Standards of Cover

La Crosse Fire Department

2019

Introduction

The following report serves as the La Crosse Fire Department "Integrated Risk Management Plan: Standards of Cover" document. The Commission on Fire Accreditation International (CFAI) defines the process, known as "deployment analysis", as written procedure which determines the distribution and concentration of fixed and mobile resources of an organization. This document will assist the agency in ensuring a safe and effective response force for fire suppression, emergency medical services, and specialty response situations in addition to homeland security issues.

Creating an Integrated Response Management Plan Standards of Cover requires that a number of areas be researched, studied, and evaluated. The following report will begin with an overview of the community and the agency. Following this overview, the agency will discuss areas such as risk assessment, critical task analysis, agency service level objectives, and distribution and concentration measures. The agency will provide documentation of reliability studies and historical performance through charts and graphs.

The analysis for this document includes a historical perspective using data from the years 2013, 2014, 2015, 2016 and 2017. Although all incident types are taken into consideration, the primary efforts remain with all emergency fire, emergency medical, emergency rescue, emergency hazardous materials incidents, and emergency report out incidents (bomb threats, power line complaints, odor complaints, water complaints, and airport stand by).

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Executive Summary

The La Crosse Fire Department is committed to being re-accredited through the Commission on Fire Accreditation International (CFAI). Part of this process involves creating a Standards of Cover document to assist with:

- Evaluating and defining an agency's baseline of operations
- Identifying benchmarks for achieving the agency's goals and objectives
- Determining levels of service for all portions of the community
- Measuring an agency's performance over different budget or operational years

Risk Definitions

The agency has conducted an overall risk assessment of the community. Both fire and non-fire risks were evaluated; starting with individual buildings and continuing with a systematic evaluation of each planning zone. Fire risks were categorized as low, moderate, high, and maximum/special; based on several life safety and consequential factors such as probability, economic impact, etc. Non-fire risks including medical risk, rescue risk, hazardous materials risk, and natural disaster risk were also included in the evaluation and categorized in a similar manner.

Performance Goals, Objectives, and Measures

The agency set performance goals and objectives and measured for five risk categories; emergency fire, emergency medical, emergency rescue, emergency hazardous materials, and emergency report out incidents (bomb threats, power line complaints, odor complaints, water complaints, and airport standby).

Level of Service

It is necessary for the agency to evaluate historical response data for the past five years (2014 through 2018) for the typical emergency response risks for; emergency fire, emergency medical, emergency rescue, emergency hazardous materials, and emergency report outs within the community.

Data was measured against current baseline performance objectives. Once the analysis was completed, the agency established benchmark response performance objectives, which will become what the agency will continue to strive to meet as part of its on-going efforts towards self-improvement.

Benchmark service level objectives have been established for the overall initial response for the first arriving units. The objectives further describe responses for low, moderate, and high risk factors for each of the five risk categories (emergency fire, emergency medical, emergency rescue, emergency hazardous material, and emergency report out incidents).

Availability and reliability of each first due unit within their respective districts was measured to determine how often the unit was available to respond to calls within their area of coverage. Of those calls responded to within each planning zone of the respective area of coverage, further evaluation was conducted to determine the percentage of times they were responded to within the established benchmarks.

Compliance Methodology

Established performance objectives and other goals and objectives will be monitored regularly by command staff to ensure that the plans put into place for self-improvement are measureable and attainable. When necessary, modifications to the various systems will occur as part of the compliance methodology. Established goals and objectives will also be monitored for progress to completion; with new goals and objectives being introduced on a continuing cycle.

Conclusions and Recommendations

The agency has experienced success during the time period since the development of its first Standards of Cover document and the focus it brought to quality improvement. With a new Fire Chief, new senior management structure, new Accreditation Manager, and many other departmental leadership roles that have new members in place, the agency has a renewed focus on quality improvement data and goals. A summary of recommendations are as follows in no particular order of importance:

- The agency is upgrading its data analysis software to the First Watch data management platform. The First Watch program will allow the agency to address issues more timely and effectively by affording us the opportunity to have response data in a real time format.
- The agency is working as part of a citywide transition to the EnerGov platform for tracking and managing building inspection data and progress. Future work will be done to integrate preplanning and chronic nuisance building strategies between all city departments.
- The agency is in the process of replacing Engine 4 and that project is expected to be completed in 2018. The agency is also in the process of replacing its 1985 Water Tender with a new, combined Pumper/Tender in 2019. This will not only provide us a more reliable water tender, but also add a versatile reserve engine to our fleet.
- The agency will begin to merge its existing policies and procedures into the Lexipol Knowledge Management System in 2018, in effort to provide dependable and defendable policy to our personnel. The system also affords us individual policy acknowledgement accountability and additional training capacity.
- Beginning in 2018, the agency will begin using the Target Solutions training management platform for training and occupational compliance standards. This program will allow the agency to better track certifications, probationary firefighter task books, education assignments and verify individual training records.

- The agency has completed ongoing needs assessment of decontamination equipment and procedures. Occupational exposure awareness training has been completed in 2017 to address alarming health statistics, and the agency will focus its efforts on adding exhaust capture systems and turnout gear extractors in all four fire stations as future opportunities and budgets processes allow.
- The end of 2017 has shown some initial promise towards an emerging opportunity to get the agency's Paramedic-level trained personnel approved to work as first-response Paramedics within our response system. This would address recruitment and retention issues and allow the agency to provide a higher standard of care. Negotiations will continue into 2018 with the hopes of a pilot program beginning in early 2019.

Although the agency has identified specific improvement needs and challenges, it is confident that by working within the established parameters identified above and within other applicable accreditation documents, the agency will meet its performance objectives and expectations of the CFAI.

Standards of Cover and Accreditation

The Standards of Cover is a major component of the agency's commitment towards the internationally recognized accreditation process. Through the coordinated assistance of the Commission on Fire Accreditation International (CFAI), the agency's self-assessment efforts towards achieving continued improved services will evolve for years to come.

The CFAI specifies that an agency must review its historical data for a minimum of five years for a valid analysis. Attaining accreditation will benefit both the agency and the community it serves by creating a culture that focuses on self-improved services through the effective implementation of current and identified future resources.

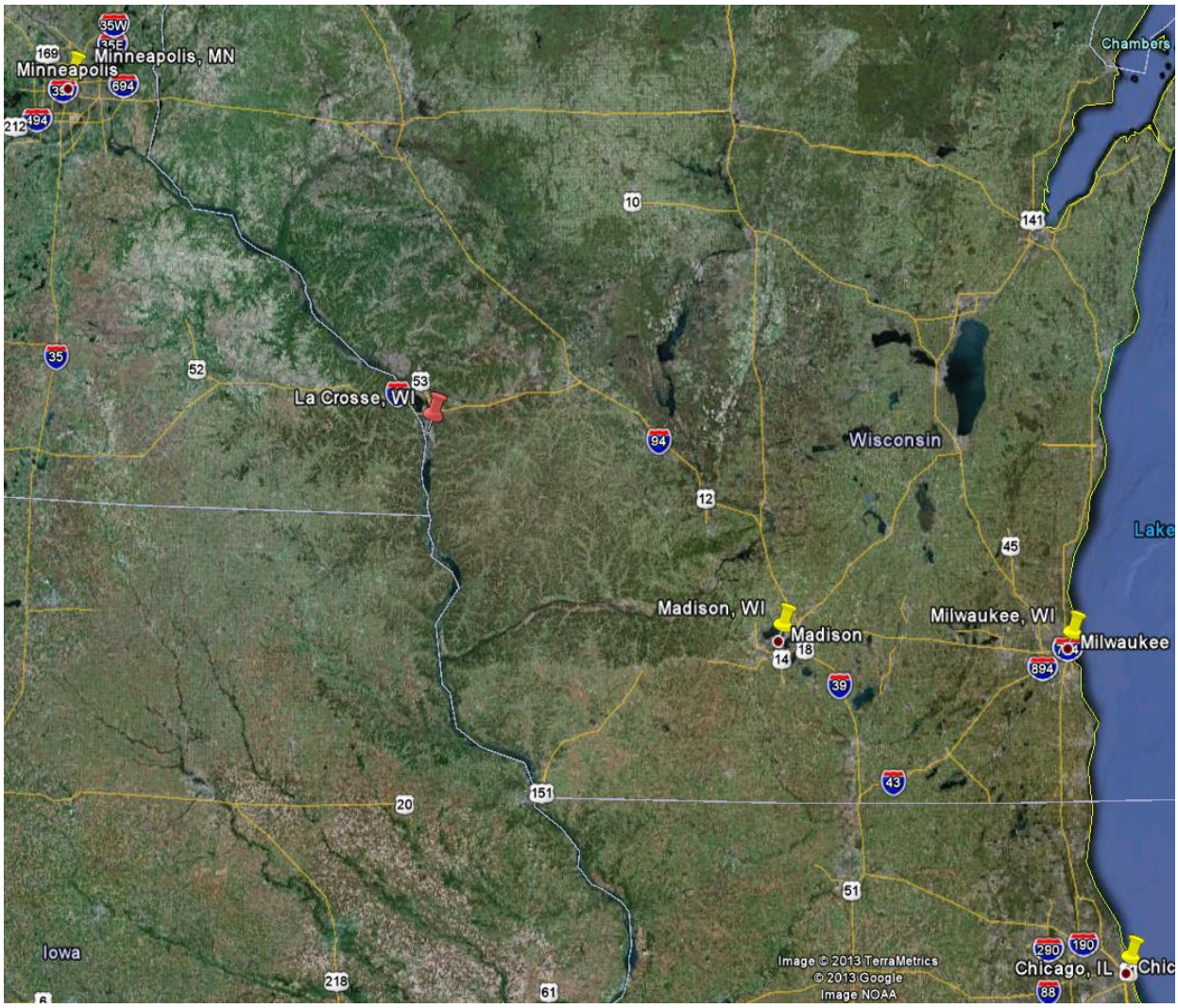
This process also encourages and assists the agency with improved decision making policies, procedures, and practices that will positively impact the organizational culture.

Community Overview

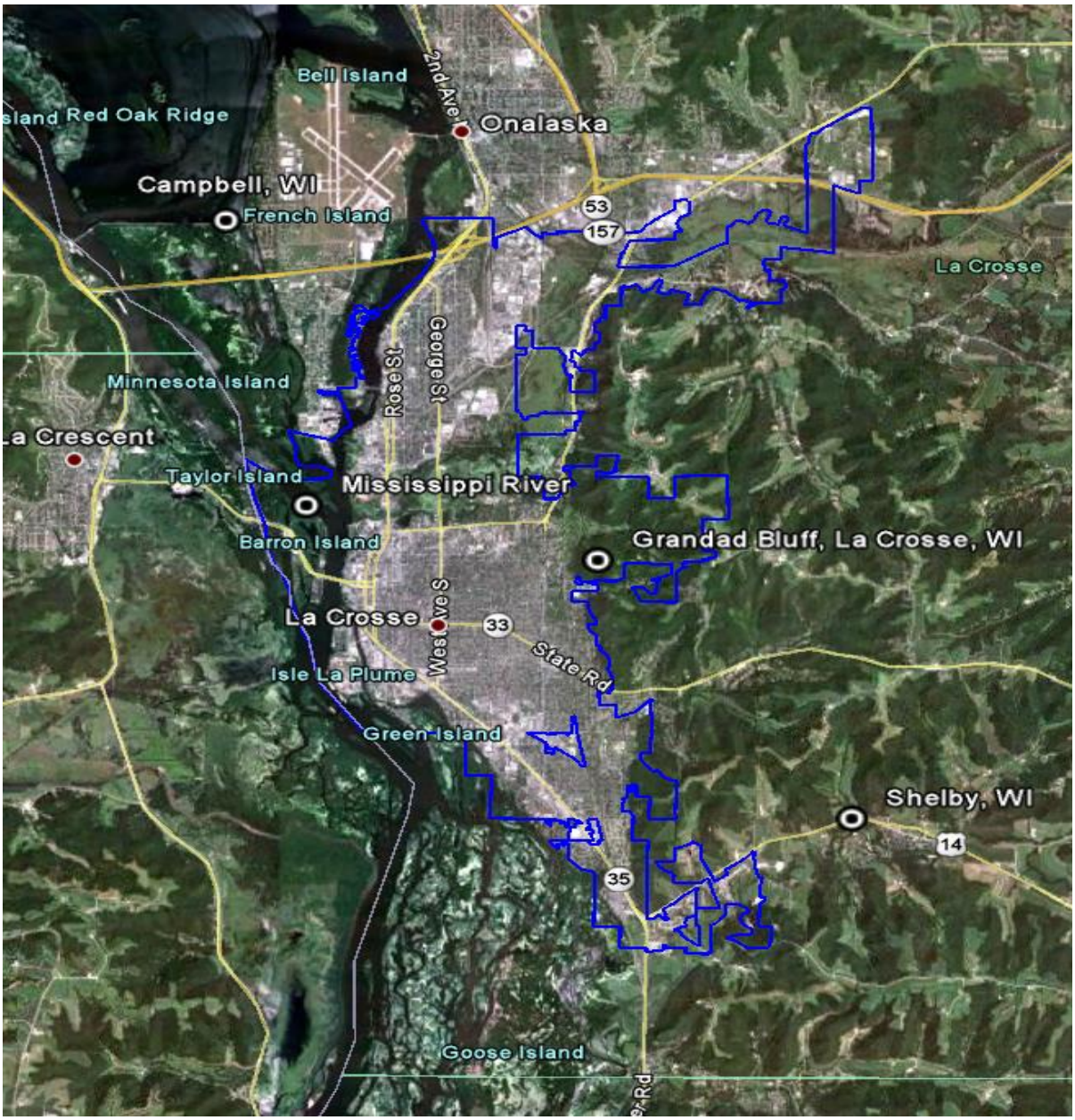
"Here is a town of twelve or thirteen thousand population with electric lighted streets and with blocks of buildings which are stately enough, and architecturally fine enough to command respect in any city. It is a choice town and we made satisfactory use in roaming it over."

-Mark Twain on La Crosse, Wisconsin in 1882

The City of La Crosse is located on the mighty Mississippi River, approximately 140 miles northwest of Wisconsin's capital city of Madison. La Crosse is located approximately 155 miles to the southeast of Minneapolis, Minnesota and 280 miles to the northwest of Chicago, Illinois.



La Crosse has a resident population of 51,800 and covers 22 square miles. Working, visiting, and student populations swell the daily population to more than double the population. The shape of the city is determined by the Mississippi River on the west and south and the sandstone bluffs on the east. These defining characteristics of La Crosse have caused the city to become very long and narrow. A large marsh along the La Crosse River separates the city between north and south. To the north lies the Town of Campbell and the City of Onalaska, and its southeast border meets the Town of Shelby.

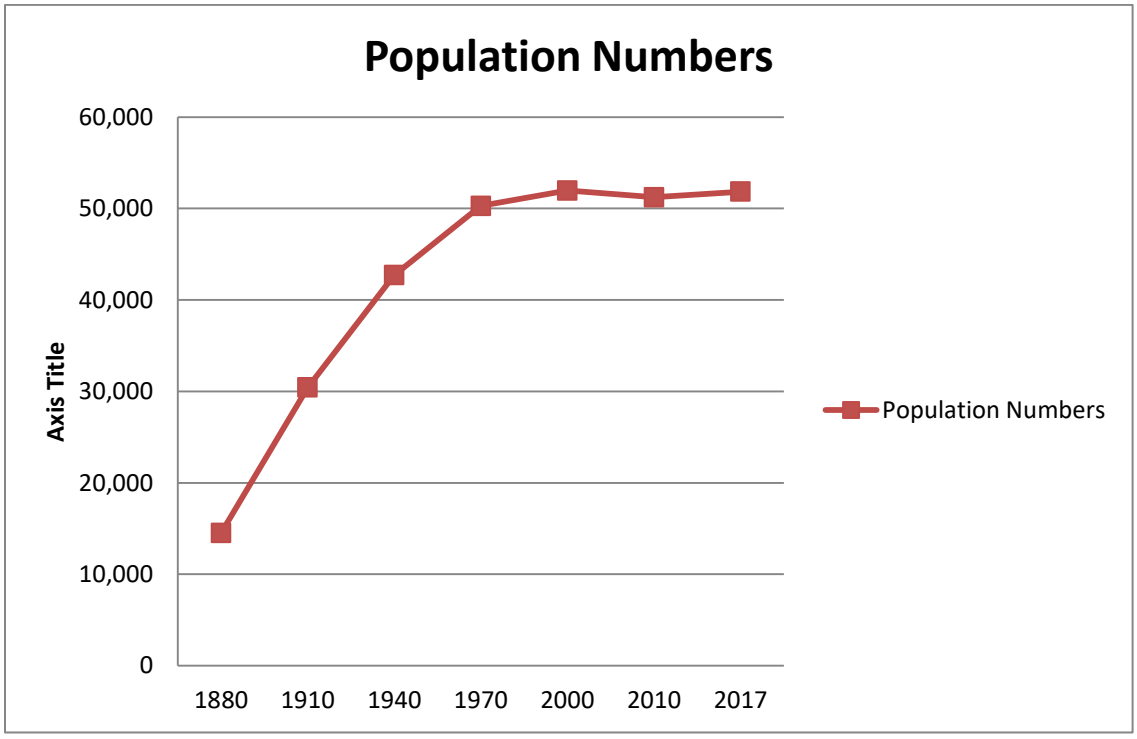


La Crosse began as a trading post on the Mississippi River. The city, as we know it, developed beginning in 1851 with the introduction of local sawmills. This industry caused a significant increase in population, and an increase in the range of the city borders. Steamboat traffic grew from four boats per year in 1851, to 1,312 boats in 1858. La Crosse continued steady expansion, both in population and area, when the first railroad line, the La Crosse & Milwaukee Railroad was built into La Crosse in 1858. Railroads helped to bring waves of immigrants to the city between 1870 and 1890. These immigrants were predominantly German and Norwegian. The population of foreign born immigrants grew as high as 37% in 1880. The logging industry eventually began to decline near the end of the nineteenth century when the supposedly "inexhaustible" supply of pine was exhausted. However, manufacturing jobs were on the rise, so the economic progress of La Crosse was not halted and rather shifted in a new direction. La Crosse became home to several industries including a rubber mills, several breweries, and a button company.

La Crosse's population grew steadily, until nearly reaching its population ceiling in the 1970's. La Crosse had maximized it land use, and its resident population has remained steady to current day. La Crosse's resident population experienced a very slight decline from 2000 to 2010 (as noted in the following charts) but appears to be leveling out with a population of 51,834 in 2017. The following charts also provide population demographic data to paint a picture of the make-up of the residents of the city.

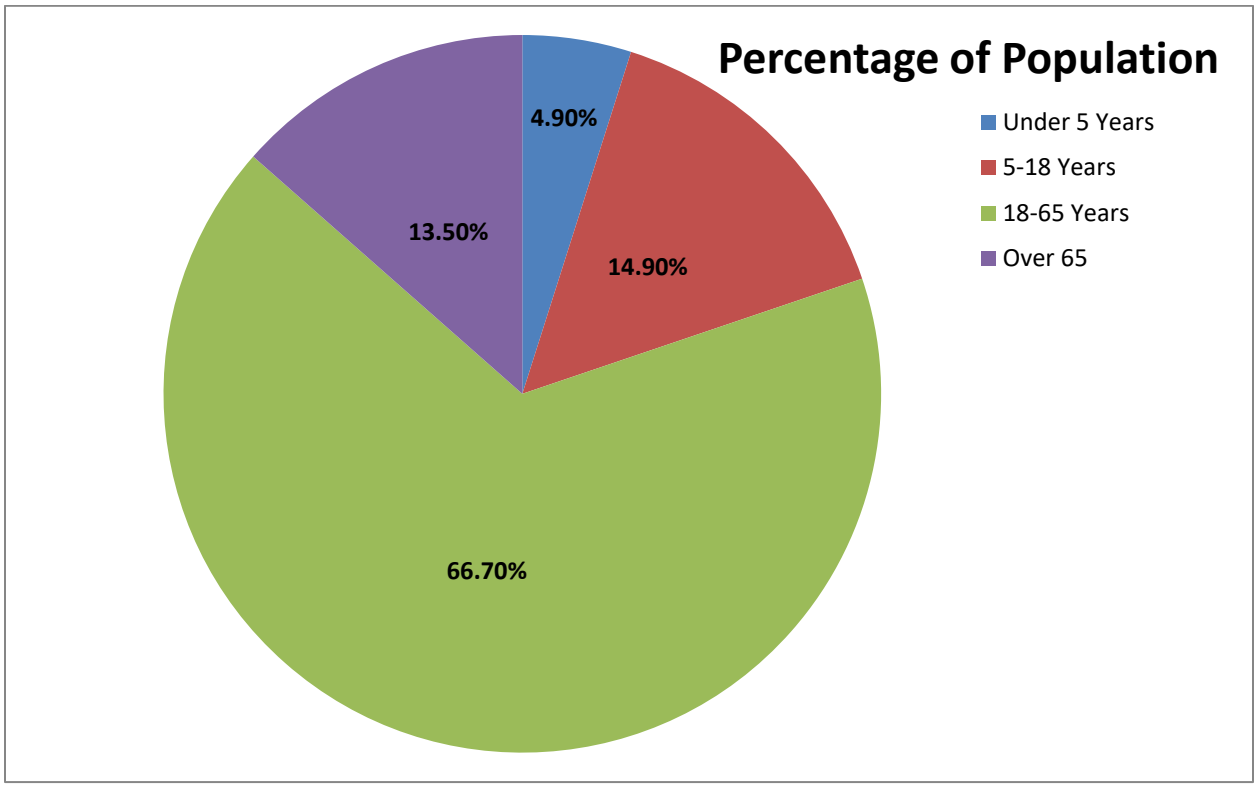
Source: U.S. Census Bureau

Year	Population Numbers
1880	14,505
1910	30,417
1940	42,707
1970	50,285
2000	51,965
2010	51,230
2017	51,834



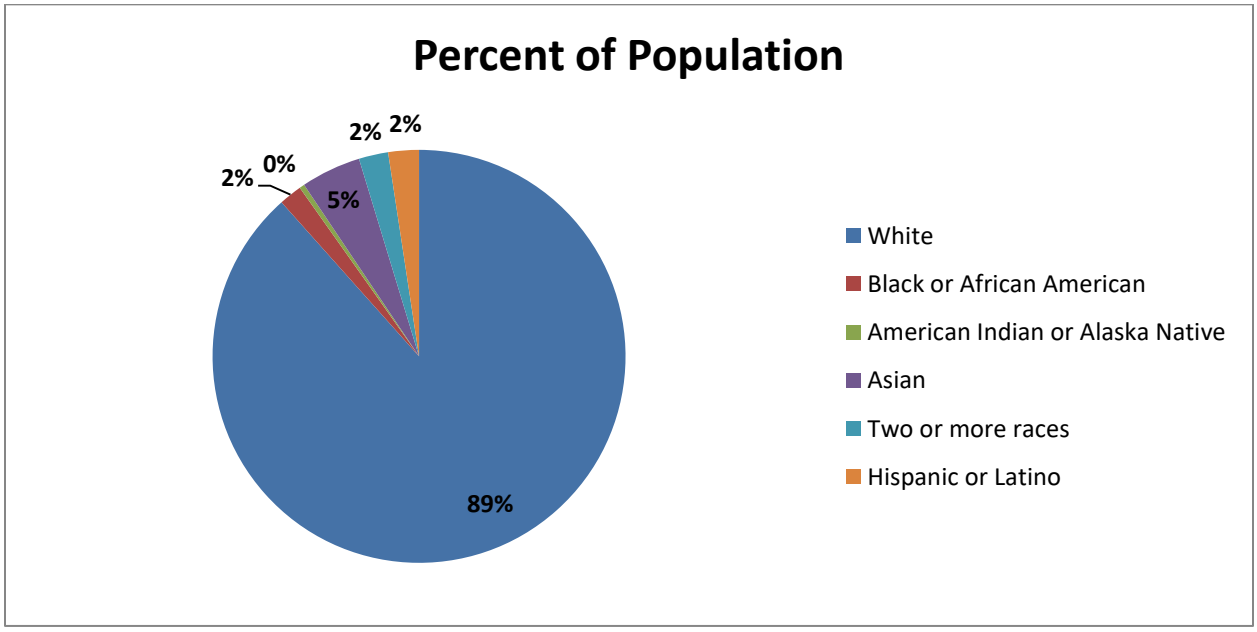
Source: U.S. Census Bureau

Age	Percentage of Population
Under 5 Years	4.90%
5-18 Years	14.90%
18-65 Years	66.70%
Over 65	13.50%



Source: U.S. Census Bureau

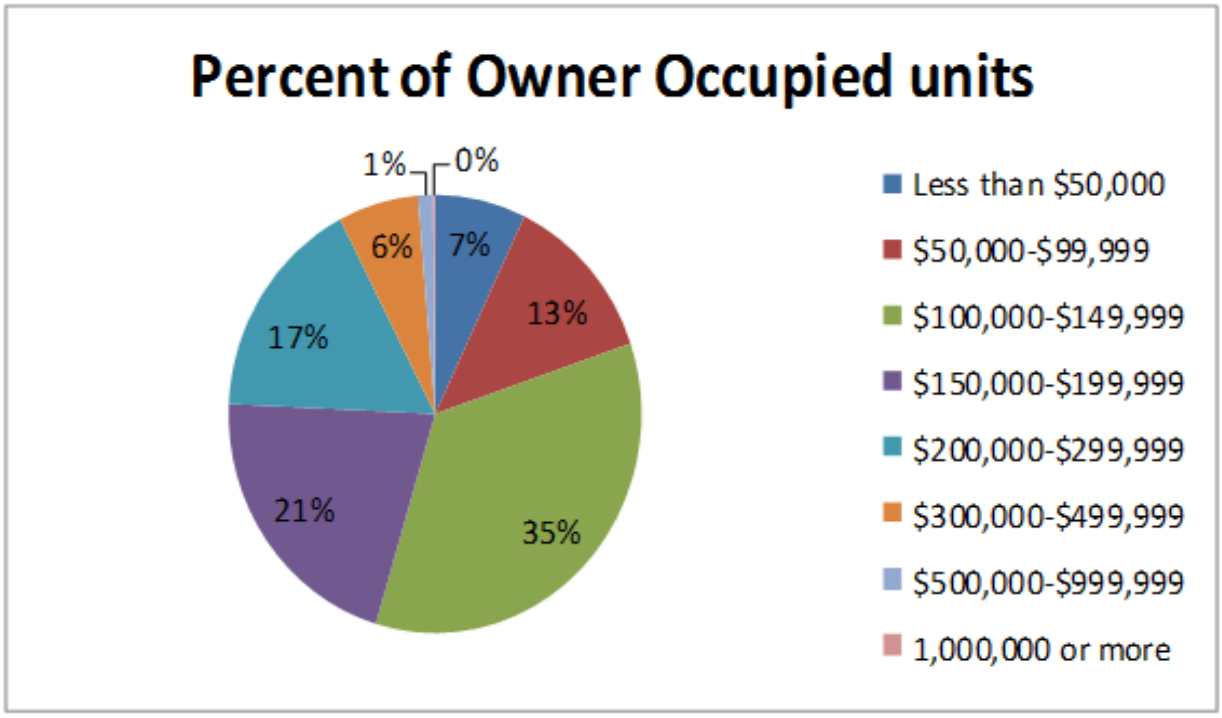
Race	Percentage
White	88.40%
Black or African American	1.80%
American Indian or Alaska Native	0.40%
Asian	4.70%
Two or more races	2.30%
Hispanic or Latino	2.40%



Source: U.S. Census Bureau

Housing	
Owner-occupied housing unit rate, 2013-2017	46.70%
Median value of owner-occupied housing units, 2013-2017	$132,200
Households, 2013-2017	20,937
Persons per household, 2013-2017	2.25
Per capita income in past 12 months (in 2017 dollars), 2013-2017	$23,385
Median household income (in 2017 dollars), 2013-2017	$42,243
Persons in poverty, percent	25.20%
Land area in square miles, 2010	20.52
Population per square mile, 2010	2,501.50
Owner-occupied housing unit rate, 2013-2017	46.70%
Median value of owner-occupied housing units, 2013-2017	$132,200
Median selected monthly owner costs -with a mortgage, 2013-2017	$1,197
Median selected monthly owner costs -without a mortgage, 2013-2017	$506
Median gross rent, 2013-2017	$747

The U.S. Census Bureau was used to analyze La Crosse housing demographics:



Value	Number of Owner Occupied units	Percent of Owner-occupied units
Less than $50,000	808	7.10%
$50,000-$99,999	1,438	12.70%
$100,000-$149,999	3,953	34.80%
$150,000-$199,999	2,393	21.10%
$200,000-$299,999	1,891	16.70%
$300,000-$499,999	712	6.30%
$500,000-$999,999	131	1.20%
1,000,000 or more	20	0.20%

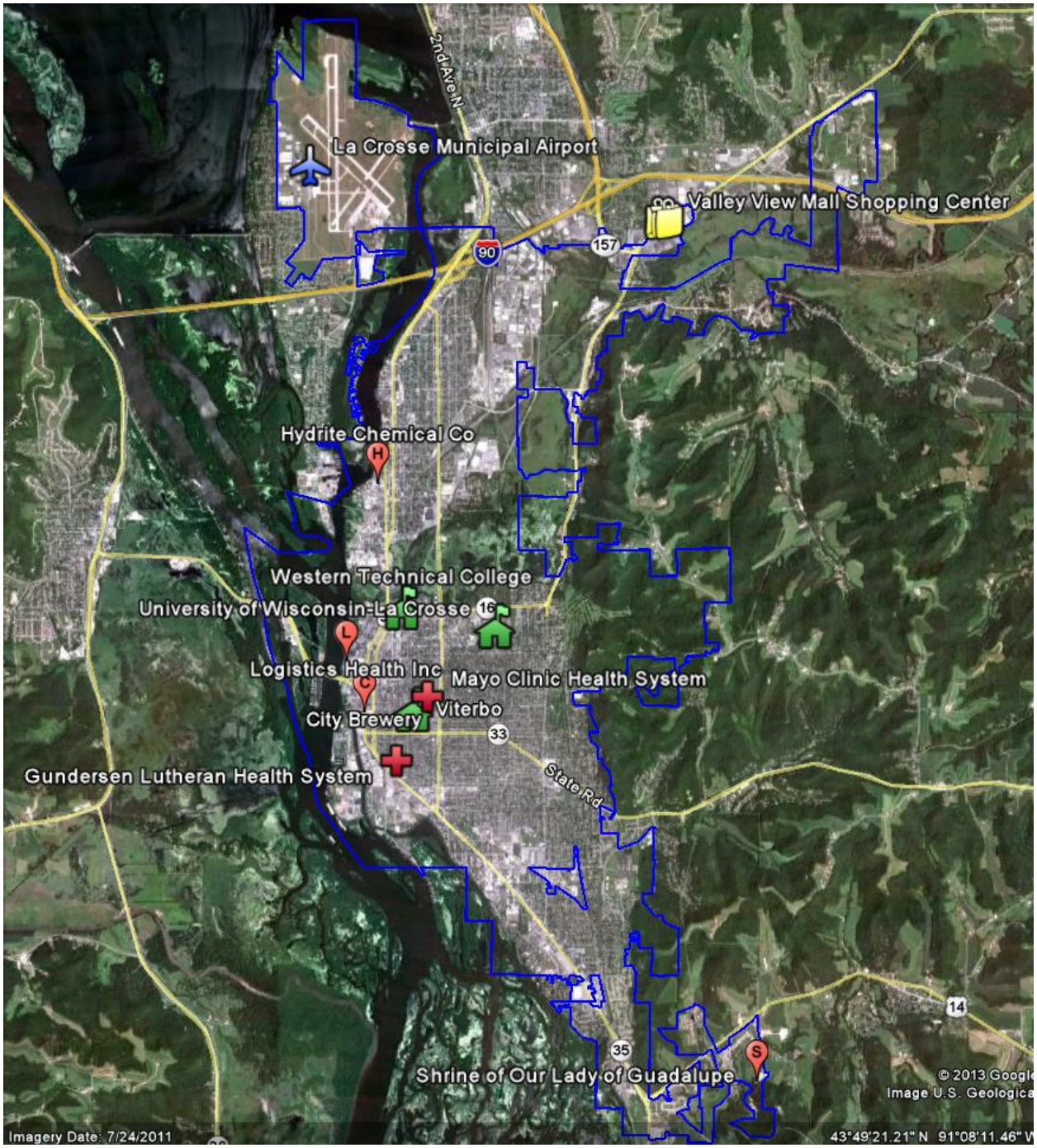
The U.S. Census Bureau was used to analyze La Crosse housing demographics:

Year Built	Number of Structures Built	Percent of Structures in La Crosse
2005 or Later	670	3.20%
2000-2004	1,085	5.10%
1990-1999	2,213	10.50%
1980-1989	2,089	9.90%
1970-1979	2,787	13.20%
1960-1969	2,199	10.40%
1950-1959	2,801	13.30%
1940-1949	1,752	8.30%
1939 or earlier	5,504	26.10%

The U.S. Census Bureau was used to analyze La Crosse work force demographics:

Occupation	Number of people Employed	Percent of people employed
Management, business, science, and arts	9,295	35.90%
Service	5,330	20.60%
Sales and office	6,142	23.70%
Natural resources, construction, and maintenance	1,702	6.60%
Production, transportation, and material moving	3,438	13.30%

Many businesses call La Crosse home, to include Gundersen Health System, Mayo Clinic Health System, Trane Company, CenturyLink, Logistics Health, Chart Industries, Kwik Trip, Hydrite Chemical, Valley View Mall, and City Brewery.



The following list defines the critical infrastructure assets in La Crosse:

Electricity & Nuclear - Xcel Energy, Dairyland Power Cooperative, Genoa Nuclear Power Plant near Genoa, WI (located only twelve miles to the south of La Crosse) and Prairie Island Nuclear Power Plant near Red Wing, MN are in the agency's radiological field team response district.

Gas/Oil – Northern Natural Gas Company submerged pipeline, 18-inch, 800-1200 psi, running across the riverbed of the Mississippi River, serving Midwest Natural Gas Co. and WE Energies.

Transportation Systems – Interstate I-90 and numerous State Highways are critical to transportation in the agency's response region. La Crosse railway traffic includes the Canadian Pacific Railway that operates 28 trains per day including two Amtrak passenger trains and the Burlington Northern-Santa Fe that operates 40 to 50 trains per day. A significant quantity of crude oil and other hazardous materials move through La Crosse every day. There are several major rivers in the agency's response region, to include the Mississippi River, the Black River, and the La Crosse River. La Crosse has 23-miles of shoreline and 1,350 acres of marshland. Barge traffic on the Mississippi River brings 4,594 barges annually, transporting 45,575 tons of petroleum and 966,115 tons of chemical fertilizers. The La Crosse Regional Airport transports 189,000 passengers annually.

Public Health – There are two major medical facilities in La Crosse, Gundersen Health System and Mayo Clinic Health System.

Chemical Facilities - Hydrite Chemical, located in La Crosse near the Black River, is one of the nation's largest independent providers of chemicals and services, shipping and storing more than 400 different chemicals. Hydrite Chemical has a bulk storage capacity of 2,027,500 gallons. La Crosse has 94 additional facilities that have a reportable amount of hazardous materials.

Institutions of Higher Learning - the University of Wisconsin La Crosse, Viterbo University, and Western Technical College have a combined student population of over 18,000.

City of La Crosse Water Utility - La Crosse utilizes a five million gallon reservoir to maintain water system pressure, and to store water for times of high demand such as fire protection. La Crosse utilizes 15 high pressure wells and maintains 220 miles of water mains.

La Crosse, like most cities its size, relies heavily on property tax collections as a primary source of revenue. La Crosse is severely limited in its opportunity to collect money through property tax revenue. Due to a large amount of tax exempt properties (hospitals, universities, churches, etc.); just over 40% of the properties in La Crosse are tax-exempt. La Crosse has an aging housing stock, with 26% of all properties built prior to 1939. With three universities in the city, La Crosse has a significantly large number of rental properties, equaling 49% of its total housing stock.

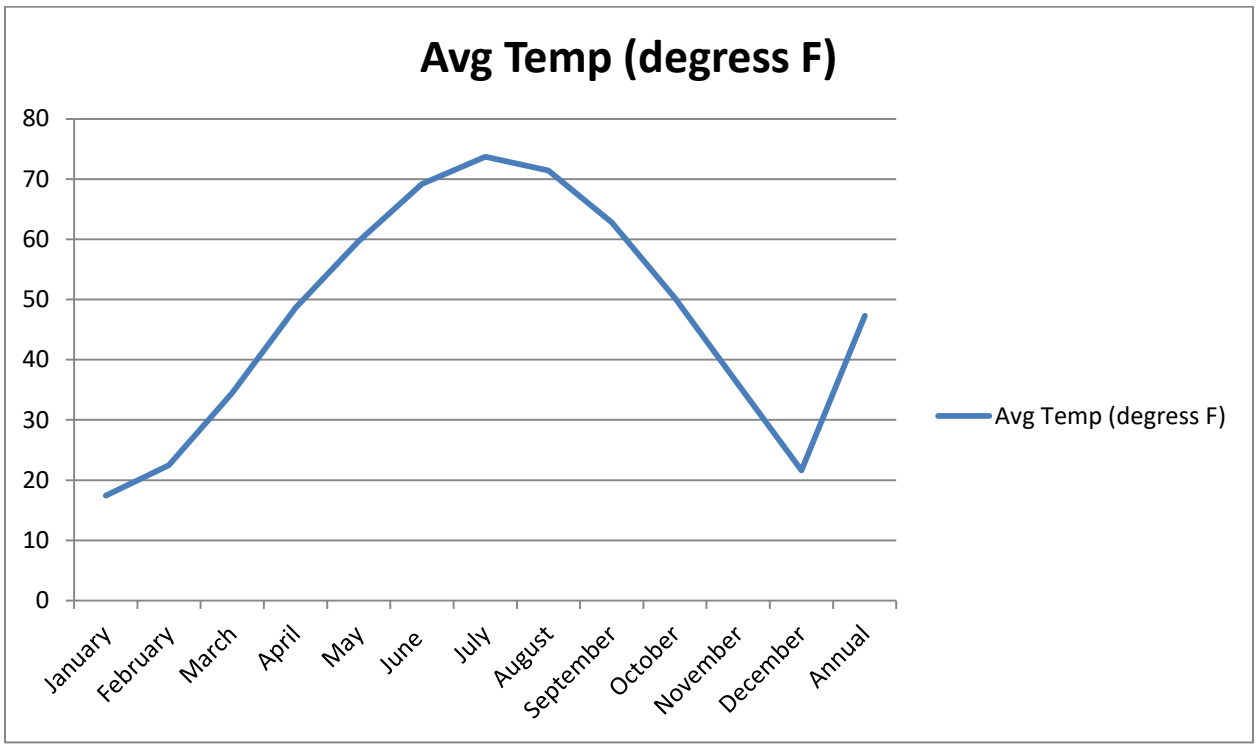
According to the latest United States Census Bureau's statistics, the median income of La Crosse workers is $42,243, compared to the Wisconsin average of $56,759 and the national average of $57,652. Over 25% of all La Crosse citizens fall below the poverty level, as compared to the state average of 11% and the national average of 12%.

Weather and Climate:

La Crosse's weather and climate is known for its extreme heat in the summer and extreme cold in the winter. Winter snowfall leaves the potential for response times being delayed during the months of November through March because of inclement weather related road conditions. According to the National Weather Service, La Crosse has historic tornado activity that is 75% greater than the national average. (The most recent devastating tornado was in May of 2011).

Source: National Weather Service

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Avg. Temp. (degrees F)	17.4	22.5	34.5	48.6	59.7	69.2	73.7	71.4	62.8	50.2	35.9	21.6	47.3
Avg. Precipitation (inches)	1.12	1.05	2.04	3.34	3.52	4.34	4.26	4.29	3.56	2.17	2.01	1.36	33.1
Avg Snowfall (inches)	10.7	8.2	7.1	1.7	0	0	0	0	0	0.2	4.1	11.3	43.3


Avg Temp (degress F)
80
70
60
50
40
30
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January
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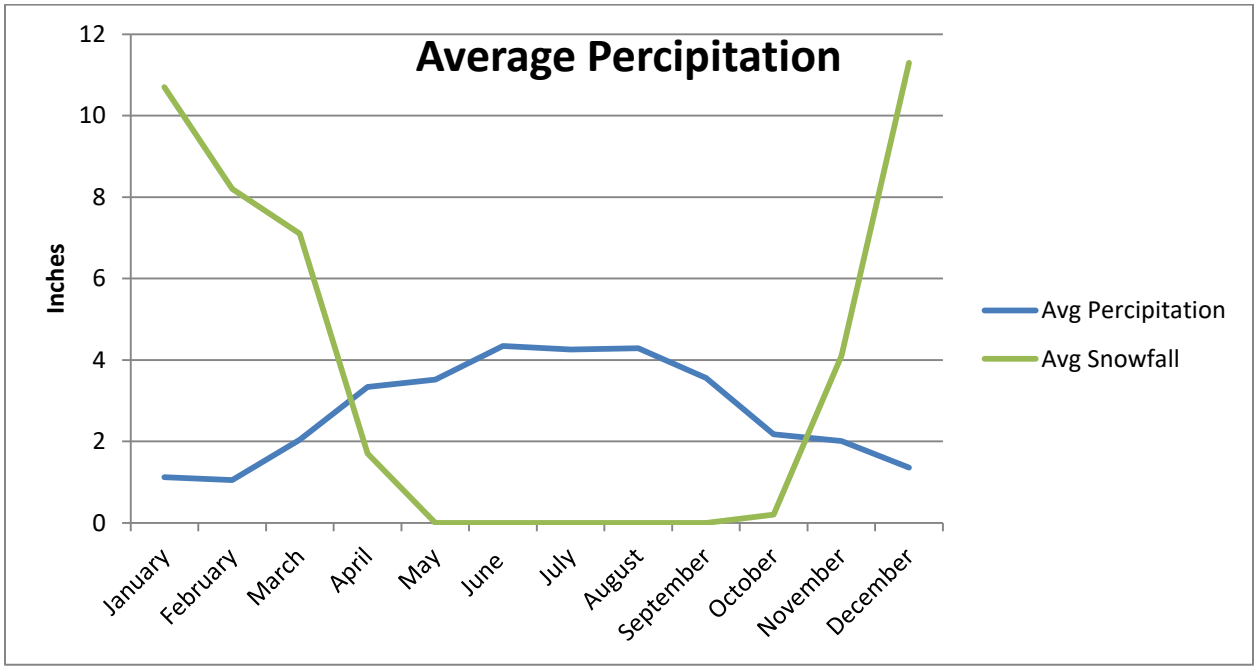
June
July
August
September
October
November
December
Annual
Avg Temp (degress F)


Average Percipitation
Inches
12
10
8
6
4
2
0
January
February
March
April
May
June
July
August
September
October
November
December
Avg Percipitation
Avg Snowfall

Governance Model of the Authority Having Jurisdiction

The City of La Crosse is governed by a Mayor and thirteen Common Council Members, who serve on staggered four year terms. The city is divided into thirteen aldermanic districts. The Mayor and Common Council Members are responsible for policy and decision making, monitoring the operations of the city, analyzing and approving budgets, and determining spending priorities. The Mayor serves full-time as the City's manager.

See Appendix A for a map of aldermanic districts.

Services Provided

Historical Formation and Development of the La Crosse Fire Department

An in depth review of the history of the La Crosse Fire Department reveals an organization which has been able to provide a consistent, high-quality service to a community that has undergone dramatic change over the past 160 years. As the community of La Crosse has changed, so has the level of services provided by the agency. The City of La Crosse has grown from a primarily manufacturing-based community, to a regional leader in the health care field while also supporting a broad array of private business and industry beyond the original occupational base..

The first volunteer fire company in La Crosse, the Pioneer Engine Company, was organized in 1857 after the first fire conflagration of significant magnitude occurred on March 7th of that year. After that fire, all of the buildings on Front Street, from State Street to Mt. Vernon Street, were left in charred ruins. The agency purchased a hand-pumped fire engine in 1858 and a steam engine in 1867.

The decade of the 1880's saw a great growth for the City of La Crosse. The population of the city had increased from 14,505 in 1881 to over 25,000 by the end of the decade. In 1889 a fire alarm system was installed to keep up with La Crosse's rapid expansion. In 1890 a new water main system with a reservoir was installed to provide a reliable water system for the agency.

The agency remained a strictly volunteer agency until October 5, 1895, when a full-time career agency was established. The new full-time agency was divided into five stations with forty-five personnel. They utilized two Silsby steam engines, five hose wagons and hose carts, and three hook and ladder trucks. The agency responded to 232 emergency calls in 1896. La Crosse was also very fortunate in having an excellent water supply to support firefighting capabilities, with thirty-six miles of water main,335 hydrants, and a water storage capacity of 20,000,000 gallons.

The horse-drawn pumper era, which started in 1874, began to come to an end with the transition to motorized apparatus in 1915. In 1925, the city allocated $1,300 to the agency for a rebuilt Pierce-Arrow combination chemical and hose motor cart. La Crosse grew and expanded in the 1940's and 1950's, forcing the agency to grow as well.

In 1957, a total of 93 authorized firefighters worked out of five fire stations, and the agency responded to 729 emergency calls. In 1968, a total of 102 authorized firefighters responded from four fire stations to a total of 882 calls, and of which 30 calls were medical in nature. In comparison, in 2017 the agency responded with a total of 92 personnel to a total of 6,446 calls, and of which 4,622 were medical calls.

In 1983, the 911 La Crosse County Emergency Dispatch Center (EDC) opened to serve La Crosse County. Between 1967 and 1983, all fire dispatching for the City of La Crosse was conducted by firefighters from Fire Station 1 at 5th and Market Streets. La Crosse County 911 EDC is still operating today, but as a separately staffed agency working out of the La Crosse County Law Enforcement Center.

In 1993, the agency trained personnel to the EMT-D (Emergency Medical Technician Defibrillation) level to answer a growing need to provide quality Emergency Medical Services. In 1997, the agency was reorganized from an engine/truck based system to a Quint based system, with light rescue apparatus added to respond to a growing volume of Emergency Medical Services response.

In the early 1990's the agency recognized the need to provide specialized emergency services in the fields of hazardous material, technical rescue, and water rescue. La Crosse is built within a rugged topography of bluff land, with three major rivers (Mississippi, La Crosse, and Black), and

major transportation hubs (Mississippi River, Interstate 90, and Burlington Northern – Santa Fe railway) forcing the need for these three specialty technical rescue teams. Over the years, these specialty teams have evolved into partnerships with the State of Wisconsin regional teams providing statewide coverage for Urban Search and Rescue and Hazardous Materials response.

The agency has provided fire and building inspection training to its members, and provides life safety building inspections for all residential properties over two units, and all commercial properties located within the City. The agency "Inspection/Public Education Bureau" has evolved over the years to become a true Community Risk Management Division. This Division of the agency now provides services in code enforcement, fire investigations, fire sprinkler and alarm testing, building plan reviews, underground and above ground tank inspections, fireworks and pyrotechnics inspections, juvenile fire setters program, pre-planning, City safety training coordination, and fire safety public education.

During the fall of each year and for the past 35 years, the agency supports a Fire Prevention Week in which firefighters visit nineteen area schools. This program reaches more than 3,600 children annually from preschool to fifth grade. During these school visits and at other public events throughout the year, members have used the agency's Fire Safety House to educate children and adults on how to safely escape a house fire. In 2013, the agency added a Kitchen Fire Demo Trailer to demonstrate grease fire safety. This has reached an additional 1,000 people or more annually at public events.

In 2014, the agency absorbed the City of La Crosse Building Inspection Department into its operational structure. The Building Inspection Department was renamed "Fire Prevention and Building Safety" (FPBS), and became a combined division within the structure of the Fire Department. These 11 civilian building inspection employees and the city's Safety Coordinator are now working under the direction of the Assistant Chief of FPBS. In 2019, the division will be appropriately renamed the Community Risk Management Division, to more accurately reflect the nature of the Division's and the Fire Department's total mission

In recent years, the agency's Maintenance Division has maintained buildings and grounds for four fire stations, seventeen fire apparatus, eight Fire Operations support vehicles, eleven Fire

Prevention and Building Safety vehicles and all fire tools and equipment. The Maintenance Division conducts annual certification testing for all agency ladders, hose, pumps, self-contained breathing apparatus, and other equipment.

The agency has seen considerable change over its lifespan and that change continues today and expectedly into the future. The agency has evolved from the early years of bucket brigades and horse drawn steam engines, to our current deployment model of specialized apparatus and properly trained "all-hazards response" firefighters. With the more recent addition of the City's Building Inspection program and employees, the agency continues to take even more of a lead in all aspects of safety to the citizens and the visitors of the City of La Crosse.

Special Response Capabilities

- The La Crosse Fire Department has a fully equipped Hazardous Materials Response Team trained to the Operations and Technician levels. This team is a "Type II" regional member of the State of Wisconsin Hazardous Materials Response Network.
- The La Crosse Fire Department has a fully equipped radiological field response team. This team is a regional member of the State of Wisconsin Radiological Response Network.
- The La Crosse Fire Department has a fully equipped Urban Search and Rescue (USAR) response team. This team includes members that are also part of the State of Wisconsin USAR (WI-Task Force 1).
- The La Crosse Fire Department has a fully equipped Water and Ice Rescue response team that provides the community with rescue and recovery capabilities. These capabilities include underwater dive rescue and recovery, open/moving water and ice rescue, and all water and boating related emergencies. The agency operates two boats, as well as several other water access tools which address harder to reach rescue situations.
- All agency Engine, Quint, and Rescue apparatus are equipped with hydraulic extrication and technical rescue equipment.

- Engines, quints, and rescue apparatus are equipped with first responder medical supplies, including defibrillators.
- In 2018 the La Crosse Fire Department began a partnership with Gundersen Health System, which will move the agency towards the ability to staff firefighter/paramedics on fire apparatus throughout the City. While currently very early in the planning phase, this developing program will address agency identified recruitment and retention issues, and better position the Fire Department to eventually provide advanced life support services as part of its emergency medical services mission.

Legal Establishment

The La Crosse Fire Department was legally established on October 5, 1895 by City Ordinance 249. The ability to enforce local and state fire codes is outlined in Municipal Code, Chapter III, Section 3.13. The Board of Police and Fire Commission is authorized by Wisconsin Statute 62.13.

Fire Stations

The agency currently operates out of four fire stations. The agency's Administration, Fire Inspectors, Training Division, and maintenance personnel operate out of Fire Station 1in the downtown district. The Building Inspectors operate out of the La Crosse City Hall.

See Appendix B for a fire station location map.

See Appendix C for a response zone map for the four fire stations.

Current Station Locations

Station 1 at 726 5th Avenue South – built in 1967 (Downtown District)

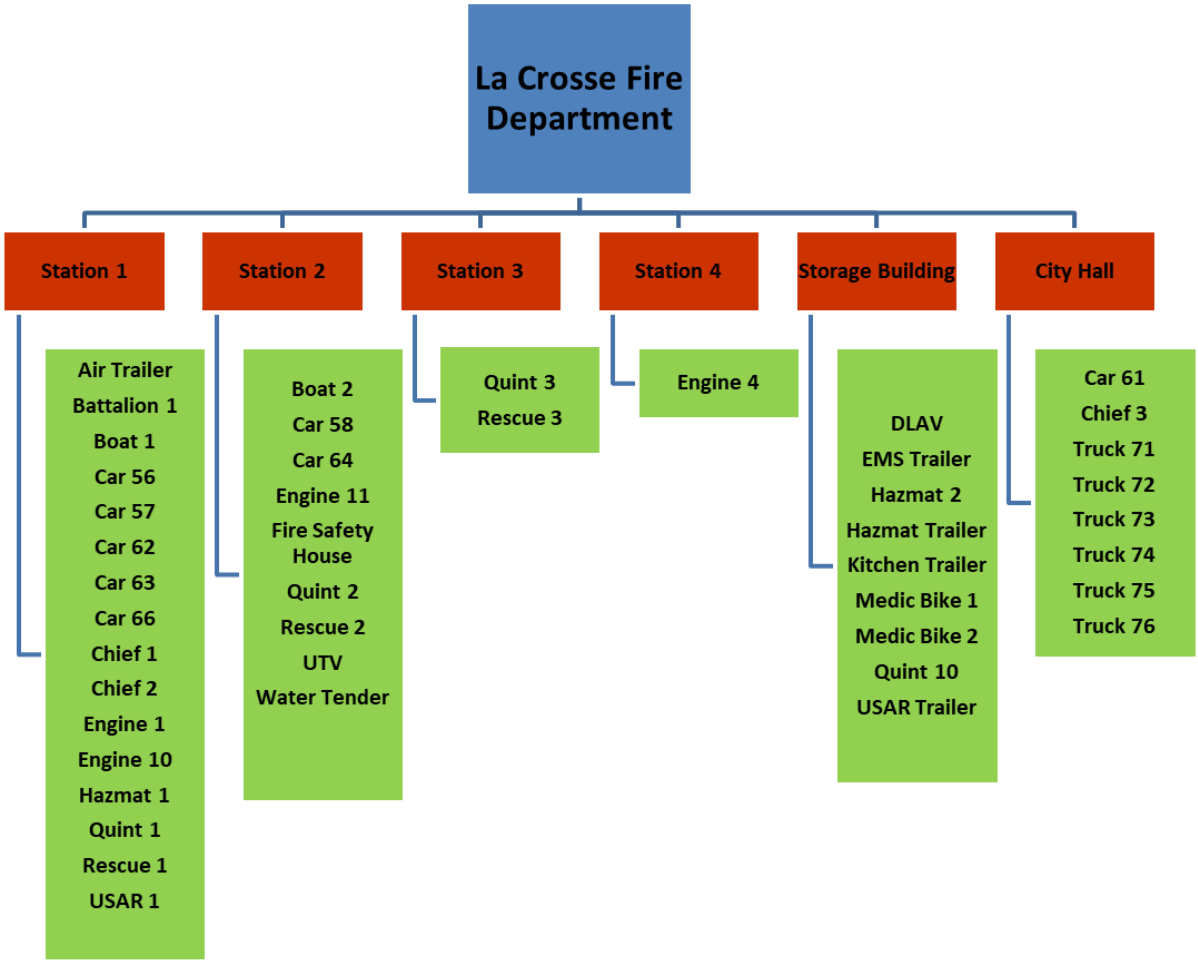
Station 2 at 626 Monitor Street – built in 1957 (North District)

Current Station Locations

Station 3 at 1710 Losey Blvd. S. – built in 1967 (South District)

Station 4 at 906 Gillette Street – built in 1941 (North District)

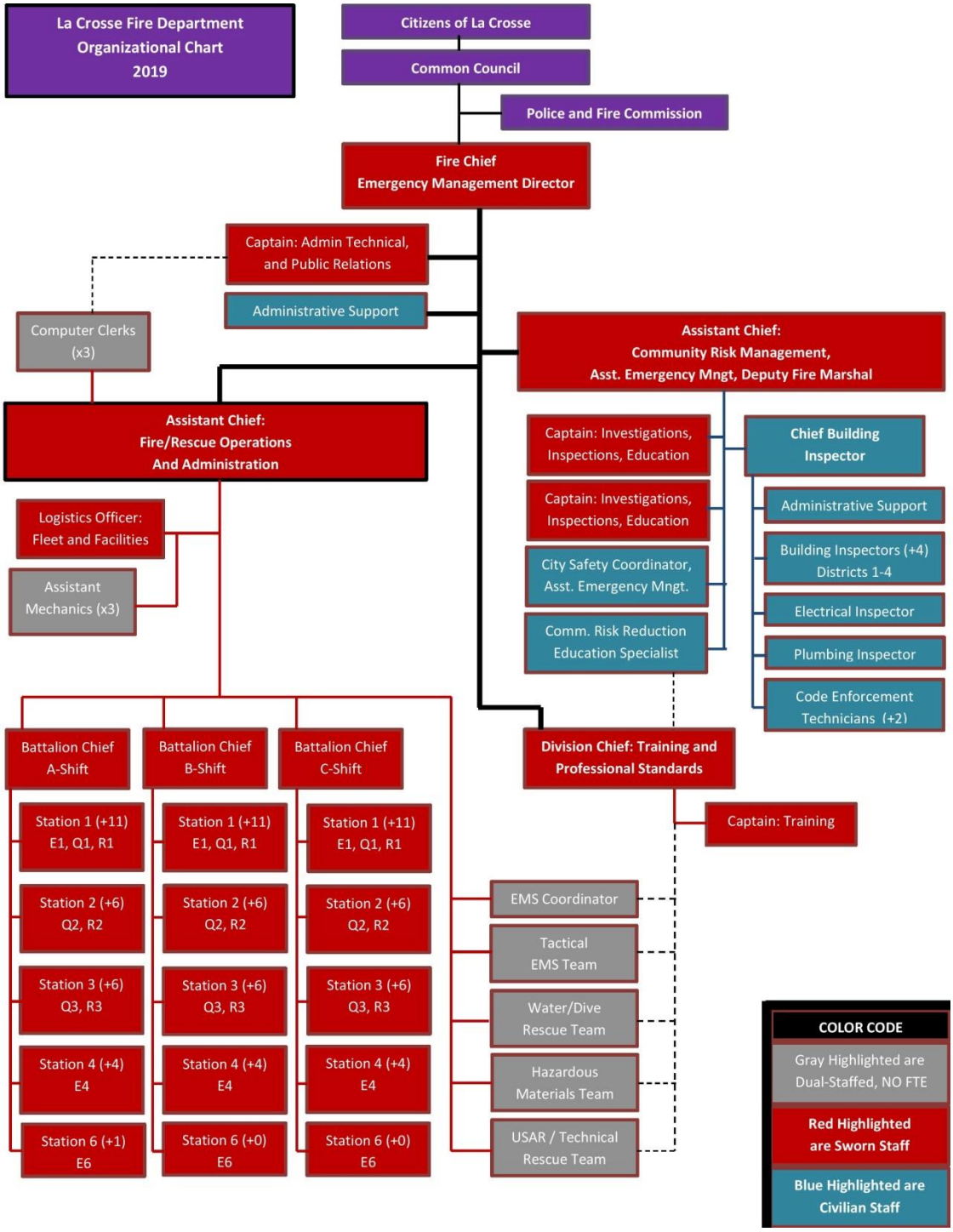
La Crosse Fire Department Apparatus



La Crosse Fire Department Staffing

The agency's Operations Division operates a three-platoon system, with a daily minimum staffing level of twenty-four personnel per shift. There are a total of 92 uniformed personnel, consisting of one Fire Chief, two Assistant Chiefs, one Division Chief of Training, three Battalion Chiefs, one Facilities Maintenance Specialist, 16 Captains, 10 Lieutenants, 27 Engineers, and 31 Firefighters. The Fire Prevention Building Safety division includes 6 Building Inspectors, 2 Code Enforcement Technicians, and 1 City Safety Coordinator. There are 2 Administrative Support Staff personnel, and one Medical Director on contract.

La Crosse Fire Department Table of Organization



Agency Overview

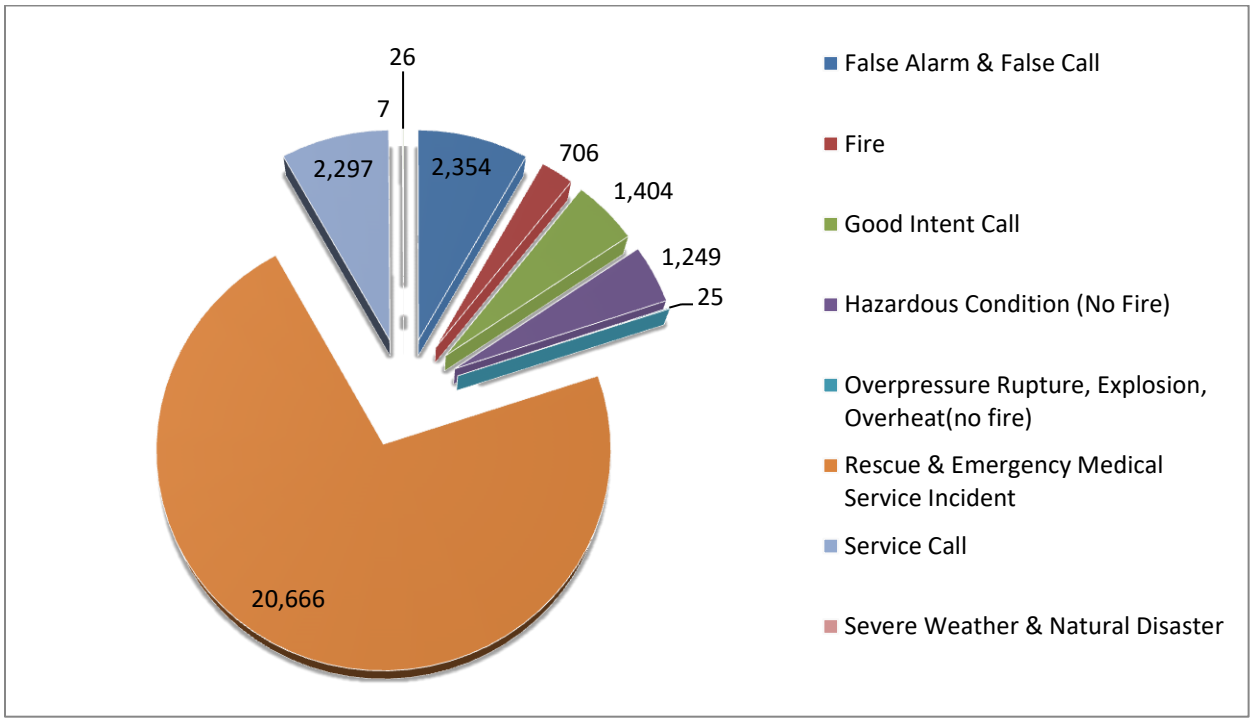
The agency operates nine front-line apparatus out of its four fire stations (Battalion Car, Engine 1, Quint 1, Rescue 1, Quint 2, Rescue 2, Quint 3, Rescue 3, and Engine 4). The agency has two reserve engines (Engine 10 and Engine 11) and a reserve quint (Quint 10). The agency has one Water Tender in front-line dual-staffed reserve status. The agency provides specialized services for hazardous materials, water rescue, high-angle rescue, confined space rescue, trench rescue, structural collapse, and vehicle extrication. The agency is a "Type II" Regional Hazardous Materials Team for the State of Wisconsin, serving a region of nine counties. The agency is also a member of the Wisconsin Task Force Urban Search and Rescue Team (WI-Task Force 1), specializing in the confined space, rope rescue, trench rescue, and structural collapse. The agency provides technical rope rescue capability to a significant risk area on our bluffs, and does a significant quantity of water rescue work due to our area rivers and marshes. The agency protects 23 miles of river shoreline, 1,350 acres of marsh grass, and 265 miles of biking trails.

The agency has an approximate annual Fire Operation Division operating budget (2017) of $10,031,570 and responds to approximately 18 calls per day; for an overall average of approximately 6,500 calls per year. Incident response data is detailed below.

Year	Total Responses	Average Responses Per Day
2013	5,025	13.76
2014	5,415	14.84
2015	5,730	15.70
2016	5,999	16.44
2017	6,446	17.66

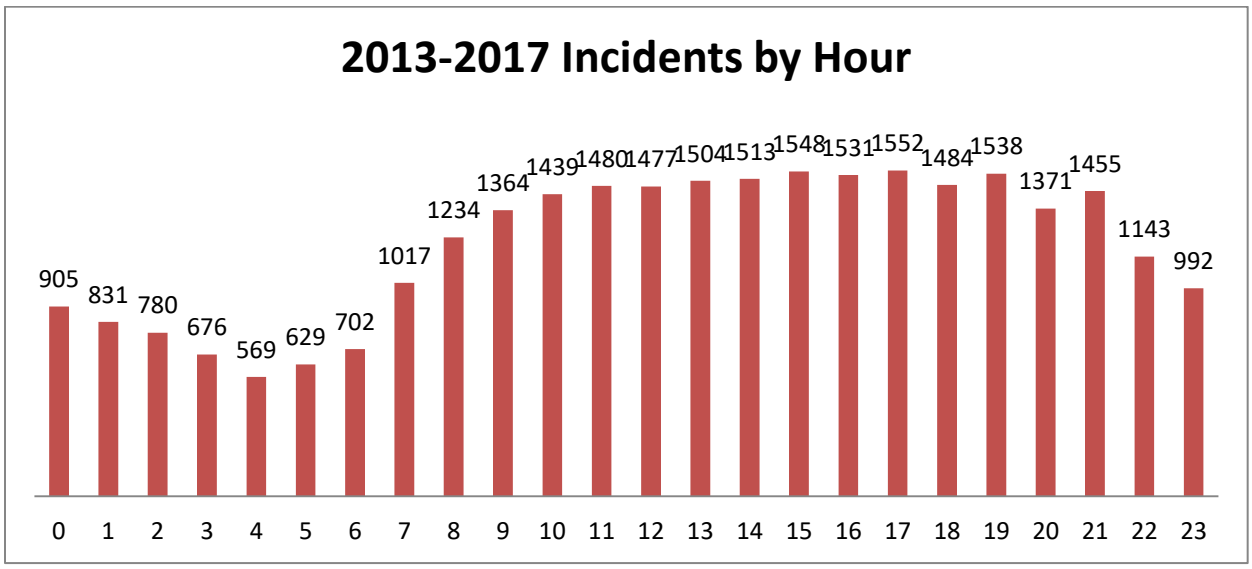
2013 through 2017 agency response types are shown below:

NFIRS Description 1	Incidents
Total	**28,743**
False Alarm & False Call	2,354
Fire	706
Good Intent Call	1,404
Hazardous Condition (No Fire)	1,249
Overpressure Rupture, Explosion, Overheat(no fire)	25
Rescue & Emergency Medical Service Incident	20,666
Service Call	2,297
Severe Weather & Natural Disaster	7
Special Incident Type	26



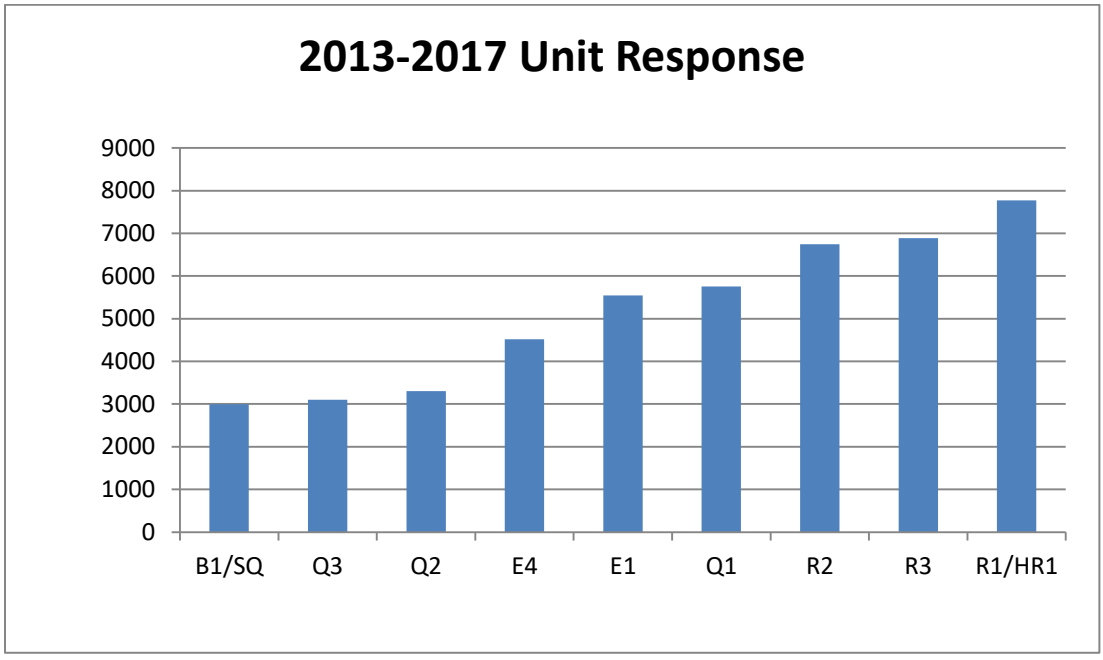
2013 through 2017 agency incident time of day analysis is shown below:

Hour	Incidents
23	992
22	1,143
21	1,455
20	1,371
19	1,538
18	1,484
17	1,552
16	1,531
15	1,548
14	1,513
13	1,504
12	1,477
11	1,408
10	1,439
9	1,364
8	1,234
7	1,017
6	702
5	629
4	569
3	676
2	780
1	831
0	905


2013-2017 Incidents by Hour
905
831
780
676
569
629
702
1017
1234
1364
1439
1480
1477
1504
1513
1548
1531
1552
1484
1538
1371
1455
1143
992
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

2013 through 2017 agency response by apparatus is shown below:

Unit	Responses
SQ(Renamed B1)	2,996
Q3	3,103
Q2	3,302
E4	4,520
E1	5,544
Q1	5,757
R2	6,743
R3	6,887
HR1 (Renamed R1)	7,768
	49,509



The Future

The geography of La Crosse has not allowed for recent expansion, and will most likely limit future growth and expansion in a traditional sense. The Mississippi River borders La Crosse to the west, steep bluff land to the east, the City of Onalaska to the north, and the Town of Shelby to the south. In recent years the City has seen a dramatic increase in vertical growth. Multiple apartment complexes have been constructed and the increase in "Downtown Living" has led to an increase of almost 23% more people living downtown than the previous decade.

Requests for emergency services have steadily increased, with no end to this trend in site. A look at call volume by decade shows this steady increase; 1960 – 849 calls, 1970 – 932 calls, 1980 - 1,527 calls, 1990 – 2,747 calls, 2000 – 3,404 calls, 2010 – 4,828 calls, 2017 – 6,452. While we cannot predict the future, the call volume trend over the past fifty years, and especially the past decade, is exponentially trending upward. In consideration of the vertical development downtown, the city boundary agreement plans in the works, and an aging "baby boomer" population putting more demands on emergency services, we can expect to see more demands for service in the coming five years of this plan and beyond.

While city growth appears slow due to the natural east and west boundaries, a review of emergency responses and response times to outlying areas near the La Crosse Municipal Airport, Valley View Mall, the Highway 16 corridor, the County Road B corridor, and the Highway 14/61 corridor to the south, show a clear need for future fire station expansion or relocation. These areas of La Crosse are seeing growth and new development which has driven an increase in demand for agency services to those areas. In early 2017, the Mayor created a Fire Station Task Force to assess several years of data collection on the City's fire station needs. The committee comprised of citizens and council members finalized their report near the end of 2017. This report provided City Council recommendations that included adding a fifth station on the far south side, along with recommendations for replacement or remodeling of the current four fire stations in the future. (see exhibit)

At the writing of this document, the agency has resolved an immediate crisis and is providing temporary all-hazards emergency response and community risk management services to our

neighboring Town of Medary. The Town of Medary is located adjacent to the City of La Crosse to the northeast. The township reached out the agency at the end of 2017 to provide service due to an impasse in contract negotiations with their previous service provider, and a temporary protection agreement was approved through the end of 2018.

The agency will continue its mission to protect lives and property through sound resource management and utilization of innovative strategies designed to provide cost-effective emergency services protection and community risk reduction efforts. The City of La Crosse will continue to support the Fire Department's mission by providing adequate funding for staffing, training, equipment, and facilities in line with the Common Council's strategic priorities

The agency's future performance goals and objectives will be formally documented in the La Crosse Fire Department's 2019 to 2023 Strategic Plan.

Community Expectations and Performance Goals

The following is the La Crosse Fire Department mission statement*:

> "The La Crosse Fire Department serves all who live in and visit the City of La Crosse through excellence in fire protection, safety, emergency medical services, rescue and educational services at the highest professional standard in a compassionate, ethical, and cost effective manner."

*The strategic planning committee will be developing a new agency mission statement with new goals and objectives.

This comprehensive Standards of Cover and deployment plan addresses the following community questions:

- What is the nature of the environment in which the agency delivers service?
- What level of risk exists within the community (life and property)?
- How will the community evolve in the future?
- What level of service is expected of the agency?
- What resources (facilities, apparatus, and personnel) are needed to safely and effectively deliver the desired level of service?
- How should resources be deployed to assure the expected level of service is achieved?
- How will resources need to change in the future in order to maintain the expected level of service?

Community Stake Holders Input

In early 2018, to help better identify community service needs, expectations, and strengths and weaknesses, the La Crosse Fire Department will be conducting external listening sessions with community leaders from many different viewpoints in the City. The results of these community listening sessions, as well as an internal committee focus group, will be the driving force behind many of the performance goals listed in the 2019 to 2023 strategic plan. During the first months of the transition of the agency's new Fire Chief, the agency has been working from dynamic goals and objectives list to track new projects and some reprioritization of efforts. The culmination of this with work will be formally implemented in a community based five-year strategic plan in January of 2019.

See the La Crosse Fire Department 2019 to 2023 strategic plan for all performance goals and objectives.

ISO Rating

The agency was re-evaluated by the Insurance Service Office (ISO) in 2017, and maintained its Class II fire service rating status, which the agency first attained in the mid 1970's. The agency is proud to be one of 42 fire departments, out of approximately 864 fire departments, in Wisconsin that have received a Class II rating.

Performance Goals and the Cascade of Events

In every emergency there is a sequence of events that are critical elements in respect to time and evaluation of the response system, known as the cascade of events and it occurs on every emergency call. Part of the risk assessment includes the evaluation of the agency's ability to respond to emergencies.

Emergency Operations Cascade of Response Elements from State of Normalcy

Pre- Response Elements

- Event Initiation
- Emergency Event
- Alarm
- Notification

Response Time

- Alarm Processing
- Turnout Time
- Travel Time
- On Scene Time

Post Response Elements

- Initiation Action and Termination of Incident

Time Points and Time Intervals:

Event Initiation - the point at which factors occur that may ultimately result in activation of the emergency response system. Precipitating factors can occur seconds, minutes, hours, or even days before the point of awareness is reached. An example is the patient who ignores chest discomfort for days until it reaches a critical point at which time he/she makes the decision (Point of Awareness) to seek assistance. Rarely is it possible to quantify the point at which event initiation occurs.

Emergency Event - the point at which an awareness of conditions exists that requires an activation of the emergency response system. Considered the Point of Awareness, it may be the recognition by an individual that assistance is needed, or it may consist of a mechanical or electronic recognition of an event such as smoke or heat detector activation.

Alarm - the point at which emergency response system activation is initiated. The transmittal of a local or central alarm to public safety answering point is an example of this time point. Again, it is difficult to determine with any degree of reliability the time interval during which this process occurs.

Notification - the time point at which an alarm is received and acknowledged at a communications center. This transmittal may take the form of electronic or mechanical notification to the point at which a call is received and answered in the public safety answering point.

Alarm Processing - the time interval from when the alarm is acknowledged at the communications center until response information begins to be transmitted via voice or electronic means to emergency response facilities (ERF's) and Emergency Response Units (ERU's.) The benchmark for this element of response time is 60 seconds for 90 % of events.

Turnout Time - the time interval that begins when the Emergency Response Facilities (ERF's) and Emergency Response Units (ERU's) notification process begins by either an audible or visual annunciation or both and ends at the beginning point of time travel. For staffed fire stations the

benchmark is 80 seconds for fire and special operations response and 60 seconds for EMS response, for 90 % of events.

Travel Time - time interval that begins when a unit is en route to the emergency and ends when the unit arrives at the scene. This can generally be interpreted as from wheels rolling to wheels stopped. When conducting simulated analysis, travel time is based on 35 mph average or 53.1 feet/second. The benchmark for travel time is 240 seconds or less travel time for the arrival of the first engine company at a fire suppression incident and 240 seconds or less travel time for the arrival of a unit with first responder with automatic defibrillator (AED) or higher capability at an emergency medical incident. The benchmark performance objective is 90 % for achievement of travel time objectives.

On - Scene Time - time point at which the responding unit arrives on the scene.

Initiation Action - the time interval from when a unit arrives on the scene to the initiation of emergency mitigation. May include size-up, resource deployment, etc.

Termination of Incident - time point at which unit(s) have completed the assignments and are available to respond to another assignment or emergency request.

Total Response Time – the time interval from the receipt of the alarm at the primary PSAP to when the first emergency response unit is initiating action or intervening to control the incident.

State of Normalcy

If a state of normalcy exists there is no need to call emergency services to the scene. However, once an event initiation begins and the cascade of events begins to unfold the degree of loss of life and property that can be prevented may be impacted by the passage of time.

For the accreditation process, total response time is a compilation of the elements beginning with notification up to on-scene time. It has three elements: alarm processing time, turnout time, and travel time.

Community Benchmarks/Baselines - Therefore, for the purposes of definition and the need to establish a common baseline for purposes of evaluating total response time accreditation criteria;

Total Response Time is:

Alarm Processing = 60 second/90 % baseline and benchmark

Turnout Time = for fire response, rescue response, hazardous conditions response, and emergency report out response is 80 seconds/90 % baseline and benchmark; and **EMS response** is 60 seconds/90 % baseline and benchmark

Travel time = based on criteria for the different risk categories and within guidelines provided for service area and/or population density (see table below)

For the City of La Crosse – using the urban travel time benchmark/baseline (see below), a first unit 4 minute/90% benchmark, and 5 minute 12 second/90% baseline

Total response time = Alarm processing + Turnout time + Travel time

Urban Benchmark/Baseline (CFAI)

Definition:

Urban - An incorporated or unincorporated area with a population of over 30,000 people and/or a population density over 2,000 people per sq. mile.

The times below relate to travel times only:

	1st Unit	2nd Unit	Balance of 1st alarm	Performance
Benchmark	4 minutes	8 minutes	8 minutes	90%
Baseline	5 minutes/12 seconds	10 minutes/24 seconds	10 minutes/24 seconds	90%

The criteria listed in the above table provide a target benchmark by CFAI and the lesser baseline of 70% of the benchmark time.

Performance Objective Measurement With a total response time equaling the alarm processing + turnout time + travel time, the agency has a goal of a total response time under 6 minutes on emergency medical responses; and under 6 minutes and 20 seconds for all other emergency responses; 90% of the time. The following tables show agency performance on emergency fire responses, EMS responses, emergency rescue responses, emergency hazardous condition responses, and emergency report out responses agency wide from 1-1-2013 to 12-31-2017.

January 1, 2013 to December 31, 2017

Baseline Time Elements– 1st Due Unit/Pumper to be measured against the 90th Percentile				
NFIRS Descriptions	Dispatch Time ≤60 sec	Turnout Time ≤80sec	Travel Time 1st Unit ≤ 5:12	Travel Time 1st Unit ≤ 4:00
Fire (NFIR 100)	71.98%	52.91%	94.16%	86.57%
Rescue (NFIR 300 Excluding EMS)	64.46%	64.11%	93.19%	85.88%
Hazardous Conditions (NFIR 400)	48.62%	56.07%	90.78%	82.94%
Report Out (NFIR 500, 600)	48.54%	64.48%	94.05%	86.52%

Baseline Time Elements– 1st Due EMS Unit to be measured against the 90th Percentile				
NFIRS Descriptions	Dispatch Time ≤60 sec	Turnout Time ≤60sec	Travel Time 1st Unit ≤ 5:12	Travel Time 1st Unit ≤ 4:00
EMS (NFIR 300 excluding rescue)	69.68%	55.35%	94.13%	85.17%

The following table shows agency performance on emergency fire responses, EMS responses, emergency rescue responses, emergency hazardous condition responses, and emergency report out responses agency wide from January 1, 2013 to December 31, 2017. Data includes the total response times for the second arriving unit, and the balance of the remaining units. Target benchmark times are established by CFAI and the lesser baselines times are 70% of the benchmark time.

January 1, 2013 to December 31, 2017

Performance Objective				
	Baseline	**Benchmark**	**Baseline**	**Benchmark**
	2nd Unit ≤13:43	2nd Unit ≤10:20	Balance of Remaining Units ≤13:43	Balance of Remaining Units ≤10:20
Fire	99.24%	96.71%	97.52%	93.94%
EMS	96.33%	92.02%	98.22%	97.21%
Rescue	98.99%	94.95%	92.35%	91.17%
Hazardous	97.95%	92.10%	96.63%	87.67%
Report Out	99.66%	98.00%	98.82%	93.16%
Response Times measured against 90th Percentile				

Community Risk Assessment

One of the issues the fire service has historically faced is how to define the levels of service for the community it serves. As part of the Commission on Fire Accreditation International (CFAI) process, a Standards of Cover (SOC) document has to be developed and adopted by the agency having jurisdiction. The La Crosse Fire Department proceeded to establish its service level goals based on the CFAI accreditation model. Specific resource needs were based upon the concept of meeting established service level goals for the types of emergencies routinely responded to in the City of La Crosse.

The agency must assess community risks based upon the potential frequency (probability of an incident occurring) and consequence (potential damage should an event occur). For example, a terrorist act has a low probability; however, if a terrorist act occurs, the damage and the psychological impact are potentially very high. This same outlook regarding risk assessment can also be applied to natural disasters. For example, an earthquake generally does not hit the same communities every year; but, if it does strike, the damage can be great. Conversely, medical emergencies happen every day. The overall potential damage from medical emergencies to the community as a whole is not nearly as significant as that from an earthquake or other natural disaster (though these individual incidents greatly affect those requiring the service). To design future deployment strategies, the agency must be able to compare the potential frequency and potential damage of events that may affect the community and service area.

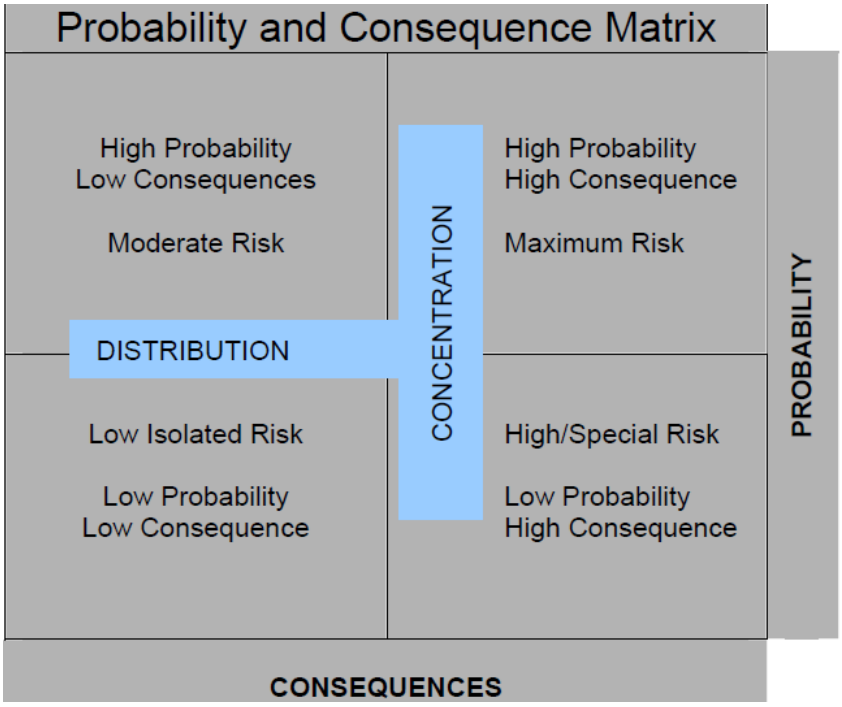
Community Risk Management

Risk management is the analysis of the chance of an event occurring and the resulting damage that could occur as a result of the event.

Probability Matrix	
High Probability Low Consequence	High Probability High Consequence
Low Probability Low Consequence	Low Probability High Consequence

For example: structure fires are relatively infrequent in comparison to medical incidents in La Crosse; however, the loss of subsequent dollars, loss of irreplaceable items, and loss of business or jobs make the consequences of such fires high; activation of automatic fire alarms is high probability with low consequence; earthquakes or a large hazmat incident may be infrequent but represent a large potential loss to life and property. Comparatively, a dumpster fire may be a high probability but have little consequence outside of the fire response. With an understanding of the different levels of probability and consequences, proper strategic planning in respect to risk management, and resource deployment can take place.

The evaluation of fire risks must take into account the frequency and severity of fires and other significant incidents. Risk assessment can be divided into four quadrants, which impose different requirements for commitment of resources in each area.



The relationships between probability and consequence and the community's adopted service level goals determine the needed concentration and distribution of resources. Distribution is the number of resources placed throughout the city. Concentration is the number of resources needed in a given area within the city. This varies depending on many factors including the number of events (calls) for service; the risk factors of the area; the availability, reliability, and time of arrival of secondary responding units; etc. A challenge will be to find the proper balance for the distribution and concentration of resources needed to meet the service level goals today and in the future.

Community Risk Assessment and Evaluations

For the most part it is the potential types of risks, their associated consequences, and the expected outcomes of fire and other emergency service occurrences within a community that become the determining factors when establishing an overall risk assessment strategy. Without knowing this information, we cannot plan effectively. Once the above issues have been determined, those factors in turn become highly dependent upon other components such as efficient geographical positioning of fire stations, effective equipment, and staffing levels to support the various needs.

Planning Zone Risk Assessment and Response Analysis:

The agency divided the city into forty seven planning zones. These zones are approximately one mile by one mile. NFIRS 5ALIVE software was originally used in creating risk assessment scores, occupancy analysis, and fire flow analysis. Vinelight software was used for emergency call history and response time analysis in the planning zones. A detailed risk assessment and response analysis was conducted for each of the city's forty seven planning zones. The agency now relies on Metrics and the City IT department utilizes Arcview GIS to analyze our planning zones.

See Appendix D and J for the forty seven planning zones and subsequent data.

Fire Flow Analysis

As part of the risk assessment process the agency conducted a fire flow analysis of inspected buildings in the City of La Crosse. The information was entered and filtered from the agency's Zoll Fire Records Management System (RMS).

See Appendix D and J for the forty seven planning zones, which includes fire flow data.

See Appendix E for the La Crosse Fire Department Fire Flow Analysis Report.

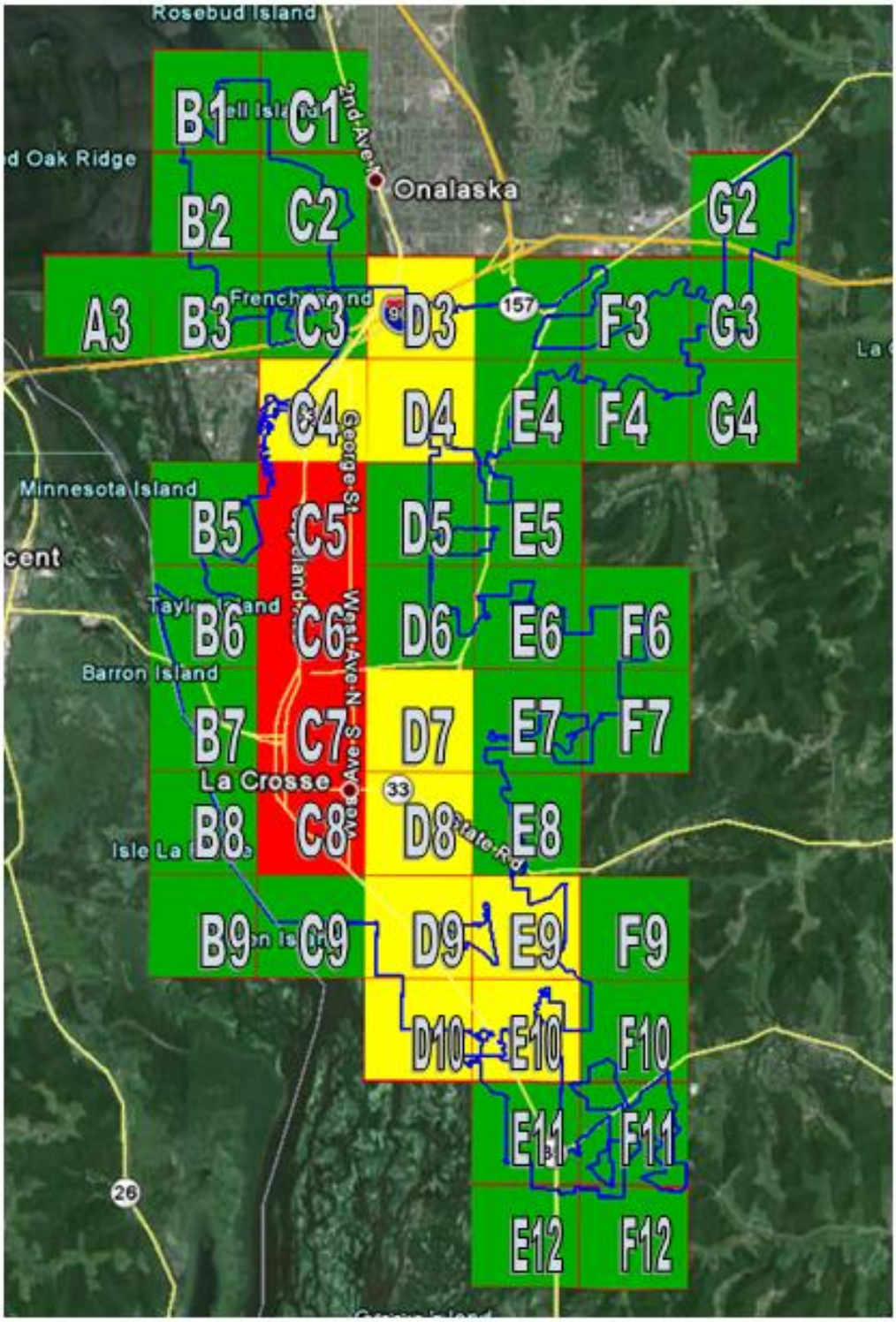
Structure Fire Risk Assessment Process

The agency originally began its risk assessment evaluation of the city in 2010. The agency has semi-annually conducted approximately 3,000 occupancy inspections. These buildings include all commercial properties and all three unit or larger residential properties. The agency's fire inspection officers gather risk assessment data while conducting building inspections on an ongoing basis and enter this data into the agency's Zoll Fire Records Management System (RMS).

See Appendix F for an explanation of the agency's risk assessment process and the results of the risk assessment.

The following page shows the results of the demand zone analysis for fire risk:

City of La Crosse Fire Department
Fire Risk Response



Non-Structure Fire Risk Assessments

The following non-structural/building risks have been identified by type and location:

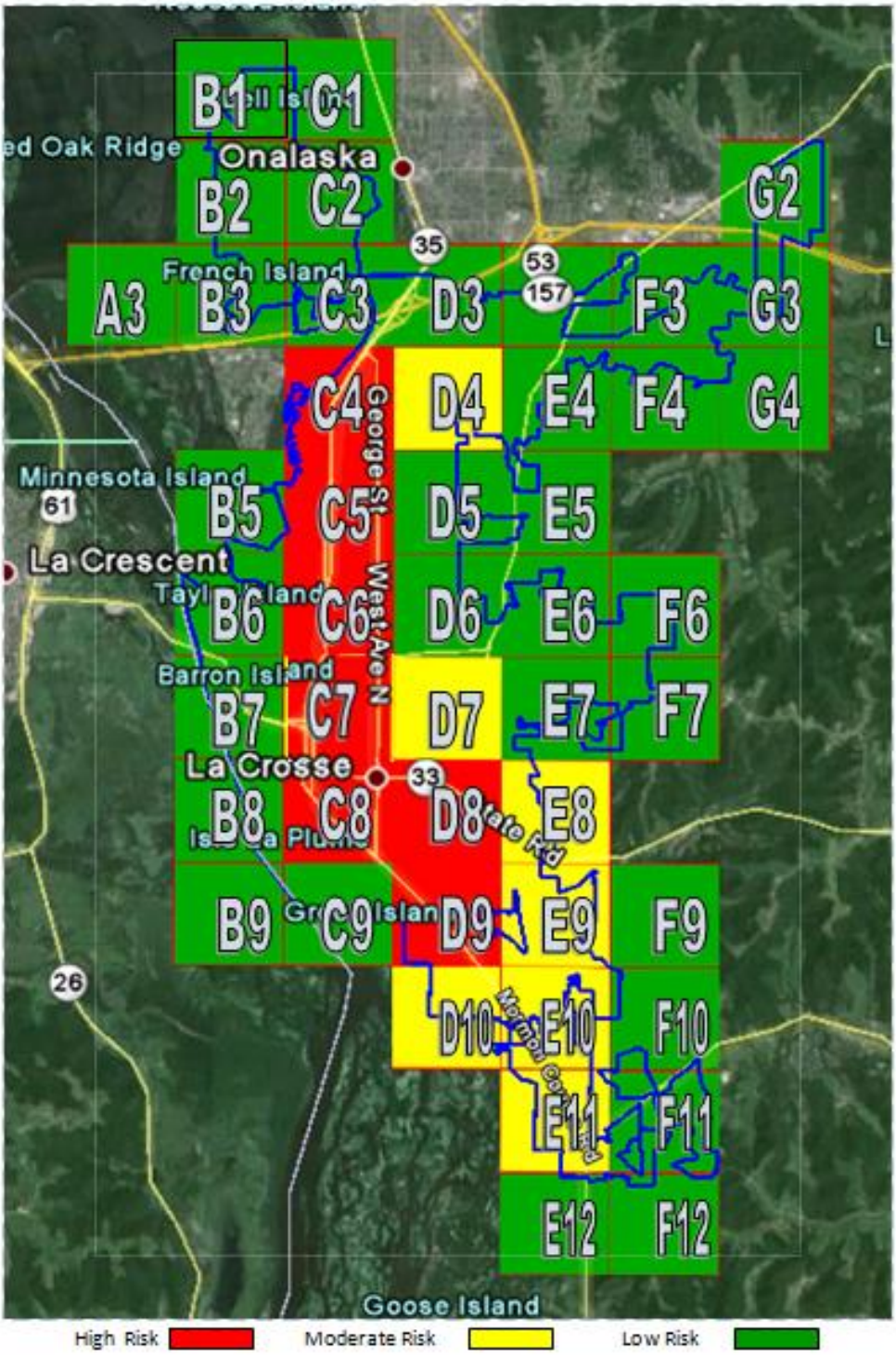
Emergency Medical Incidents

Agency firefighters are authorized to practice to the EMT-D level, serving as first responders trained to use defibrillators. The agency is not licensed for patient transport; Gundersen Tri-State Ambulance (a private service) is authorized for medical transports. It is not uncommon for agency personnel to assist Gundersen Tri-State Ambulance with patient transport to local hospitals (by assisting in the ambulance en route to the hospital).

Emergency medical risks – typically ranging from basic first aid to cardiac arrest, were evaluated as low, medium, or high; based on incident types, location (i.e. district, demand zone), demographics, population density, and call volume.

The following page shows the results of the demand zone analysis for EMS risk:

City of La Crosse Fire Department
EMS Risk Response



Rescue Incidents

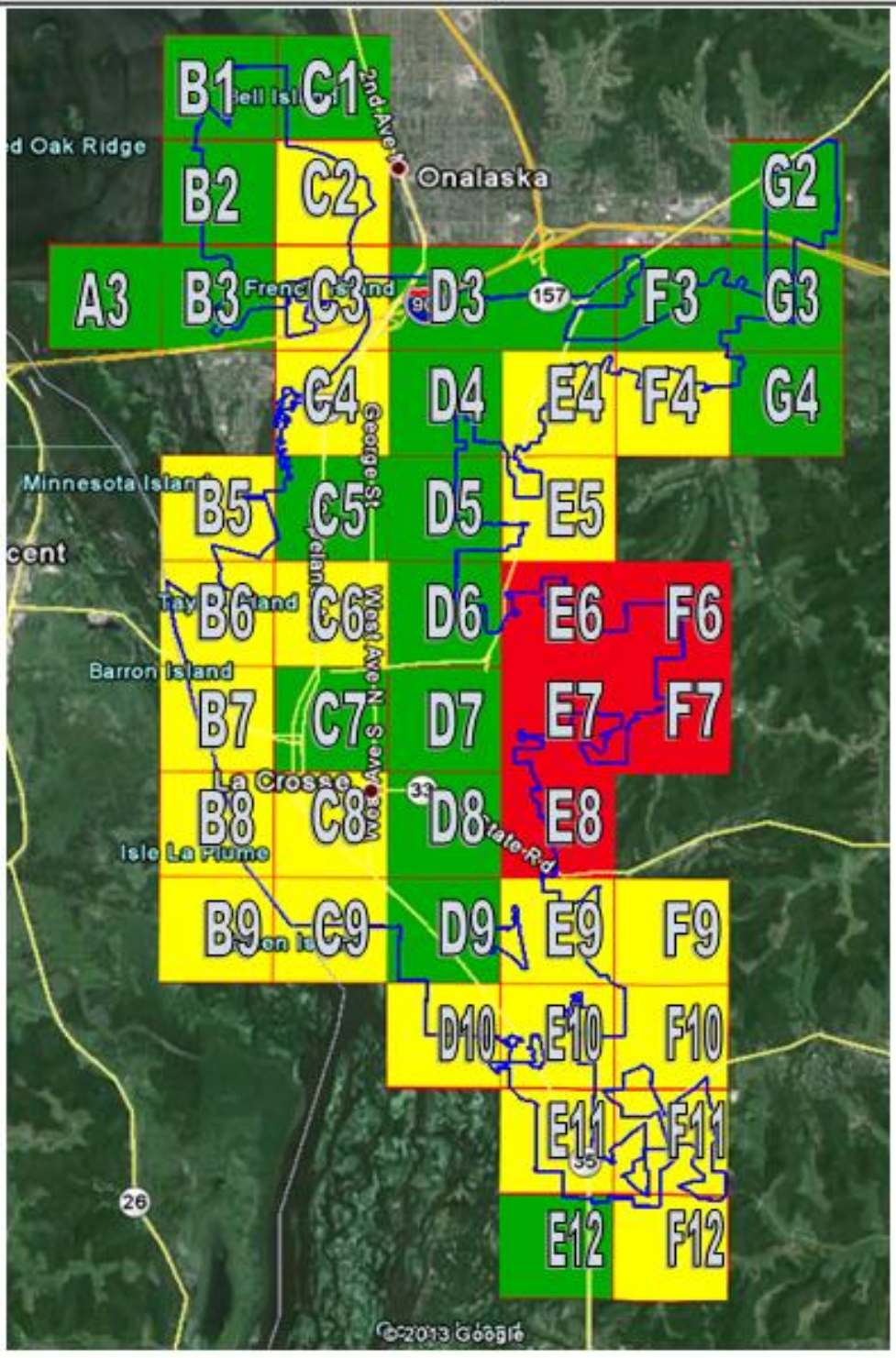
Rescue risks – typically range from industrial accidents, motor vehicle collisions, entrapment, water/ice rescues, and urban search and rescue. All firefighters are trained in the use of extrication equipment, and basic rescue techniques. The agency has two specialty rescue teams (water/ice rescue, and Urban Search and Rescue - USAR). The water rescue team has 20 members including 13 divers. The USAR team has members that serve as part of the State of Wisconsin technical rescue team (WI-TF1). The USAR team has 18 firefighters trained in their area of specialized rescue.

Risks were evaluated as low, medium, or high; based on incident types, location (i.e. district topography - bluff land, demand zone, major road, rail & water ways), and call volume.

The following page shows the results of the demand zone analysis for rescue risk:

City of La Crosse Fire Department

Rescue Risk Response



High Risk | Moderate Risk | Low Risk

Hazardous Materials Incidents

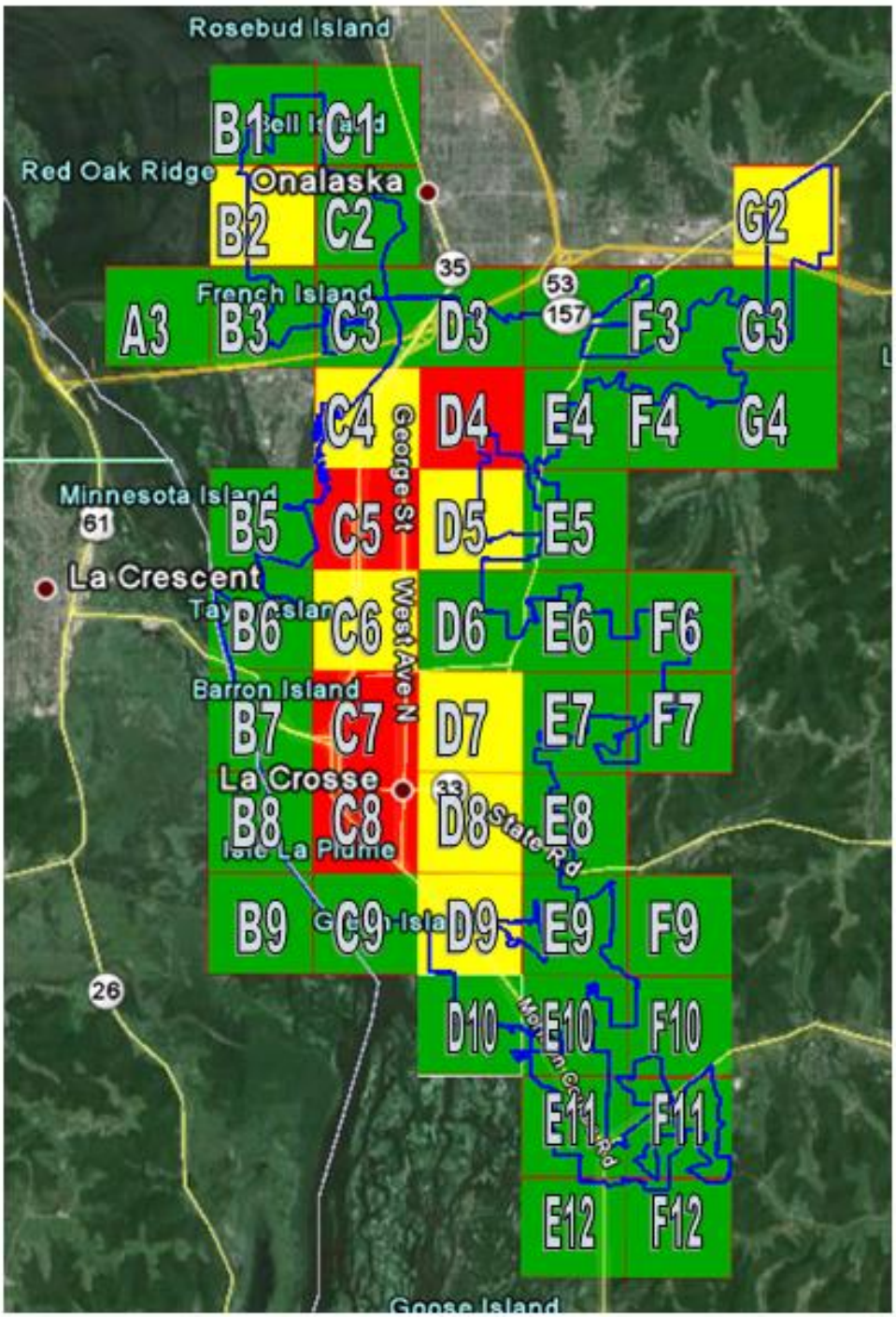
Hazardous materials risks – typically range from spills, leaks, releases, product identification, and product disposal. The agency has a specialty hazardous material team, which also serves as a State of Wisconsin regional hazardous materials team. This team has twenty-six firefighters trained at the technician level and all agency firefighters are trained at the operations level.

Risks were evaluated as low, medium, high; based on occupancy and incident types, location (i.e. district, demand zone, major road, rail & water ways), and call volume.

The following page shows the results of the demand zone analysis for hazardous materials risk:

City of La Crosse Fire Department

Hazardous Material Risk Response



Natural Hazard Assessment

Natural hazards such as tornadoes, severe thunderstorms/lightning, flooding, winter storms and extreme cold, heat drought and wildfires, and earthquakes have been identified as risks or possible risks to the City of La Crosse. These hazards have the ability to create conditions that would strain the resources of the La Crosse Fire Department. The La Crosse County Natural Hazards Assessment, prepared by NOAA/National Weather Service La Crosse and updated in November of 2015 was referenced for this natural hazard assessment.

Overview

La Crosse is in the Upper Mississippi River Valley of the Midwest with relatively hilly terrain and bluffs. The area experiences a temperate climate with both warm and cold season extremes. Winter months can bring occasional heavy snows, intermittent freezing precipitation or ice, and prolonged periods of cloudiness. While true blizzards are rare, winter storms impact the area on average about 3 to 4 times per season. Occasional arctic outbreaks bring extreme cold and dangerous wind chills. Thunderstorms occur on average 30 to 50 times a year, mainly in the spring and summer months. The strongest storms can produce associated severe weather like tornadoes, large hail, or damaging wind. Both river flooding and flash flooding can occur, along with urban-related flood problems. The terrain can lead to mud slides and generally increases the flash flood threat. Heat and high humidity is occasionally observed in June, July, or August. The autumn season usually has the quietest weather. Valley fog is most common in the late summer and early fall months. On calm nights, colder air settles into valleys leading to colder low temperatures compared to ridge top locations. High wind events can also occur occasionally, usually in the spring or fall.

Since 1998, La Crosse County has been included in a FEMA Federal Disaster Declaration 5 times:

1998 – Severe storms

2001 – Flooding

2004 – Severe storms / flooding

2007 – Severe storms / flooding

2008 – Severe storms / flooding

Tornadoes

The risk potential for a tornado is low to moderate, primarily highest in May and June. Even though Wisconsin averages about 23 tornadoes per year, La Crosse County has only had 16 tornadoes since 1950, averaging about one tornado every 4 years. Most tornadoes are short-lived and small. May and June are the peak months and most occur between 3 and 9 p.m., but they can occur nearly any time of year and at all times of the day. In May 2011, a tornado (EF2) crossed the south end of the City of La Crosse from the west side to the east side, damaging infrastructure, power and gas lines, buildings, businesses, homes, and many trees, miraculously there were no reported injuries. LCFD resources were quickly exhausted and an all call was placed for all off duty firefighters to report for duty.

Severe Thunderstorms / Lightning

The risk potential for severe thunderstorms is moderate, primarily highest from April to September, with a peak month of June. The National Weather Service (NWS) considers a thunderstorm severe when it produces wind gusts of 58 mph (50 knots) or higher, 1 inch diameter hail or larger, or a tornado. Downdraft winds from a severe thunderstorm can produce local or widespread damage, even tornado-like damage if strong enough. Most severe thunderstorm winds occur in June or July and between the hours of 4 and 8 p.m., but can occur at other times. Most damage involves blown down trees, power lines, and damage to weaker structures (i.e. outbuildings, garages) with occasional related injuries. In 1998, a large squall line moved through the region with wind gusts in excess of 100 mph knocking down hundreds of trees and damaging buildings. Large hail can also occur in a severe thunderstorm. June is the peak month with the most common time between 1 and 9 p.m., but it can occur in other warm season months and at any time of day. Hail is typically a crop damaging hazard but can damage roofs, windows, and vehicles if large enough (> 1”). Expenses can be high. Injuries or fatalities are rare for hail. In April 2011, hail up to 3” in diameter damaged hundreds of roofs and vehicles across mainly the south side of La Crosse causing millions in damages.
Non-severe thunderstorms still pose a lightning risk. Nationally, Wisconsin ranks 24th in lightning related fatalities with 6 deaths reported between 2001 and 2010.

All of these factors, in combination, or individually, have been cause for concern to the community and the agency over the years. Response incidents ranging from building lightning strikes causing structure and/or utility fires/power outages, fire alarm activations, to fallen trees and power lines can present a challenge to the agency. Since the resultant occurrences can be wide spread throughout the City, resources can be taxed to maximum levels; however normally only for a short period of time.

Flooding and Hydrologic Concerns

The risk potential for flooding is moderate from April to September. The highest probability for Mississippi River related flooding is late April from snow melting. On occasion intense, heavy rain producing thunderstorms or consecutive thunderstorms can bring excessive rainfall leading to flash flooding. The hilly terrain promotes rapid run-off and enhances the threat. Mudslides can occur in extreme cases. Intense rainfall rates also lead to occasional urban street flooding. June is the most common month for flash floods, but they can occur from May through September. They are most common in the evening hours, between 8-10 p.m., but can occur at other times and typically last from 3 to 6 hours. In August 2007, nearly 12 inches of rain fell in one evening across the City of La Crosse leading to widespread flash flooding and property damage. Water swept across parts of Highways 14 and 35 with large mudslides and a train derailment. The county was declared a federal disaster area with an estimated 15 million dollars in damage. Three main rivers can impact La Crosse, the Mississippi River, the Black River, and the La Crosse River. The Mississippi River is often highest in the spring associated with the seasonal snowmelt, but on rare occasions can reach flood stage during the summer or fall from heavy rain patterns. The combination of up-river snowmelt and area rain brought major flooding along the Mississippi River in April 2001, setting the 2nd highest crest levels in many locations. The record Mississippi River crest year remains 1965.

The agency is prepared to assist with flooding situations, including assisting with evacuation and surface water rescue, which could involve Boat 1, Boat 2, Dry Land Access Vehicle (DLAV), three inflatable Rapid Deployment Crafts (RDC), and other water rescue equipment.

In the event of a 100 year flood (depth of water at a river stage of 16.5 feet), sections of La Crosse's north side would be under water as projected by flood maps from the City's engineering department.

Winter Storms and Extreme Cold

The risk potential for winter storms and extreme cold are moderate to high from December to March. Hazardous winter weather can bring a variety of conditions to La Crosse. Since 1982, an average of three to four winter storms impact the area each season. The terrain does limit the number of true blizzards (only 3 since 1982) but heavy snow, blowing snow, ice, and sleet all occur. The 30-year average seasonal snowfall at La Crosse is 44.5 inches. The all-time record one-day snowfall in La Crosse was 16.7 inches set on December 7, 1927. The bulk of snow falls between December and March. On February 23-25, 2007, a major winter storm impacted La Crosse. Heavy snow, including lightning, brought nearly a foot of snow the first night. Winds later increased and created major blowing and drifting. Some sleet and freezing rain fell next, followed by another round of heavy snow and blizzard conditions the next night. When the storm finally moved out, 22.4 inches of snow had fallen, ranking as the largest multi-day snow storm on record. Another major storm hit less than a week later, leading to the snowiest week on record (27.4" in a 7-day period, ending 3/2/07). March can often be a snowy month. Even though snowfall may be less frequent, heavy wet snow can form from large spring storms. In 1997, a large winter storm dropped nearly 20 inches (19.7") of wet snow in La Crosse.

Ice storms (1/4" of ice or more) can occur but are relatively rare with only six occurrences since 1982. Arctic cold outbreaks can occur in the upper Midwest as well. Snow depth can modify these cold temperatures leading to sub-zero readings on average 22 times a winter. Occasionally strong northwest winds will combine with arctic outbreaks to create dangerous wind chill conditions as well. The coldest temperatures are usually in January and February with average lows in the single digits and record lows colder than -25°F most days. The all-time record low is -43°F set in 1873. In 1996 La Crosse went six consecutive days with temperatures below zero degrees (F) following a blizzard about a week earlier. Record low temperatures of -34 degrees (F), -35 degrees (F), and -31 degrees (F) were set on three straight mornings.

Winter storms can be such that severe cold could affect pumping operations due to freezing and snow/ice accumulation. Ice accumulation on power lines causes downed power lines and power outages. It also affects road conditions; slowing down response times for emergency calls, and makes hydrant location and access difficult.

Heat, Drought, and Wildfires

The risk potential for heat, drought, and wildfires is moderate during the summer months. On occasion the weather pattern across the upper Midwest favors prolonged heat and humidity, leading to heat waves. June through August is the warmest months with average high temperatures in the 80s and record highs above 100°F most days. The warmest temperature on record at La Crosse has occurred twice, 108°F set on July 13, 1995 and July 14, 1936. Prolonged dry spells can also lead to drought causing extreme damage to crops. Droughts vary in length and intensity but abnormally dry to moderate drought conditions can occur quite frequently. Severe to extreme droughts occur far less frequently. Dry weather can also lead to a wildfire threat, especially in the spring before foliage has emerged (i.e. before green up) or in the fall after vegetation has started to die off. Warm, dry (i.e. lower relative humidity's), and windy conditions all favor higher fire danger and can lead to sporadic grass fires in La Crosse. Thick, wooded areas also pose a threat for wildfires under extremely dry conditions but occur far less frequently.

High heat conditions can be taxing to firefighters during an emergency situation as the risk of heat exhaustion increases. Fighting a large grass fire can be very labor intensive to firefighting staff, as they are many times faced with using water cans if the locations are not accessible by fire apparatus. The general population is also at greater risk during high heat conditions which can lead to an increase in related medical responses for the agency

Earthquake

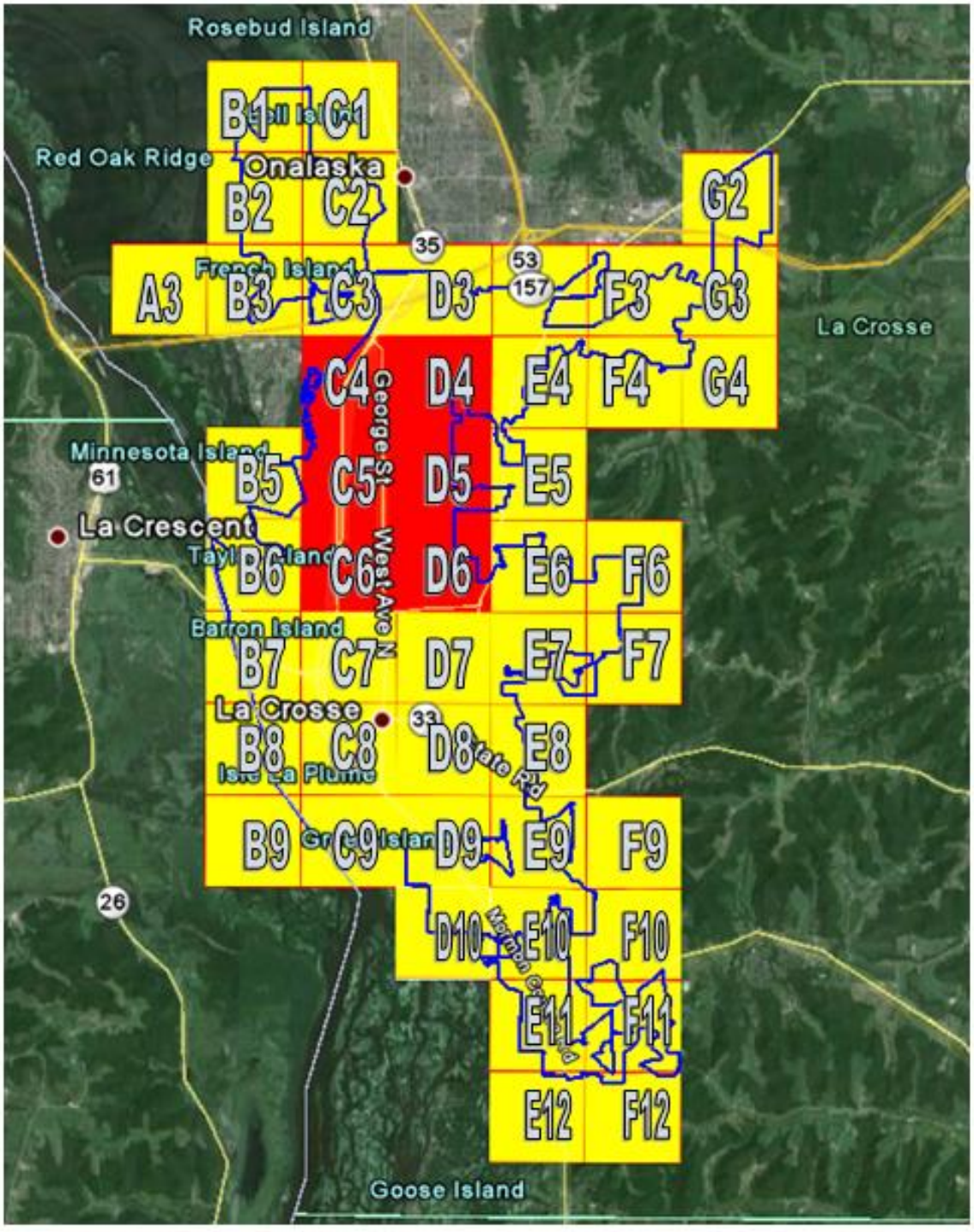
The risk potential for an earthquake is generally low as compared to the rest of the United States. The La Crosse area has a low rate of seismic activity. The La Crosse Fire Department would be

prepared to assist in the rare event that a seismic movement was strong enough to cause damage to areas of La Crosse. As history indicates, most movement that has occurred has been minimal; therefore any damage that may occur could be expected to be limited to infrastructure such as underground water mains and water and gas lines and possibly power interruptions. Evacuation assistance or standby requirements could also be a possibility.

The following page shows the results of the demand zone analysis for natural disaster risk:

City of La Crosse Fire Department

Natural Disaster Risk Response



High Risk | Moderate Risk | Low Risk

Population Analysis

La Crosse's population was analyzed for each of the forty seven planning zones, basically to find out where people live and were the potential is for emergency responses.

The following page shows the results of the demand zone analysis for population:

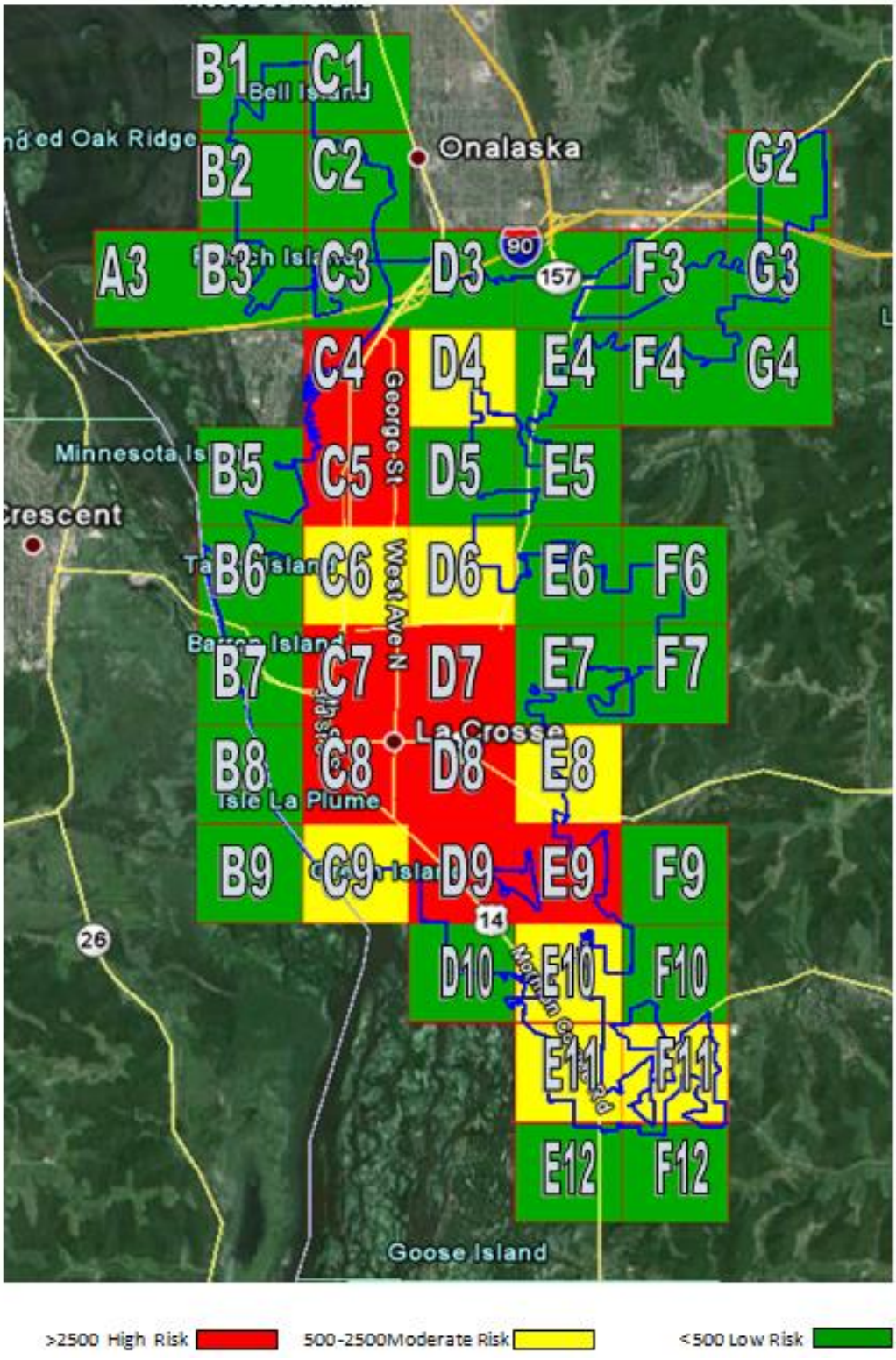
Low planning zones (green) have less than 500 persons

Moderate planning zones (yellow) have between 500 and 2500 persons

High planning zones (red) have greater than 2500 persons

City of La Crosse Fire Department

Population Risk Response



Technological/Human Hazard Assessment

The following technological/human hazards were identified as being potential risks to the City of La Crosse. An incident involving any one of these hazards has the ability to create a dramatic strain on the emergency services resources.

1) **Utility Failure**

The risk potential for prolonged utility failure in La Crosse is low to moderate; with low consequence. However, this would be dependent upon the duration of incident and time of year. Utilities such as water, gas, electricity and phone are located throughout La Crosse which all are at risk of disruption in service as a result of equipment fatigue or failure as well as being affected by natural causes i.e. weather related, or mechanical damage i.e. road construction mishaps.

The disruption of any of these services could essentially affect response times because of detours caused by necessary repairs being conducted, traffic lights not working etc. Interruptions in gas and electrical service can also cause an increase in public service calls, fire alarm signals and fire calls due to unsafe or improper candle and wood burning appliance use. Generally, utility service is only disrupted for a relatively short period of time; however the potential is always there.

The agency is prepared to respond and assist with water main breaks and resulting flooding, gas line breaks, securing the scene when downed power lines are a threat to the community etc. La Crosse County 911 Emergency Dispatch Center (EDC), as well as the Emergency Operations Center (EOC) is able to continue functioning in the event of an electrical power failure.

2) Structure Fires – Conflagration

The City of La Crosse covers approximately 22 square miles with the bulk of the buildings consisting of commercial, industrial, and residential structures. The agency responds to over 100 structure related fires annually; therefore the risk is moderate with the consequence being moderate as well. Although there is always a low risk of conflagration as a result of an incident such as an aircraft mishap in a heavily populated area, the main area of concern with respect to the possibility of conflagration would be in the downtown core. The core is made up of several

rows of century old multi story physically attached commercial/residential buildings. Many downtown buildings do not have sprinkler systems or fire alarm systems and have been through various structural alterations over the years; including dividing walls and false ceilings. However, stone walls originally constructed as fire walls between many of the buildings have proven to be effective in the past at preventing major fires from escalating into a conflagration situation. Since 2010 there has been an increase of 23% of people living in the downtown area. La Crosse has started to go vertical with its buildings with a mix of commercial and residential living in our downtown district.

Currently, the agency's headquarters station #1 is located at the south end of the downtown core. Station #1 houses the largest number of on-duty staff and equipment. Therefore, first due response time to the downtown core with the greatest number of equipment and staff is very quick, improving the chance of containing a fire at the incipient or early stage. The agency has the resources to deal with major structure fires and when required, can initiate a call-back utilizing TeleStaff or EDC whereby all off-duty staff would be called to respond. Should a conflagration occur to the point where more resources would be required, mutual aid could also be initiated.

3) Transportation – air, rail, highway, and water

Air

The La Crosse Regional Airport lies within the city limits of La Crosse on the city's far north side. The airport sits on 1,380 acres of land and supports 25,000 operations annually, and processes 189,000 passengers annually. Delta Airlines and American Airlines are currently offering several daily flights. While there is a constant stream of aircraft activity over the City, the potential risk hazard for an aircraft incident is low with the consequence being very high.

LCFD conducts joint training operations with the La Crosse Regional Airport Fire Department. The agency participates in annual disaster drills at the airport to prepare for an airline emergency.

Rail

La Crosse railway traffic includes the Canadian Pacific Railway that operates 28 trains per day including two Amtrak passenger trains and the Burlington Northern-Santa Fe that operates 40 to

50 trains per day. These rail tracks cross many of the City's roadways used for responding to various locations throughout the City. Response strategies are in place to use overheads (bridges built over railroad tracks) to avoid encountering delays from train traffic while on emergency responses. In 2017 the agency installed computer screens at Station 3 that have a live graphical usage feed of the train tracks. This gives crews the opportunity to verify if the tracks are clear of train traffic at a glance and if we can cross them, thus saving time on responding to emergencies. The agency has been faced with vehicle train collisions as well as pedestrians being struck at crossings. The possibility of a train derailment is a very real possibility within the City; however the risk is low, but the consequence could be very high; especially if the train was transporting hazardous materials as is so often the case. There is also the possibility of a derailment being a threat to residential, commercial or industrial properties which could increase the overall threat.

Over the years, members of the agency have participated in rail car training and hazardous materials release/fire incident training and would be prepared to respond accordingly to fire, rescue and/or hazardous release incidents involving rail car(s).

Highway

Interstate I-90 and numerous State highways are critical to transportation in the agency's response region. La Crosse has approximately 220 miles of streets and highways. The risk potential for having to respond to an incident on any portion of these streets and highways is moderate with the consequence in most cases being low i.e. motor vehicle collision involving two or more vehicles with possible injuries/fatalities. However, in the event of an incident involving a major fuel or other hazardous product spill/fire from a transporting water tender could result in a moderate hazard for the agency's resources.

The agency's first responding fire apparatus contains vehicle extrication equipment and basic life support supplies as well as an adequate water/foam supply to deal with motor vehicle collisions; including fire.

Water

There are three major rivers in the agency's response region, the Mississippi River, the Black River, and the La Crosse River. La Crosse has 23 miles of shoreline and 1,350 acres of

marshland. Barge traffic on the Mississippi River brings 2,434 barges annually transporting 45,575 tons of petroleum and 966,115 tons of chemical fertilizers.

The possibility of a barge or large vessel accident is a possibility on the Mississippi River; however the risk is low, but the consequence could be very high; especially if the barge was transporting dangerous goods. There is also the possibility of an accident causing environmental harm to the Mississippi River which could increase the overall threat. Every year the agency responds to multiple requests for water/ice rescues.

Members of the agency have participated in water rescue training and would be prepared to respond accordingly to fire, rescue and/or hazardous release incidents on area water ways.

4) Natural Gas Pipelines

The City of La Crosse has a high concentration of underground natural gas pipelines supplying fuel for heating to the many homes and businesses throughout the City. It is not uncommon for the agency to respond to reported gas leaks as a result of a ruptured pipeline. This occurrence, in many cases, is usually a result of mechanical damage caused during construction activity of some sort. The risk hazard with this type of occurrence is low to moderate with the potential consequence being moderate to high. La Crosse also contains several industries that have internal processes involving the transfer of flammable/combustible liquids and/or gases.

The agency conducts training sessions with the local gas utility company (Xcel Energy) on how to respond to natural gas incidents; while the agency's hazmat team has the knowledge and equipment to assess and deal with associated risks involving transfer piping systems.

5) Chemical Facilities

Hydrite Chemical, located in La Crosse near the Black River, is one of the nation's largest independent providers of chemicals and services, shipping and storing more than 400 different chemicals. Hydrite Chemical has a bulk storage capacity of 2,027,500 gallons. La Crosse has 94 facilities that have a reportable amount of hazardous materials. The risk hazard for a hazardous materials incident at a chemical facility is low to moderate with the potential consequence being moderate to high.

The agency has participated in hazardous materials mitigation training at chemical facilities. The agency has conducted training in hazardous materials release/fire incident training and would be prepared to respond accordingly to fire, rescue and/or hazardous release incidents involving a chemical facility.

Security Hazard Assessment

The following security hazards have been identified as possible risks to the City of La Crosse. Although the following events are mentioned in this document, it is felt that the overall risk potential of an actual occurrence of this nature is very low. Nevertheless, the consequences associated to any one of the following could be very high and severely strain the resources of the agency.

1) **Civil Disorder**

The City of La Crosse is located on the mighty Mississippi River, approximately 140 miles northwest of Wisconsin's capital city of Madison. La Crosse is located approximately 155 miles to the southeast of Minneapolis, Minnesota and 280 miles to the northwest of Chicago, Illinois. La Crosse has a population of 51,800 and covers 22 square miles. The University of Wisconsin La Crosse, Viterbo University, and Western Technical College have a combined student population of over 17,000, of which many do not reside in the City. To date, there has not been any significant disorder or unrest within the City. Moderate to low levels of civil disturbance have occurred in the downtown and college areas during civic events and festivals (such as Oktoberfest). Therefore, the risk of civil disorder in the City of La Crosse is low with the consequences being low to moderate.

Civil disorder could include riots, violent protests, and large outbreaks of destructive or malicious behavior which could involve the setting of vehicle and structure fires. In the event that civil disorder of any kind did break out, the agency's role would be to only perform the normal fire and emergency functions and not to be involved with crowd control or in preventing resulting human destruction/vandalism.

In the event a threat of any kind was received, the City of La Crosse Police Department would initially prepare for the potential situation. If and when the event escalated or had the potential

to escalate to a scale that could affect the community at large, the police would notify the agency. The agency would act accordingly upon being placed on standby and respond as necessary.

2) Nuclear Attack

The City of La Crosse is far enough away from major cities that the possibility of a nuclear attack, specifically on La Crosse, is highly improbable. Although in today's world, the threat from a nuclear attack could be anywhere around the globe; with the possibility of broad range coverage that could pose as a high consequence.

The City of La Crosse is in close proximity to two nuclear power generation plants*;* Genoa Nuclear Power Plant near Genoa, WI (12 miles to the south of La Crosse) and Prairie Island Nuclear Power Plant near Red Wing, MN (92 miles to the northwest of La Crosse). Both facilities store spent radioactive fuel. The agency has a hazardous materials radiological field response team, under its hazardous materials program, that would respond to a radiological emergency at either site. The radiological field team is also available to respond to radiological emergencies in the City of La Crosse and in its State of Wisconsin regional response district.

3) Terrorism

The threat of terrorism is a reality in any city in the United States. The City of La Crosse does not have the "typical" terrorism targets that are found in larger metropolitan cities. As is all too common in the world today, domestic terrorism can happen anywhere, and at any time; although the risk is very low, the consequence has the potential to be very high. The agency would deliver emergency services in the event of an act of terrorism. The agency would perform fire, medical, hazardous materials, urban search and rescue, and water rescue activities accordingly with the option of initiating a department call- back and possibly a mutual aid request. All agency Emergency Medical Technicians (EMTs) are trained in first response awareness for Weapons of Mass Destruction (WMD). The agency's hazardous materials response team is a member of the State of Wisconsin regional network. The agency has twenty five members trained to the

hazardous materials technician level. Team members are trained for Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) responses, which could result from a domestic terrorism attack. All agency members are trained to an awareness level in CBRNE responses. The agency has a radiological field team available to respond to radiological emergencies in the City of La Crosse and in its State of Wisconsin regional response district. The agency has the hazardous materials apparatus and equipment to respond and mitigate an act of terrorism. The La Crosse Fire Department Urban Search and Rescue (USAR) team is a member of the State of Wisconsin regional network (WI-Task Force 1). The agency has 18 members trained in the four disciplines of technical rescue; confined space, trench, collapse, and rope rescue. The agency has the USAR apparatus and equipment to respond and mitigate an act of terrorism.

Critical Task Analysis

There are critical tasks that must be conducted by firefighters at structure fires, by rescuers at vehicle accidents, and by EMS personnel at a medical-aid incident. The agency conducted an assessment of critical firefighter tasks to create a standard level for response in the mitigation of an emergency incident. In the Effective Response Force (ERF) section of this document (page 109) the agency listed critical firefighter tasks for low, moderate, and high risk occupancy responses to structure fires, emergency medical calls, emergency rescues, emergency hazardous materials responses, and emergency report out responses.

The agency reviewed in detail the operations required at all of the above listed emergency responses. For example, an interior fire attack operation was reviewed. To conduct an interior attack, firefighters are required to use protective equipment, including turnout gear, SCBA, and an appropriate number of fire attack and exposure protection and minimum of 1 ¾ inch hose lines. Additional personnel must be staged to perform rescue functions for interior firefighting personnel, and a command structure must be in place. Since the establishment of OSHA 29 CFR 1910 (2 in/ 2 out standard), the agency must have in place a rapid intervention crew, as the effective response force arrives on scene. While other tasks may be achieved at different times, these functions must be in place prior to entry into the IDLH atmosphere.

In conducting this critical task analysis the agency followed industry standards, such as OSHA 29 CFR 1910, Wisconsin SPS 330.14(3), National Institute of Standards and Technology (NIST) studies on Residential Fireground Field Experiments and EMS Field Experiments. The agency also relied on past historical practices and past performance outcomes at these emergencies.

Historical Perspective and a Summary of the System Performance with Performance Objectives and Performance Measures

Resource Management

A critical element in the assessment of any emergency service delivery system is the ability to provide adequate resources for anticipated fire control and extinguishment, medical emergencies, and other incidents such as rescue, hazardous materials, and natural or uncommon disasters.

Each incident requires a variable amount of staffing and resources to be effective. Properly trained and equipped fire crews must arrive, deploy, and mitigate the event within specific timeframes if successful emergency event strategies and tactical objectives are to be met. Each event whether fire, medical emergency, rescue operation, disaster response, and other situations will require varying and unique levels of resources. For example, controlling a fire before it has reached its maximum intensity requires a rapid deployment of personnel and equipment within a limited timeframe.

There is a direct correlation between the type of risk and the amount of resources needed to mitigate that risk. More resources, both in equipment and staffing, is required for the rescue of persons trapped within a high-risk building with a high-occupant load, than for a low-risk building with a low-occupant load. Similarly, more resources are required to control fires in large heavily loaded buildings than in small buildings with limited contents. Therefore it is important to create a well-matched level of service through the distribution and concentration of resources to that of the potential demand placed upon them by the level of risk in the community.

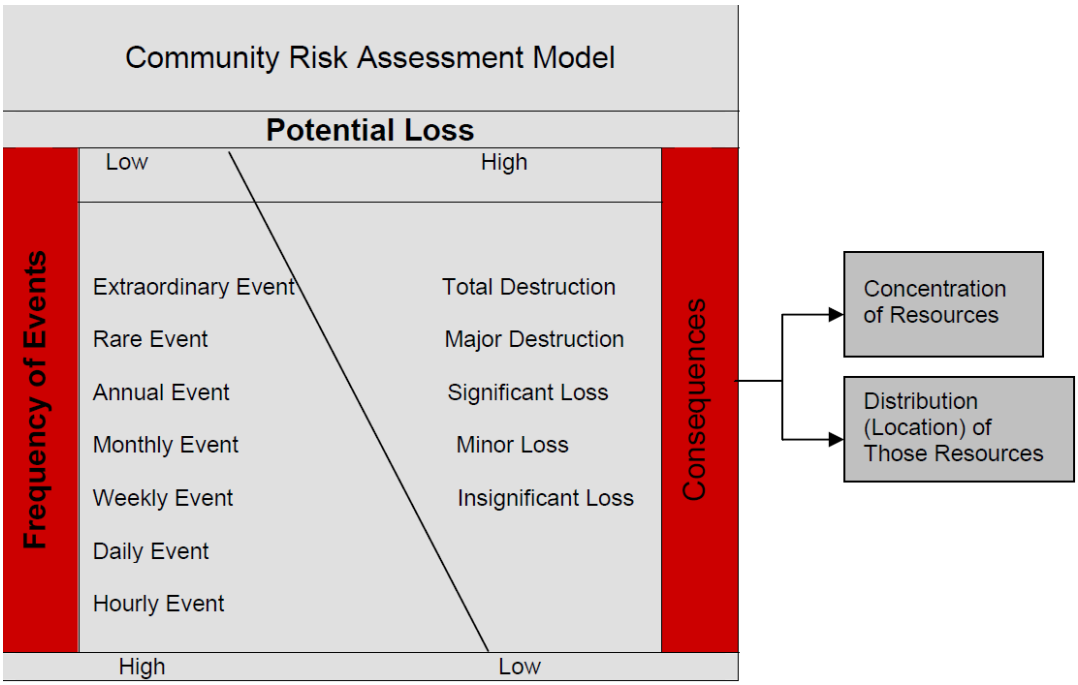
The objective is to have a distribution of resources that is able to reach a majority of events in the timeframe as stated in the service level goals. The following factors; (or lack thereof) are examples of what can attribute to different types of risk levels, and which would indicate the need for higher or lower concentration of resources:

- Inability of occupants to take self-preserving measures
- Type of construction
- Size and height of building
- Lack of built-in fire protection (fire alarms, automatic sprinklers)
- Exposures
- Lack of needed fire flow (water supply)
- Building access (exterior & interior)
- Separation distance between buildings
- Hazards in a building

Evaluation of such factors lead to the number of personnel needed to conduct the critical tasks necessary to contain the event in an acceptable timeframe. The level of service provided by an agency should be based on the agency's ability to cope with various types and sizes of emergencies that the agency can reasonably expect after conducting a risk assessment. This process starts with examining the most common community risk, the potential fire problem, target hazards, critical infrastructure, and an analysis of historic call data review.

Community risk assessment incorporates the various elements of risk to the relationship among the community as a whole, the frequency of events that occur, the severity of potential losses, and the usual distribution of risks. Overall, the City and its service areas are likely to have a wide range of potential risks. Normally, there is an inverse relationship between risk and frequency. The daily event is usually the routine type of risk that results in minimal losses, while significant events are less frequent. Toward the highest risk levels, the events are less frequent. If

the risk management system is working in the community, a catastrophic loss should be an extraordinary event. The objective of a risk assessment is to reduce the truly serious loss to a very unusual event for the area served and involves trying to keep routine emergencies from becoming serious loss situations. This is accomplished only when a comprehensive Standards of Cover integrated risk management plan has been developed, which provides the necessary resources for those risks identified within the city.



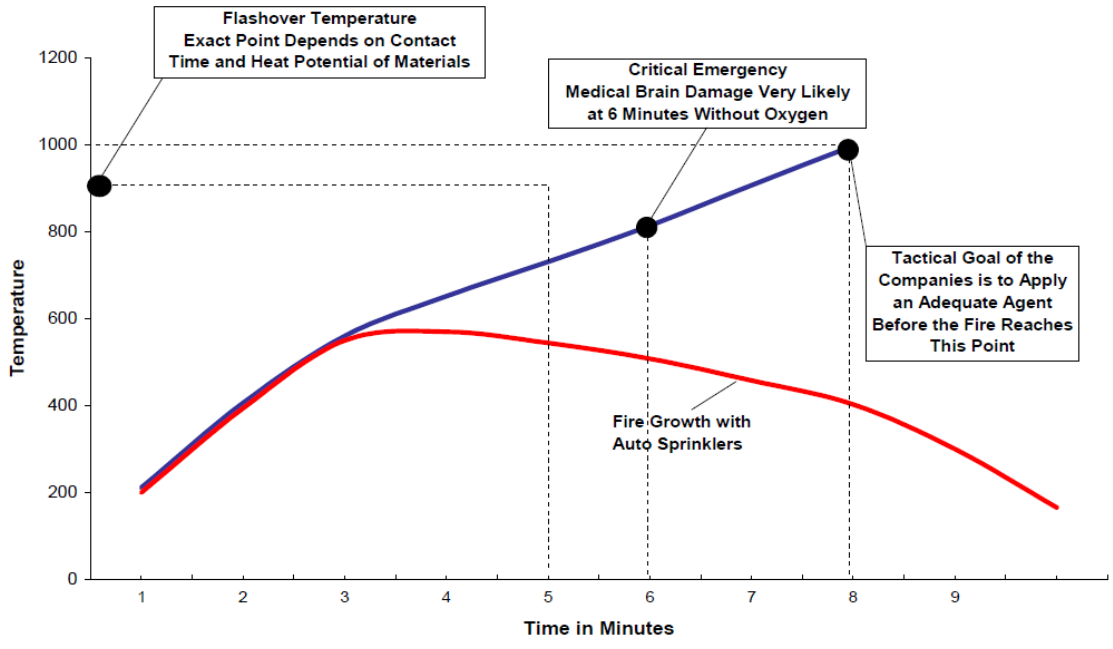
The purpose of risk assessment is not only to evaluate risks and hazards in the agency's response area, but also to provide a basic methodology to evaluate existing response coverage. The process begins with the identification of community hazards and risks. Hazard is defined as *a source of potential danger or an adverse condition*; risk is defined as *the possibility of loss or injury; the exposure to the chance of loss; the probability of an event multiplied by the significance of the consequence (impact) of the event = Risk (Risk = Probability x Impact)*. To determine the overall community risk and vulnerability, several areas must be assessed.

Evaluating Community Risk

It is important to provide a description of the scope, complexity, and relationship of the various risk factors within the City of La Crosse and the method used to evaluate these risks.

The City of La Crosse presents a variety of risks that the agency is routinely called upon to respond to. These areas include both a structural/fire and non-structural/fire risk in this evaluation. Non-structural risks include emergency medical, hazardous materials, rescue (motor vehicle, water & ice, machinery entrapment), grass/brush fires, and possible natural disasters. Structural risks evaluated included various types of buildings throughout the service area. In order to determine the extent of various risk factors, the agency analyzed the demographics in the area protected, the building stock, historical call volume, assessed value, the existing deployment of resources.

The following table illustrates the need for rapid response to fire response to mitigate these emergencies.



Evaluating Fire Suppression Capabilities

Firefighters encounter a wide variety of conditions at each fire. Some fires will be at an early stage and others may have already spread throughout the building. This variation in conditions complicates attempts to compare agency capability. A common reference point must be used so that the comparisons are made under equal conditions. In the area of fire suppression, service-level objectives are intended to prevent the flashover point, a particular point of a fire's growth that makes a significant shift in its threat to life and property. Fire suppression tasks required at a typical fire scene can vary a great deal.

What fire crews must do, simultaneously/systematically and quickly, if they are to save lives and limit property damage, is to arrive within a short period of time with adequate resources to do the job. Adequately matching the arrival of resources within a specific time period is the objective of developing a comprehensive Standards of Cover.

The Stages of Fire Growth

Virtually all structure fires progress through a series of identifiable stages.

Stage 1: *The Ignition Stage* -The ignition of a fuel source takes place. Ignition may be caused by any number of factors, from natural occurrences such as lightning to premeditated arson.

Stage 2: *The Smoldering Stage* – When heat is applied to a combustible material, the heat oxidizes the material's surface into combustible gases. The oxidation process is exothermic; meaning the oxidation process itself produces heat. The heat from oxidation raises the temperature of more material, which increases the rate of oxidation and begins a chemical chain reaction of heat release and burning. This stage can vary in time from a few minutes to several hours. When sufficient oxygen is present, the fire will progress to the open-burning stage.

Stage 3: *The Incipient/Open Burning Stage* - When the temperature gets high enough, flames can be seen. The visible burning at this stage is still limited to the immediate area of

origin. The combustion process continues to release more heat, which heats nearby objects to their ignition temperature, and they begin burning.

Stage 4: *The Flashover Stage* - Not all combustible gases are consumed in the incipient stage; they rise and form a superheated gas layer at the ceiling. As the volume of this gas layer increases, it begins to bank down to the floor, heating all combustible objects regardless of their proximity to the burning object.

Flashover:

The flashover stage is very significant because it marks a critical change in conditions. This turning point in fire conditions escalates the challenge to a fire department's resources.

Research into the flashover phenomenon has yielded criteria that precisely measure when flashover occurs; however, any exact scientific measurement in the field is extremely difficult. Observable events that would indicate a flashover are "total room involvement" and "free burning." These indicators are easily observable by firefighting personnel and the public and can be easily recorded and retrieved for future evaluation. Both scientific tests and field observations have shown when flashover is experienced, it has a direct impact on fire protection and the ability of the emergency services system.

a. Flashover occurs at a temperature between 1,000 and 1,200 degrees Fahrenheit. These temperatures are well above the ignition points of all common combustibles in residences, businesses, and industries. When this temperature range is reached, all combustibles are immediately ignited. Human survival after this point is highly improbable without specialized protective equipment.

b. At the point of flashover, lethal fire gases (carbon monoxide, hydrogen sulfide, cyanide) increase explosively. People exposed to these gases, even when not directly exposed to the fire, have drastically reduced chances of survival.

c. Flashover can occur within a relatively short period of time. Precisely controlled scientific tests indicate that flashover can occur in as little as two minutes from the flame stage. On the other hand, field observations of actual fires indicate that total room involvement can take as long as 20 minutes or more. There is no way to ascertain the time to flashover since it is not possible to determine when a fire started. Nevertheless, a correlation can be drawn between flashover and the entire fire protection system. As suggested previously, the number of times that fires are controlled before flashover depends on the entire fire protection system and is not solely dependent upon emergency response forces.

The Significance of Flashover

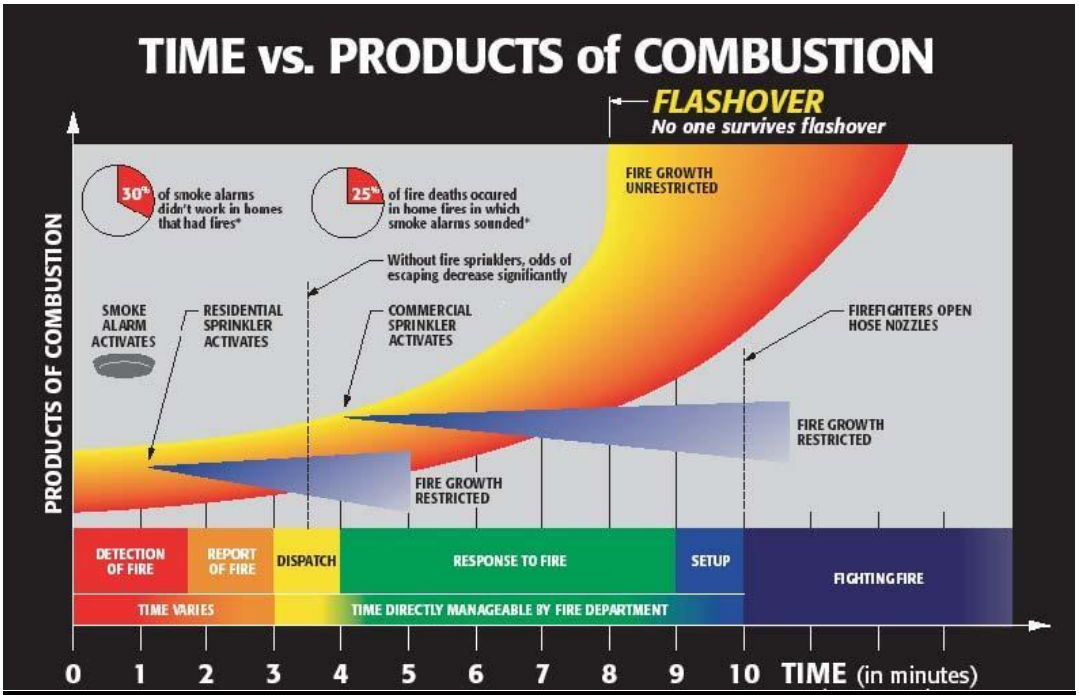
Pre – Flashover	Post - Flashover
Limited to one room	May spread beyond one room
Requires smaller attack lines	Requires larger, more attack lines
Search and rescue is easier	Compounds search and rescue
Initial assignments can handle	Requires additional companies

Staffing and equipment needs can be reasonably predicted for different risk levels and fire stages. The correlation of staffing and equipment needs with fires according to their stage of growth is the basis for response coverage. The goal is to maintain and strategically locate enough firefighters and equipment so a minimum acceptable response force can reach a fire scene before flashover occurs, and mitigate medical emergencies.

To minimize risk, the agency strives to extinguish small fires quickly before they reach flashover potential to minimize risk and to mitigate medical emergencies quickly to reduce cardiac death. As flashover is such a significant fire event, preventing this stage of fire behavior is imperative. Time is a key factor in this effort. Once flashover potential is reached, an exponential increase occurs not only in the rate of combustion, but in the amount of resources necessary to mitigate the fire emergency.

Products of Combustion

The air people breath is approximately 21 percent oxygen. When oxygen levels drop below 19 percent and is still above 12 percent, judgment is impaired, the pulse rate increases, and fatigue is present. If levels drop further, to less than 12 percent, but greater than 6 percent, extreme fatigue, nausea, and vomiting will occur. In the final stages of deprivation, when levels are 6 percent or lower, convulsions and cardiac arrest will occur, resulting in death. This is simply due to the absence of oxygen. The graphic below illustrates the relationship between the physics of the fire and the factors the agency can control:



To summarize the above, the stage of a fire affects staffing and equipment needs. Several critical points are obvious. The time it takes to detect the fire and report it can be positively influenced by automatic-alarm systems. The early suppression of fires by installed fire protection systems can also have significant impact on the outcome. However, if neither of these mitigations sources is present, the fire suppression forces must arrive within a certain timeframe, allowing adequate application of water to the fire prior to flashover if the suppression efforts are to have the most beneficial results.

Evaluating EMS Capabilities

Additionally, survival of cardiac death or in a fire preventing flashover is often time driven. The brain can only be without oxygen for a short period of time, i.e., four to six minutes. Rapid intervention is necessary to prevent brain death from occurring.

From an emergency medical perspective, the service-level objective typically is to provide medical intervention within a six-minute timeframe, as brain damage is very likely at six minutes without oxygen. However, in a cardiac arrest situation, survivability dramatically decreased beyond four minutes without appropriate intervention. Intervention includes

early recognition and bystander CPR. When cardiac arrest occurs, the heart starts to beat chaotically (fibrillation) and cannot pump blood efficiently. Time is critical. If a normal heart rhythm is not restored in minutes, the person will die. In fact, for every minute without defibrillation, the odds of survival drop seven to ten percent. A sudden cardiac arrest victim who is not defibrillated within eight to ten minutes has virtually no chance of survival.

The shortest possible response times create the highest probabilities of resuscitation. An important evaluation point lost on most agencies is the time that crews reach patient side. Often the clock stops when the vehicle arrives or stops at the address. The key to a successful outcome is the point the patient is actually contacted. In high-rise communities or other larger complexes, this time period can be substantial and can most certainly affect the outcome due to delayed intervention.

A study by the Emergency Medical Director's Association of California offers supporting evidence. The results of that study, depicting the relation of timing to two key resuscitation efforts, CPR and defibrillation, are illustrated in the following table:

Collapse to CPR	Collapse to Defibrillation	Probability of Survival
< 5 Minutes	< 10 Minutes	37%
< 5 Minutes	> 10 Minutes	7%
> 5 Minutes	< 10 Minutes	20%
> 5 Minutes	> 10 Minutes	0%

Distribution

Distribution is the geographic location of all first-due resources for initial intervention.

The agency has four fire stations. See Appendix B for a fire station response zone map.

The City of La Crosse has approximately 220 miles of roads.

The following shows the approximate road miles per station response area:

Station	Road Miles	Percent
Station 1	55	25
Station 2	35	16
Station 3	75	34
Station 4	55	25

The City of La Crosse covers approximately 22 square miles or 14,283 acres.

The following shows the approximate square miles covered per station response area:

Station	Square Miles	Percent
Station 1	4.4	20
Station 2	3.3	15
Station 3	8.8	40
Station 4	5.5	25

The City of La Crosse has a population of approximately 51,800, with approximately 16,000 buildings.

See Appendix G for a population map by the forty seven planning zones.

The following table shows the approximate number of buildings per station response area:

Station	Buildings	Percent
Station 1	3,281	20
Station 2	1,615	10
Station 3	8,104	51
Station 4	3,000	19

GIS Analysis

In 2011 the La Crosse Common Council "Fire Department Management and Operations Committee" hired a consulting firm to provide GIS analysis of the agency and City of La Crosse. ArcGIS 9.2 navigation model software was used by Mapping Specialists Ltd.

The results of this GIS analysis are in Appendix H.

Since that time the City has hired a part time GIS Analyst that works under the City IT Department.

Significant points:

- Based on GIS analysis the study determined that there was a need for one more fire station in La Crosse to meet travel time standards
- Maps were provided with optimum station locations and the location of a proposed fifth fire station

- Travel time analysis was provided of the four current stations – areas of concern were noted with over 5 mile travel distances of first due units and over 8 mile travel distances for balance of alarm units
- Travel time analysis expectations including a proposed fifth fire station

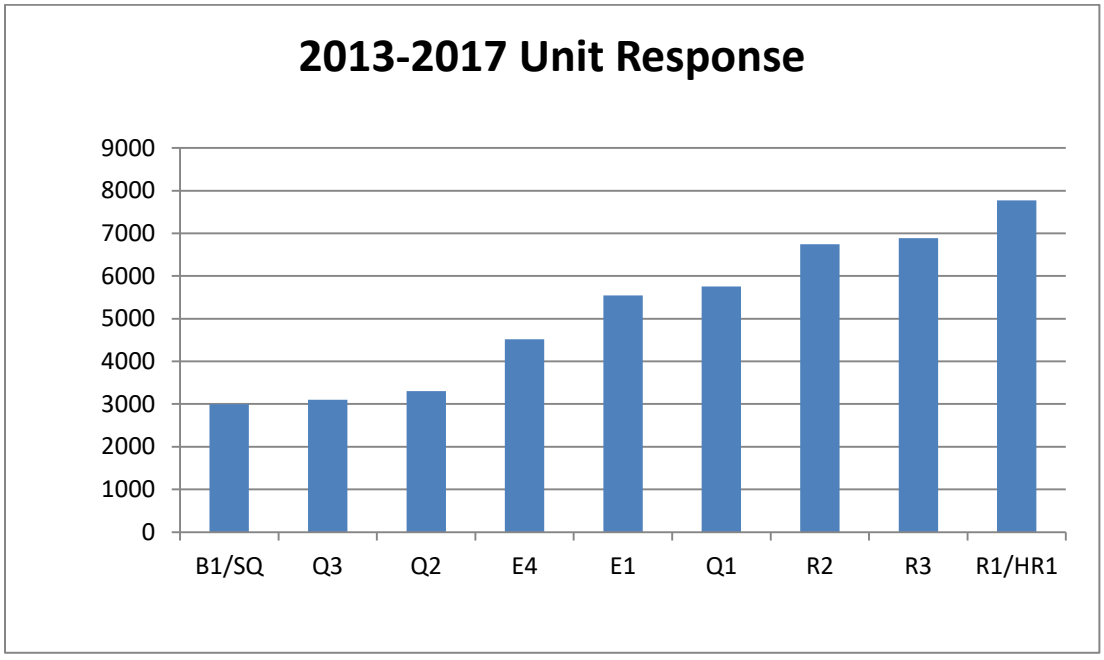
Concentration

Concentration is the spacing of multiple resources arranged to that an "effective response force (ERF)" can arrive on scene within the adopted time frames.

Due to the loss of our previous software and turnover of personnel the agency has invested in First Watch software to measure performance ERF data for all different types of agency responses in 2018. The build out of our ERF tables are being finalized.

An overview of agency responses by apparatus from 2013 through 2017 is shown below:

Unit	Responses
SQ(Renamed B1)	2,996
Q3	3,103
Q2	3,302
E4	4,520
E1	5,544
Q1	5,757
R2	6,743
R3	6,887
HR1 (Renamed R1)	7,768
	49,509



Performance Objectives

Performance objectives follow the SMART (Specific, Measureable, Attainable, Relevant, and Timely) formula. They are relevant to the following analysis on the evaluation of fire growth, flashover, EMS response needs, special service needs, response times, on-scene operations, problem-solving critical tasks, and the determined effective response force for the community served.

Fire Benchmark Performance Objective:

For all fire incidents, La Crosse Fire Department shall arrive in a timely manner with sufficient resources to stop the escalation of the fire and keep the fire to the area of involvement upon arrival. Initial response resources shall be capable of containing the fire, rescuing at-risk victims, and performing salvage operations, while providing for the safety of the responders and general public.

- **Distribution Performance Measure for all Structure Fires:** The first due pumper (Engine or Quint) in the first due area staffed with a minimum of three personnel shall arrive within 6 minutes and 20 seconds total response time, for 90% of all requests for emergency services.
- **Concentration Performance Measure for Fire – Low:** Requires second pumper (Engine or Quint) staffed with a minimum of three personnel and shall arrive within 10 minutes and 20 seconds total response time for 90% of all requests for emergency service. Remaining units including Battalion Chief and rescue apparatus, for a minimum of 12 personnel in total shall arrive within 10 minutes and 20 seconds total response time for 90% of all requests for emergency services. A minimum of 12 personnel is required.
- **Concentration Performance Measure for Fire – Moderate:** Requires second pumper (Engine or Quint) staffed with a minimum of three personnel shall arrive within 10 minutes 20 seconds total response time for 90% of all requests for emergency service. Remaining units which may include a third pumper (Engine or Quint), Battalion Chief, and rescue apparatus for a total of 14 personnel, shall arrive in 10 minutes 20 seconds

total response time for 90% of all requests for emergency services. A minimum of 14 personnel is required.

- **Concentration Performance Measure for Fire – High:** Requires second pumper (Engine or Quint) staffed with a minimum of three personnel and shall arrive within 10 minutes 20 seconds total response time for 90% of all requests for emergency service. Remaining units which may include a fourth pumper (Engine or Quint), Battalion Chief, and rescue apparatus for a minimum of 18 personnel, shall arrive in 12 minutes 20 seconds total response time for 90% of all requests for emergency services. A minimum of 18 personnel is required.

Actual Baseline Fire Service Level Performance from 2013 through 2017:

TBD and built out with aggregate numbers. Year by year data is available as part of the agency's ACR

EMS Benchmark Performance Objective:

For all emergency medical incidents, La Crosse Fire Department shall arrive in a timely manner with sufficiently trained and equipped personnel to provide medical services. They will stabilize the situation, provide care and support to the victim and/or reduce, reverse, or eliminate the conditions that have caused the emergency.

- **Distribution Performance Measure for all EMS**: The first due apparatus (Engine, Quint, or Rescue) in the first due area, with Basic Life Support (BLS) and defibrillation capabilities; staffed with a minimum of two personnel shall arrive within 6 minutes total response time for 90% of all requests for emergency services. A minimum of 2 personnel is required.
- **Concentration Performance Measure for EMS – Low**: Same as distribution performance measures.
- **Concentration Performance Measure for EMS – Moderate**: The second apparatus (Engine, Quint, or Rescue) with Basic Life Support (BLS) and defibrillation capabilities, staffed with a minimum of two personnel shall arrive within 6 minutes total response time for 90% of all requests for emergency service. Any further requested units; including a third apparatus (Engine, Quint, or Rescue) with Basic Life Support (BLS) and defibrillation capabilities, shall arrive in 8 minutes total response time, for 90% of all requests for emergency services. A minimum of 4 personnel is required.
- **Concentration Performance Measure for EMS – High:** The second apparatus (Engine or Quint) with Basic Life Support (BLS) and defibrillation capabilities, staffed with a minimum of three personnel shall arrive within 8 minutes total response time for 90% of all requests for emergency service. Any further requested units; including a third apparatus (Engine, Quint, or Rescue) with Basic Life Support (BLS) and defibrillation capabilities, shall arrive in 8 minutes total response time, for 90% of all requests for emergency services. A minimum of 5 personnel is required.

Rescue Performance Objective:

For all incidents where rescue of victims is required (Elevators, Water, Ice, Technical (Urban Search and Rescue - USAR), La Crosse Fire Department shall arrive in a timely manner with sufficient resources to stabilize the situation and remove the victim(s) from the emergency situation or location without causing further harm to the victim, responders, public or the environment.

- **Distribution Performance Measure for all Rescues:** The first due apparatus (Engine, Quint, USAR, or Boat) in the first due area (with rescue equipment); staffed with a minimum of 3 personnel shall arrive within 6 minutes and 20 seconds total response time for 90% of all requests for emergency services. A minimum of 3 personnel is required.
- **Concentration Performance Measure for Rescue – Low (Elevator):** Same as distribution performance measure.
- **Concentration Performance Measure for Rescue – Moderate:** Requires that the Battalion Chief and the apparatus needed to meet the needs of the response, with the appropriate rescue equipment, for a minimum of 14 personnel; shall arrive within 10 minutes 20 seconds total response time, for 90% of all requests for emergency service. A minimum of 14 personnel is required.
- **Concentration Performance Measure for Rescue – High:** In addition to what is already present for equipment and staffing for the above **Moderate** incident, it may be necessary to request all, or part, of the remaining off-duty USAR or Water Team members. A minimum of 18 personnel shall arrive within 14 minutes and 20 seconds total response time, for 90% of all requests for emergency service.

The response time goal for a call-back of off duty USAR or Water Team members to respond to a rescue incident is 60 minutes, for 90% of all requests for emergency service.

Hazardous Materials/Special Hazards Objectives:

For all hazardous materials/special hazards (spills, leaks, odors, carbon monoxide complaint), La Crosse Fire Department shall arrive in a timely manner with sufficiently trained and equipped personnel to secure, assess, contain, and/or mitigate hazardous incidents. Where applicable, an action plan for the successful conclusion of the incident while providing for the safety and security of the responders, public and the environment will be established.

- **Distribution Performance Measure for all Hazardous Incidents:** The first due apparatus (Engine or Quint) in the first due area staffed with a minimum of three personnel shall arrive within 6 minutes and 20 seconds total response time for 90% of all requests for emergency services. A minimum of 3 personnel is required.
- **Concentration Performance Measure for Hazardous Incident – Low (Vehicle Leaking Fuel, Carbon Monoxide Complaint):** Same as distribution performance measure.
- **Concentration Performance Measure for hazardous Incident – Moderate:** Requires that the Battalion Chief and the apparatus needed to meet the needs of the response, with the appropriate hazardous materials equipment, for a minimum of 17 personnel (of which 4 will be trained to the technician level); shall arrive within 10 minutes 20 seconds total response time, for 90% of all requests for emergency service. A minimum of 17 personnel is required.
- **Concentration Performance Measure for Hazardous Incident – High:** In addition to what is already present for equipment and staffing for the above **Moderate** incident, it may be necessary to request all, or part, of the remaining off-duty Hazmat Technician Team (for a possible total of 25 technicians). A minimum of 24 personnel shall arrive within 16 minutes and 20 seconds total response time, for 90% of all requests for emergency service.

The response time goal for a call-back of off duty Hazardous Materials Technicians to respond to a hazardous materials/special hazard incident is 90 minutes, for 90% of all requests for emergency service as required by the State of Wisconsin.

Report Out Performance Objective:

For all emergency report out incidents (bomb threats, power line complaints, odor complaints, water complaints, and airport stand by), La Crosse Fire Department shall arrive in a timely manner with sufficiently trained and equipped personnel to provide services. They will stabilize the situation, provide care and support to the victim and/or reduce, reverse, or eliminate the conditions that have caused the emergency.

Availability

Availability is the amount of time a unit is available to respond to an emergency within its own service area/district.

Reliability

See Appendix D and J, planning zone map and planning zone analysis, for all emergency call data from 2013 through 2017.

Reliability is the ability of a unit to perform and maintain its functions in routine circumstances. Reliability is measured as the number of calls for service, in relationship to the total number of serviced calls that the fire units performed within the system adopted timeframes (performance measures).

The system analysis included the agencies established first due baseline performance measure of 6 minutes, 20 seconds at the 90th percentile for all emergency type responses in the following five categories (emergency fire, emergency medical, emergency rescue, emergency hazardous materials, and emergency report outs). This is the total response time from receipt of call to the first unit on scene. The comparisons shown in the following table depicts first due workload from 2013 through 2017, by station (all responses), first due unit responses in the first due district, and calls missed by the first due unit. Calls may have been missed due to concurrent calls, training, maintenance, etc. The table also shows the percentage of calls answered by the first due unit in its first due response district, the percentage of any first due unit meeting response standards in any response district, and the percentage of first due units meeting response standards in its own response district.

La Crosse Fire Department
726 5th Ave South, La Crosse, WI 54601 (608) 789-7260 Fax (608) 789-7276
http://www.cityoflacrosse.org Gilliamk@cityoflacrosse.org

Serving La Crosse and Southwestern Wisconsin Quality Emergency Services Since 1896

Availability vs. Reliability

2013-2017

Fire Station/District	FS-1	FS-2	FS-3	FS– 4
First-Due Workload(All Responses) (Any First Due Unit)	11,520	4,766	7,011	3,801
First Due Unit Responses in	10,344	4,415	6,647	3,318
Calls Missed by First Due	1,176	351	346	483
Availability– First-Due Unit in	89.79%	92.63%	94.80%	87.29%
Reliabilty-Any First Due Unit (<=6:20sec) (Emergency Response Only)	93.06%	91.51%	76.08%	77.32%
Reliabilty-First Due Unit (<=6:20 sec) (Emergency Response Only)	94.11%	91.86%	76.36%	79.62%
Reliability is based on the established 6:20 second for first unit standard				

The chart above shows the availability vs. reliability for the years 2013 through 2017

Availability and Reliability Analysis

Station 1 houses multiple apparatus (Quint 1, Engine 1, Rescue 1 and Battalion 1) and had an availability level of (89.79%). Station 2 houses multiple apparatus (Quint 2 and Rescue 2) and had an availability level of 92.63%. Station 3 houses multiple apparatus (Quint 3 and Rescue 3) and had an availability level of 94.80%. Station 4 is a single house (Engine 4) and had an availability level of 87.29%.

Station 1 had availability of (89.79%), yet had adequate reliability (93.06%). Station 1 had the highest call volume (11,520 calls) with four frontline apparatus. Station 1's reliability was assisted by Station 2 to the north and Station 3 to the south. Station 4 had the lowest call volume (3,801 calls), and also had the 2nd lowest reliability (77.32%). Station 3 had the second highest call volume (7,011 calls) and with two frontline apparatus and automatic move ups from station 1, had a reliability level of 76.08 %. Station 3 and Station 4's reliability were hurt because they only had one station nearest to each of them and large response districts.

Stop-Loss Points and Resources Exhaustion

Stop-loss point is the resource level an agency will not go below when asked for assistance or mutual aid. In any organization there will be a specific number of initial attack resources. For example, an agency may have six fire emergency response vehicles. The agency may also have reserve vehicles staffed by recalling personnel. An example of the stop-loss policy is "Every Town Fire Department will commit up to 50% of its resources to respond on mutual aid or automatic aid emergencies. Once this level is committed, the agency will no longer respond to requests until reserves are placed in service, or upon approval of the chief or designate." Setting stop-loss points prevents the agency from facing a situation where an emergency occurs within the jurisdiction and its resources are totally out of position.

Resources exhaustion is when a system has depleted its resources for both initial response and an area-wide effective response force. In the City of La Crosse this would be when all agency units were committed.

In an effort to ensure the agency's resources will not be depleted it has established the following criteria:

- **Stop-loss point**
    - For mutual aid the agency will normally send a water tender and/or an Engine/Quint. Other specialized vehicle(s) may be sent in place of the tender or Quint upon request.
    - The agency will normally not commit resources beyond the point of having only two remaining Quints within the City.
- **Resource exhaustion**
    - A Call-back (request for off-duty staff) will be initiated when additional staffing beyond the on-duty staffing and equipment capabilities is necessary to mitigate an effective response. This would normally occur when all on-duty resources have been depleted, or when specialized resources (i.e. hazmat technicians, USAR, water rescue) are required.

  - Requests for mutual aid from participating mutual aid communities will be initiated by the agency when all available resources have been utilized and are expected to be required for an extended period of time.

- **Authorization**
  - The decision to initiate and/or alter a stop-loss point or resource exhaustion point normally lies at the discretion of the Incident Commander/Battalion Chief; through consultation with the Assistant Chief and/or the Chief

Comparability

It is important to compare the performance of the agency to other agencies of similar size. See Appendix I for comparable city data.

The data in Appendix I is from a recent La Crosse Common Council "Fire Department Management and Operations Review Committee" study that compared La Crosse to 34 cities in Wisconsin. The data compares population, square miles, number of fire stations, authorized firefighters, firefighters/1000 population, budget, and expenditures per capita. The study also compared services offered, equipment, response volume, property loss data, response times, building inspection data, city housing data, and agency community programs.

Significant findings listed in the study are as follows:

- La Crosse Fire Department ranked 9 out of 34 departments based upon cost per capita
- La Crosse Fire Department is one of two departments that does not have an ambulance service of the reporting agencies
- The City of La Crosse ranked 2 out of the 34 cities in percent of individuals living below the poverty line
- 49% of the housing stock in the City of La Crosse is rental property
- La Crosse Fire Department has one of the best overall response times of the reporting agencies
- La Crosse Fire Department community programming is at par or slightly above other fire departments in the state

The agency also compared Insurance Service Organization (ISO) ratings in Appendix I. The agency has a Level 2 ISO rating.

Effective Response Force (ERF) for structure fire with low risk occupancy: Example is a detached garage.

Representative Tasks

Rescue and Subsequent Fire Control	Firefighter Tasks	Number of Firefighters
Size-up, Incident Command, Accountability	Incident Command assumed by Battalion Chief	1
Attack Line	Establish a pre-connect hose line for initial firefighting, search & rescue	2
	First arriving officer to supervise interior operations once command assumed by Battalion Chief	1
Establish Water Supply	Water supply hook-up to hydrant with 5 inch hose	1
	Establish 5 inch water supply into first arriving pumper	1
Rescue	Search & rescue with additional back-up pre-connect hose	2
Rapid Intervention Team	On standby should firefighter rescue be required	2
Exposures, Utilities, Ventilation	Establish additional hose line if required to protect exposures and/or shut down utilities (e.g. natural gas). Provide ventilation as required	2 * assisted by water supply team
Total		**12**

Effective Response Force (ERF) for structure fire with moderate risk occupancy: Example is a typical single family dwelling.

Representative Tasks

The following table depicts LCFD's likely critical tasks for a moderate risk structure fire with a hydrant water supply, and concludes with an Effective Response Force (ERF) of 14 personnel.

Rescue and Subsequent Fire Control	Firefighter Tasks	Number of Firefighters
Size-up, Incident Command, Accountability	Incident Command assumed by Battalion Chief	1
Attack Line	Establish a pre-connect hose line for initial firefighting, search & rescue	2
	First arriving officer to supervise interior operations once command assumed by Battalion Chief	1
Establish Water Supply	Water supply hook-up to hydrant with 5 inch hose	1
	Establish 5 inch water supply into first arriving pumper	1
Rescue	Search & Rescue with additional back-up pre-connect	2
Rapid Intervention Team	On standby should firefighter rescue be required	2
Exposures, Utilities, Ventilation	Establish additional hose line if required to protect exposures and/or shut down utilities (e.g. natural gas). Provide ventilation as needed	2 * assisted by water supply team
Confinement	Secondary search & rescue and fire attack operations with back up hose lines.	2
Total		**14**

Effective Response Force (ERF) for structure fire with high risk occupancy: Example is a large commercial or industrial property.

Representative Tasks

The following table depicts LCFD's likely critical tasks for a high risk structure fire with a hydrant water supply, and concludes with an Effective Response Force (ERF) of 18 personnel.

Rescue and Subsequent Fire Control	Firefighter Tasks	Number of Firefighters
Size-up, Incident Command, Accountability	Incident Command assumed by Battalion Chief	1
Attack Line	Establish a pre-connect hose line for initial firefighting, search & rescue	2
	First arriving officer to supervise interior operations once command assumed by Battalion Chief	1
Establish Water Supply	Water supply hook-up to hydrant with 5 inch hose	1
	Establish 5 inch water supply into first arriving pumper	1
Rescue	Search & Rescue with additional back-up pre-connect	2
Rapid Intervention Team	On standby should firefighter rescue be required	2
Exposures, Utilities, Ventilation	Establish additional hose line if required to protect exposures and/or shut down utilities (e.g. natural gas). Provide ventilation as needed	2 * assisted by water supply team
Confinement	Additional search & rescue and fire attack operations with back up hose lines	6
Total		**18**

Effective Response Force (ERF) for an EMS response in the low category: Example is typical first responder response.

EMS	Firefighter Tasks	Number of Firefighters
Deliver patient care	Provide emergency medical services care at the EMT level with appropriate medical equipment	2
Total		**2**

Effective Response Force (ERF) for an EMS response in the moderate category: Example is a first responder code (pulseless non breathing patient).

EMS	Firefighter Tasks	Number of Firefighters
Deliver patient care	Provide emergency medical services care at the EMT level with appropriate medical equipment: including CPR and defibrillation	4
Total		**4**

Effective Response Force (ERF) for an EMS response in the high category: Example is a vehicle accident with injuries.

EMS	Firefighter Tasks	Number of Firefighters
Deliver Patient Care	Provide emergency medical services care at the EMT level with appropriate medical equipment	3
Conduct Vehicle Extrication	Provide vehicle extrication with the appropriate extrication equipment	2
Total		**5**

Effective Response Force (ERF) for a rescue response in the low category: Example is a person trapped in an elevator.

Rescue	Firefighter Tasks	Number of Firefighters
Conduct Rescue Operations	Provide rescue services with the appropriate rescue equipment	3
Total		**3**

Effective Response Force (ERF) for a rescue response in the moderate category: Example is a typical water rescue or technical rescue response with a single victim.

Rescue	Firefighter Tasks	Number of Firefighters
Size-up, Incident Command, Accountability	Incident Command assumed by Battalion Chief	1
Operations Officer	Establish an operations officer to run the operations of the incident	1
Conduct Rescue Operations	Provide rescue services with the appropriate equipment (boats, rapid deployment crafts, technical rescue equipment) for a single victim rescue or a small scale incident	10
Support/Safety	Provide support (rescue back up team) and safety officer	2
Total		**14**

Effective Response Force (ERF) for a rescue response in the high category: Example is a water rescue or technical rescue response with multiple victims.

Rescue	Firefighter Tasks	Number of Firefighters
Size-up, Incident Command, Accountability	Incident Command assumed by Battalion Chief	1
Operations Officer	Establish an operations officer to run the operations of the incident	1
Conduct Rescue Operations	Provide rescue services with the appropriate equipment (boats, rapid deployment crafts, technical rescue equipment) to rescue multiple victims or a large scale incident	14
Support/Safety	Provide support (rescue back up team) and safety officer	2
Total		**18**

Effective Response Force (ERF) for a hazardous materials response in the low category: Example is a vehicle leaking fuel or a carbon monoxide alarm investigation.

Hazardous Materials	Firefighter Tasks	Number of Firefighters
Conduct Hazardous Materials Operations	Provide hazardous materials services with the appropriate rescue equipment	3
Total		**3**

Effective Response Force (ERF) for a hazardous materials response in the moderate category: Example is a spill or leak mitigation or a single victim rescue.

Hazardous Materials	Firefighter Tasks	Number of Firefighters
Size-up, Incident Command, Accountability	Incident Command assumed by Battalion Chief	1
Operations Officer	Establish an operations officer to run the operations of the incident	1
Conduct Hazardous Materials Operations (identify, monitor, sample, evacuate, rescue, decontaminate)	Provide hazardous materials services with the appropriate equipment (entry team, back up entry team, decon, research, medical support) for a single victim rescue or a small scale incident	13
Liaison/Safety	Provide support services and a safety officer	2
Total		**17**

Effective Response Force (ERF) for a hazardous materials response in the high category: Example is a large spill or leak investigation or a multiple victim rescue.

Hazardous Materials	Firefighter Tasks	Number of Firefighters
Size-up, Incident Command, Accountability	Incident Command assumed by Battalion Chief	1
Operations Officer	Establish an operations officer to run the operations of the incident	1
Conduct Hazardous Materials Operations (identify, monitor, sample, evacuate, rescue, decontaminate)	Provide hazardous materials services with the appropriate equipment (entry team, back up entry team, decon, research, medical support) for a multiple victim rescue or a large scale incident	20
Liaison/Safety	Provide support services and a safety officer	2
Total		**24**

Effective Response Force (ERF) for an emergency report out in the low category: Example is a power line complaint or water complaint.

Report Out	Firefighter Tasks	Number of Firefighters
Mitigate Incident	Provide services with the appropriate equipment to mitigate the incident (investigate and mitigate complaint)	3
Total		**3**

Effective Response Force (ERF) for an emergency report out in the moderate category: Example is an odor complaint.

Report Out	Firefighter Tasks	Number of Firefighters
Mitigate Incident	Provide services with the appropriate equipment to mitigate the incident investigate and mitigate complaint)	4
Total		**4**

Effective Response Force (ERF) for an emergency report out in the high category: Example is a bomb threat or airport stand-by.

Report Out	Firefighter Tasks	Number of Firefighters
Size-up, Incident Command, Accountability	Incident Command assumed by Battalion Chief	1
Mitigate Incident	Provide services with the appropriate equipment to mitigate the incident (investigate and secure area)	7
Total		**8**

The Following pages contain response data collected from 2013-2017 that are categorized in the High Risk Category and include the Effective Response Force response.

Fire Supression - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:06	00:41	00:51	00:53	01:01	01:22	*01:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:34	01:30	01:40	01:12	00:54	01:32	*01:20*
Travel Time	Travel Time 1st Unit Distribution	URBAN	04:43	04:41	03:37	03:36	04:32	07:17	*04:00*
	Travel Time ERF Concentration	URBAN	40:08	42:33	46:31	18:57	25:34	42:45	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	05:19	05:02	04:13	04:15	05:04	07:38	*05:20*
			n = 46	***n = 8***	***n = 11***	***n = 7***	***n = 11***	***n = 9***	
	Total Response Time ERF Concentration	URBAN	41:15	43:16	47:43	20:22	26:11	43:25	*09:20*
			n = 46	***n = 8***	***n = 11***	***n = 7***	***n = 11***	***n = 9***	

EMS - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:24	01:24	01:18	01:18	01:24	01:34	*01:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:38	01:44	01:39	01:32	01:34	01:35	*01:00*
Travel Time	Travel Time 1st Unit Distribution	URBAN	04:53	04:31	05:05	04:47	05:08	04:35	*08:00*
	Travel Time ERF Concentration	URBAN	08:07	08:44	07:20	08:19	08:18	07:41	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	05:58	05:54	06:19	05:42	06:24	05:56	*09:00*
			n = 1,232	***n = 266***	***n = 278***	***n = 222***	***n = 223***	***n = 243***	
	Total Response Time ERF Concentration	URBAN	10:08	11:25	09:25	09:46	10:28	09:56	*09:00*
			n = 1,232	***n = 266***	***n = 278***	***n = 222***	***n = 223***	***n = 243***	

Water Rescue - 90th Percentile Times			2013 - 2017	2017	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	00:26	00:28	00:00	*01:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:04	00:13	01:25	*01:20*
Travel Time	Travel Time 1st Unit Distribution	URBAN	04:39	04:39	02:27	*04:00*
	Travel Time ERF Concentration	URBAN	04:39	04:39	02:27	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	04:39	04:39	02:27	*05:20*
			n = 4	***n = 3***	***n = 1***	
	Total Response Time ERF Concentrationn	URBAN	04:39	04:39	02:27	*09:20*
			n =	***n =***	***n =***	

Public Assist - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:36	00:59	02:04	01:33	01:36	01:38	*02:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:31	01:58	01:19	01:27	01:27	01:11	*02:00*
Travel Time	Travel Time 1st Unit Distribution	URBAN	04:42	07:07	03:28	03:20	03:33	03:32	*08:00*
	Travel Time ERF Concentration	URBAN	04:42	07:07	03:28	03:20	03:33	03:32	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	04:42	07:07	03:28	03:20	03:33	03:32	*05:20*
			n = 45	***n = 8***	***n = 5***	***n = 11***	***n = 13***	***n = 8***	
	Total Response Time ERF Concentration	URBAN	04:42	07:07	03:28	03:20	03:33	03:32	*09:20*
			n = 45	***n = 8***	***n = 5***	***n = 11***	***n = 13***	***n = 8***	

Good Intent - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:58	01:57	02:15	01:36	01:55	02:27	*02:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:27	01:28	01:27	01:29	01:22	01:24	*02:00*
Travel Time	Travel Time 1st Unit Distribution	URBAN	04:33	05:34	04:53	03:56	03:32	03:28	*08:00*
	Travel Time ERF Concentration	URBAN	04:33	05:34	04:53	03:56	03:32	03:28	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	04:33	05:34	04:53	03:56	03:32	03:28	*08:00*
			n = 168	***n = 42***	***n = 28***	***n = 36***	***n = 32***	***n = 30***	
	Total Response Time ERF Concentrationn	URBAN	04:33	05:34	04:53	03:56	03:32	03:28	*09:20*
			n =	***n =***	***n =***	***n =***	***n =***	***n =***	

False Alarms - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:27	01:32	01:16	01:29	01:24	01:34	*02:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:31	01:36	01:33	01:33	01:23	01:27	*02:00*
Travel Time	Travel Time 1st Unit Distribution	URBAN	04:41	05:02	04:46	04:33	04:11	04:17	*08:00*
	Travel Time ERF Concentration	URBAN	04:41	05:02	04:46	04:33	04:11	04:17	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	04:41	05:02	04:46	04:33	04:11	04:17	*08:00*
			n = 1,098	***n = 208***	***n = 231***	***n = 215***	***n = 238***	***n = 206***	
	Total Response Time ERF Concentrationn	URBAN	04:41	05:02	04:46	04:33	04:11	04:17	*09:20*
			n =	***n =***	***n =***	***n =***	***n =***	***n =***	

The Following pages contain response data collected from 2013-2017 that are categorized in the Moderate Risk Category and include the Effective Response Force response.

Fire Supression - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:11	00:54	01:16	01:14	01:12	01:01	*01:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:36	01:42	01:33	01:36	01:22	01:15	*01:20*
Travel Time	Travel Time 1st Unit Distribution	URBAN	04:49	04:53	04:15	04:53	05:00	03:58	*04:00*
	Travel Time ERF Concentration	URBAN	09:42	11:35	09:34	07:59	09:29	08:23	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	05:28	05:26	05:11	05:57	05:55	04:47	*05:20*
			n = 179	***n = 38***	***n = 36***	***n = 36***	***n = 30***	***n = 39***	
	Total Response Time ERF Concentration	URBAN	11:36	13:35	11:33	10:20	11:41	09:38	*09:20*
			n = 179	***n = 38***	***n = 36***	***n = 36***	***n = 30***	***n = 39***	

Haz Mat - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:24	00:30	01:28	01:22	01:04	01:08	*01:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:10	00:34	01:06	01:05	01:15	00:53	*01:20*
Travel Time	Travel Time 1st Unit Distribution	URBAN	03:53	04:17	03:27	01:15	03:38	02:36	*04:00*
	Travel Time ERF Concentration	URBAN	20:15	05:57	09:39	05:57	22:25	07:59	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	04:31	04:29	04:15	02:20	04:40	03:29	*05:20*
			n = 11	***n = 2***	***n = 4***	***n = 1***	***n = 3***	***n = 1***	
	Total Response Time ERF Concentration	URBAN	22:52	06:56	11:52	08:24	23:54	10:00	*09:20*
			n = 11	***n = 2***	***n = 4***	***n = 1***	***n = 3***	***n = 1***	

EMS - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:31	01:26	01:31	01:30	01:27	01:38	*01:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:39	01:47	01:42	01:35	01:27	01:38	*01:00*
Travel Time	Travel Time 1st Unit Distribution	URBAN	04:56	05:10	04:29	05:04	04:53	04:59	*08:00*
	Travel Time ERF Concentration	URBAN	04:59	05:10	04:29	05:05	04:57	05:00	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	05:57	06:14	05:45	05:56	05:47	05:53	*09:00*
			n = 4,480	***n = 970***	***n = 892***	***n = 895***	***n = 880***	***n = 843***	
	Total Response Time ERF Concentration	URBAN	06:57	07:14	06:47	06:56	06:51	06:53	*09:00*
			n = 4,480	***n = 970***	***n = 892***	***n = 895***	***n = 880***	***n = 843***	

Technical Rescue - 90th Percentile Times			2013 - 2017	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	00:00	00:00	*01:00*
Turnout Time	Turnout Time 1st Unit	URBAN	00:00	00:00	*01:20*
Travel Time	Travel Time 1st Unit Distribution	URBAN	10:21	10:21	*04:00*
	Travel Time ERF Concentration	URBAN	10:21	10:21	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	10:21	10:21	*05:20*
			n = 1	***n = 1***	
	Total Response Time ERF Concentration	URBAN	10:21	10:21	*09:20*
			n = 1	***n = 1***	

Public Assist - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	03:16	03:55	03:46	02:40	02:39	02:24	*02:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:59	02:15	02:04	02:04	01:37	01:50	*02:00*
Travel Time	Travel Time 1st Unit Distribution	URBAN	05:54	06:15	06:05	05:52	05:08	05:23	*08:00*
	Travel Time ERF Concentration	URBAN	05:54	06:15	06:05	05:52	05:08	05:23	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	05:54	06:15	06:05	05:52	05:08	05:23	*05:20*
			n = 756	***n = 194***	***n = 212***	***n = 153***	***n = 124***	***n = 73***	
	Total Response Time ERF Concentration	URBAN	05:54	06:15	06:05	05:52	05:08	05:23	*09:20*
			n = 756	***n = 194***	***n = 212***	***n = 153***	***n = 124***	***n = 73***	

Good Intent - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	02:14	01:58	02:33	01:49	02:33	02:04	*02:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:53	01:57	02:00	01:55	01:32	01:59	*02:00*
Travel Time	Travel Time 1st Unit Distribution	URBAN	05:14	05:14	05:50	06:08	04:30	04:23	*08:00*
	Travel Time ERF Concentration	URBAN	05:14	05:14	05:50	06:08	04:30	04:23	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	05:14	05:14	05:50	06:08	04:30	04:23	*08:00*
			n = 347	***n = 88***	***n = 81***	***n = 57***	***n = 75***	***n = 46***	
	Total Response Time ERF Concentrationn	URBAN	05:14	05:14	05:50	06:08	04:30	04:23	*09:20*
			n =	***n =***	***n =***	***n =***	***n =***	***n =***	

False Alarms - 90th Percentile Times			2013 - 2017	2017	2016	2015	2014	2013	Benchmark
Alarm Handling	Pick-up to Dispatch	URBAN	01:37	01:31	01:42	01:36	01:31	01:46	*02:00*
Turnout Time	Turnout Time 1st Unit	URBAN	01:33	01:33	01:48	01:33	01:31	01:18	*02:00*
Travel Time	Travel Time 1st Unit Distribution	URBAN	06:37	07:48	06:14	06:22	06:28	06:35	*08:00*
	Travel Time ERF Concentration	URBAN	06:37	07:48	06:14	06:22	06:28	06:35	*08:00*
Total Response Time	Total Response Time 1st Unit Distribution	URBAN	06:37	07:48	06:14	06:22	06:28	06:35	*08:00*
			n = 674	***n = 129***	***n = 138***	***n = 137***	***n = 149***	***n = 121***	
	Total Response Time ERF Concentrationn	URBAN	06:37	07:48	06:14	06:22	06:28	06:35	*09:20*
			n =	***n =***	***n =***	***n =***	***n =***	***n =***	

Demand Planning Zone Evaluation

All emergency incident types from the beginning of 2013 to end of 2017 were evaluated in each of the forty seven planning zones. The focus was to determine what zones posed the greatest number of emergency responses that were outside of the established benchmark of 6 minutes 20 seconds. The agency recorded emergency 90th percentile total response times of the first arriving unit in the forty seven planning zones. See Appendix D and J for the results of this demand zone evaluation.

Observations:

Fringe areas of the city have worse total response times than the core areas of the city (which is to be expected as fire station locations are in the core areas of the city). In most cases the fringe planning zones only contain a small portion of the city. Some fringe areas of the city have little to no request for agency services (for example; A3, B1, B9, C1, C2, E12, F6, F7, F9, F10, F12, G2, G3, and G4). Some fringe areas of the city have a small number of requests for agency services (for example; B2, B3, B5, B6, B8, C3, E3, E4, E5, F3, F4, F5, and F11). The bottom line is that the agency has poor total response times to the fringe areas of the city, but the call volume is low to these areas.

Total response times meet agency benchmarks in the core areas of the city, where agency fire stations are located (C5, C6, C7, and D8), and in close proximity to agency fire stations (planning zones surrounding C5, C6, C7, and D8).

The areas of greatest concern are where the agency has a higher call volume, but does not meet total response time benchmarks. These areas are mainly in the southeast portion of the city (for example; D9, D10, E9, E10, E11). Several of these areas require agency apparatus to travel via the State Road Overhead (Overpass) to avoid north/south train tracks which dissect the city from east to west. Station 3 apparatus use the State Road Overhead whenever they have an emergency response east of the train track, which slows response times, but ensures the arrival of apparatus versus being totally delayed by a train.

Compliance Methodology

Introduction

The purpose of this section is to determine the how, when, and what will be measured to ensure the Standards of Cover is valid and continues to provide the appropriate direction for the strategic planning process.

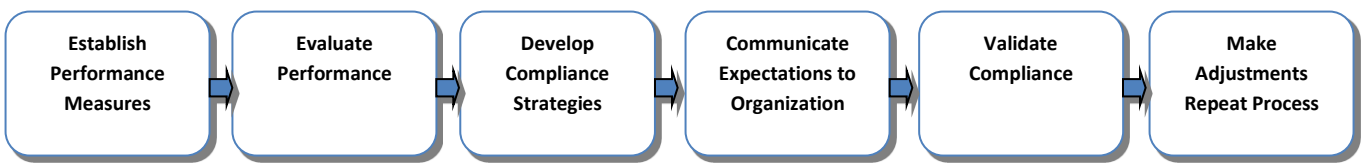
Compliance methodology requires that the service level objectives and performance measures are evaluated and efforts are made to reach or maintain the established levels.

The overall responsibility for the agency's ongoing efforts to provide analysis and evaluation of the adopted Standards of Cover has been assigned to the Captain of Administration that serves as the accreditation manager. Assistance will be provided by the agency's management staff, computer trainers, and other assigned designates in accordance with their established responsibility and work-plans.

The agency will continue to use Zoll Fire Records Management (RMS) system and is in the process of adding First Watch to measure response in real time for future analysis and evaluation of the Standards of Cover. The agency has also added Lexipol to assist in policy KMS and Target Solutions for training and certification tracking.

Compliance Model

The following compliance model is utilized to demonstrate the entire six-step systematic approach that will be taken on an annual basis. Certain components within the full model may be conducted more frequently (quarterly or bi-annually) to account for any unforeseen system variables



Strategic Plan

The agency will complete its Strategic Plan for 2019-2023 at the end of 2018. This plan will include analysis and strategic objectives and initiatives. This SOC document's conclusion and recommendations will include information from the Strategic Plan is addition to data analysis completed in the SOC.

See 2019 – 2023 Strategic Plan.

Conclusions/Recommendations

The agency has experienced success during the time period since the development of its first Standards of Cover document and the focus it brought to quality improvement. With a new Fire Chief, new senior management structure, new Accreditation Manager, and many other departmental leadership roles that have new members in place, the agency has a renewed focus on quality improvement data and goals. A summary of recommendations are as follows in no particular order of importance:

1. The agency is upgrading its data analysis software to the First Watch data management platform in 2018. The First Watch program will allow the agency to address issues more timely and effectively by affording us the opportunity to have response data in a real time format, as well as data assessment tools to evaluate cross divisional information.
    - Annual unit activity reporting should include 90th percentile by unit and shift.
    - The LCFD should consider refining the way it reports fire loss to include contents loss, structure loss values.
    - Capture community risk management and marketing metrics using internal databases sources.
    - Address inconsistencies in turnout time and evaluate by station, shift and unit.
2. The agency is working as part of a citywide transition to the EnerGov platform for tracking and managing building inspection data and progress. Future work will be done to integrate preplanning and chronic nuisance building strategies between all city departments.
    - Create goals and statistic metrics to analyze efficiency and impact of Building Inspection and Fire Prevention activities.
3. The agency is in the process of replacing Engine 4 and that project is expected to be completed in 2018. The agency is also in the process of replacing its 1985 Water Tender with a new, combined Pumper/Tender in 2019. This will not only provide us a more reliable water tender, but also add a versatile reserve engine to our fleet.
4. The agency will begin to merge its existing policies and procedures into the Lexipol Knowledge Management System in 2018, in effort to provide dependable and defendable

policy to our personnel. The system also affords us individual policy acknowledgement accountability and additional training capacity.

5. Beginning in 2018, the agency will begin using the Target Solutions training management platform for training and occupational compliance standards. This program will allow the agency to better track certifications, probationary firefighter task books, education assignments and verify individual training records.
6. The agency has completed ongoing needs assessment of decontamination equipment and procedures. Occupational exposure awareness training has been completed in 2017 to address alarming health statistics, and the agency will focus its efforts on adding exhaust capture systems and turnout gear extractors in all four fire stations as future opportunities and budgets processes allow.
7. The end of 2017 has shown some initial promise towards an emerging opportunity to get the agency's Paramedic-level trained personnel approved to work as first-response Paramedics within our response system. This would address recruitment and retention issues and allow the agency to provide a higher standard of care. Negotiations will continue into 2018 with the hopes of a pilot program beginning in early 2019.

Although the agency has identified specific improvement needs and challenges, it is confident that by working within the established parameters identified above and within other applicable accreditation documents, the agency will meet its performance objectives and the expectations of the CFAI.