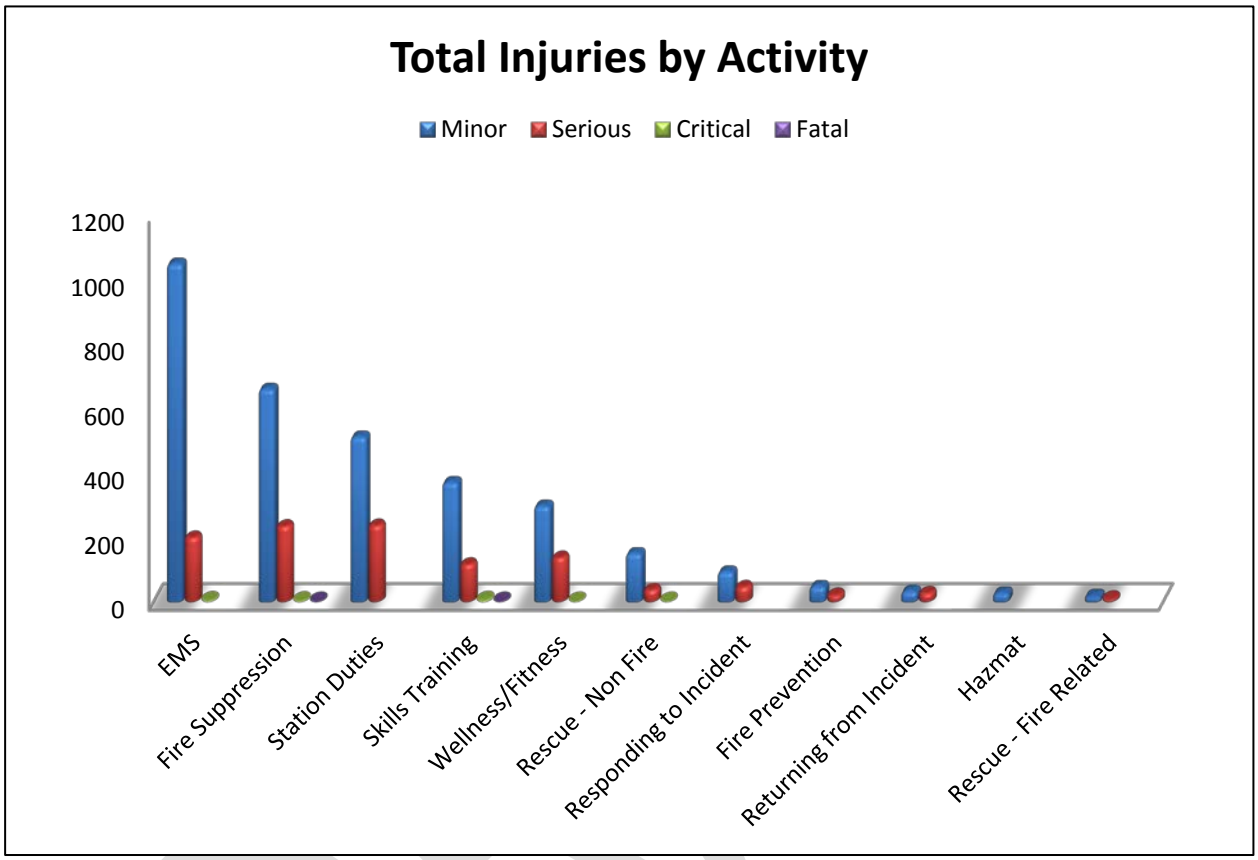
Serious injuries are those that require the firefighter to miss more than one full duty period.

Critical injuries are those that require the firefighter to miss more than one full duty period and be hospitalized.

DRAFT

The Total Injuries by Activity graph shows the overall severity of injuries incurred in 2012. There were a total of 3,215 minor injuries, 1,033 serious, 14 critical and two fatalities.

Figure 1



Injuries by Type

The injury by type chart shows the overall categories of the types of injuries incurred during 2012.

Chart 2
Type of injury

Injury by Type	Number of Injuries
Stroke	1
Exposure-Chemical-CO	1
Heart Attack	2
Fracture Spine-Neck	4
Hearing Loss - Chronic	7
Electrocution	11
Hearing Loss - Acute	18
Smoke-Gas Inhalation	22
Exposure-Undetermined	23
Chest Pains-Cardiac	40
Broken Bones	46
Pain Medical Unspecified	49
Debris/Penetrating	51
Bites-Stings	93
Exposure - body fluids	124
Exposure-Chemical	128
Environmental	133
Exposure Blood Pathogens	160
Burns	176
Exposure Airborne Pathogens	404
Wound	631
Strain-Sprain	2140
Grand Total	**4264**

DRAFT

Task at time of injury

Collection of how fire personnel are getting injured was requested in 2012 during a user group discussion. The information was previously being collected in the narrative, but there was no place to capture this for reporting purposes until August 2012. This information reflects five months of data collection. It is a representative sample of the injuries occurring. (The "uncategorized" number includes injuries reported prior to implementation of the new data gathering processes.)

Chart 3
Injury Categories

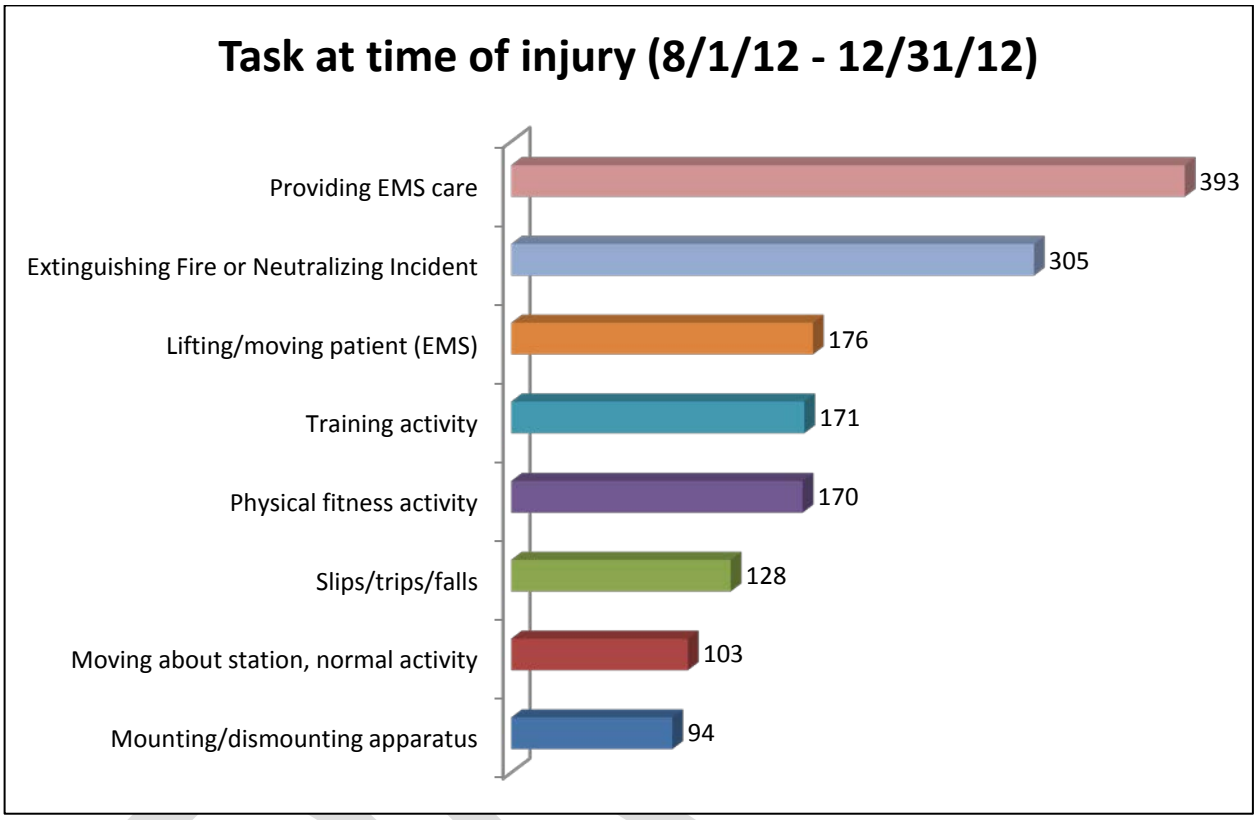
Injury Categories	Number Injured
Carrying/dragging a person (rescue)	1
Operating in low/no visibility	1
Moving about station, alarm sounding	2
Operating power tool	2
Salvage	2
Inspection Activity	3
Manually moving item to gain access	3
Operating Fire Department Apparatus	3
Operating nozzle	3
Crawling in a confined or otherwise hazardous area	5
Raising/lowering ladder	6
Ascending/descending stairs	8
Ascending/descending ladder	9
Incident Investigation	9
Forcible Entry	10
Non-Fire Incidents	12
Administrative Work	13
Vehicle Maintenance	13
Responding to/returning from incident	20
Operating manual tool	27
Overhaul	28
Deploying and extending hose line	29
Removing equipment from/returning equipment to apparatus	31
Driving/riding in a vehicle	36
Equipment Maintenance	37
Rescue, other	37
Moving/picking up tools or equipment	40
Station Maintenance	47
Other: Description	54
Mounting/dismounting apparatus	94
Moving about station, normal activity	103
Slips/trips/falls	128
Physical fitness activity	170
Training activity	171
Lifting/moving patient (EMS)	176
Extinguishing Fire or Neutralizing Incident	305
Providing EMS care	393

DRAFT

Uncategorized	2233
Grand Total	**4264**

Figure 2 reflects the top eight identified categories of tasks being performed at time of injury.

Figure 2



Exposures

Exposures are a large number of reported injuries. The majority have not resulted in immediate reactions or lost time to these individuals. The top three categories are airborne pathogens, chemical and blood pathogens. Figure 3 reflects the information in graph form.

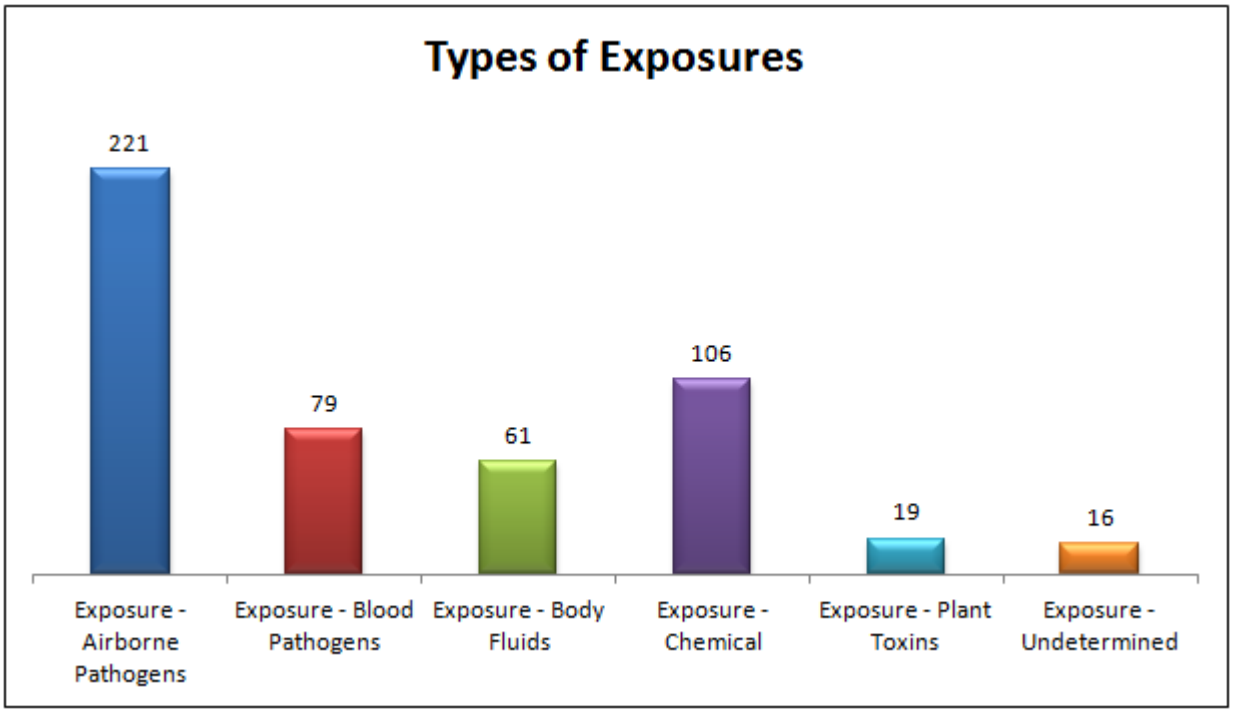
Chart 4
Types of Exposures

Types of Exposures	Totals
Exposure - Airborne Pathogens	221
Airborne, Other	40
Asbestos	11
Bacterial Pneumonia (lungs)	1
Body fluids	2
Chemicals/household/industrial	1
Chlorine	1
Meningitis	61
MRSA	5
Sickness, other	2
TB	97
Exposure - Blood Pathogens	79
Animals/Wildlife	1
Blood	68
Hep C	6
HIV	1
Lice	2
Staph	1
Exposure - Body Fluids	61
Body fluids	50
Vomit	11
Exposure - Chemical	106
Aluminum Phosphide (PH3)	3
Asbestos	58
Chemicals/household/industrial	45
Exposure - Plant Toxins	19
Poison Plants	19
Exposure - Undetermined	16
Chemicals/household/industrial	3
Scabies	4
Sickness, other	4
Unknown	5
Grand Total	**502**

DRAFT

DRAFT

Figure 3



Injuries by Employment Status

Chart 5
Employment Status

Employment Status	2012	2011	2010
Full Time	4046	4098	2565
Part Time	25	21	12
Student (i.e. college)	68	23	0
Trainee (i.e. fire dept)	40	0	10
*Volunteer	85	100	20
Grand Total	**4264**	**4242**	**2607**

*Volunteer injuries reported here represent only those who chose to report their injuries.

Injuries by Severity

In 2010, 78 percent of the injuries reported were minor; in 2011, 76 percent and in 2012, 75 percent. Serious injuries in 2010 were 20 percent, increased in 2011 to 23 percent and again in 2012 to 24 percent.

Chart 6
Totals by severity

Severity	Total 2012	Total 2011	**Total 2010
Critical	14	16	11
Fatal	2	4	1
Minor	3215	3182	1897
Serious	1033	978	496
Grand Total	4264	4180	2405

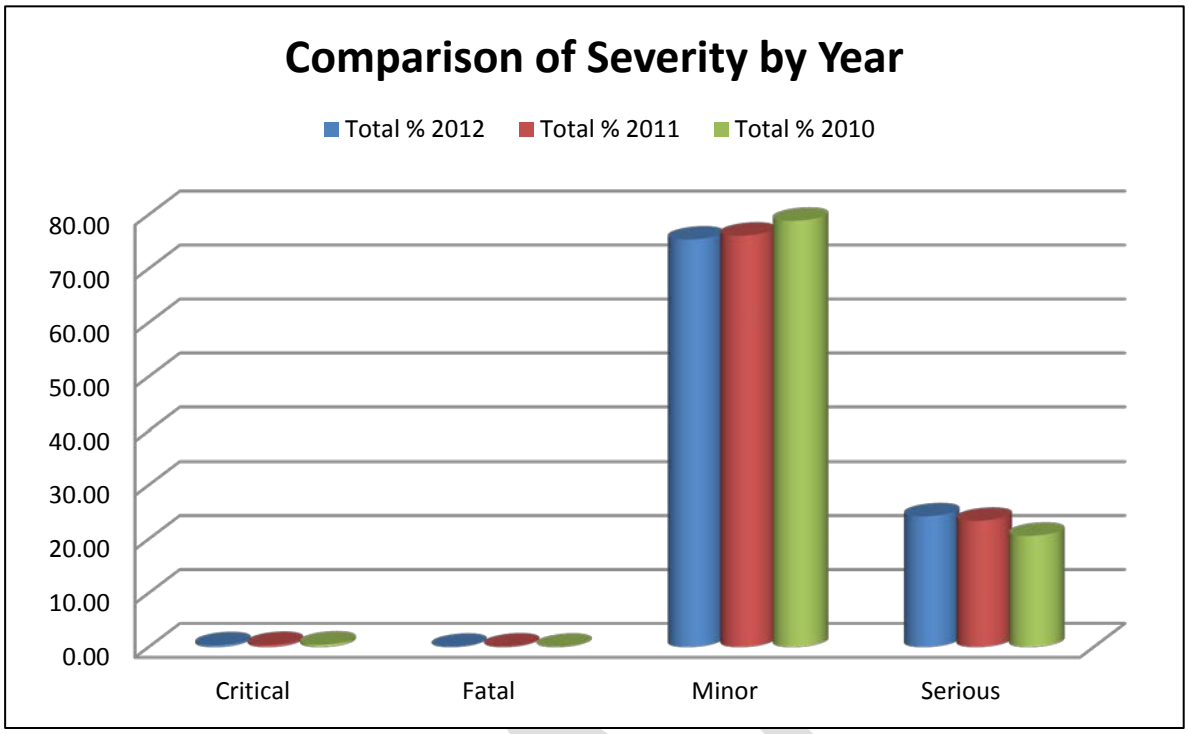
The table below shows the percentage of injuries reported by severity for 2010, 2011 and 2012.
**2010 was a nine-month reporting year.

Chart 7
Percentage by severity

Severity %	Total % 2012	Total % 2011	Total % 2010
Critical	0.33	0.38	0.46
Fatal	0.05	0.10	0.04
Minor	75.40	76.12	78.88
Serious	24.23	23.40	20.62
Grand Total	100.00	100.00	100.00

Figure 4

DRAFT

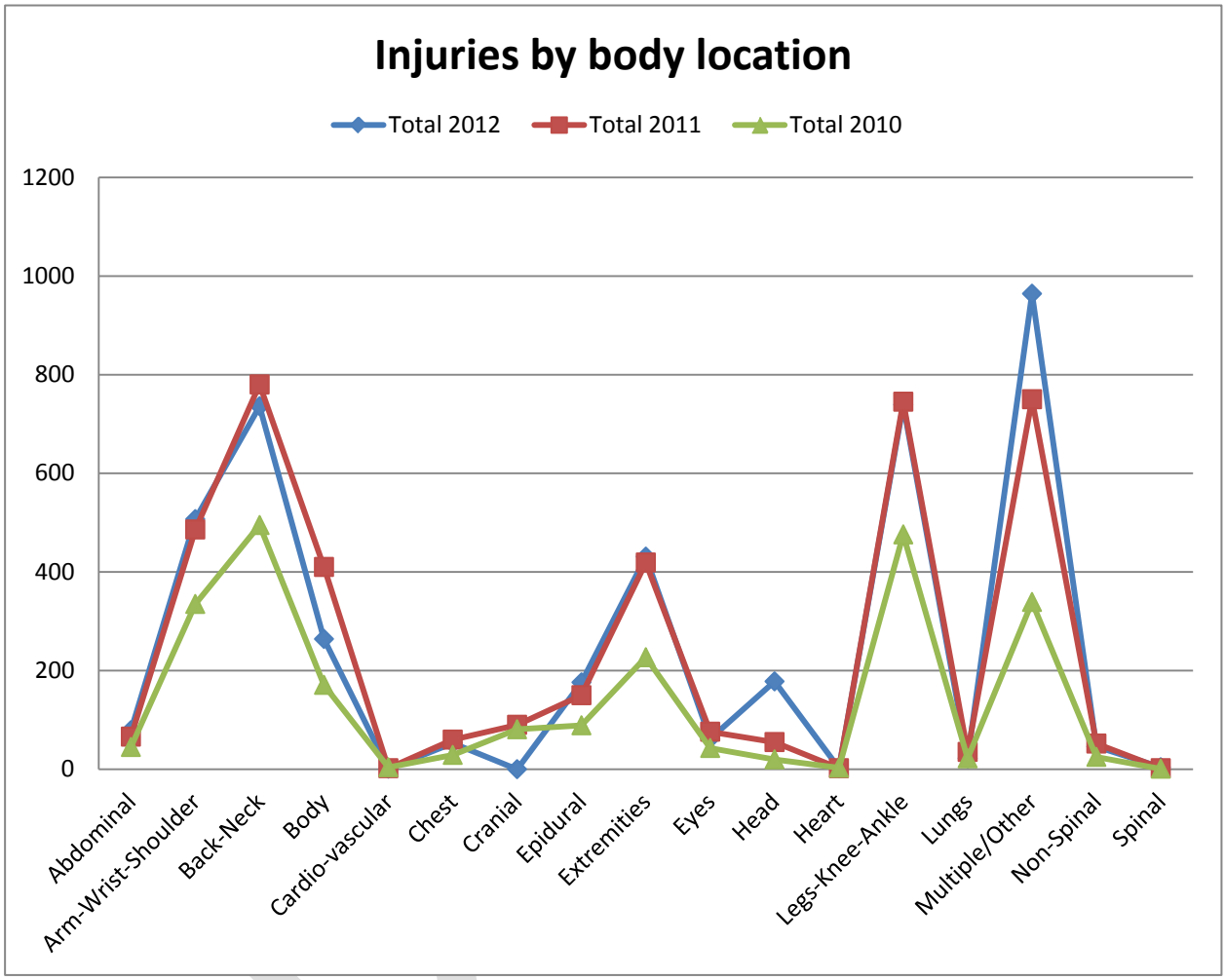

Comparison of Severity by Year
Total % 2012
Total % 2011
Total % 2010
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Critical
Fatal
Minor
Serious

DRAFT

Injuries by Body Location

Trends in injury body locations remain consistent.

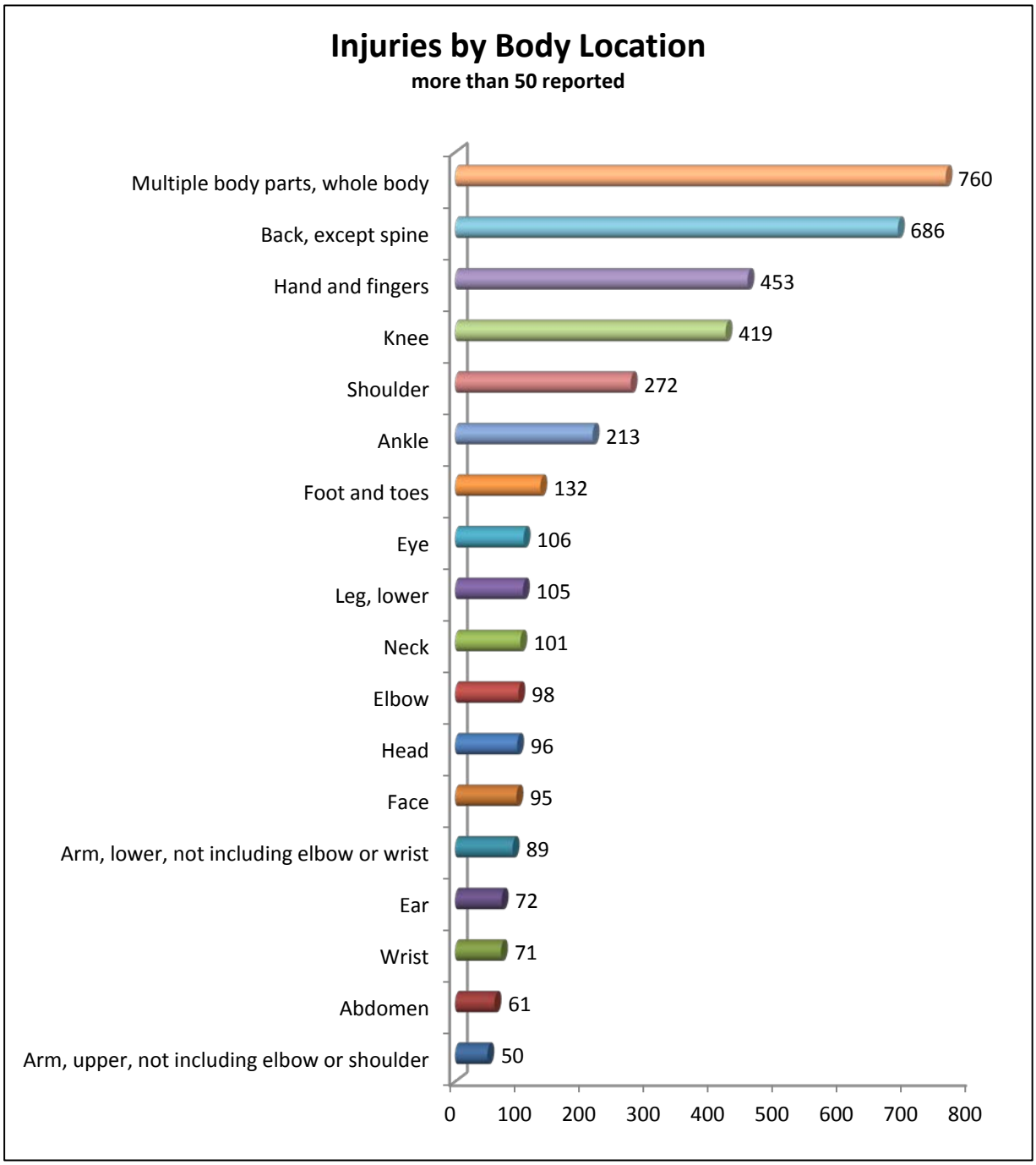
Figure 5



**2010 was a partial reporting year of nine months.

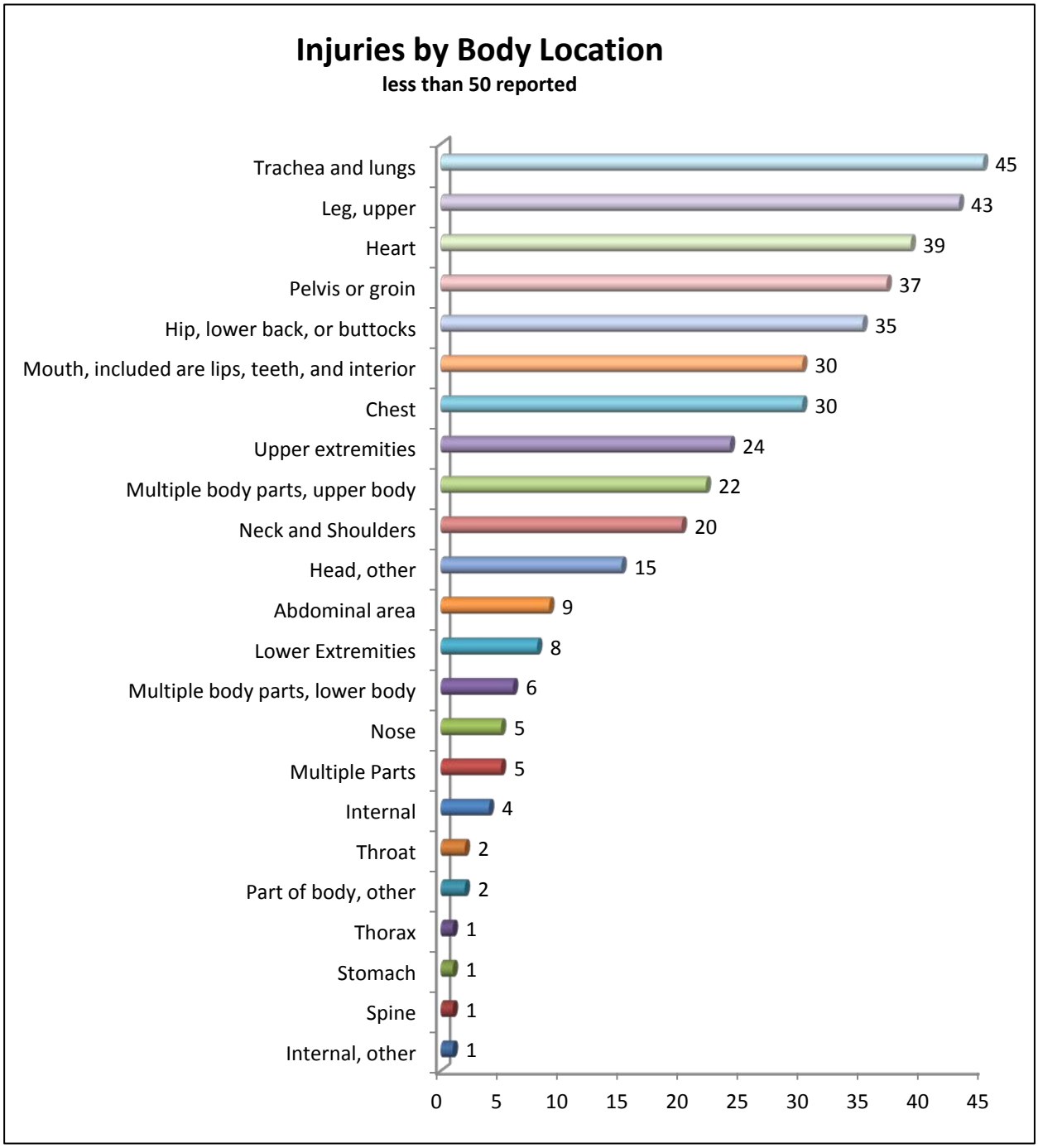
The next two figures show the number of injuries by specific body location. Multiple body parts and whole body injuries are mostly exposure reports.

Figure 6



DRAFT

Figure 7


Injuries by Body Location
less than 50 reported
Trachea and lungs 45
Leg, upper 43
Heart 39
Pelvis or groin 37
Hip, lower back, or buttocks 35
Mouth, included are lips, teeth, and interior 30
Chest 30
Upper extremities 24
Multiple body parts, upper body 22
Neck and Shoulders 20
Head, other 15
Abdominal area 9
Lower Extremities 8
Multiple body parts, lower body 6
Nose 5
Multiple Parts 5
Internal 4
Throat 2
Part of body, other 2
Thorax 1
Stomach 1
Spine 1
Internal, other 1
0 5 10 15 20 25 30 35 40 45

Injuries by Activity

The trend shows injuries are occurring during the same activities with a similar degree of severity. There were a few changes in 2012 compared to 2011. Fire Suppression injuries were reduced in 2012, while Skills Training, Wellness/Fitness and Station duties increased slightly. Figures 8 and 9 reflect the numbers in graph form.

Chart 8
Injury by activity by percent

Activity by %	Minor 2012	Minor 2011	Minor 2010	Serious 2012	Serious 2011	Serious 2010
Fire Prevention	1.4	1.6	1.2	1.74	1.7	1.4
Fire Suppression	20.34	28	22	22.36	28	23
Hazmat	0.75	0.06	0.4	0.00	0	0.8
Rescue - Fire Related	0.44	0.4	0.6	0.68	0.4	0.4
Rescue - Non Fire	4.57	35	38	3.29	21	24
EMS	32	0	0	18.97	0	0
Responding to Incident	2.8	2.8	3.6	4.16	5.4	5.2
Returning from Incident	0.93	1.6	1.6	2.32	3	3.2
Skills Training	11.42	8.3	7	10.94	11	11
Station Duties	15.8	15	18	22.56	20	19
Wellness/Fitness	9.14	6.7	8.5	12.97	10	11.7
Grand Total	3215	3182	1897	1033	978	496

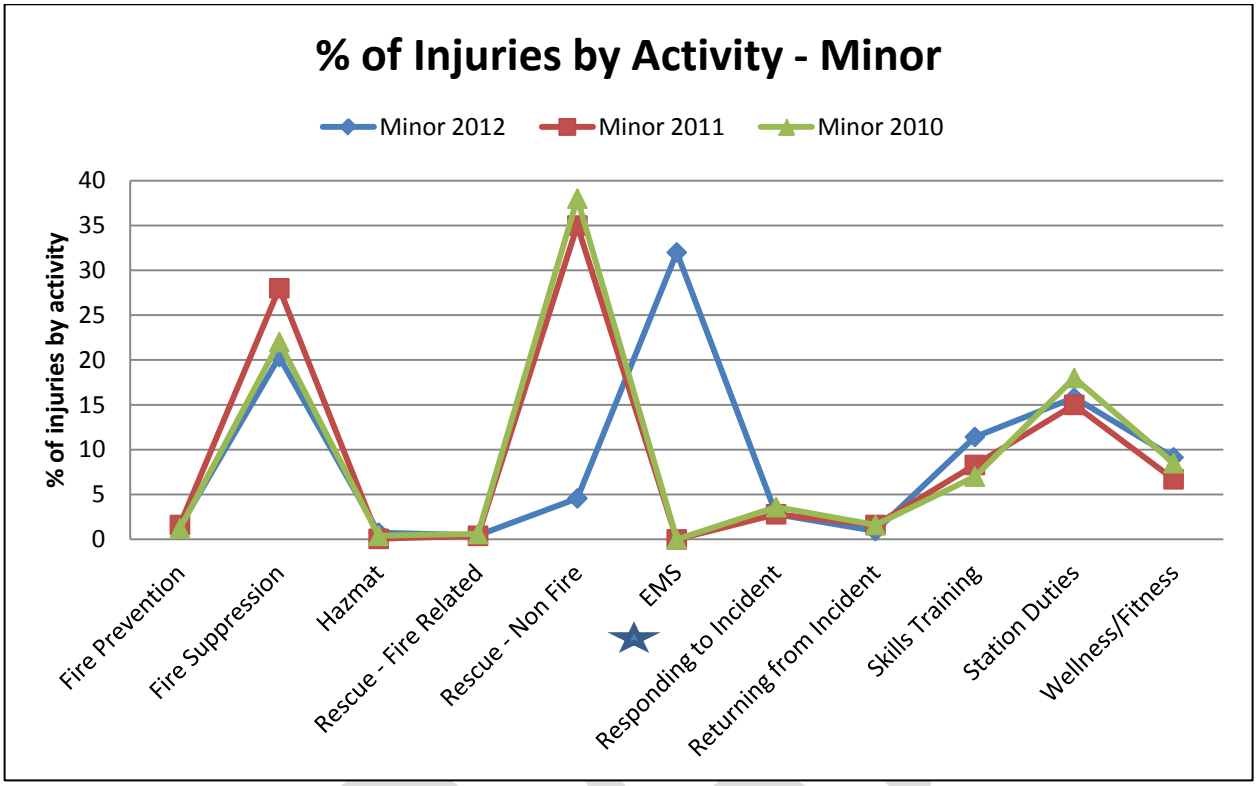
Chart 9
Injury by activity by number

Activity	Minor 2012	Minor 2011	Minor 2010	Serious 2012	Serious 2011	Serious 2010
Fire Prevention	45	51	22	18	17	7
Fire Suppression	654	900	412	231	270	115
Hazmat	24	2	7	0	0	4
Rescue - Fire Related	14	14	11	7	4	2
Rescue - Non Fire	147	1113	716	34	208	119
EMS	1042	0	0	196	0	0
Responding to Incident	90	92	68	43	53	26
Returning from Incident	30	50	30	24	28	16
Skills Training	367	263	135	113	104	55
Station Duties	508	485	335	233	193	94
Wellness/Fitness	294	212	161	134	101	58
Grand Total	3215	3182	1897	1033	978	496

**2010 was a partial reporting year of nine months.

DRAFT

Figure 8

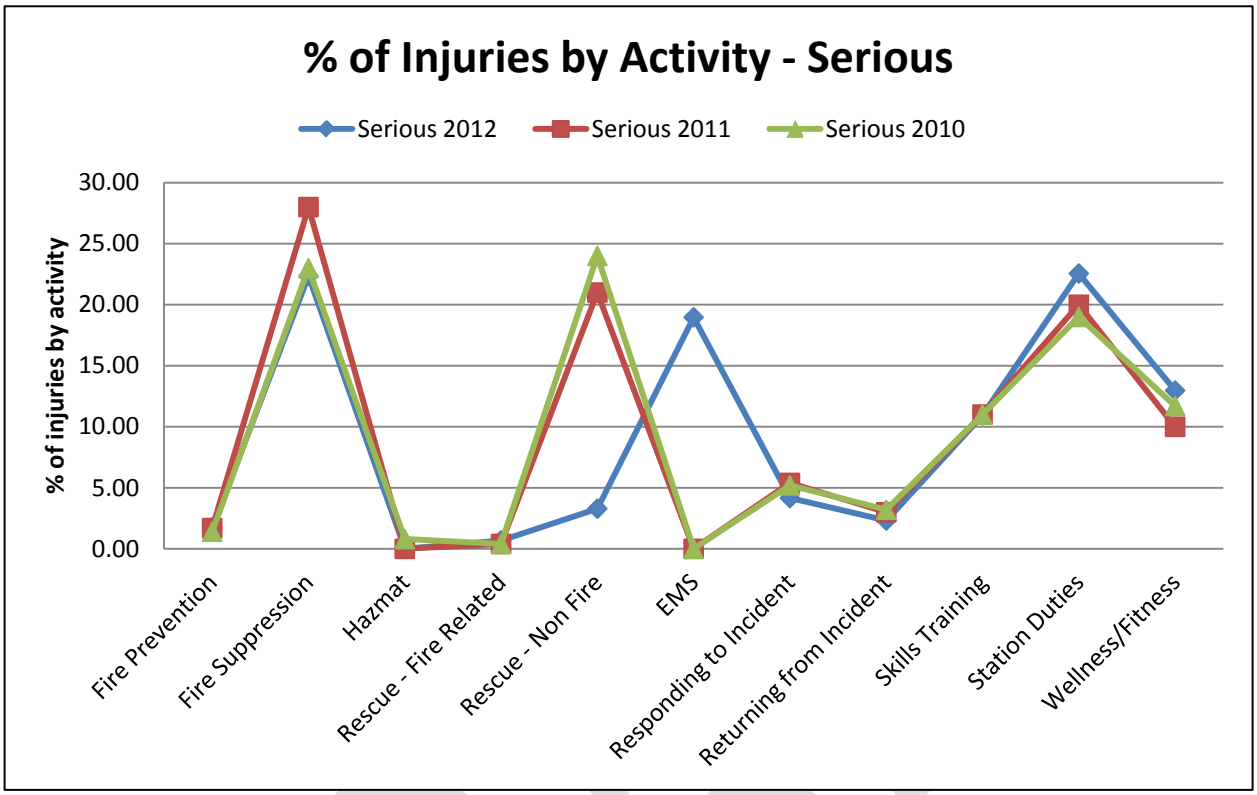


*EMS injuries were separated from the Rescue Non-Fire Category in 2012.

**2010 was a partial reporting year of nine months.

DRAFT

Figure 9



*EMS injuries were separated from the Rescue Non-Fire Category in 2012.

**2010 was a partial reporting year of nine months.

DRAFT

Injuries by Age Group

The average age of the injury reporting population is 37. Figure 10 reflects a 10 year spread in age while Figure 11 reflects five year spread in age.

Chart 10
Injury by age group

	12 months		12 months		9 months	
Age Groups	2012	2012	2011	2011	2010	2010
18-19	27	0.63%	12	0.29%	4	0.17%
20-29	821	19.25%	833	19.93%	495	20.58%
30-39	1746	40.95%	1648	39.43%	956	39.75%
40-49	1056	24.77%	1056	25.26%	580	24.12%
50-59	566	13.27%	597	14.28%	361	15.01%
60-69	47	1.10%	34	0.81%	9	0.37%
70+	1	0.02%	0	0.00%	0	0.00%
	4264		4180		2405	

Figure 10

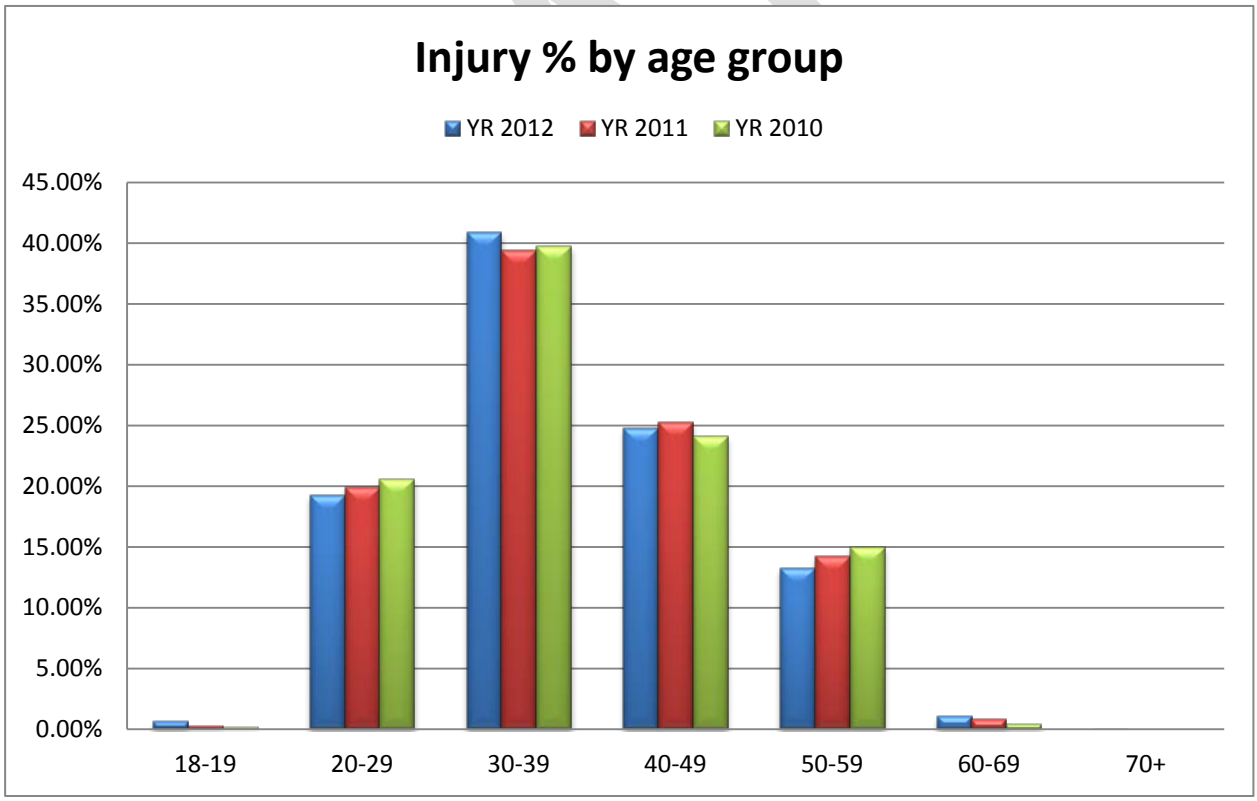
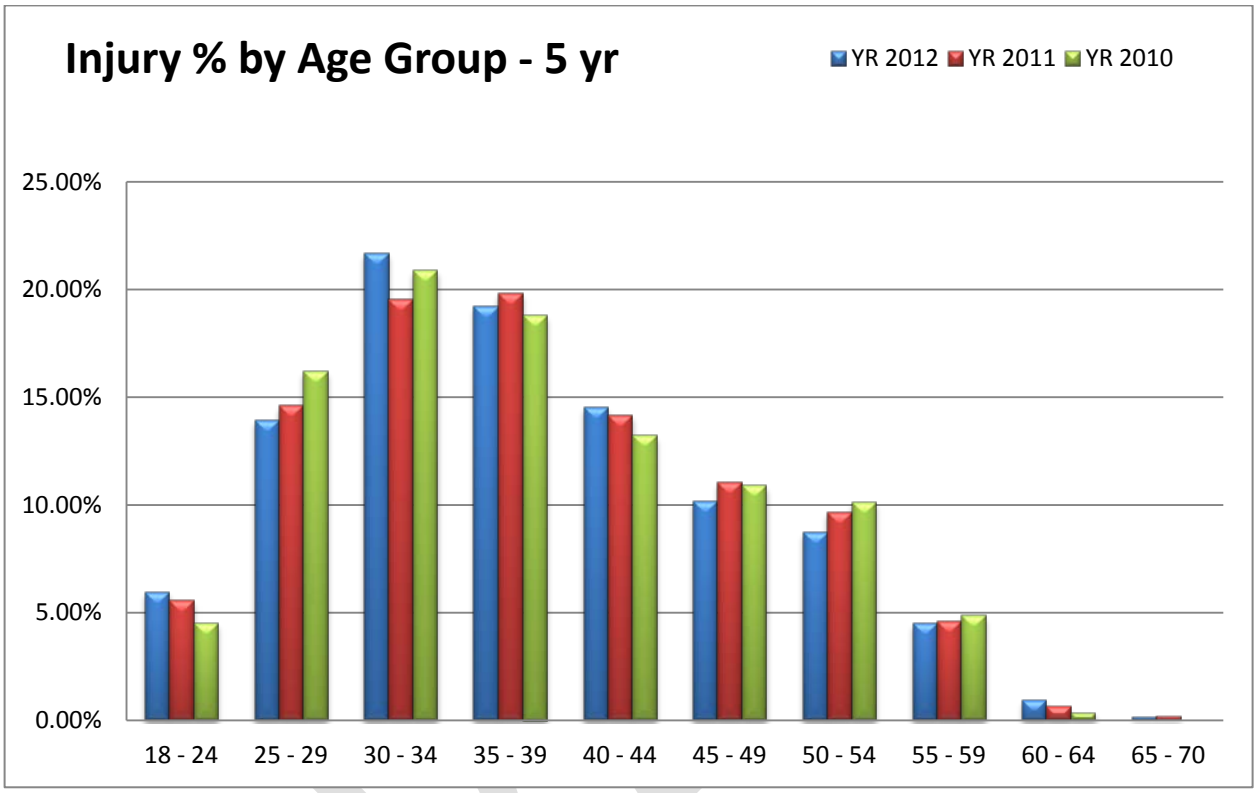


Figure 11



DRA

Injuries – With Lost Time

Of the 4,264 injuries reported in 2012, 24.81 percent of the injuries resulted in missed days. In 2012, 18 percent of injuries resulted in missed days. The commission defines missed work as "lost time" when an individual misses more than one full duty period as a direct result of an injury and does not return to the duties to which they were assigned prior to the injury.

Example: an individual who sustained an injury returns to work on their normally assigned duty period, but the department temporarily assigns the individual to modified or light duty temporarily, rather than to their normal, pre-injury duty. This person has sustained a lost time injury.

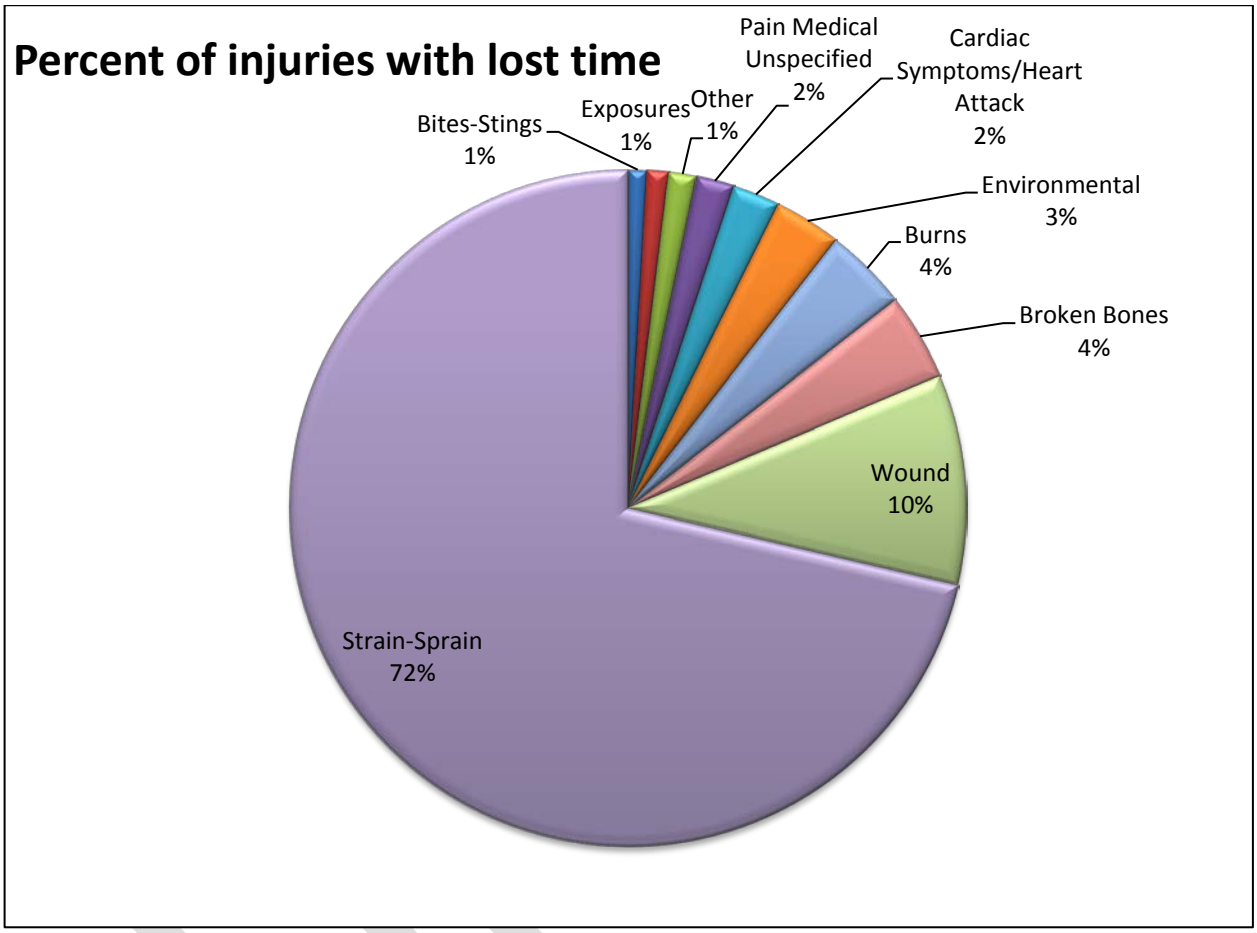
Chart 11
Lost time types of injuries

Type of Injury	# of injuries with lost time
Bites-Stings	9
Broken Bones	41
Fracture Spine-Neck	3
Burns	42
Chest Pains-Cardiac	22
Debris/Penetrating	4
Electrocution	4
Environmental	34
Exposure Airborne Pathogen	5
Exposure Blood Pathogens	2
Exposure-Chemical	3
Exposure-Undetermined	1
Hearing Loss - Acute	1
Heart Attack	2
Pain Medical Unspecified	19
Smoke-Gas Inhalation	5
Strain-Sprain	755
Wound	106
Grand Total	**1058**

DRAFT

Strain-Sprain injuries were up six percent in 2012 (from 66 percent). Wounds were down two percent and burns and broken bones remain the same at four percent.

Figure 12



Injury	Average # of days missed (1-30)	Average # of days missed (31-90)	Average # of days missed (91+)
Broken Bones	17.11	63.27	161
Strain-Sprain	11.17	53.71	204
Wound	9.195	48.28	219

Injuries – Lost Time

Chart 12
By Activity – between 1 and 30 days

Activity	# of Injuries leading to 1-30 days missed	Average # of days missed (lost time)	Total days missed (lost time)
Fire Prevention	13	10.69	139
Fire Suppression	149	10.31	1536
Rescue - Fire Related	4	9.50	38
Rescue - Non Fire	24	13.58	326
EMS	127	10.89	1383
Responding to Incident	24	10.58	254
Returning from Incident	11	12.45	137
Skills Training	75	9.48	711
Station Duties	152	10.97	1667
Wellness/Fitness	68	10.25	697
Grand Total	647	10.65	6,888

Chart 13
By Activity – between 31 and 90 days

Activity	# of Injuries leading to 31-90 days missed	Average # of days missed (lost time)	Total days missed (lost time)
Fire Prevention	3	37.33	112
Fire Suppression	45	54.49	2452
Rescue - Fire Related	2	40.50	81
Rescue - Non Fire	11	46.82	515
EMS	42	52.50	2205
Responding to Incident	9	61.11	550
Returning from Incident	9	58.56	527
Skills Training	21	53.95	1133
Station Duties	45	56.07	2523
Wellness/Fitness	34	54.06	1838
Grand Total	221	54.01	11,936

Chart 14
By Activity – 91+ days

Activity	# of Injuries leading to 91+ days missed	Average # of days missed (lost time)	Total days missed (lost time)
Fire Prevention	1	257.00	257
Fire Suppression	42	204.62	8594
Rescue - Fire Related	1	451.00	451
Rescue - Non Fire	14	252.57	3536
EMS	24	216.17	5188
Responding to Incident	9	240.33	2163
Returning from Incident	5	253.40	1267
Skills Training	23	201.35	4631
Station Duties	47	181.98	8553

DRAFT

Wellness/Fitness	24	156.75	3762
Grand Total	190	202.12	38,402

DRAFT

Chart 15
Lost Time by Activity – combined chart of lost time from 1 day to 91+ days.

Activity	# of Injuries leading to 1-30 days missed	# of Injuries leading to 31-90 days missed	# of Injuries leading to 91+ days missed
Fire Prevention	13	3	1
Fire Suppression	149	45	42
Rescue - Fire Related	4	2	1
Rescue - Non Fire	24	11	14
EMS	127	42	24
Responding to Incident	24	9	9
Returning from Incident	11	9	5
Skills Training	75	21	23
Station Duties	152	45	47
Wellness/Fitness	68	34	24
Grand Total	647	221	190

Chart 16
Average Lost Time by Activity – combined chart average lost time from 1 day to 91+ days.

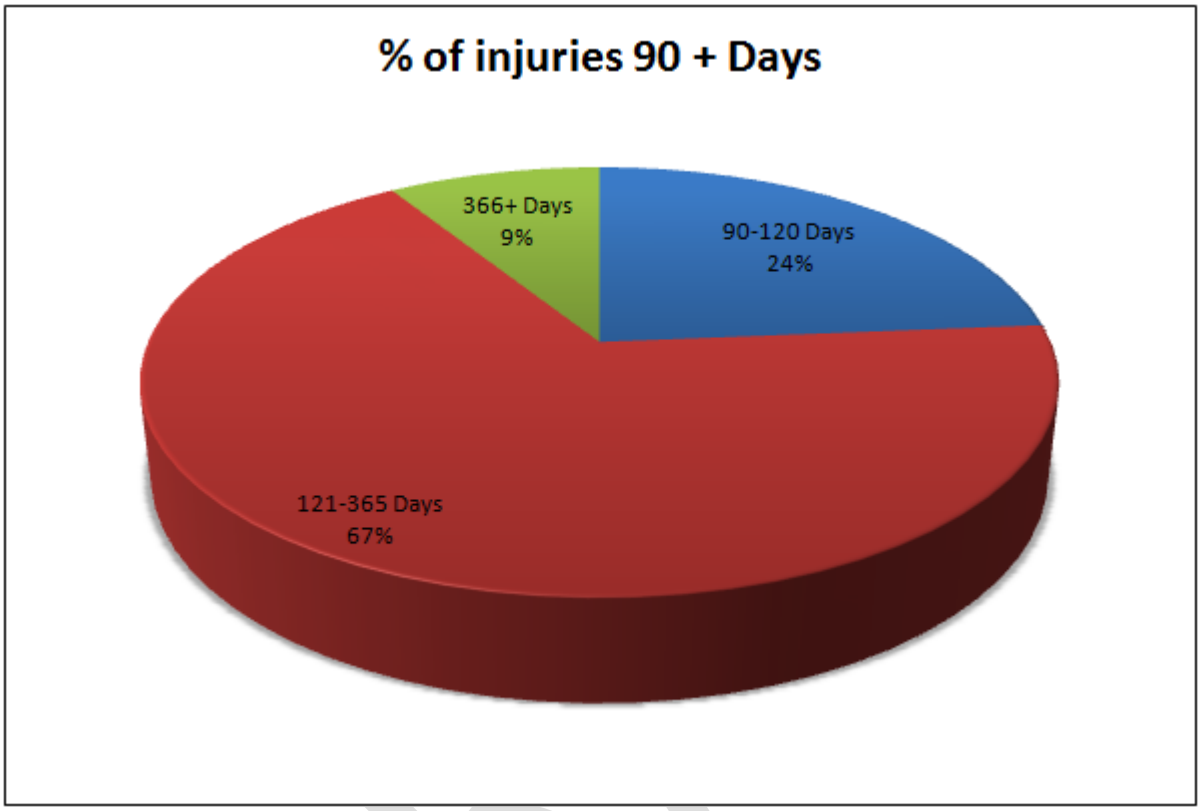
Activity	Average # of days missed (1-30)	Average # of days missed (31-90)	Average # of days missed (91+)
Fire Prevention	10.69	37.33	**257.00**
Fire Suppression	10.31	54.49	204.62
Rescue - Fire Related	9.50	40.50	**451.00**
Rescue - Non Fire	**13.58**	46.82	252.57
EMS	10.89	52.50	216.17
Responding to Incident	10.58	**61.11**	240.33
Returning from Incident	**12.45**	**58.56**	**253.40**
Skills Training	9.48	53.95	201.35
Station Duties	**10.97**	**56.07**	181.98
Wellness/Fitness	10.25	54.06	156.75
Grand Total	10.65	54.01	202.12

The bold areas above reflect the three highest lost time injuries from each category.

DRAFT

Figure 13 reflects the percent of injuries occurring in the 90 + day category. 67% of the injuries are occurring in the 121-365 day time span.

Figure 13



Examples of narratives reported for lost time injuries

- Employee was at the scene of an MVA and was helping load a patient into the back of an ambulance. Employee had his left thumb caught in the hinge mechanism of stretcher and thumb was crushed.
- During fire became overheated.
- FF stated he strained his back while pulling fire hose.
- Employee strained back while opening hydrant.
- Firefighter tripped over charged attack line at a fire scene and injured his right knee.
- Firefighter was riding in the front passenger seat en-route to an emergency run when the apparatus was involved in an accident. He was wearing his seatbelt when the apparatus was struck approximately 5 feet behind where he was sitting causing him to hit his head on the window. He was in full bunker gear including his hood but not his SCBA nor his gloves.
- Firefighter dismounted fire engine after responding to an incident and twisted left knee.
- During training hooking hose to pump panel, coupling popped off striking right hand.
- The firefighter was training with the stair chair used for evacuation of incapacitated patients. While pulling the chair up with a fellow firefighter in the chair he pulled something in his back.
- The firefighter was participating in a skills assessment when he felt a pain in his lower back while attempting to drag a 175-pound dummy. The firefighter was in full PPE including breathing air from a SCBA during the event.
- Firefighter was performing hose maintenance when a coupling under tension released and struck him in the ankle.
- Firefighter was preparing food for dinner and cut the end of thumb.
- Firefighter reports at fire station during equipment check he strained left side of lower back when lowering/raising the stretcher from the rescue unit.
- Improper lifting of equipment causing sprain/strain to lower back.
- While stepping out of engine, firefighter missed bottom step of truck.
- Firefighter reported felt sharp pain in back and leg after weight lifting.
- Firefighter pulled hamstring while playing basketball.

DRAFT

Burns and PPE

The majority of the burn injuries reported in 2012 were to the hands, ears, neck, face and wrist. Based on the information gathered, the gear appeared to perform as designed and may have prevented more serious injuries from occurring. We did not see any trends or patterns indicating problems with any particular brand or manufacturer. Specific information on gear manufacturer, etc., was not collected on burns where the individual was not wearing the provided PPE/SCBA.

Chart 17
Burns by lost time

Injury Type	Avg.1-30 days missed (lost time)	Avg. 31-90 days missed (lost time)	Avg. 91+ days missed (lost time)
Burns	12.78	37.6	0

Figure 14 reflects in descending order the number of injuries by specific body part.

Figure 14

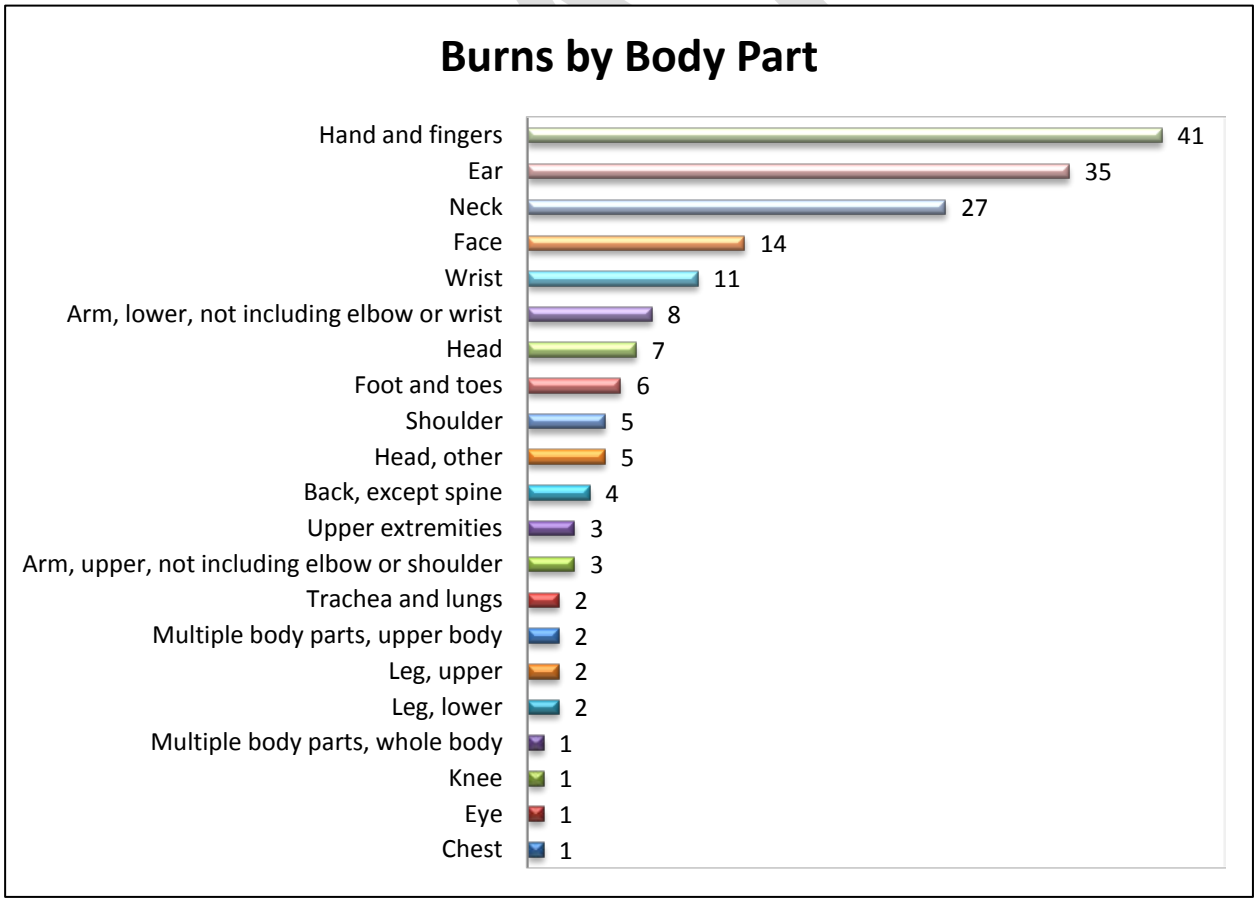


Figure 15

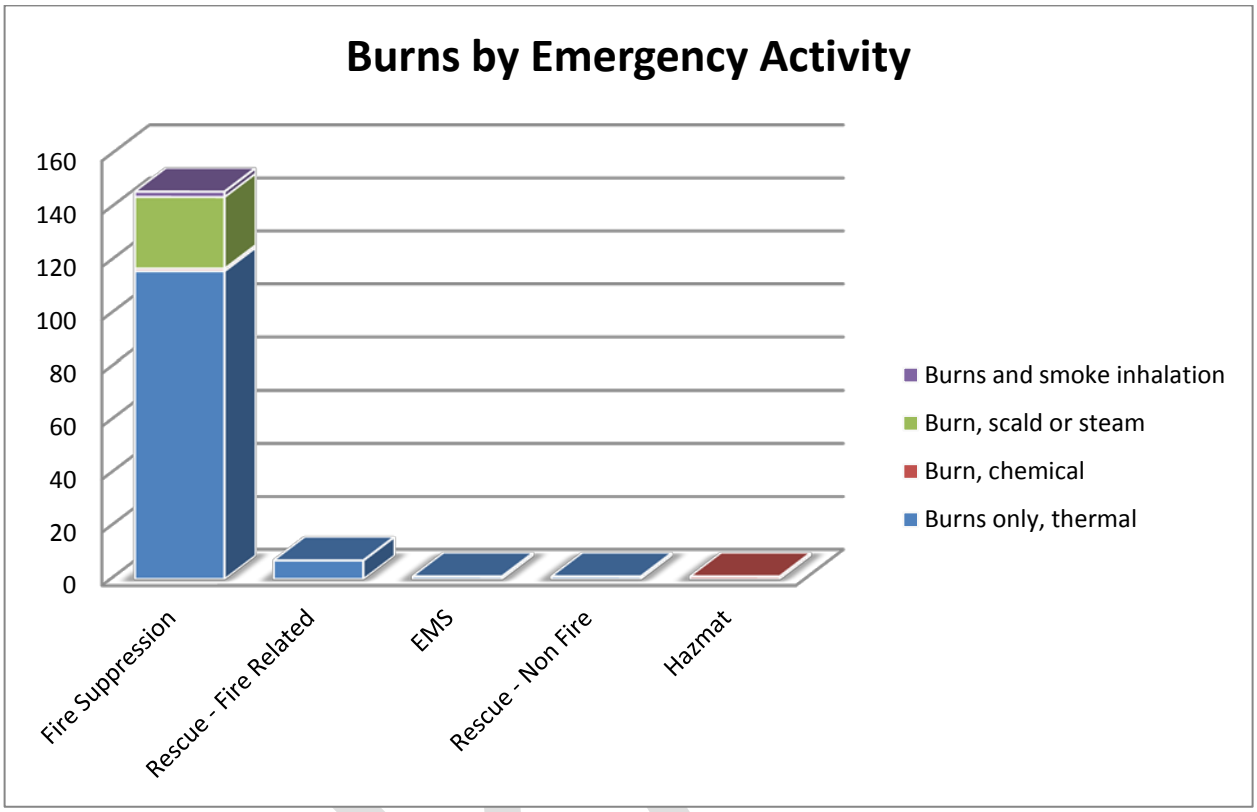
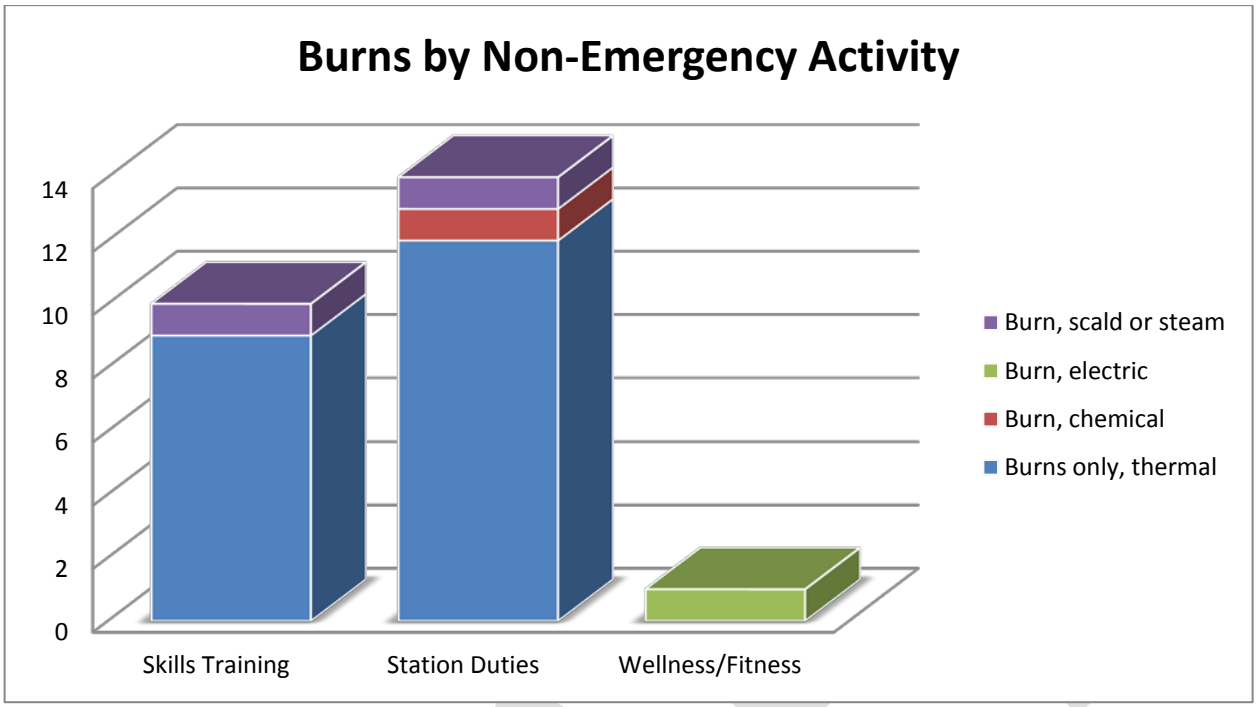


Figure 16


Burns by Non-Emergency Activity
14
12
10
8
6
4
2
0
Skills Training
Station Duties
Wellness/Fitness
Burn, scald or steam
Burn, electric
Burn, chemical
Burns only, thermal

DRAFT

Chart 18
Burns by type

Burn by Type and Body Location	Total
Burn, chemical	**3**
Arm, lower, not including elbow or wrist	1
Hand and fingers	1
Wrist	1
Burn, electric	**1**
Hand and fingers	1
Burn, scald or steam	**29**
Arm, lower, not including elbow or wrist	1
Back, except spine	1
Ear	9
Face	3
Hand and fingers	2
Head	1
Head, other	1
Neck	6
Shoulder	2
Upper extremities	1
Wrist	2
Burns and smoke inhalation	**2**
Trachea and lungs	2
Burns only, thermal	**146**
Arm, lower, not including elbow or wrist	6
Arm, upper, not including elbow or shoulder	3
Back, except spine	3
Chest	1
Ear	26
Eye	1
Face	11
Foot and toes	6
Hand and fingers	37
Head	6
Head, other	4
Knee	1
Leg, lower	2
Leg, upper	2
Multiple body parts, upper body	2
Multiple body parts, whole body	1
Neck	21
Shoulder	3
Upper extremities	2
Wrist	8
Grand Total	**181**

DRAFT

SOP Issues

There were 19 injuries resulting from fire protection personnel failing to follow their departments' Standard Operating Procedures (SOPs) reported in 2012. 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. The departments are reviewing their SOPs to make sure they are up to date, and are completing additional training to make sure these issues do not occur again.

In these situations, the Texas Commission on Fire Protection verifies with the department that the SOPs are in place and that they cover the appropriate subject matter. The commission does not become involved in any internal disciplinary actions surrounding these issues, as this is not within the commission's scope of authority. However, the commission stands ready to partner with the fire service by providing assistance, expertise and educational resources to promote a safer community.

Fatalities

Two fatalities were reported to the Texas Commission on Fire Protection in 2012.

The State Fire Marshal's office compiles all the LODD reports for the state. Full reports can be viewed at the State Fire Marshal's Office at http://www.tdi.texas.gov/reports/fire/documents/fmloddannul12.pdf

DRAFT

Comparison between the State of Texas (2012) and National Fire Protection Association (NFPA), *U.S. Firefighter Injuries - 2011*

We compared our numbers with NFPA's annual report from 2011, which was issued in October 2012. (NFPA numbers include injuries reported from Texas, so there is some overlap.)

Chart 19 and Figure 17 compares the State of Texas' reported injuries and the NFPA's report. The number of non-fire emergencies for the State of Texas is a much larger percentage compared with national numbers. According to the NFPA's report, the number of non-fire emergencies has increased significantly, but they are not seeing the number of injuries increasing (see report page 5 in 2009, 2010 and 2011).

> *For the same period, the number of non-fire emergencies increased a substantial 274%, due in large part to an increase in the number of medical aid incidents. When the injury rate per 1000 non-fire emergencies is examined, the rate has declined during the period from 1.24 in 1981 to 0.50 in 2011 (Figure 3), because the number of non-fire emergencies increased at a higher rate than the number on injuries at non-fire emergencies.*
>
> - NFPA, *U.S. Firefighter Injuries - 2011*

In Texas, the number of non-fire emergencies and the resultant number of injuries, specifically around EMS calls, is significant.

DRAFT

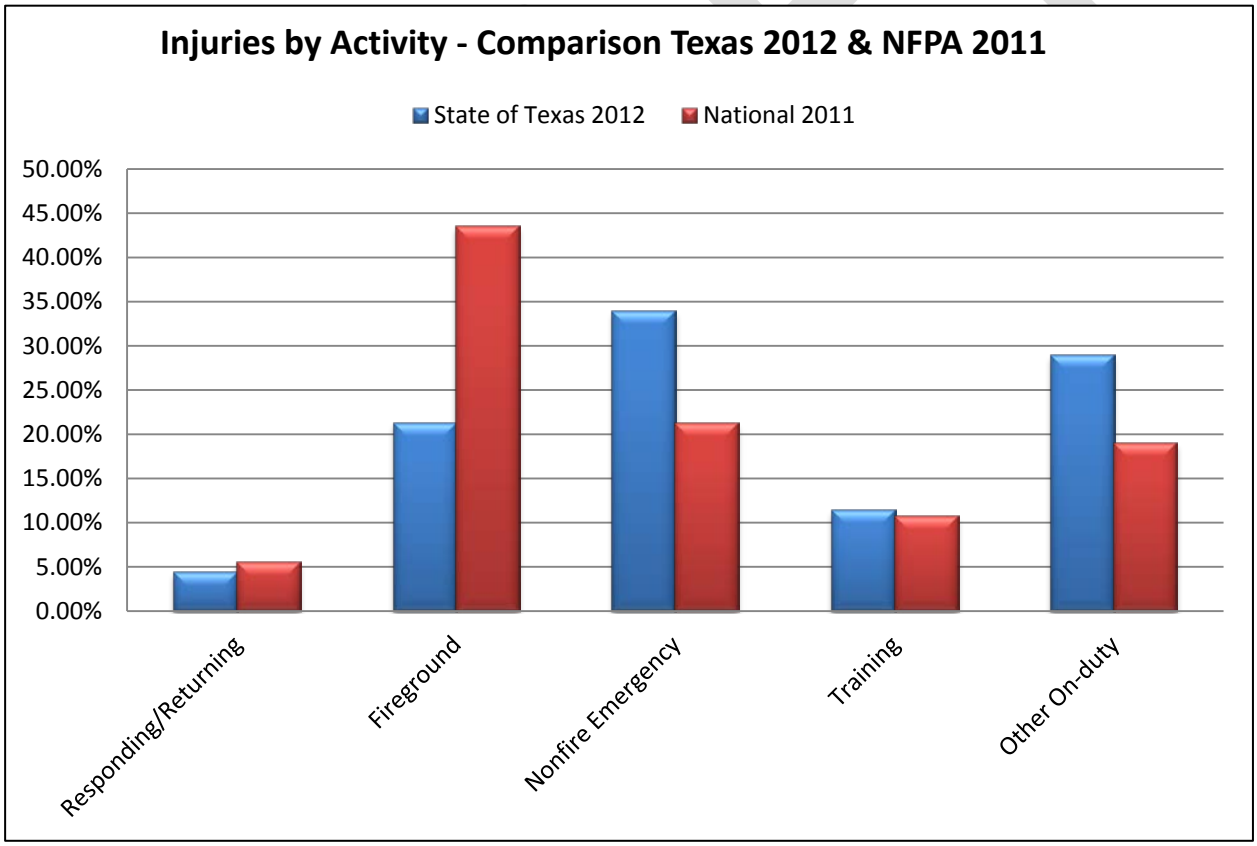
Texas Commission on Fire Protection categories:

- Fireground includes 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.

Chart 19
Comparison of Texas and NFPA

Activity	State of Texas 2012		National 2011	
Responding/Returning	187	4.39%	3870	5.52%
Fireground	910	21.34%	30505	43.52%
Non-fire Emergency	1448	33.96%	14905	21.27%
Training	486	11.40%	7515	10.72%
Other On-duty	1233	28.92%	13295	18.97%
	4,264		**70,090**	

Figure 17



Firefighter Injuries by Nature of Injury and Type of Duty, NFPA, *U.S. Firefighter Injuries - 2011*, Page 10

Chart 20
Responding and Returning from incidents

Report 2012	Respond/Return TX 2011		Respond/Return NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	0	0.000%	30	0.78%
Smoke-Gas Inhalation	0	0.000%	80	2.07%
Other Respiratory Distress	0	0.000%	50	1.29%
Burns & Smoke Inhalation (no)	0	0.000%	5	0.13%
Wound, cut, bleeding, bruise	38	20.321%	515	13.31%
Dislocation, fracture	2	1.070%	145	3.75%
Heart Attack or Stroke	5	2.674%	30	0.78%
Strain, sprain, muscular pain	135	72.193%	2485	64.21%
Thermal stress (frostbite, heat exhaustion)	1	0.535%	140	3.62%
Other	4	2.139%	390	10.08%
Exposures	2	1.070%		
Totals	187	100.00%	3870	100.00%

Chart 21
Fireground incidents

Report 2012	Fireground TX 2011		Fireground NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	158	17.363%	1905	6.24%
Smoke-Gas Inhalation	20	2.198%	1430	4.69%
Other Respiratory Distress	0	0.000%	595	1.95%
Burns & Smoke Inhalation (no)	0	0.000%	605	1.98%
Wound, cut, bleeding, bruise	148	16.264%	4435	14.54%
Dislocation, fracture	8	0.879%	735	2.41%
Heart Attack or Stroke	5	0.549%	255	0.84%
Strain, sprain, muscular pain	385	42.308%	15460	50.68%
Thermal stress (frostbite, heat exhaustion)	68	7.473%	2115	6.93%
Other	13	1.429%	2970	9.74%
Exposures	105	11.538%		
Totals	910	100.00%	30505	100.00%

DRAFT

DRAFT

Chart 22
Non fire emergency incidents

Report 2012	Non Fire Emergency TX 2011		Non Fire Emergency NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	4	0.276%	60	0.40%
Smoke-Gas Inhalation	0	0.000%	190	1.27%
Other Respiratory Distress	0	0.000%	130	0.87%
Burns & Smoke Inhalation (no)	0	0.000%	5	0.03%
Wound, cut, bleeding, bruise	185	12.776%	1865	12.51%
Dislocation, fracture	7	0.483%	290	1.95%
Heart Attack or Stroke	4	0.276%	125	0.84%
Strain, sprain, muscular pain	605	41.782%	9545	64.04%
Thermal stress (frostbite, heat exhaustion)	11	0.760%	135	0.91%
Other	17	1.174%	2560	17.18%
Exposures	615	42.472%		
Totals	1448	100.00%	14905	100.00%

Chart 23
Training incidents

Report 2012	Training TX 2011		Training NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	10	2.062%	165	2.20%
Smoke-Gas Inhalation	1	0.206%	5	0.07%
Other Respiratory Distress	0	0.000%	105	1.40%
Burns & Smoke Inhalation (no)	0	0.000%	55	0.73%
Wound, cut, bleeding, bruise	106	21.856%	1115	14.84%
Dislocation, fracture	5	1.031%	270	3.59%
Heart Attack or Stroke	9	1.856%	60	0.80%
Strain, sprain, muscular pain	260	53.608%	4680	62.28%
Thermal stress (frostbite, heat exhaustion)	27	5.567%	375	4.99%
Other	11	2.268%	685	9.12%
Exposures	56	11.546%		
Totals	485	100.00%	7515	100.00%

DRAFT

Chart 24
Other on Duty incidents

Report 2012	Other On Duty TX 2011		Other On Duty NFPA 2010	
	Number	Percent	Number	Percent
Burns (Fire or Chemical)	15	1.217%	2385	3.40%
Smoke-Gas Inhalation	1	0.081%	1760	2.51%
Other Respiratory Distress	0	0.000%	1060	1.51%
Burns & Smoke Inhalation (no)	0	0.000%	695	0.99%
Wound, cut, bleeding, bruise	301	24.412%	10210	14.57%
Dislocation, fracture	28	2.271%	1885	2.69%
Heart Attack or Stroke	20	1.622%	860	1.23%
Strain, sprain, muscular pain	754	61.152%	39960	57.01%
Thermal stress (frostbite, heat exhaustion)	26	2.109%	2945	4.20%
Other	29	2.352%	8660	12.36%
Exposures	59	4.785%		
Totals	1233	100.00%	70090	100.00%

DRAFT

2012 Findings / Recommendations

Recommendation for the reduction of skills training related injuries

Chart 23 of this annual report identifies the types of injuries and their numbers occurring during skills training exercises. Of course, detailed accident and injury analysis should be performed to determine the causes that lead to injuries in each specific case, but generally speaking the prevention or reduction of training injuries falls upon the quality of the training and the environment where the training takes place. The individuals responsible in this category are the Fire Instructor and the Safety Officer assigned to deliver and oversee the training. Another area that has a direct relation to training injuries is the Health and Wellness/Fitness program administered by the department.

Firefighter Life Safety Initiative #5 from the National Fallen Firefighter Foundation's Everyone Goes Home Program promotes the certification of personnel in the applicable standards of professional qualifications, and the accreditation of agencies as a means to improve safety in training environments and the prevention of training related injury.

The curriculum for the certification of Fire Instructors, Fire Officers, and Incident Safety Officers all address safety concerns in the training environment. The commission believes that certification in these professional development courses will help improve safety in skills training exercises, and reduce the number of injuries reported in Chart 23 of this report.

NFPA 1041, *Standard for Fire Service Instructor Professional Qualifications*, Chapter 4.4.2 states that the job performance requirement of the Fire Instructor I is to organize the outdoor learning environment so that safety is considered. Chapter 5.4.3 states that the job performance requirement for the Fire Instructor II is to supervise both instructors and students so that safety standards and practices are followed.

NFPA 1403, *Standard on Live Fire Training Evolutions*, Chapter 4.4 requires a Safety Officer to be appointed for all live fire training evolutions. The job performance requirements for the professional qualifications of the Fire Safety Officer can be found in NFPA 1521.

Some of the listed burn injuries were the result of incorrectly worn personal protective equipment (PPE), or that the PPE was not worn at all. NFPA 1403, in Chapters 4.6 and 4.8, clearly indicates that Fire Instructors shall ensure that all protective clothing and equipment shall be compliant with NFPA standards and worn according to the manufacturer's instructions. Great emphasis is also placed on the responsibility of the Safety Officer to inspect every detail of the training environment for potential hazards. In addition, commission rules in 37 TAC §435.1 and 37 TAC §435.3 requires departments to develop Standard Operating Procedures (SOPs) to address the use of PPE and SCBA and the conditions in which they must be worn.

Many of the heart attacks/strokes, sprains and strains that occur in skills training can be reduced by implementing a comprehensive and properly managed wellness/fitness program. Just as diagnosis and preventive maintenance is understood to be necessary to keep fire apparatus in service, so also are they no less important for the health and safety of each firefighter.

Fire Instructors and Safety Officers should follow NFPA 1561, *Standard on Emergency Services Incident Management System*, for the use of Command, Accountability, and Rehabilitation during every skills training exercise.

DRAFT

Of the training injuries listed, the most preventable types are the burns, smoke inhalation, and heat-related exposures. Proper donning of PPE and controlled live fire evolutions that adhere to department policy and NFPA standards can reduce and potentially eliminate these injuries.

The more difficult-to-prevent injuries are wounds, fractures, and dislocations. Proper inspection of the training environment to remove unnecessary hazards, and constant, ongoing evaluation of the training field by the safety officer, will help in this area. Additionally, adherence to the proper instructor-to-student ratio will help identify causes for these injuries before they occur.

Sprains and strains are difficult to completely eliminate even in the controlled training environment, but they can be greatly reduced by a well-managed strength and flexibility exercise training program that addresses the pushing, pulling, and lifting that are incident to fire service duties.

Finally, the most difficult-to-prevent events that occur in training are the cardiac and stroke emergencies. Physical and medical assessments in department health and wellness programs are absolutely necessary to discover the potential for these emergencies before participation in a strenuous training exercise.

The commission has adopted several NFPA and other nationally recognized standards to help keep Texas firefighters safe. This list summarizes the relationships between some of the Texas laws and national standards; it 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

DRAFT

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.

DRAFT