LINCOLN FIRE & RESCUE

STANDARDS OF COVER

2018-2023

CONTRIBUTORS

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COMMUNITY HISTORY

When Nebraska became a state, in 1867, a new state capitol was needed. Originally, the territorial capitol was in Omaha, in the eastern part of the state. Omaha was a growing city along the Missouri River and was the headquarters of the newly formed Union Pacific Railroad. With much debate, the capitol was moved to Lincoln, a somewhat more centralized location within the state. Lincoln began to grow rapidly, both in population and size. Contributing to this growth was the development of five separate railroads passing through the city. Over the years, these rail companies triggered a rapid population increase. With this rapid growth, Lincoln recognized a need for fire protection.

Initially, volunteer fire companies sprang up. These companies operated out of livery stables and eventually purchased steamers for fire protection purposes. These volunteer companies survived a few years then disbanded, usually from a lack of financial support. By 1885, the citizens of Lincoln determined the need for a full-time, paid fire department. On January 4th, 1886, Mayor H.C. Burr organized the Lincoln Fire Department (LFD). An engine house and headquarters were then erected on the north edge of the downtown area and Fire Station 1 was established.

Within 3 years, Stations 2 and 3 were built and occupied, with Station 2 landing on the east side of downtown and Station 3 to the South. With the city expanding in different directions, all three stations were equipped with a hook and ladder truck, steam engines, and/or hose and chemical companies. In 1910, Station 4 was built adding to the east side of Lincoln.

During the latter part of the nineteenth century, four suburbs had sprung up east of Lincoln. Three of these, Bethany, College View, and University Place were established around newly formed colleges. The fourth, Havelock, was built around the large shops of the Burlington and Missouri River Railroads. All the suburbs had volunteer fire companies, each with stations and personnel. These suburbs were subsequently annexed into Lincoln between 1926 and 1930. Their fire stations and equipment, except for the town of Bethany, were absorbed by LFD. With the absorption of these towns, Stations 5, 6, and 7 materialized. Havelock's original Station 5 lives on as a restaurant.

(Lincoln Journal-Star, 2018)

During World War II, many Lincoln firefighters joined the military. With this reduction in force, Station 4 was closed. Station 7, in Havelock, then became Station 4. Additionally, the Lincoln Airport saw the construction of the Lincoln Army Air Field. This base was deactivated after the war, reopened as an Air Force Base in 1952, and permanently ceased operation in 1966. LFD then assumed all responsibility for ARFF operations. Station 11 was opened to provide fire protection to the entire area, including former base housing, gifted to Lincoln Housing and Urban Development.

*ARFF training, circa 1966 (Lincoln Journal-Star, 2018)

With Lincoln's growth and numerous annexations, large areas of the city had inadequate fire service coverage. After much deliberation, in the late 1950s, Stations 7 and 8 were built. In the mid-1960s, the City of Lincoln opened Stations 9 and 10. Stations 12 and 13 were built in the 1970s and 80s respectively to provide coverage to Lincoln's far eastern and western boundaries. In 1994, the now named Lincoln Fire & Rescue's (LF&R) most recent station, 14, was built in northwest Lincoln.

ABOUT LINCOLN, NE

Named after our 16th president, Lincoln is the second most populated city in Nebraska and home to the University of Nebraska's main campus (UNL). Lincoln is also home to several other colleges and universities including Bryan College of Health Sciences, Nebraska Wesleyan University, Southeast Community College, Union College, and satellite campuses for both Doane and Bellevue Universities. Nebraska's state government and UNL are both large contributors to the local economy along with other prominent industries including health care, financial services, and technology. Many popular events are held in Lincoln including state high school championship events, UNL sporting events, Lincoln Stars hockey, Lincoln Saltdogs baseball, the annual International Thespian Festival, hosted by UNL, the Lancaster County Fair, and the Capital City Ribfest. Lincoln also has an extensive park system, with over 100 individual parks (Forbes, 2017).

A thriving and prideful community, Lincoln appears in a host of "best of" lists including best places to raise a family, Silicon Prairie Cities, best place to start a career, most romantic cities, Midwest startup cities, most caring cities, and top travel destinations (Journal-Star, 2017). Lincoln boasts one of the lowest unemployment rates in the nation (Bureau of Labor Statistics, 2017) and is the fastest growing city in Nebraska (Kiersz, 2017).

https://www.youtube.com/watch?v=8M1rT9hX1nE

https://www.youtube.com/watch?v=5AVC-e7p5k8

LEGAL EXISTENCE OF LINCOLN FIRE & RESCUE

The City of Lincoln, Nebraska, is legally defined as a city of the primary class pursuant to Neb. Rev. Stat. § 15-101 (2017):

> All cities having more than one hundred thousand and less than three hundred thousand inhabitants as determined by the most recent federal decennial census or the most recent revised certified count by the United States Bureau of the Census shall be known as cities of the primary class. The population of a city of the primary class shall consist of the people residing within the territorial boundaries of such city and the residents of any territory duly and properly annexed to such city.

The City of Lincoln is granted the authority to establish the fire department pursuant to Neb. Rev. Stat. § 15-225 (2017):

> A primary city shall have power to provide for the organization of a fire department, to procure fire engines, hooks, ladders, buckets and other apparatus, to organize fire engine, hook, ladder and bucket companies, to prescribe rules of duty, and the government thereof, with such penalties as the council may deem proper, not exceeding a one-hundred-dollar fine, to make all necessary appropriations therefor, and to establish regulations for the prevention and extinguishment of fires.

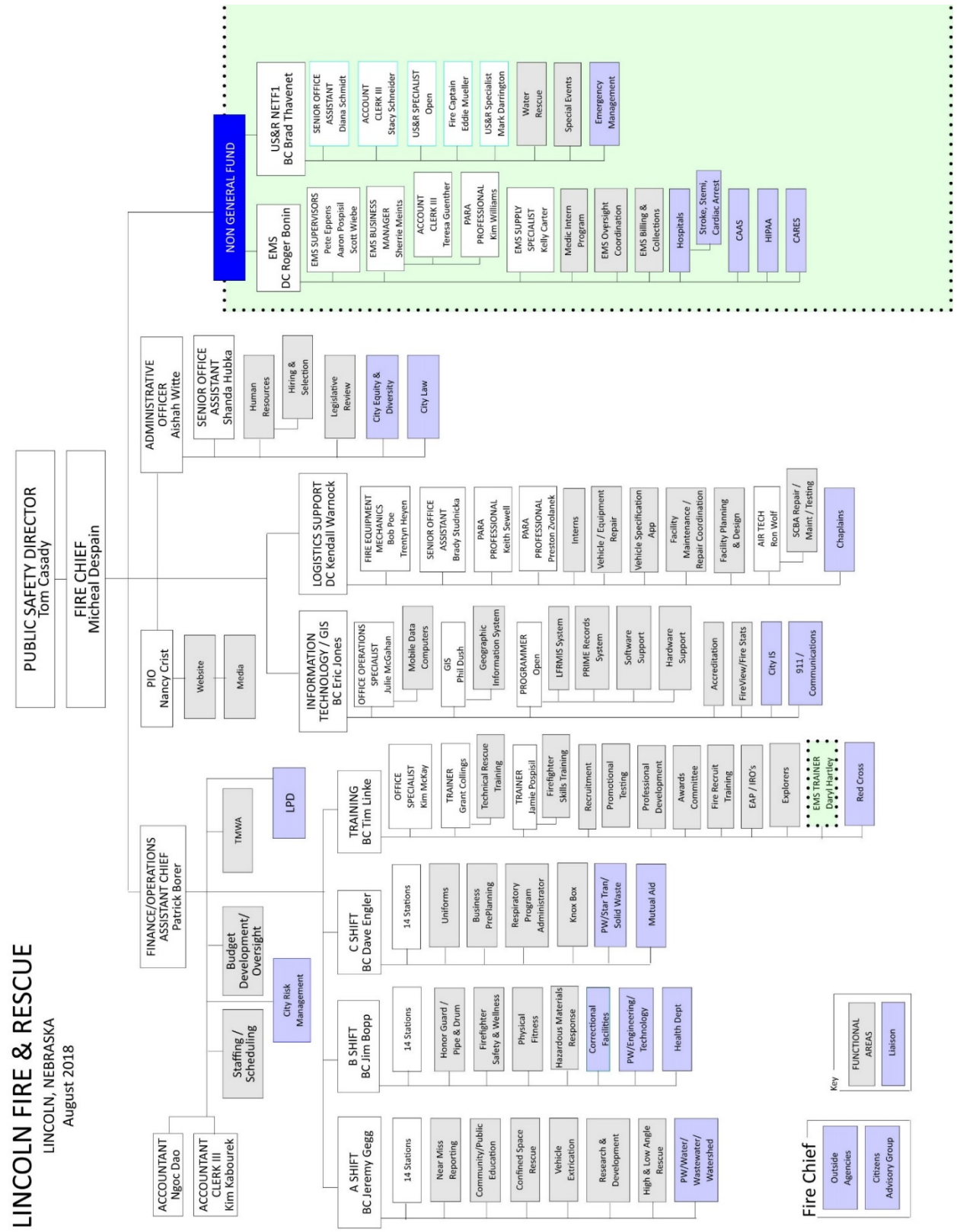
LEGAL AUTHORITY. Within the structure of local government, the fire chief is granted authority, under the supervision of the Mayor, to manage the fire department under Lincoln Municipal Code (LMC) § 2.02.020:

> The administration of the affairs of the city shall be performed under the direction and supervision of the Mayor by the following departments, each of which department shall have the necessary staff and a director as designated herein. (c) Fire – Fire Chief.

LMC § 2.02.060 (2017) defines the fire department, specifically the fire chief:

> Under the direction and supervision of the Mayor, the Fire Chief shall have charge and supervision over the Fire and Rescue Department and such divisions as the Fire Chief shall designate. The Fire Chief shall have such duties as provided by the ordinances of the city, this code, and as may be provided by the Mayor or by the City Council consistent with the Charter of the City of Lincoln.

ORGANIZATIONAL CHART



INSURANCE SERVICE OFFICE (ISO) RATING. For a broad array of commercial and personal lines of insurance, ISO provides statistical, actuarial, underwriting, claims information and analyses; consulting and technical services; policy language; information about specific locations and communities; fraud-identification tools; and data processing. In the United States and around the world, ISO serves insurers, reinsurers, agents, brokers, self-insurers, risk managers, insurance regulators, and other government agencies.

Fire remains one of the leading causes of property loss. A community's efforts to mitigate those losses before, during, or after a fire are of great importance to insurers. For more than 30 years, ISO has used the Fire Suppression Rating Schedule (FSRS) to review the firefighting capabilities of individual communities helping to provide the insurance industry with information on a community's ability to suppress and limit fire losses. The FSRS develops a numerical grading, ISO's Public Protection Classification (PPC), to help insurers differentiate the varying levels of fire protection. Class 1 represents the best public protection, and Class 10 indicates no recognized protection:

Class	Percentage Credited
1	90.00 or more
2	80.00 to 89.99
3	70.00 to 79.99
4	60.00 to 69.99
5	50.00 to 59.99
6	40.00 to 49.99
7	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99
10	0 to 9.99

Lincoln's ISO Score Sheet

FSRS Item	Earned Credit	Credit Available
Emergency Communications		
414. Credit for Emergency Reporting	3	3
422. Credit for Telecommunicators	3.2	4
432. Credit for Dispatch Circuits	3	3
440. Credit for Emergency Communications	9.2	10
Fire Department		
513. Credit for Engine Companies	5.33	6
523. Credit for Reserve Pumpers	0.48	0.5
532. Credit for Pumper Capacity	3	3
549. Credit for Ladder Service	2.69	4
553. Credit for Reserve Ladder and Service Trucks	0.5	0.5
561. Credit for Deployment Analysis	5.56	10
571. Credit for Company Personnel	11.11	15
581. Credit for Training	8.34	9
730. Credit for Operational Considerations	2	2
590. Credit for Fire Department	39.01	50
Water Supply		
616. Credit for Supply System	29.29	30
621. Credit for Hydrants	2.94	3
631. Credit for Inspection and Flow Testing	4	7
640. Credit for Water Supply	36.23	40
Divergence		
1050. Community Risk Reduction	-2.51	
	3.7	5.5
Total Credit:	85.63	105.5

The classification numbers are interpreted as follows:

> Class 1 through (and including) Class 8 represents a fire suppression system that includes an FSRS creditable dispatch center, fire department, and water supply.
>
> Class 8B is a special classification that recognizes a superior level of fire protection in otherwise Class 9 areas. It is designed to represent a fire protection delivery system that is superior except for a lack of a water supply system capable of the minimum FSRS fire flow criteria of 250 GPM for 2 hours.
>
> Class 9 is a fire suppression system that includes a creditable dispatch center, fire department but no FSRS creditable water supply.
>
> Class 10 does not meet minimum FSRS criteria for recognition, including areas that are beyond five road miles of a recognized fire station.

Lincoln's final rating, as of 1/1/2018, is 02/2X, improved from a rating of 3, in effect since 1974. With this improvement, Lincoln's citizens should see improvement in their insurance rates.

See Appendix E for Lincoln's official ISO report.

GOVERNMENT

The City of Lincoln has a strong mayor/city council form of government. City government is divided into departments, each headed by a director who reports directly to the mayor. The mayor is chief executive officer and administrative head of the city government. The mayor is elected on a non-partisan, at-large basis and serves a four-year term, with no term limit at this time. Legislative powers of the city are exclusively vested in the council. The seven city council members are selected in non-partisan elections with four members elected from geographical districts and three elected on an "at large" basis. Essentially, the mayor and city council approve the organizational structure of LF&R with the adoption of an operating budget. As present in the Standards of Cover (SOC), LF&R's administrative structure strives to meet the agency's mission, goals, and objectives within our budgetary constraints.

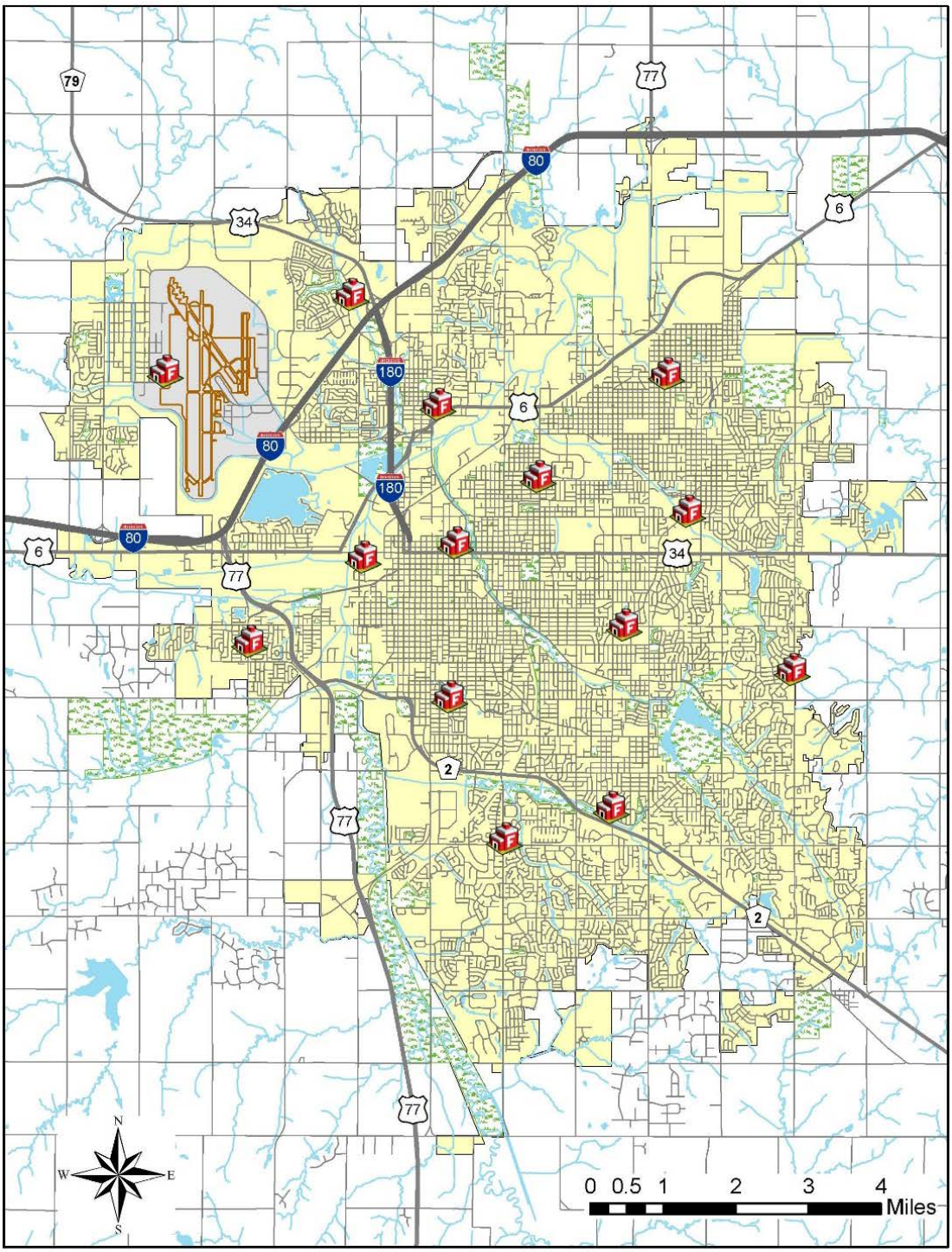
FUNDING. The city's budget, in its entirety, is developed biennially, when the mayor proposes a budget and the city council approves it. During this process, prior budgets are critically analyzed to identify trends to predict funding needs. once the mayor receives budget requests from each city department, meetings are scheduled with department heads and members of the city council. The mayor then determines how much money is allocated to each department. When the proposed budget is finalized, the mayor submits it to the city council who accepts or rejects the proposal. The mayor may also request changes after submission to the city council. Once the mayor and city council collaborate on potential concerns or needs, the final budget is voted upon by the city council. An adopted budget requires a 4-3 majority vote by the city council. Notably, any increase in the tax levy requires a 5-2 super majority vote

The City of Lincoln's top two sources of revenue are sales and property tax. As of the 2018-2019 budget cycle, LF&R has a total budget of $32,868,619, approximately 18 percent of the city's total budget. In addition to tax revenue, the budget includes additional monies collected from an EMS Enterprise Fund, and federal sources. Revenue from LF&R's EMS Enterprise Fund is generated by ambulance operation revenue and funds the ambulance services LF&R provides. Likewise, LF&R's USAR operations are funded through FEMA. For the biennial budget years 2018-2020, LF&R was granted an additional $2,500,000 for in funds earmarked for apparatus replacement, and $1,000,000 for fire station upgrades and remodeling. LF&R's most recent budget is available in Appendix E.

SERVICE AREA BOUNDARIES

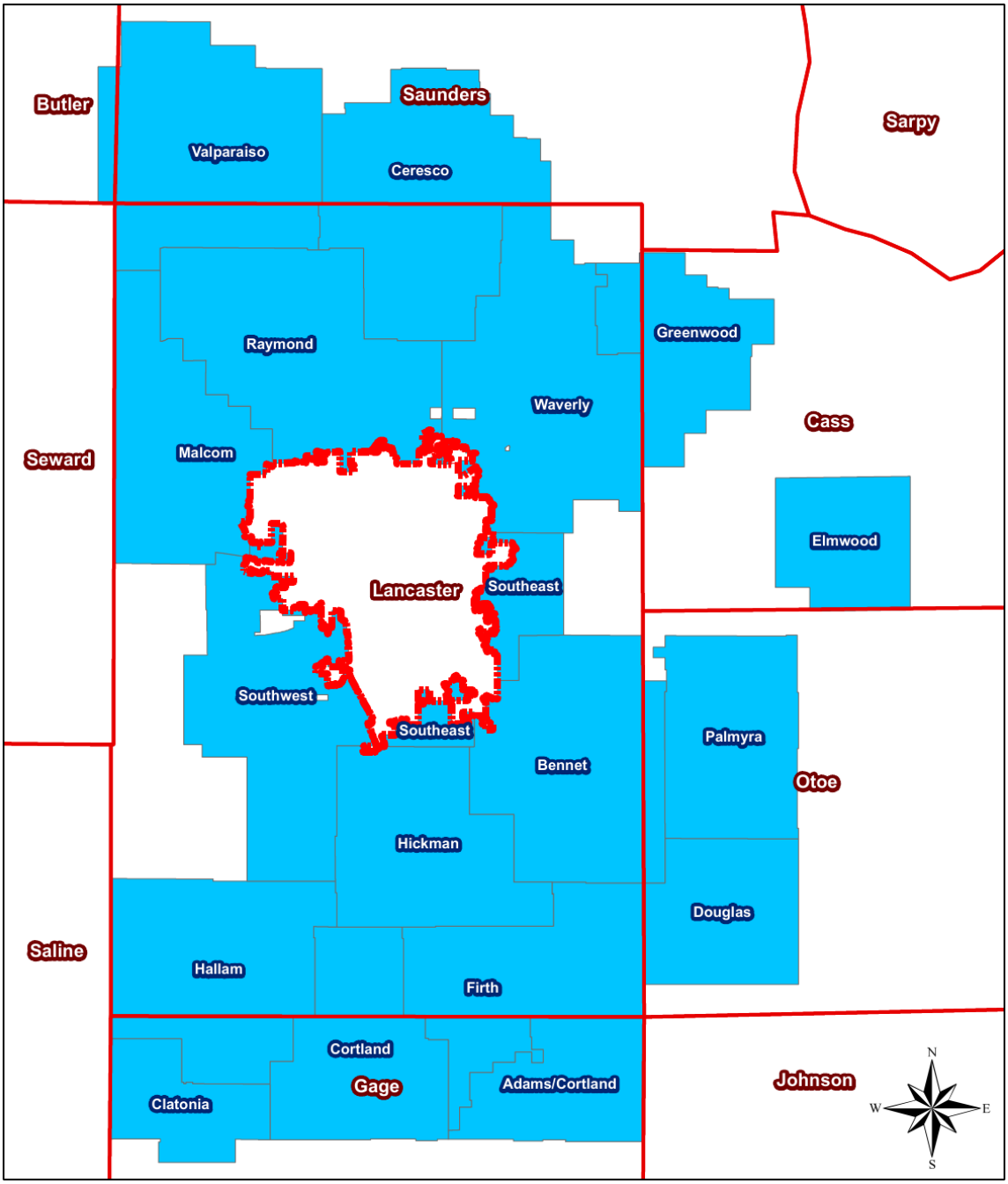
LF&R provides emergency services to the City of Lincoln. The political boundaries of the city and contents within are considered the primary response area.

PRIMARY RESPONSE AREA

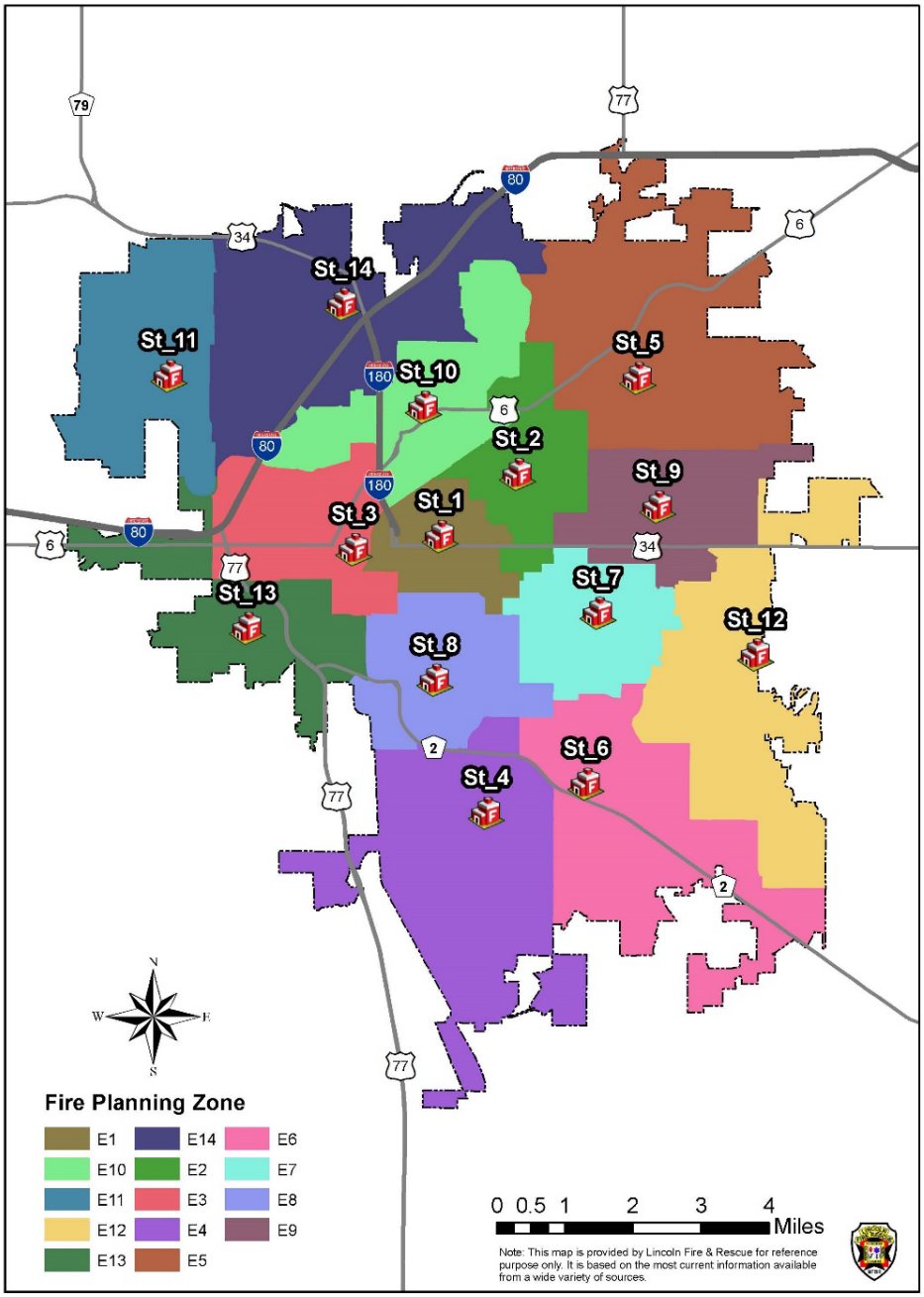


In addition to the city, LF&R provides mutual aid in the form of EMS transport to several rural Lancaster County Fire Protection Districts on a contractual basis. These mutual aid areas begin at the city limits and extend, in some cases, beyond the border of Lancaster County. This is considered the secondary response area.

SECONDARY RESPONSE AREA

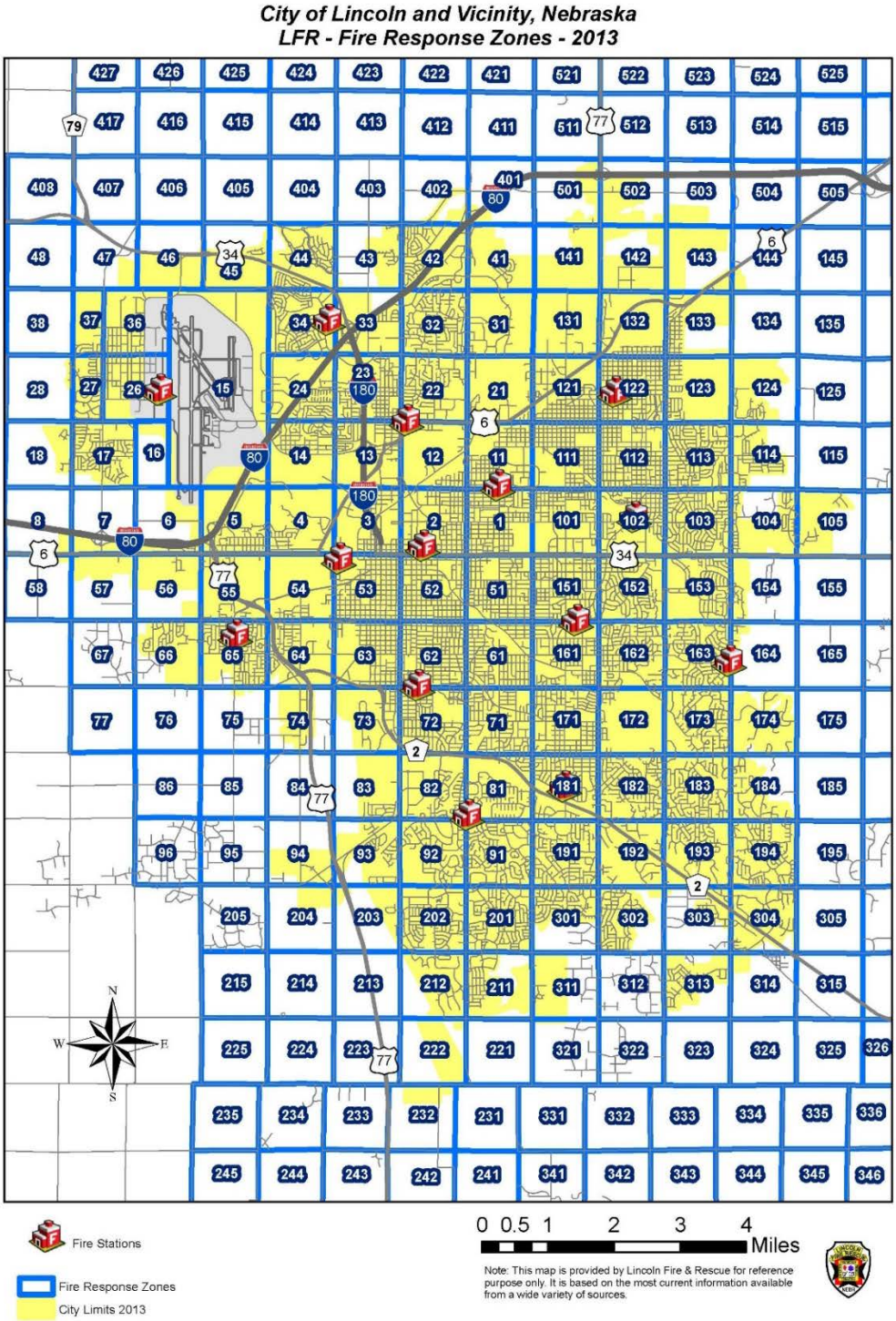


PRIMARY SERVICE AREA CHARACTERISTICS. The primary response area is further broken down into 14 initial dispatch/fire planning zones (FPZs). These zones are the primary response area for each front line/primary response apparatus (engine company) and are used for mapping and informational services.

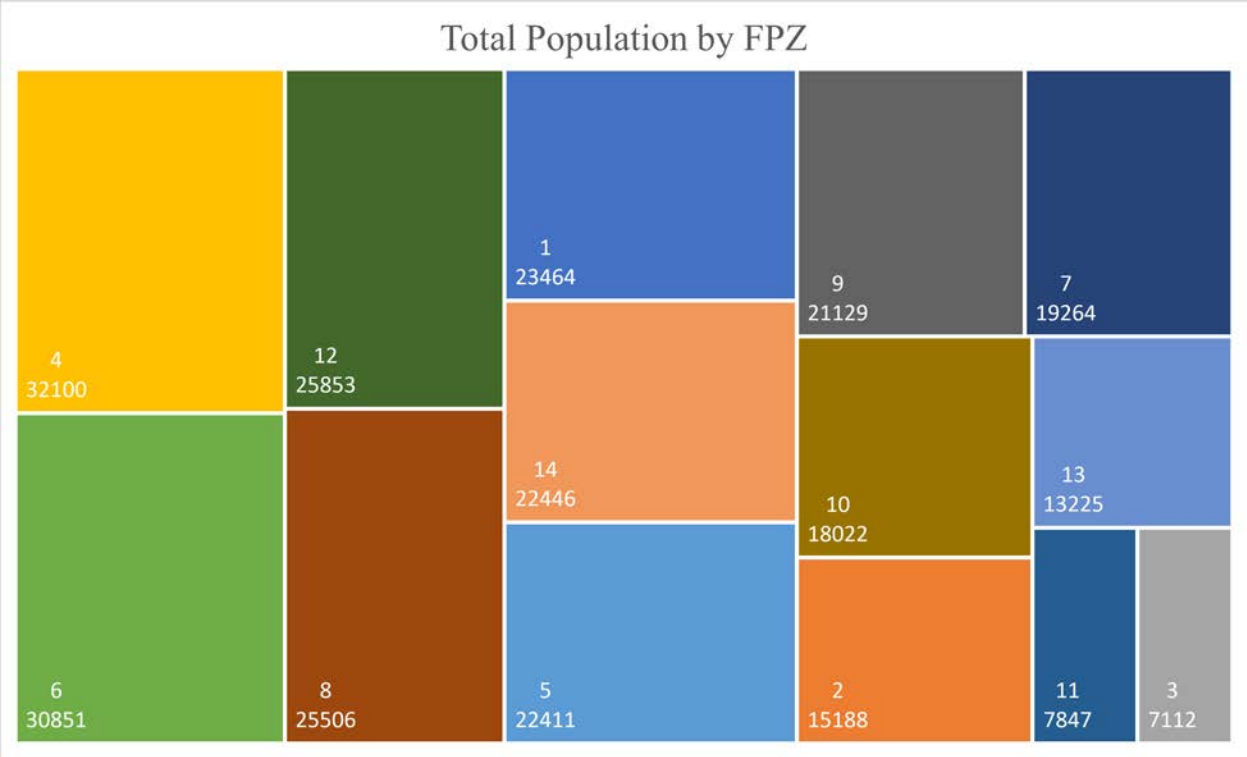


DISPATCH RESPONSE ZONES. The primary response area is also broken down into individual one square mile zones for dispatch purposes.

Example: Engine 10, respond to Zone 22, 1440 Adams Street.



COMMUNITY DEMOGRAPHICS AND POPULATION BY FPZ



Population statistics	
Female percent of population	50%
Male percent of population	50%
Percent of English speakers	88%
Average persons per household	2.4
Housing statistics	
Housing units	118,654
Occupation percentage	95%
Owner occupied	56%
Single family occupancy	67%
Median home value	$160,600
Education statistics	
High school graduate	92.8%
Bachelor’s degree or higher	40.3%

(Censusreporter.com)

FPZ	Caucasian	African American	American Indian	Asian	Pacific Islander	Hispanic	Children < 14 yrs	Seniors > 65 yrs	Diversity Index
1	16010	1859	330	2736	16	2785	2306	1566	60.9
2	10791	1412	258	1129	17	1836	2948	1266	59.5
3	5373	467	86	547	0	1413	1127	681	30.3
4	28361	1024	150	1668	22	1426	6648	4328	63.6
5	20036	697	132	382	37	1405	3975	3554	30.3
6	28581	699	128	1076	39	1411	6046	5665	46.8
7	17061	606	123	526	64	1119	3568	3901	59.9
8	20431	1457	345	943	27	2519	4670	3222	50.4
9	18726	608	90	850	9	1156	3728	3930	49.8
10	13177	1189	253	1439	14	2587	3594	2484	20.4
11	6334	518	119	153	9	1017	2449	446	40
12	24287	398	52	867	2	846	4494	5986	25.6
13	10372	938	153	909	25	1342	3018	886	29.6
14	19310	789	92	2006	35	1485	5261	1708	30.7

*All demographic data supplied by ESRI, unless otherwise noted.

The Diversity Index from ESRI represents the likelihood that two persons, chosen at random from the same area, belong to different race or ethnic groups. (Reese-Cassal, 2014)

As typical with growing communities, Lincoln annexes new lands when expansion needs arise. LF&R continuously monitors these areas to provide a level of service appropriate for the property and population density. For example, a newly annexed neighborhood with a low population density and a rural classification has a different service need than one classified as metropolitan.

LF&R defines population density by specific criteria:

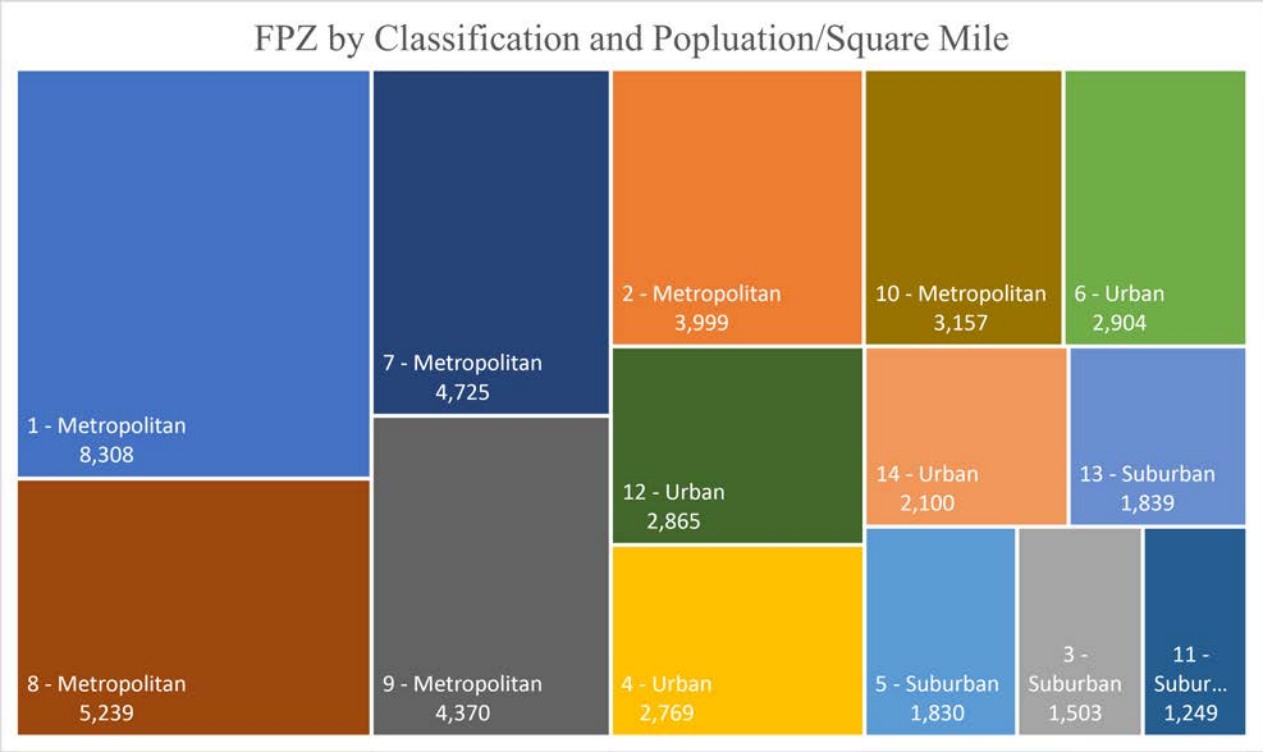
Metropolitan – an incorporated or unincorporated area with a population of over 200,000 people and/or a population density over 3,000 people per square mile.

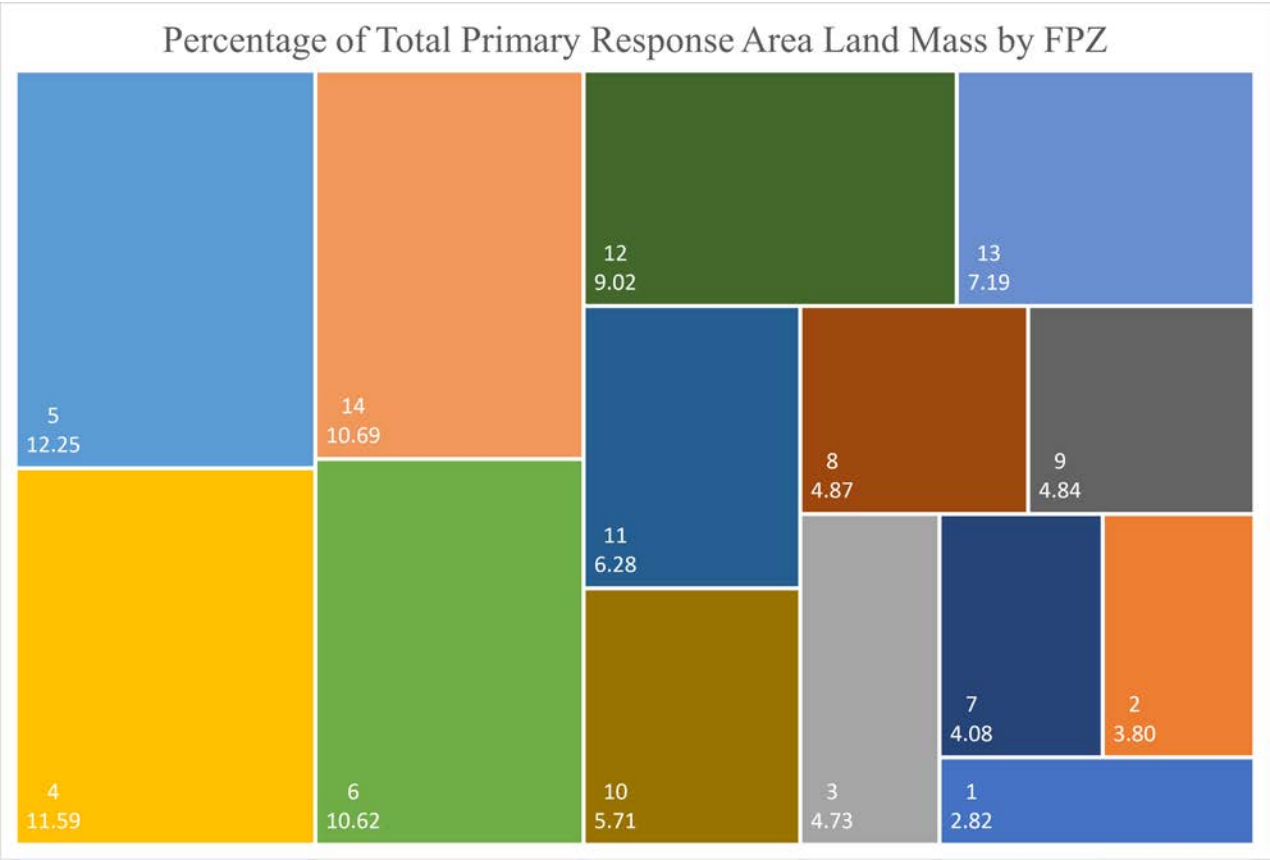
Urban – an incorporated or unincorporated area with a population of over 30,000 people and/or a population density over 2,000 people per square mile.

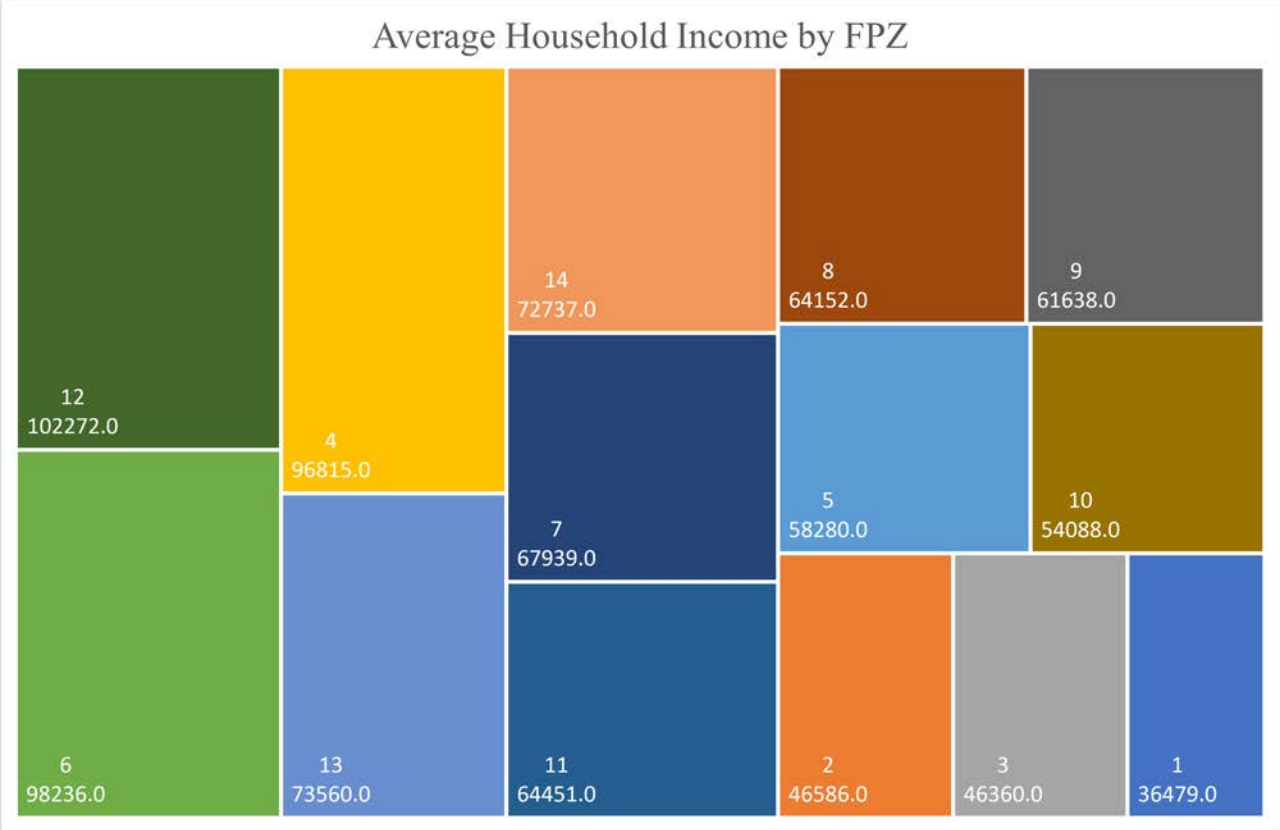
Suburban – an incorporated or unincorporated area with a population of 10,000 to 29,999 and or/any area with a population density of 1,000 to 2,000 people per square mile.

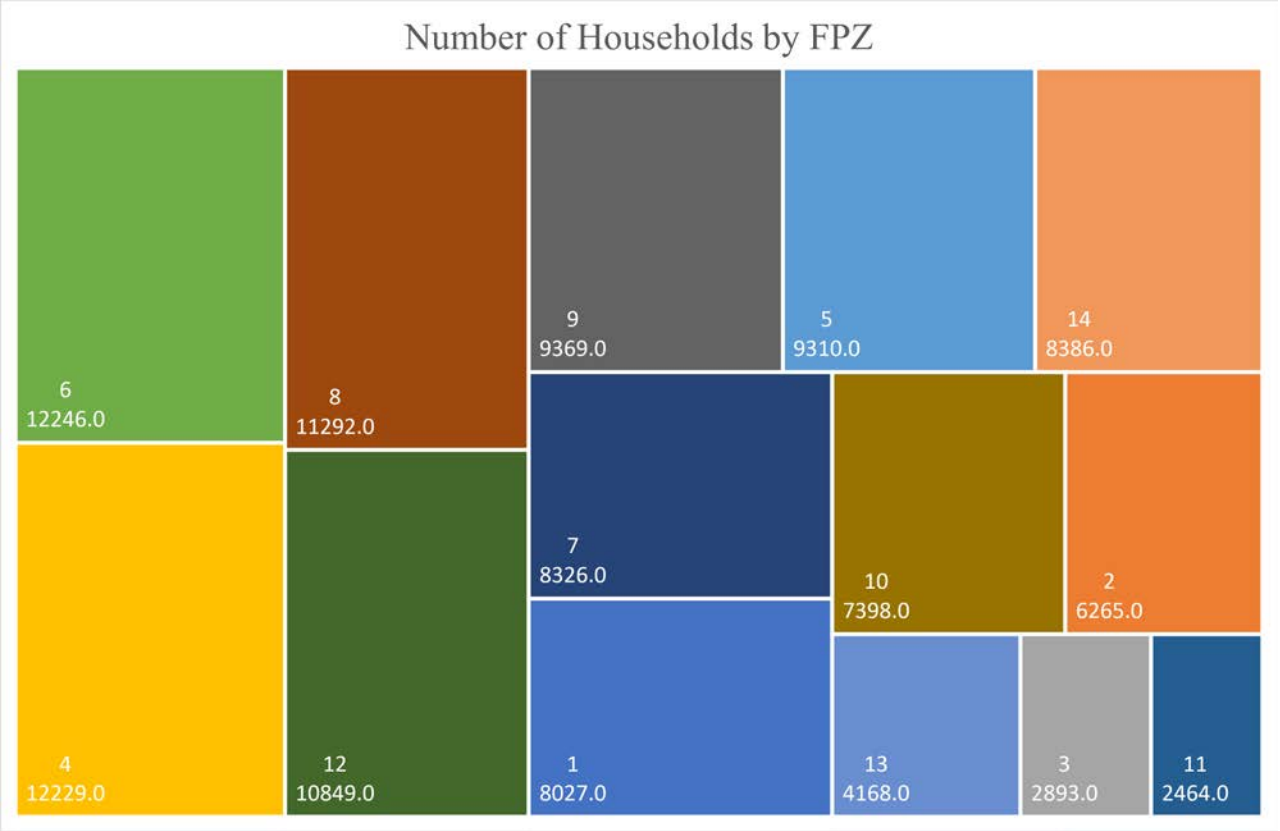
Rural – an incorporated or unincorporated area with a population of less than 10,000 people, or with a population density of less than 1,000 people per square mile.

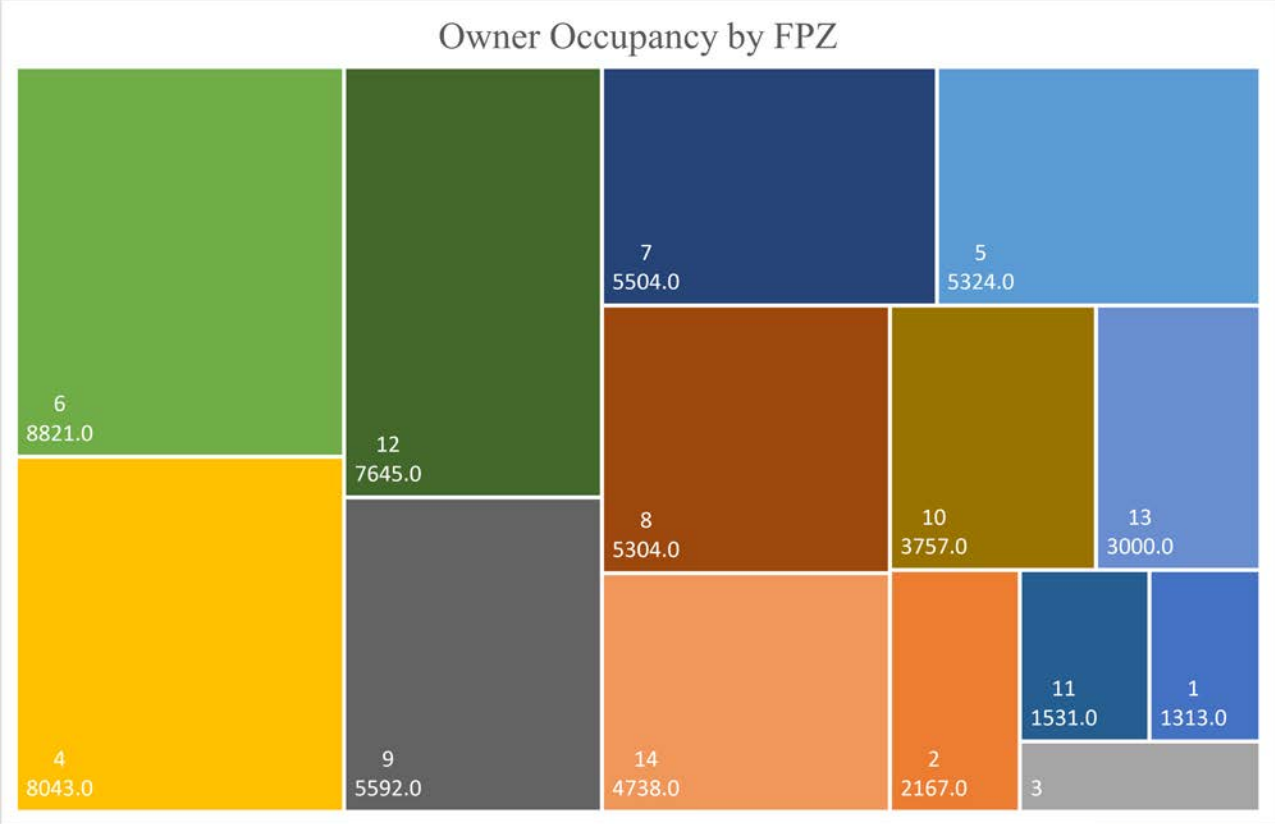
Wilderness – any rural not readily accessible by public or private maintained road.

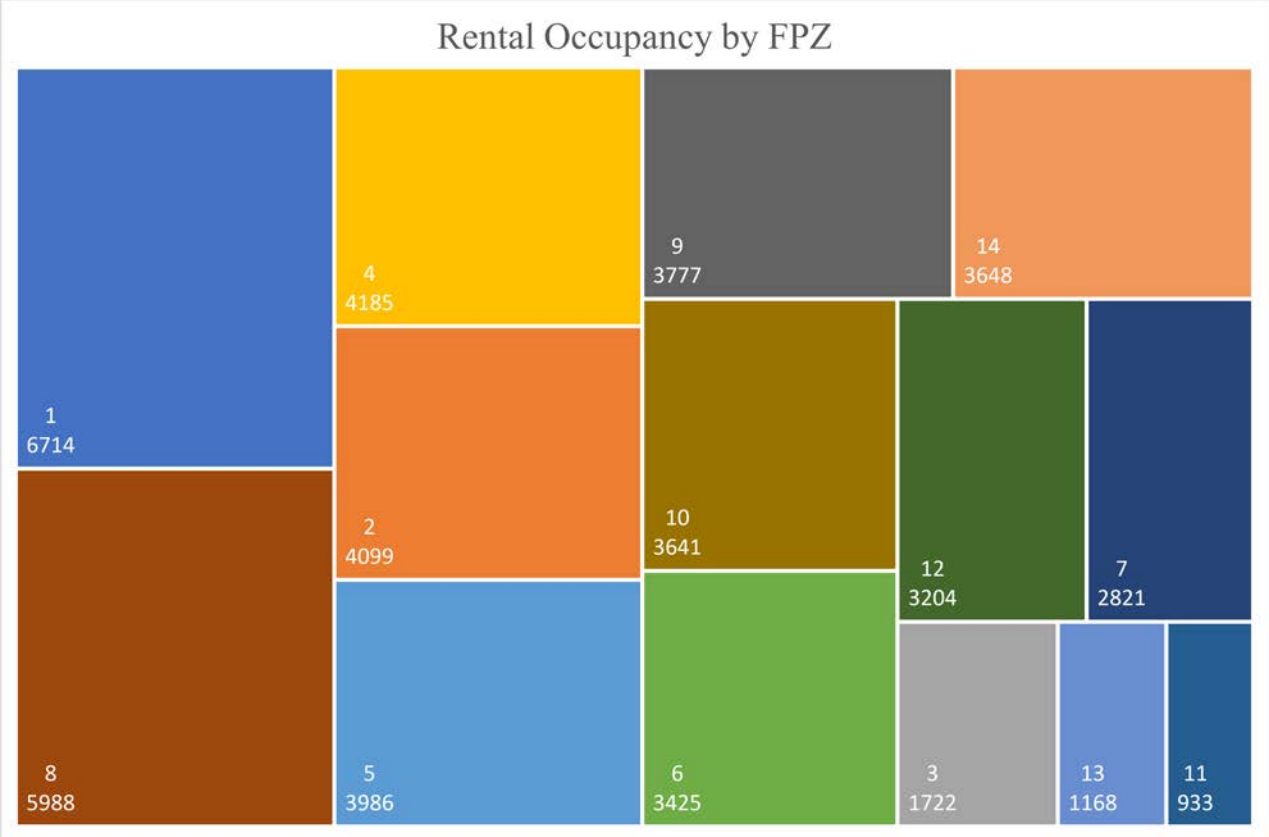

FPZ by Classification and Popluation/Square Mile
1 - Metropolitan 8,308
8 - Metropolitan 5,239
7 - Metropolitan 4,725
9 - Metropolitan 4,370
2 - Metropolitan 3,999
12 - Urban 2,865
4 - Urban 2,769
10 - Metropolitan 3,157
14 - Urban 2,100
5 - Suburban 1,830
6 - Urban 2,904
13 - Suburban 1,839
3 - Suburban 1,503
11 - Subur... 1,249

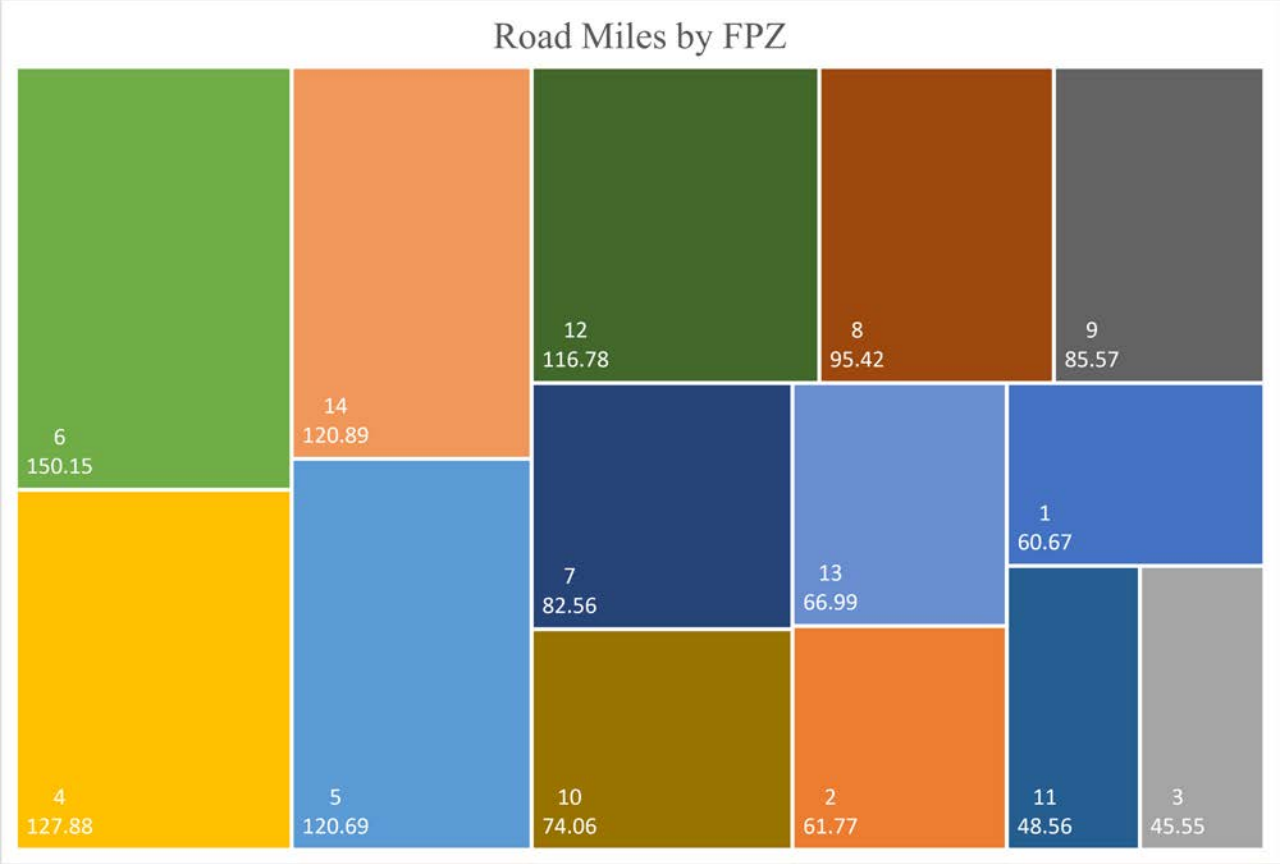

Percentage of Total Primary Response Area Land Mass by FPZ
5 12.25
4 11.59
14 10.69
6 10.62
12 9.02
11 6.28
10 5.71
13 7.19
8 4.87
3 4.73
9 4.84
7 4.08
2 3.80
1 2.82

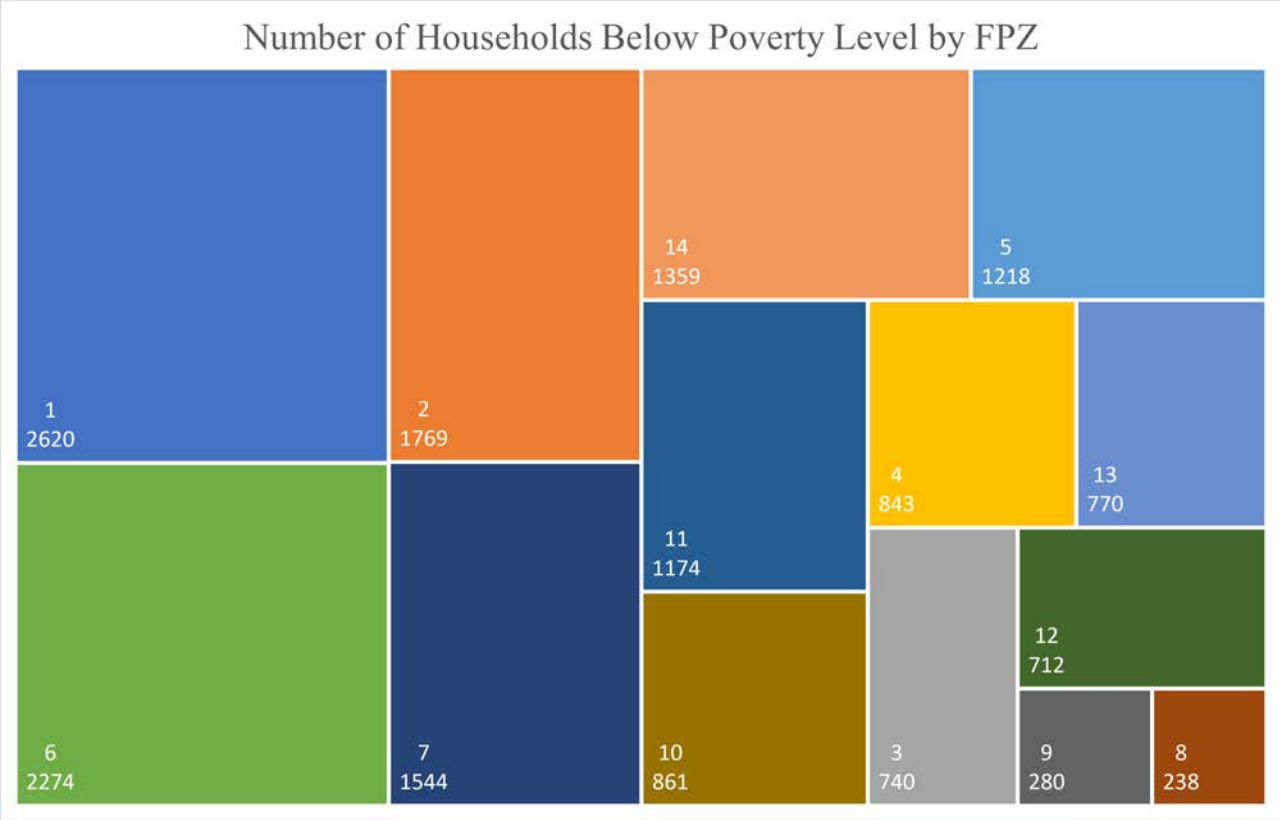

Average Household Income by FPZ
12
102272.0
4
96815.0
14
72737.0
8
64152.0
9
61638.0
7
67939.0
5
58280.0
10
54088.0
6
98236.0
13
73560.0
11
64451.0
2
46586.0
3
46360.0
1
36479.0


Number of Households by FPZ
6
12246.0
8
11292.0
9
9369.0
5
9310.0
14
8386.0
7
8326.0
10
7398.0
2
6265.0
4
12229.0
12
10849.0
1
8027.0
13
4168.0
3
2893.0
11
2464.0


Owner Occupancy by FPZ
6
8821.0
12
7645.0
7
5504.0
5
5324.0
8
5304.0
10
3757.0
13
3000.0
4
8043.0
9
5592.0
14
4738.0
2
2167.0
11
1531.0
1
1313.0
3


Rental Occupancy by FPZ
1
6714
4
4185
9
3777
14
3648
2
4099
10
3641
12
3204
7
2821
8
5988
5
3986
6
3425
3
1722
13
1168
11
933


Road Miles by FPZ
6
150.15
14
120.89
12
116.78
8
95.42
9
85.57
7
82.56
13
66.99
1
60.67
4
127.88
5
120.69
10
74.06
2
61.77
11
48.56
3
45.55


Number of Households Below Poverty Level by FPZ
1
2620
2
1769
14
1359
5
1218
11
1174
4
843
13
770
12
712
6
2274
7
1544
10
861
3
740
9
280
8
238

PROPERTY, CONTENT, AND LIFE LOSS BY FPZ, 2013-2017

FPZ	Property Loss	Content Loss	Total Loss	Life Loss
1	$4,487,401.00	$4,237,807.00	$8,725,208.00	2
2	$916,865.00	$336,800.00	$1,253,665.00	0
3	$668,524.00	$363,800.00	$1,032,324.00	0
4	$4,290,629.00	$3,321,927.00	$7,612,556.00	0
5	$1,145,960.00	$669,500.00	$1,815,460.00	0
6	$3,420,103.00	$1,922,150.00	$5,342,253.00	0
7	$329,500.00	$29,700.00	$359,200.00	1
8	$1,514,410.00	$481,875.00	$1,996,285.00	2
9	$410,050.00	$73,250.00	$483,300.00	0
10	$1,230,730.00	$532,900.00	$1,763,630.00	0
11	$130,650.00	$182,500.00	$313,150.00	0
12	$882,200.00	$582,000.00	$1,464,200.00	1
13	$290,900.00	$71,900.00	$362,800.00	0
14	$425,149.00	$212,800.00	$637,949.00	2
Grand Total:	**$20,143,071.00**	**$13,018,909.00**	**$33,161,980.00**	**8**

TOP 50 PRIVATELY OWNED PROPERTIES BY VALUE

Rank	Zone	Value in Dollars	Address	Rank	Zone	Value in Dollars	Address
1	7	$205,377,200.00	1600 S 48 ST	26	4	$18,500,000.00	8801 S 33 ST
2	9	$129,439,102.00	555 S 70 ST	27	6	$18,441,002.00	6400 S 70 ST
3	8	$118,707,102.00	2300 S 16 ST	28	10	$17,469,900.00	4921 N 32 ST
4	1	$68,229,300.00	301 CENTENNIAL MALL S	29	3	$17,149,300.00	555 S 10 ST
5	5	$61,272,400.00	5000 SAINT PAUL AVE	30	12	$16,810,402.00	8280 ROCKLEDGE RD
6	9	$49,719,302.00	6100 O ST	31	1	$16,800,000.00	1248 O ST
7	14	$46,383,200.00	6600 NW 27 ST	32	14	$16,318,502.00	777 RESEARCH DR
8	6	$45,988,600.00	3800 S 48 ST	33	9	$16,087,002.00	390 N COTNER BLVD
9	13	$39,526,402.00	3801 W O ST	34	9	$15,939,702.00	5905 O ST
10	1	$37,172,800.00	235 S 11 ST	35	12	$15,831,502.00	7500 S 91 ST
11	14	$30,437,700.00	375 FLETCHER AVE	36	12	$15,410,102.00	7100 S 91 ST
12	1	$29,908,400.00	1900 Q ST	37	14	$15,408,602.00	1301 W HIGHLAND BLVD
13	4	$29,082,602.00	2910 PINE LAKE RD	38	4	$15,309,902.00	8801 EXECUTIVE WOODS DR
14	10	$28,660,502.00	601 W CORNHUSKER HWY	39	12	$15,100,002.00	7200 VAN DORN ST
15	7	$27,559,600.00	5401 SOUTH ST	40	7	$14,883,102.00	4720 RANDOLPH ST
16	9	$22,727,302.00	241 N 44 ST	41	5	$14,771,100.00	4100 N 84 ST
17	1	$22,251,800.00	1040 P ST	42	1	$14,739,200.00	808 R ST
18	12	$22,109,500.00	222 S 84 ST	43	1	$14,375,700.00	601 R ST
19	11	$20,624,902.00	5120 NW 38 ST	44	10	$14,100,000.00	3101 NORTH HILL RD
20	9	$20,222,900.00	5011 VINE ST	45	14	$13,792,902.00	4301 N PARK RD
21	1	$20,198,800.00	100 CENTENNIAL MALL N	46	10	$13,756,300.00	2800 FLETCHER AVE
22	14	$20,141,102.00	4301 N 1 ST	47	4	$13,669,702.00	3010 PINE LAKE RD
23	4	$19,950,702.00	1345 OLD CHENEY RD	48	4	$13,308,202.00	1001 NORWOOD DR
24	3	$19,595,000.00	575 S 10 ST	49	1	$13,117,200.00	1901 Y ST
25	6	$18,984,700.00	8300 CHENEY RIDGE RD	50	12	$13,103,902.00	500 S 84 ST

*In 2017, The State of Nebraska Department of Revenue estimates a total of $28,911,839.84 in collected city sales tax from the top 20 most valuable retailers in Lincoln.

INDIVIDUAL FIRE STATIONS/FPZs

https://lincoln.ne.gov/city/fire/info/stations/index.htm

Apparatus assigned to individual stations:

Station/FPZ	Primary Apparatus	Reserve Apparatus	Specialty Apparatus
1	Engine 1, Medic 1, Truck 1, Battalion 1		Water Rescue, Trench Rescue, Special event bikes
2	Engine 2, Medic 2		Light tower
3	Engine 3, Medic 3		
4	Engine 4	Medic 24	
5	Engine 5, Medic 5, Truck 5	Medic 25	
6	Engine 6, Medic 6		
7	Engine 7, Medic 7, Truck 7		
8	Engine 8, Medic 8, Truck 8		
9	Engine 9, EMS 1		
10	Engine 10	Medic 210	
11	Engine 11	Medic 211	
12	Engine 12		
13	Engine 13		
14	Engine 14, Air 14	H14, M214	
Municipal Service Center	2 reserve engine companies, 1 reserve truck company, USAR		Rehab-1

STATION 1 - 1801 Q STREET

Station 1	2013	2014	2015	2016	2017	Total
FIRE						
B1	298	298	309	363	420	1688
E1	470	518	543	539	545	2615
M1		5	23	21	23	72
M21		1				1
T1	771	806	931	914	927	4349
FIRE Total	**1539**	**1628**	**1806**	**1837**	**1915**	**8725**
HAZMAT						
B1	270	232	282	349	427	1560
E1	68	75	76	85	101	405
M1		1	1	1	5	8
T1	161	168	170	215	240	954
HAZMAT Total	**499**	**476**	**529**	**650**	**773**	**2927**
MEDICAL						
B1	61	56	76	134	102	429
E1	2345	2693	2656	2747	2874	13315
M1		103	898	942	881	2824
M21	69	51	5	8	55	188
T1	318	457	514	564	586	2439
WR1		1	1	14	2	18
MEDICAL Total	**2793**	**3361**	**4150**	**4409**	**4500**	**19213**
OTHER						
B1	18	16	19	20	16	89
E1	24	26	20	23	19	112
M1		2	16	16	6	40
M21	106	60		11	1	178
T1	150	134	68	81	99	532
WR1			1	5	3	9
OTHER Total	**298**	**238**	**124**	**156**	**144**	**960**
RSALARM						
B1	139	181	142	120	88	670
E1	27	41	33	28	16	145
M1		3	25	16	10	54
M21	2	3		1		6
T1	90	119	93	77	72	451
WR1				1	5	6
RSALARM Total	**258**	**347**	**293**	**243**	**191**	**1332**
Total	**5387**	**6050**	**6902**	**7295**	**7523**	**33157**

Located in downtown Lincoln, primary response area 1 contains UNL's Downtown Campus, the downtown area, and UNL's Memorial Stadium. It primarily consists of commercial property: bars, nightclubs, restaurants, apartments, offices, and transitional residential areas.

There is a large shift in Lincoln's transient population due to the high number of downtown workers, football fans, and students who occupy much of the north area of the zone during the school year.

Significant structures in this area include the Nebraska State Capitol Building, the Federal Building, Manter Hall, Hamilton Hall, City County Building, Memorial Stadium, Bob Devaney Sports Complex, several large hotels, UNL's Innovation Campus, and UNL student housing.

. Major employers in this zone include UNL, Nelnet, City/County Offices, State Offices, NEBCO, Windstream, and Assurity. Major roadways/streets: A, O, 9th, 10th, 16th, 17th, Vine, 27th, Capital Parkway, and Antelope Valley Parkway

STATION 2 – 1545 N. 33RD STREET

Station 2	2013	2014	2015	2016	2017	Total
FIRE						
E2	304	292	334	332	319	1581
LT1			1			1
M2	75	72	71	106	81	405
FIRE Total	**379**	**364**	**406**	**438**	**400**	**1987**
HAZMAT						
E2	143	148	170	207	251	919
M2	20	29	14	21	25	109
HAZMAT Total	**163**	**177**	**184**	**228**	**276**	**1028**
MEDICAL						
E2	1135	1409	1442	1449	1441	6876
M2	3301	3525	3603	3785	3663	17877
MEDICAL Total	**4436**	**4934**	**5045**	**5234**	**5104**	**24753**
OTHER						
E2	42	51	21	20	18	152
M2	35	35	11	23	11	115
OTHER Total	**77**	**86**	**32**	**43**	**29**	**267**
RSALARM						
E2	22	28	33	21	21	125
M2	81	105	74	75	54	389
RSALARM Total	**103**	**133**	**107**	**96**	**75**	**514**
Total	**5158**	**5694**	**5774**	**6039**	**5884**	**28549**

Located in north central Lincoln, primary response area 2 contains UNL's East Campus. It primarily consists of residential housing and apartments.

Significant structures include several small industrial and commercial areas, grain elevators, a high traffic railway, and Wyuka Cemetery. Like Zone 1, there is a large shift in population due to UNL's East Campus students, especially during the school year.

Major employers in this zone include UNL's East Campus. Major roadways/streets: O, 27th, 33rd, 48th, Holdrege, Huntington, Cornhusker Highway, and Vine.

STATION 3 – 121 S. 2ND STREET

Station 3	2013	2014	2015	2016	2017	Total
FIRE						
E3	327	328	415	404	453	1927
M3	60	81	81	72	92	386
FIRE Total	**387**	**409**	**496**	**476**	**545**	**2313**
HAZMAT						
E3	47	47	42	45	51	232
M3	16	18	16	14	19	83
HAZMAT Total	**63**	**65**	**58**	**59**	**70**	**315**
MEDICAL						
E3	1526	1660	1804	1784	1863	8637
M3	3483	3689	3513	3741	3555	17981
MEDICAL Total	**5009**	**5349**	**5317**	**5525**	**5418**	**26618**
OTHER						
E3	29	23	20	17	19	108
M3	34	23	19	22	26	124
OTHER Total	**63**	**46**	**39**	**39**	**45**	**232**
RSALARM						
E3	30	43	37	28	12	150
M3	71	105	64	61	33	334
RSALARM Total	**101**	**148**	**101**	**89**	**45**	**484**
Total	**5623**	**6017**	**6011**	**6188**	**6123**	**29962**

Located west of downtown Lincoln, primary response area 3 contains a wide variety of population and structures: older commercial, industrial, and manufacturing facilities and a large rail yard. Residential areas including a large mobile home community can be found in the south and west portions of the zone Significant structures include Pinnacle Bank Arena, Haymarket Park, the Historic Haymarket, Cooks' Foods, Salt Creek, Oak Lake Park, and the BNSF Rail Yard.

Major employers in this zone include Speedway Motors, Lester Electric, Burlington Northern, and the West Haymarket District. Major roadways/streets: West O, Sun Valley Boulevard, and Highway 77 South.

STATION 4 – 5600 SOUTH 27TH STREET

Station 4	2013	2014	2015	2016	2017	Total
FIRE						
E4	232	248	248	263	245	1236
M24		1	2		2	5
FIRE Total	**232**	**249**	**250**	**263**	**247**	**1241**
HAZMAT						
E4	43	22	41	37	45	188
M24				1	1	2
HAZMAT Total	**43**	**22**	**41**	**38**	**46**	**190**
MEDICAL						
E4	957	956	1178	1222	1284	5597
M24	61	116	77	92	93	439
MEDICAL Total	**1018**	**1072**	**1255**	**1314**	**1377**	**6036**
OTHER						
E4	69	49	11	16	12	157
M24	16	21	14	47	4	102
OTHER Total	**85**	**70**	**25**	**63**	**16**	**259**
RSALARM						
E4	22	23	14	31	17	107
M24	1	3	1	3	1	9
RSALARM Total	**23**	**26**	**15**	**34**	**18**	**116**
Total	**1401**	**1439**	**1586**	**1712**	**1704**	**7842**

Located in South Lincoln, primary response area 4 primarily consists of residential housing, apartments, and retail. The residential areas are both recent and well established. Significant structures include Southpointe Pavilions Shopping Center, Southwest High School, Lincoln Electrical System - Rokeby Peaking Station, Lincoln Memorial Park Cemetery, Pegler-Sysco, Square D Manufacturing, Universal Cold Storage, a major Union Pacific rail line, a major BNSF rail line, and Clark Jeary retirement community.

Major employers in this zone include Square D, Fiserv, Allied Insurance, and the Nebraska Book Company. Major roadways/streets: Highway 2, Old Cheney, Pine Lake, Yankee Hill, 14th, 27th, 40th, and Warlick.

STATION 5 – 3640 TOUZALIN AVENUE

Station	2013	2014	2015	2016	2017	Total
FIRE						
E5	269	244	310	328	301	1452
M25	2	3	3	3	2	13
M5	51	53	59	53	70	286
T5	494	473	562	604	526	2659
FIRE Total	**816**	**773**	**934**	**988**	**899**	**4410**
HAZMAT						
E5	56	51	55	58	69	289
M25	1		1	2	1	5
M5	16	19	13	19	16	83
T5	109	122	149	141	195	716
HAZMAT Total	**182**	**192**	**218**	**220**	**281**	**1093**
MEDICAL						
E5	1283	1359	1509	1517	1608	7276
M25	109	155	177	183	118	742
M5	2597	2835	2802	2986	2910	14130
T5	149	179	259	300	319	1206
MEDICAL Total	**4138**	**4528**	**4747**	**4986**	**4955**	**23354**
OTHER						
E5	29	24	10	17	30	110
M25	14	12	7	18	1	52
M5	34	32	12	16	14	108
T5	153	132	27	45	46	403
OTHER Total	**230**	**200**	**56**	**96**	**91**	**673**
RSALARM						
E5	21	25	26	14	12	98
M25	5	10	3	5	3	26
M5	78	78	64	67	51	338
T5	64	70	65	62	41	302
RSALARM Total	**168**	**183**	**158**	**148**	**107**	**764**
Total	**5534**	**5876**	**6113**	**6438**	**6333**	**30294**

Located in Northeast Lincoln, primary response area 5 consists primarily of residential housing, industrial, and commercial structures Unique to this area is Havelock, a former town, annexed by Lincoln.

Significant structures include the Northeast Treatment Facility, Deeter Foundry, Veyance Technologies, Archer Daniels Midland, Concrete Industries, Purina Mills, Snyder Industries, Northeast High School, the Havelock Business District, Wesleyan University, Mahoney Park, and the Lancaster Event Center.

Major employers in this zone include Veyance Technologies, Archer Daniels Midland, Burlington Northern, Bosch Technologies, and Teledyne/Isco. Major roadways/streets: Cornhusker Highway, North Highway 77, 48th, 56th, Cotner, 70th, 84th, and Havelock Avenue..

STATION 6 – 5051 NORTH 48TH STREET

Station 6	2013	2014	2015	2016	2017	Total
FIRE						
E6	246	251	247	298	269	1311
M6	46	56	56	57	60	275
FIRE Total	**292**	**307**	**303**	**355**	**329**	**1586**
HAZMAT						
E6	39	30	37	47	64	217
M6	14	14	9	17	19	73
HAZMAT Total	**53**	**44**	**46**	**64**	**83**	**290**
MEDICAL						
E6	1240	1291	1453	1656	1661	7301
M6	2407	2625	2883	3027	3094	14036
MEDICAL Total	**3647**	**3916**	**4336**	**4683**	**4755**	**21337**
OTHER						
E6	69	54	21	13	21	178
M6	27	31	9	16	18	101
OTHER Total	**96**	**85**	**30**	**29**	**39**	**279**
RSALARM						
E6	27	30	14	26	20	117
M6	53	79	54	55	42	283
RSALARM Total	**80**	**109**	**68**	**81**	**62**	**400**
Total	**4168**	**4461**	**4783**	**5212**	**5268**	**23892**

Located in South Lincoln, primary response area 6 consists primarily of residential housing. Significant structures include Union College, a large concrete facility, and several big box retailers.

Major employers in this Zone include Nebraska Heart Institute and Union College. Major roadways/streets: Hwy 2, Old Cheney, 48th, 56th, 70th, and Pioneers.

STATION 7 – 1345 SOUTH COTNER BOULEVARD

Station	2013	2014	2015	2016	2017	Total
FIRE						
E7	247	289	283	303	306	1428
M7	46	57	38	54	73	268
T7	511	557	614	591	605	2878
FIRE Total	**804**	**903**	**935**	**948**	**984**	**4574**
HAZMAT						
E7	42	19	30	52	57	200
M7	23	17	5	18	17	80
T7	159	154	177	257	251	998
HAZMAT Total	**224**	**190**	**212**	**327**	**325**	**1278**
MEDICAL						
E7	1377	1462	1565	1629	1741	7774
M7	3040	3204	3394	3512	3533	16683
T7	164	219	284	322	378	1367
MEDICAL Total	**4581**	**4885**	**5243**	**5463**	**5652**	**25824**
OTHER						
E7	30	29	17	17	20	113
M7	27	35	14	15	8	99
T7	196	166	28	49	45	484
OTHER Total	**253**	**230**	**59**	**81**	**73**	**696**
RSALARM						
E7	27	42	17	21	19	126
M7	75	89	64	51	41	320
T7	68	90	68	59	43	328
RSALARM Total	**170**	**221**	**149**	**131**	**103**	**774**
Total	**6032**	**6429**	**6598**	**6950**	**7137**	**33146**

Located in Southcentral Lincoln, primary response area 7 consists primarily of residential housing. Significant structures include a commercial area along O Street, Bryan Hospital, several skilled care and assisted living facilities, and nursing homes .

Major employers in this zone include Bryan East Hospital, Madonna Rehabilitation Hospital, and Tabitha Nursing Home. Major roadways/streets: O, A, Randolph, South, Cotner, 70th, 56th, and 48th.

STATION 8 – 2760 SOUTH 17TH STREET

Station 8	2013	2014	2015	2016	2017	Total
FIRE						
E8	302	359	364	362	347	1734
M8	73	88	82	103	103	449
T8	498	597	609	620	586	2910
FIRE Total	**873**	**1044**	**1055**	**1085**	**1036**	**5093**
HAZMAT						
E8	39	27	44	60	58	228
M8	11	13	18	16	21	79
T8	160	107	144	193	201	805
HAZMAT Total	**210**	**147**	**206**	**269**	**280**	**1112**
MEDICAL						
E8	1682	1752	1861	1865	1921	9081
M8	3334	3542	3736	3818	3859	18289
T8	157	190	294	329	371	1341
MEDICAL Total	**5173**	**5484**	**5891**	**6012**	**6151**	**28711**
OTHER						
E8	26	17	23	17	18	101
M8	19	16	18	15	13	81
T8	111	72	43	48	52	326
OTHER Total	**156**	**105**	**84**	**80**	**83**	**508**
RSALARM						
E8	27	31	30	19	18	125
M8	60	72	68	57	38	295
T8	87	106	75	70	47	385
RSALARM Total	**174**	**209**	**173**	**146**	**103**	**805**
Total	**6586**	**6989**	**7409**	**7592**	**7653**	**36229**

Located in Near South Lincoln, primary response area 8 consists primarily of older residential housing. Significant structures include high occupancy residences, older apartments, Bryan West Hospital, The Nebraska State Penitentiary, State Laboratory, The Nebraska State Patrol, Department of Roads Headquarters, Lancaster Manor, and Gooch's Mill.

Major employers in this zone include Gooch's Mill, Bryan West Hospital, Celerion, Sampson Construction, and Sysco. Major roadways/streets: Hwy 2, A, South, Van Dorn, 9th, 10th, 17th, 16th, 27th, and Sheridan Boulevard.

STATION 9 – 901 NORTH COTNER BOULEVARD

Station	2013	2014	2015	2016	2017	Total
FIRE						
E9	277	292	338	299	314	1520
EMS1	288	288	289	334	350	1549
FIRE Total	**565**	**580**	**627**	**633**	**664**	**3069**
HAZMAT						
E9	107	96	96	153	205	657
EMS1	32	38	29	46	38	183
HAZMAT Total	**139**	**134**	**125**	**199**	**243**	**840**
MEDICAL						
E9	1256	1369	1380	1654	1704	7363
EMS1	725	706	806	813	853	3903
MEDICAL Total	**1981**	**2075**	**2186**	**2467**	**2557**	**11266**
OTHER						
E9	72	66	18	14	16	186
EMS1	5	9	5	1	6	26
OTHER Total	**77**	**75**	**23**	**15**	**22**	**212**
RSALARM						
E9	36	37	28	22	14	137
EMS1	164	193	150	141	96	744
RSALARM Total	**200**	**230**	**178**	**163**	**110**	**881**
Total	**2962**	**3094**	**3139**	**3477**	**3596**	**16268**

Located in North Central Lincoln, primary response area 9 consists primarily of residential housing and retail. Significant structures include: St Elizabeth Hospital, Veteran Affairs Hospital, Gateway Shopping Mall, East Park Shopping Mall, Ameritas, Southeast Community College, Eastmont Towers, Cotner Center, and Gateway Manor.

Major employers in this zone include Saint Elizabeth Hospital, Gateway Mall, Lincoln Public Schools, Ameritas, Southeast Community College, and the Veterans Affairs (VA) Health System. Major roadways/streets: O, Vine, Holdrege, Cotner, 48th, 56th, 66th, 70th, and 84th.

STATION 10 – 1440 ADAMS STREET

Station 10	2013	2014	2015	2016	2017	Total
FIRE						
E10	287	290	300	352	312	1541
M210				1	3	4
FIRE Total	**287**	**290**	**300**	**353**	**315**	**1545**
HAZMAT						
E10	63	58	56	68	81	326
HAZMAT Total	**63**	**58**	**56**	**68**	**81**	**326**
MEDICAL						
E10	1325	1458	1644	1648	1681	7756
M210		14	39	76	112	241
MEDICAL Total	**1325**	**1472**	**1683**	**1724**	**1793**	**7997**
OTHER						
E10	76	59	11	17	20	183
M210		28	104	92	77	301
OTHER Total	**76**	**87**	**115**	**109**	**97**	**484**
RSALARM						
E10	23	28	31	31	30	143
M210		2	2	1	4	9
RSALARM Total	**23**	**30**	**33**	**32**	**34**	**152**
Total	**1774**	**1937**	**2187**	**2286**	**2320**	**10504**

Located in Northwest Lincoln, primary response area 10 consists primarily of residential housing, mobile homes, industrial, and commercial retail.

Significant structures include UNL's Innovation Campus, Lincoln Northstar High School, Campbell Elementary, Goodrich Elementary, Belmont Elementary, Salt Creek, numerous industrial facilities and big box retailers, the east entrance of the Lincoln Municipal Airport, and Lincoln's Wastewater Treatment Center.

Major employers in this zone include UNL, Zoetis Laboratories, several big box and auto retailers. Major roadways/streets: Cornhusker Hwy, I-180, Superior, 14th, 27th, and Salt Creek Roadway.

STATION 11 – 3401 NORTHWEST LUKE STREET

Station 11	2013	2014	2015	2016	2017	Total
FIRE						
E11	58	61	66	66	42	293
M211	1	2		2		5
FIRE Total	**59**	**63**	**66**	**68**	**42**	**298**
HAZMAT						
E11	5	10	6	9	11	41
M211			1			1
HAZMAT Total	**5**	**10**	**7**	**9**	**11**	**42**
MEDICAL						
E11	197	235	256	350	322	1360
M211	79	71	111	119	51	431
MEDICAL Total	**276**	**306**	**367**	**469**	**373**	**1791**
OTHER						
E11	13	18	7	9	16	63
M211	18	25	31	32	7	113
OTHER Total	**31**	**43**	**38**	**41**	**23**	**176**
RSALARM						
E11	4	7	4	3	4	22
M211	2	1	2	3		8
RSALARM Total	**6**	**8**	**6**	**6**	**4**	**30**
Total	**377**	**430**	**484**	**593**	**453**	**2337**

Located in Northwest Lincoln, primary response area 11 consists primarily of residential housing and industrial structures. Significant structures include the Lincoln Municipal Airport, Duncan Aviation, Bowling Lake, Arnold Elementary, and several manufacturing facilities.

Major employers in this zone include Duncan Aviation and Crete Carrier Corporation. Major roadways/streets: I-80, Hwy 34, West O Street, and NW 48th Street

STATION 12 – 2201 SOUTH 84TH STREET

Station	2013	2014	2015	2016	2017	Total
FIRE						
E12	128	166	201	158	178	831
FIRE Total	**128**	**166**	**201**	**158**	**178**	**831**
HAZMAT						
E12	35	18	21	39	45	158
HAZMAT Total	**35**	**18**	**21**	**39**	**45**	**158**
MEDICAL						
E12	986	989	1215	1161	1291	5642
MEDICAL Total	**986**	**989**	**1215**	**1161**	**1291**	**5642**
OTHER						
E12	87	74	18	11	14	204
OTHER Total	**87**	**74**	**18**	**11**	**14**	**204**
RSALARM						
E12	13	23	14	8	6	64
RSALARM Total	**13**	**23**	**14**	**8**	**6**	**64**
Total	**1249**	**1270**	**1469**	**1377**	**1534**	**6899**

Located in Southeast Lincoln, primary response area 12 consists primarily of residential structures. Significant structures include State Farm Insurance, Lincoln Surgical Hospital, and several skilled elderly living facilities.

Major employers for this zone include State Farm Insurance. Major roadways/streets: 70th, 84th, A, South, Van Dorn, Old Cheney, and Pioneers.

STATION 13 – 1700 WEST CODDINGTON AVENUE

Station 13	2013	2014	2015	2016	2017	Total
FIRE						
E13	165	153	192	170	167	847
FIRE Total	**165**	**153**	**192**	**170**	**167**	**847**
HAZMAT						
E13	14	19	19	15	22	89
HAZMAT Total	**14**	**19**	**19**	**15**	**22**	**89**
MEDICAL						
E13	621	698	783	804	803	3709
MEDICAL Total	**621**	**698**	**783**	**804**	**803**	**3709**
OTHER						
E13	19	15	8	7	16	65
OTHER Total	**19**	**15**	**8**	**7**	**16**	**65**
RSALARM						
E13	24	28	23	7	10	92
RSALARM Total	**24**	**28**	**23**	**7**	**10**	**92**
Total	**843**	**913**	**1025**	**1003**	**1018**	**4802**

Located in Southwest Lincoln, primary response area 13 consists primarily of residential structures. Significant structures include The Lincoln Regional Center, Nebraska Department of Correction's Diagnostics and Evaluation, Community Corrections Center, and Lincoln Industries.

Major employers in this zone include Lincoln Industries, The Lincoln Regional Center, and the Lancaster County Corrections Complex. Major roadways/streets: A, Coddington, Highway 77, Van Dorn, and Rosa Parks Way.

STATION 14 – 5435 NORTHWEST 1ST STREET

Station 14	2013	2014	2015	2016	2017	Total
FIRE						
A14	286	298	303	343	351	1581
E14	185	203	235	247	263	1133
H14	4	31	35	16	19	105
M214		4	2	1		7
FIRE Total	**475**	**536**	**575**	**607**	**633**	**2826**
HAZMAT						
A14	186	174	189	255	357	1161
E14	34	30	20	43	45	172
H14	185	174	189	262	358	1168
HAZMAT Total	**405**	**378**	**398**	**560**	**760**	**2501**
MEDICAL						
A14		2	3	2	6	13
E14	671	733	825	864	949	4042
H14	2	1	2	4	6	15
M214	62	103	40	54	100	359
MEDICAL Total	**735**	**839**	**870**	**924**	**1061**	**4429**
OTHER						
A14	1	1		1	1	4
E14	33	26	11	12	14	96
H14	3					3
M214	49	55	37	29	19	189
OTHER Total	**86**	**82**	**48**	**42**	**34**	**292**
RSALARM						
A14	4	1		2	1	8
E14	14	23	23	27	23	110
H14	1	1		1	1	4
M214	1	2	1	2	4	10
RSALARM Total	**20**	**27**	**24**	**32**	**29**	**132**
Total	**1721**	**1862**	**1915**	**2165**	**2517**	**10180**

Located in Northwest Lincoln Primary response area 14 consists primarily of residential and commercial structures. Significant structures include Sandhills Publishing, and Kawasaki.

Major employers in this zone include Kawasaki, Verizon, Duncan Aviation, Molex, Cabela's, and Sandhills Publishing. Major streets/roadways: Highway 34, I-180, I-80, 1st, NW 12th, Superior, and Cornhusker Highway.

PRIMARY AND SECONDARY SCHOOLS BY FPZ

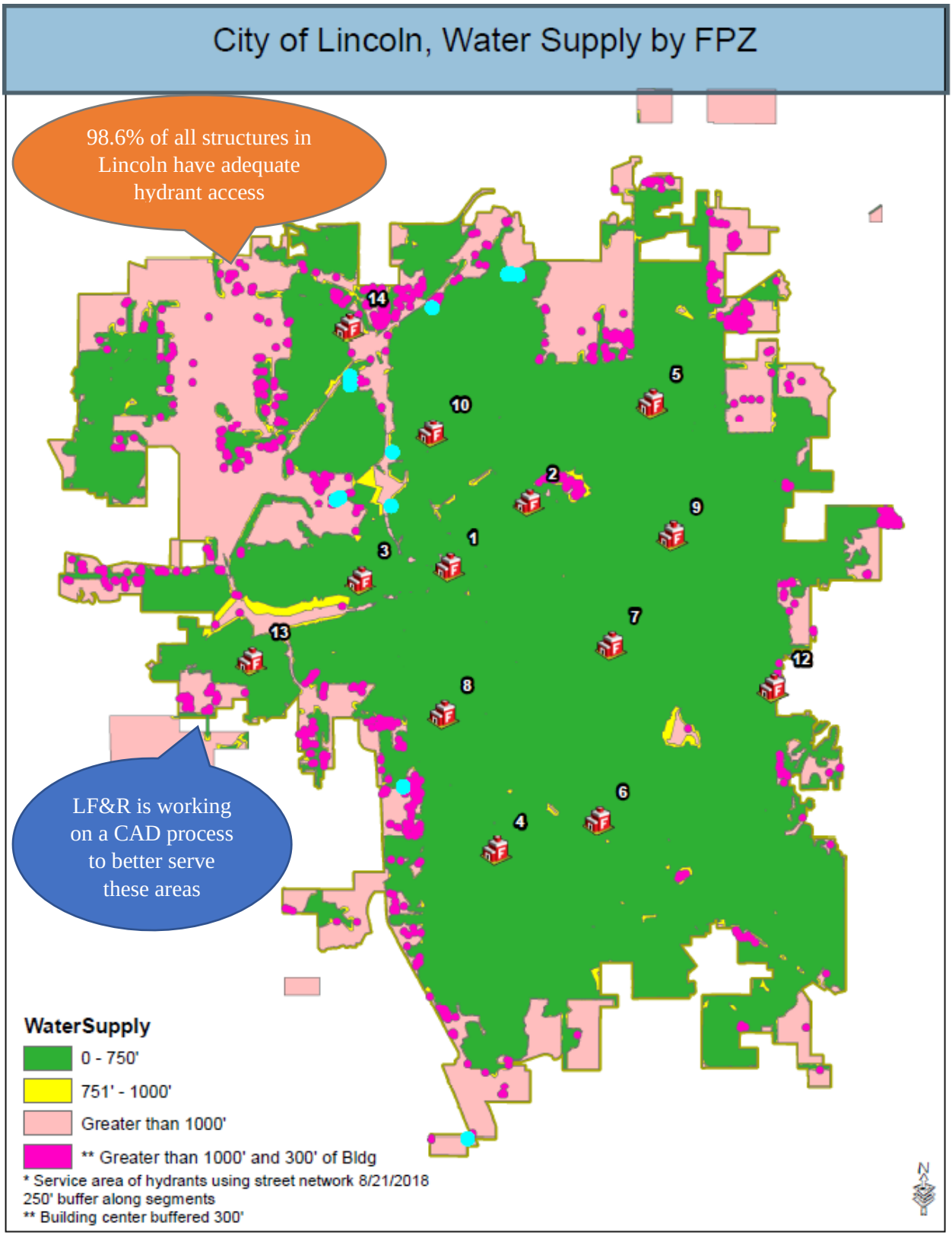
FPZ	SCHOOL
1	Elliott, McPhee' St. Mary's, Lincoln High
2	Clinton, Hartley, Huntington, Sacred Heart
3	Lakeview, Park
4	Cavett, Good Shepherd Lutheran, Hill, Rousseau, Lincoln Southwest, Scott, Adams
5	Faith Lutheran Elementary, Kahoa, Norwood Park, Pershing, St. Patrick's, Dawes, Mickle Lincoln Northeast
6	Calvert, George Stone, Helen Hyatt, Elementary, Humann, St. Peter's, Zeman, Pound, College View Academy, Lincoln Christian
7	Christ Lutheran Eastridge, Holmes, Randolph St. Teresa's, Lefler, Pius X, Bryan Community Behavioral (Grades 10-12)
8	Beattie, Blessed Sacrament, Cathedral of the Risen Christ, Everett, Prescott, Saratoga, Sheridan, St. Mark's Lutheran, Irving, Lincoln Southeast Brownell, Hawthorne, Meadow Lane
9	Riley, St. John's, Trinity Lutheran, Cornerstone Christian Academy, Culler, Lincoln Lutheran Jr/Sr High, Sherrill Behavioral (Grades 4-8)
10	Belmont, Campbell, West Lincoln, Goodrich, Lincoln North Star
11	Arnold
12	Maxey, Messiah Lutheran, Morley, Pyrtle, St Joseph's, Lux, Lincoln East
13	Roper, Yankee Hill Behavioral (Grades 9-12)
14	Fredstrom, North American Martyrs, Parkview Christian, Kooser, Schoo

ANNUAL TOTAL RESPONSES BY STATION

Station	2013	2014	2015	2016	2017
1	5404	6061	6922	7307	7552
2	5158	5694	5774	6039	5884
3	5623	6017	6011	6188	6123
4	1401	1439	1586	1712	1704
5	5535	5880	6118	6439	6336
6	4168	4461	4783	5212	5268
7	6032	6430	6598	6950	7137
8	6586	6989	7409	7592	7653
9	2962	3094	3139	3477	3596
10	1778	1953	2188	2286	2320
11	377	432	500	597	456
12	1249	1270	1469	1377	1534
13	843	913	1025	1003	1018
14	1721	1862	1915	2165	2517

COMMERCIAL STRUCTURE WATER SUPPLY ANALYSIS, BY FPZ

Primary Response Area	Structures with Sufficient Hydrant Access	Structures with Deficient Hydrant Access	Percentage of Structures Deficient
1	4258	1	0.02%
2	7020	48	0.6%
3	2931	163	5.5%
4	9026	165	1.8%
5	11446	278	2.4%
6	11772	74	0.6%
7	10720	0	0.0%
8	13040	58	0.4%
9	9383	4	0.04%
10	6865	60	.08%
11	2472	31	1.2%
12	8396	86	1.0%
13	4419	211	4.7%
14	6383	358	5.6%
Total:	108131	358	1.4%


City of Lincoln, Water Supply by FPZ
98.6% of all structures in Lincoln have adequate hydrant access
LF&R is working on a CAD process to better serve these areas
14
10
5
2
9
1
3
7
13
12
8
6
4
WaterSupply
0 - 750'
751' - 1000'
Greater than 1000'
** Greater than 1000' and 300' of Bldg
* Service area of hydrants using street network 8/21/2018
250' buffer along segments
** Building center buffered 300'
N

CONSTRUCTION LIMITATIONS

LF&R considers existing and future construction limitations to predict future jurisdiction service needs. For example, if a service area has an exceptionally large curb to structure distance, as described in ordinance, a larger aerial apparatus may be needed for sufficient reach in the event of a structure fire. As well, an ordinance defining an area of high density/high risk residential housing can dramatically alter LF&R's ERF needs. Lincoln's jurisdiction is broken down into definable areas set forth by the city planning department. (See Appendix E.)

Known as an architectural wonder of the world, Lincoln's state capitol was designed by architect Bertram Grosvenor Goodhue and erected over a ten-year period from 1922 to 1932. A true pride for the entire state of Nebraska, the City of Lincoln (with the help of the Nebraska Capitol Environs Commission) has set construction limits to keep the capitol a recognizable, inspirational view in the city's skyline. For instance, the nearer a property is to the capitol, the stricter the building codes are for that structure, regarding design, construction, and structural alteration.

*LF&R Trucks 7 and 8 with the Nebraska State Capital in the background (Kelly Day Photos, 2017).

New or renovated buildings facing the capitol also have minimum and maximum height standards. Fire towers, pitched roofs, chimneys, water towers, and satellite dishes could be prohibited, depending on the city's height limitation (City of Lincoln, 2016a).

INFRASTRUCTURE

Currently, the City of Lincoln does not experience any significant infrastructure limitations regarding utilities. Lincoln limits its provision of utilities to water, wastewater management, and electricity. Other utilities such as refuse and natural gas service are provided by private enterprise.

WATER SUPPLY. Potable water is provided to Lincoln residents and businesses by the Lincoln Water System (City of Lincoln, 2016b). The system is owned by the City of Lincoln and managed by the city's Department of Public Works and Utilities, under the direction of the mayor and city council. It is a revenue producing and self-supporting system (i.e., no tax funds are used). Lincoln's policy allows water services to only be provided to properties located within the corporate limits of the city.

Lincoln's principal source of water is groundwater from the Platte River near Ashland, Nebraska, northeast of Lincoln. The Lincoln Water System processes groundwater at the Ashland facility prior to its transmission to Lincoln for distribution. In addition, Lincoln has supplemental wells located near Antelope Park, in south central Lincoln. This additional groundwater source is used during periods of peak water consumption, typically in the summer months.

The City of Lincoln (2014) completed the water system's most recent facilities master plan in 2014. This plan is a usage and projection guide for short term and long-term improvements to the infrastructure of the Lincoln Water System. Additional supply, treatment, and transmission improvements will be necessary to meet these growing demands. The well fields currently owned by the Lincoln Water System have a projected maximum capacity approximately equal to the projected need for the year 2050. Additional well field property and

water rights need to be acquired in the planning period to meet these demands. If substantial additional residential development occurs on acreages and in towns currently served by Rural Water Districts, improvements to the system will be necessary.

Many Lancaster County water users are on private well systems. The Lincoln Lancaster County Health Department enforces standards on these wells. The Lower Platte South Natural Resources District maintains a Groundwater Management Plan for the county to ensure the protection of the resource. For establishing risk, it is imperative LF&R identify areas of the jurisdiction in which insufficient or diminished water flows are available for fire extinguishment. (See Appendix E.)

ELECTRICITY. In January 2001, Norris Public Power District (Norris) and Lincoln Electric System (LES) formalized a Joint Planning and Service Area Adjustment Agreement. Both utility companies desired to support an efficient way to serve customers as well as allowing an expansion to the City of Lincoln and the LES service area. The Norris/LES Agreement established a “joint use area” which is primarily, east and southeast of Lincoln. LES provides electricity while both LES and Norris own facilities in the area. (See Appendix E.)

By the year 2030, the LES peak load is projected to increase by 470 megawatts to a peak load of 1235. LES will need to build new 115 kilovolt (kV) lines in growth areas to serve the new development. In addition, LES will need to build several new substation sites to serve new growth areas.

WASTEWATER MANAGEMENT. The Public Works and Utilities Department recently created the Lincoln Wastewater Facilities Plan Update (City of Lincoln, 2015). The plan is a guide for short term and long-term improvements to the infrastructure of the Lincoln Wastewater System during the planning period, as well as potential service extensions beyond Lincoln's anticipated future service limits.

GEOGRAPHY

The City of Lincoln is located at 40°48′35″N, 96°40′31″W (40.809868, -96.675345) and has a total area of 93.46 square miles. Of this, 92.11 square miles is land and 1.35 square miles is water (Census Bureau, 2016).

Aside from Lincoln, many of Nebraska's larger cities are located along either the Platte River or the Missouri River. Lincoln was originally laid out near Salt Creek and among the nearly flat saline wetlands of Northern Lancaster County. Lincoln's growth has enabled development of the surrounding land. In recent years, Northward growth has encroached on the habitat of the endangered Salt Creek Tiger Beetle, native to Lincoln.

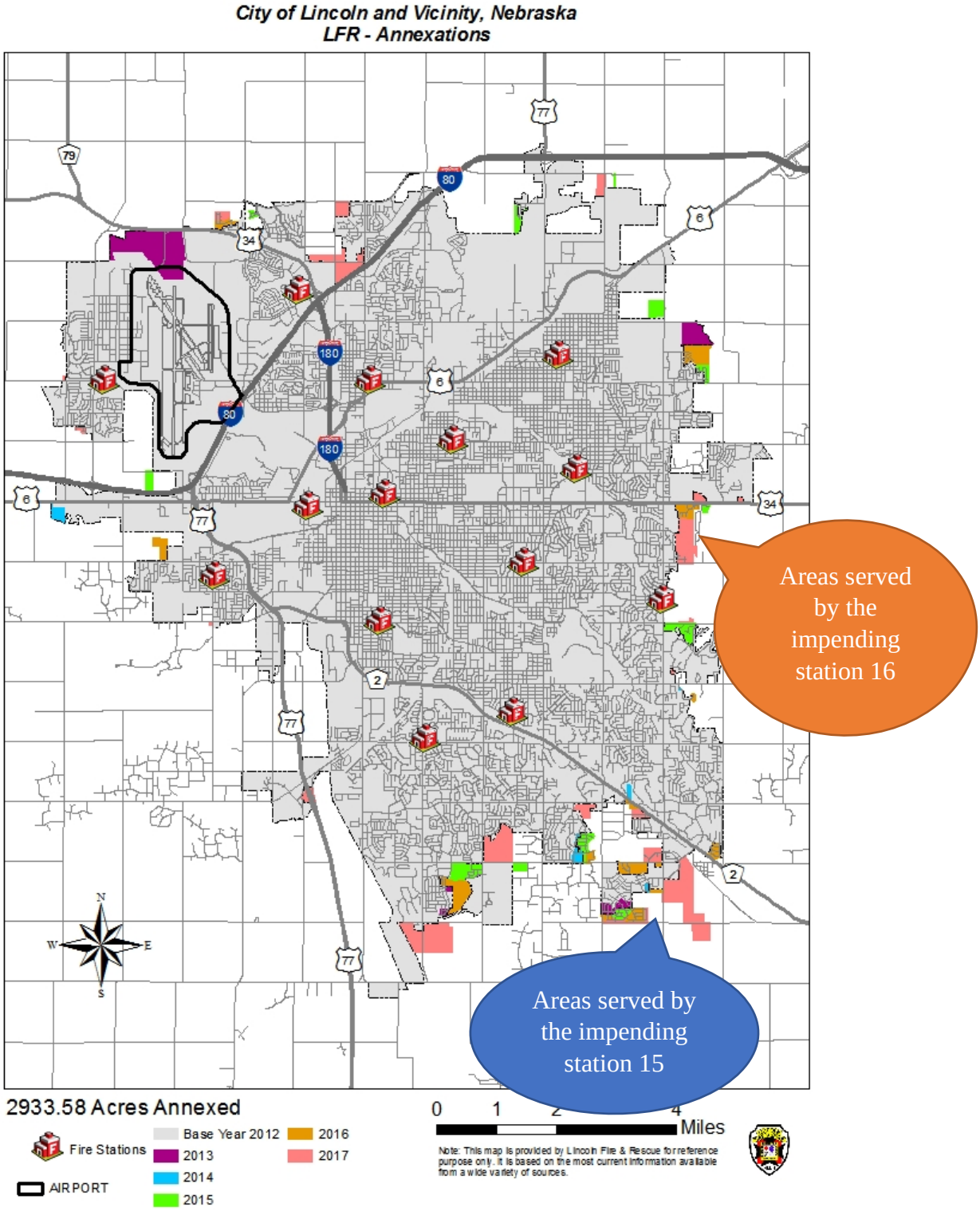
METROPOLITAN AREA. The Lincoln metropolitan area consists of Lancaster County and Seward County. Seward County was added to the metropolitan area in 2003. Lincoln has developed very little outside of its city limits and has no contiguous suburbs (the largest city that can be considered a suburb of Lincoln is Waverly) due primarily to the fact that most of the developed land has been annexed into the City of Lincoln. The Lincoln metropolitan area is the 104th largest in the United States.

Neighborhoods. See Appendix E for a list of major neighborhoods located within the City of Lincoln (Neighborhoods in Lincoln, 2017):

MUNICIPAL GROWTH. The City of Lincoln's Planning Department maintains a regularly updated comprehensive plan. This plan, known as LPlan 2040 (City of Lincoln, 2016a) outlines "where, how and when the community intends to grow and strategies for implementing the vision for how we will live, work, play and get around in the future."

As shown below, areas in the northeast, east, south and southwest are identified as planned city limit expansion. As the City of Lincoln continues to develop, annex, and expand its outer limits, LF&R will continuously monitor these new service areas. In addition to new growth, careful consideration will be given to specific land usage, etc. (See Appendix E.)

City of Lincoln Annexations, 2013-2017



TOPOGRAPHY

Topography can impact a municipality's ability to respond to emergency incidents. Elevation changes, natural or man-made barriers, and layouts of local transportation networks inflict negative consequences on fire department response. Each of these features makes it difficult to reach emergency incidents in a timely fashion.

The City of Lincoln is fortunate in that the topographical variables that affect response are somewhat limited by a relatively flat landscape with minimal elevation changes. Topographical features affecting emergency response will be further referred to as response barriers. LF&R defines response barriers as:

> Areas that cannot be accessed easily due to a lack of connectivity; for example, the lack of streets, streets not yet completed, natural features, such as waterways or mountains, blocking access or slowing responses.

ELEVATION. Elevation plays a minor role in respect to response time and associated risk for the City of Lincoln in terms of overall geography. The absence of elevation changes does however affect the city's risk to flooding as described later in this document. See Appendix E, Elevation Map, for a view of the City of Lincoln and its elevation changes.

OPEN SPACE/INTERFACE. In addition to elevation changes, areas of open space or interface that emergency vehicles must navigate around create a response barrier. Area may include creeks, streams, rivers, parks, golf courses, airports, rail yards, etc. See Appendix E for Lincoln's response barriers.

*Lincoln's Sunken Gardens (Lincoln Journal-Star, 2018)

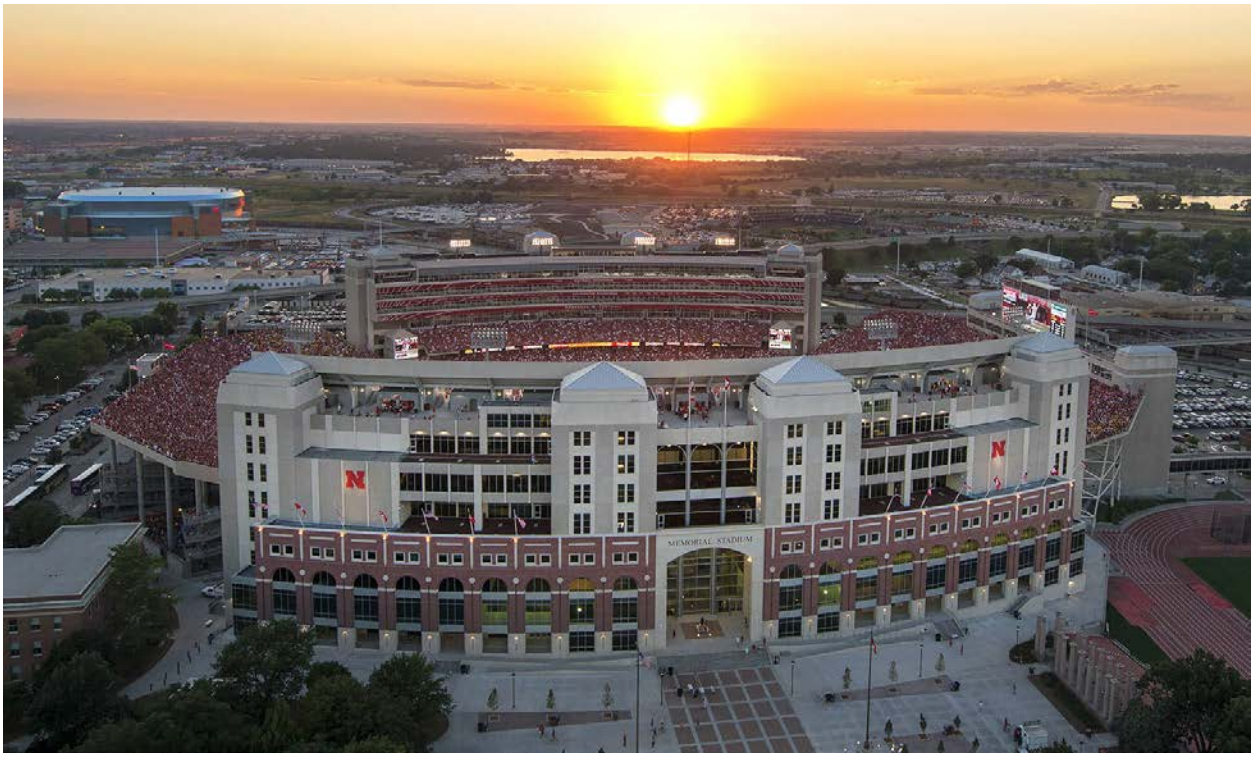
RESPONSE OBSTACLES.

***Lakes/Streams/Waterways*.** Holmes Lake, Wedgewood Lake, Bowling Lake, Capitol Beach Lake, Laguna Lake, Oak Lake, Pine Lake, Oak Creek, Beal's Slough, Antelope Creek, Salt Creek, Dead Man's Run.

Recreation Areas/Parks/Golf Courses. Antelope Creek Trail, Antelope Park, Arnold Heights Park, Bethany Park, Ballard Park, Billy Wolf Trail, Bishop Heights Park, Carson Park, Col. Densmore Park, Colonial Hills Park, Country View Park, Cripple Creek Park, Edenton South Park, Firethorn Golf Club, Herbert Park, Highland Park and Golf Course, Hi-mark Golf Course, Holmes Park and Golf Course, Irvingdale Park, Knolls Country Club, Lincoln Country Club, Mahoney Park and Golf Course, Max Roper Park, Oak Lake Park, Olympic Heights Park, Pioneers Park, Pentzer Park, Peterson Park, Pine Lake Golf Course, Porter Park, Roberts Park, Seacrest Park, Schroeder Park, South Highland Park, Stansky Park, Taylor Park, Tierra Park, Trendwood Park, West Lincoln Park, Wilderness Golf Course, Wilderness Park, Woods Park, Yankee Hill Golf Course.

*Densmore Park (Lincoln Journal Star, 2018)

General land use obstacles. ADM Mills, Bob Devaney Sports Center, Bryan/LGH East Hospital, Bryan/LGH West Hospital, Burlington Northern Rail Yard Downtown, Burlington Northern Rail Yard Havelock, East Park Place, East High School, Haymarket Park Stadium, Northeast High School, North Star High School, Lincoln High School, Lincoln Memorial Park Cemetery, Madonna Rehabilitation Hospital, Memorial Stadium, Pinnacle Bank Arena, Pius X High School, State Penitentiary, Union College, University of Nebraska Downtown Campus, University of Nebraska East Campus, Veterans Hospital, Wesleyan University, Westfield/Gateway Shopping Center, Wyuka Cemetery.



*UNL's Memorial Stadium (Lincoln Journal Star, 2018)

TRANSPORTATION NETWORKS

ROADS. Lincoln is unique in that its road system allows for short commute times. In Lincoln, the average commute time for workers is 17 minutes, as compared to the nationwide 26 min (City of Lincoln, 2016a). LF&R consistently monitors call trends as related to traffic. In addition to other resources, a crash study assists LF&R in determining frequency and probability risks with automobile accidents.

At the time of the crash study, there were a total of 7,178 crashes reported to the Lincoln Police Department (LPD). The total monetary loss to the public was estimated at $277 million. The total number of crashes has remained consistent even though the number of daily vehicle-miles traveled increased. These numbers do not reflect the 900+ accidents that were reported on private property.

Crash severity is classified into several categories (City of Lincoln, 2014):

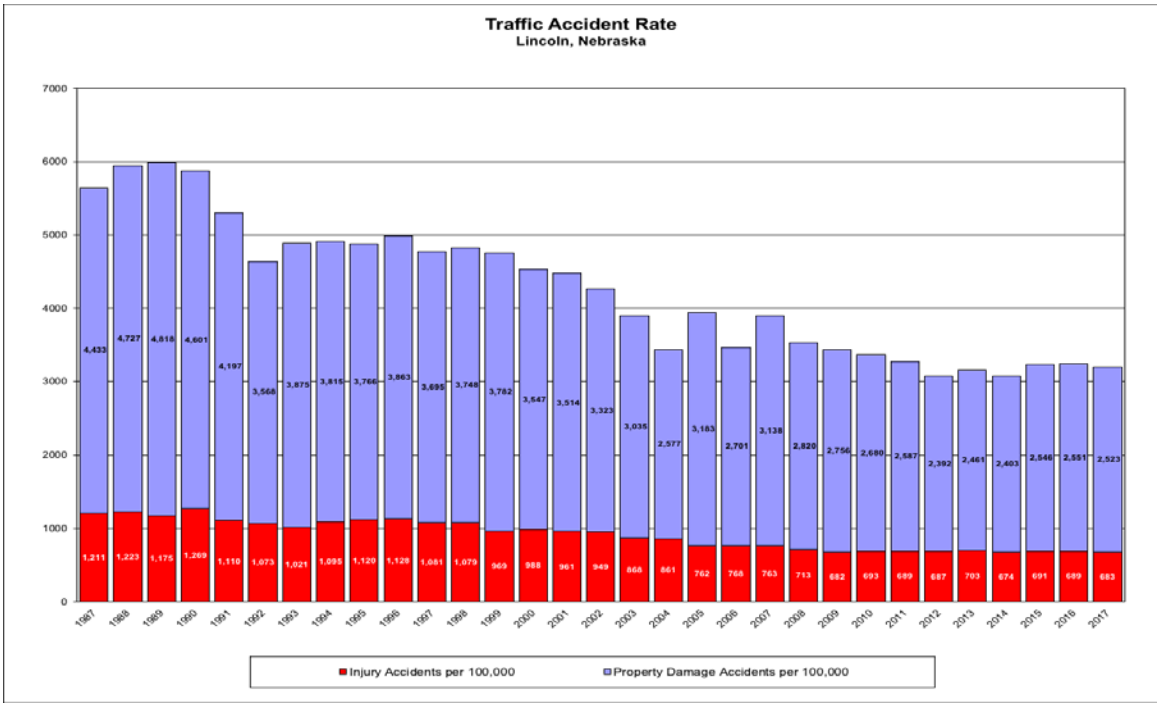
Injury/Fatality: a crash that ends in a death of incurred injury.

Property Damage: Crashes in which no persons were killed or injured but the estimated cost of the damage equaled or exceeded $1,000.

Non-Reportable: Crashes in which no persons were killed or injured, and the estimated cost of the damage was less than $1,000.

LF&R also looks at future planning of streets and major thoroughfares to determine the appropriate distribution of resources. See Appendix E for Future Service Limits.

Lincoln, NE automobile crash statistics, per Lincoln Police Department (2018):



In recent years, Lincoln has been inserting traffic roundabouts instead of traditional intersections, to reduce accidents:

*Future planned roundabout intersecting Warlick Boulevard, Old Cheney Road, and S. 14th Street. (Lincoln Journal-Star, 2018)

LF&R responds to incidents on Interstate 80 (I-80) within the primary response area, and as a mutual aid resource in the secondary response area, typically in the form of EMS transport. I-80 is trans-continental, dissecting the United States with Lincoln, NE being the true mid-point. LF&R responds to a high number of traffic related and hazardous material incidents on I-80. Other highways in and around Lincoln's community include Highway 2, Highway 6, Highway 79, Highway 34, Highway 77, and I-180. See Appendix E for Interstate and Highway Map, and Truck Routes.

The Lincoln/Lancaster County Health Department (LLCHD) estimates nearly 270,000 shipments of hazardous materials pass through Lincoln each year on I-80. As a general rule, about 10 percent of all truck shipments contain hazardous materials (City of Lincoln, 2016a).

RAIL. The locations, usage and nature of the rail lines dictate the level of risk. Side spurs into industrial areas generally have loading and unloading issues but lower volumes of overall train traffic. Main lines and passenger routes have higher frequencies of usage with higher speeds that can potentially generate major incidents.

BNSF Rail line

The city and county are currently served by two, Class I railroads and one Class III railroad: the mainline of Burlington Northern Santa Fe Railway (BNSF, Class I), a secondary branch line of the Union Pacific Railroad (Class I) and Lincoln Lumber Railroad and the Kyle Railroad (Class III). The Kyle Railroad operates a rail line in Southeast Lancaster County via the Omaha Public Power District (OPPD) track from Southeast Lincoln to Nebraska City. Both freight and passenger rail services are offered in Lincoln and Lancaster County. Currently up to 80 trains a day travel east to west through the county. (City of Lincoln, 2016a)

In recent years, railroads in Lincoln and Lancaster County have been affected by changes in the railroad industry and growth within the City. Lincoln serves as a major hub for BNSF railroad, and has a major rail yard west of the downtown area. Also located in Northeast Lincoln is the BNSF car repair shop where rail cars are repaired and maintained.

With a large rail presence, Lincoln experiences frequent railroad traffic, impacting emergency response. The two greatest areas of impact are the North rail line following Cornhusker Highway and the South rail line following Nebraska Highway 2. There are fire stations on both sides of these rail lines so initial response is rarely affected. However, subsequent response is more often affected. These factors are well known, identified and planned for in day to day operations.

The geographic location of Downtown or West Yard creates a special hazard within Lincoln's community. The East Downtown Yard experiences a relatively high frequency of hazardous materials traveling through it. Due to its immediate proximity to downtown, it creates an abnormally high hazard to one of Lincoln's most population dense areas. LLCHD also estimates that about 90,000 shipments of hazardous materials pass through Lincoln each year by rail (City of Lincoln, 2016a).

LF&R works extensively with BNSF to reduce hazards to the community through joint training exercises, rail specific training, pre-planning, community drills and a cooperative response to hazards within this facility. See Appendix E for Lincoln's rail map.

AIR TRAVEL. Typically, aircraft emergencies occur during the takeoff and landing phases of air travel. Thus, areas around airports can see increased risks and hazards. As with rail lines, the activity levels of airports have a significant impact on risk. As a regional airport, LF&R defines the airport as relatively low risk.

Lincoln's airport is geographically located four miles northwest of downtown. It is the second largest airport in Nebraska, serving the Lincoln metropolitan area and much of Southeastern Nebraska.

It supplies three main runways of 12,901 feet, 8,649 feet, and 1,646 feet in length. The longest of these is designated as an emergency landing site for the Space Shuttle. The airport is also home to Duncan Aviation, a large locally owned aircraft maintenance and refurbishing company. (Lincoln Airport, 2017)

The airport supports Delta and United Airlines as commercial carriers. In 2013, the airport had 56,624 aircraft operations, an average of 155 per day: 13,326 General aviation, 12,282 Military, 6,391 Air Carrier, and 5,625 Air Taxi. In 2013, the Lincoln Airport enplaned a total of 141,584 passengers and deplaned a total of 142,106. This brings the 2013 total passengers to 283,690 passengers. (Lincoln Airport 2017)

A portion within the Lincoln Airport is home to the Nebraska Air National Guard's 155th Air Refueling Wing and several Army National Guard units, both of which are located just East of Runway 36, right alongside taxiway Delta. The Air National Guard's tarmac is closed to general aviation and is guarded by Air Force Security Forces 24 hours a day. Lincoln is also a practice runway for Offutt Air Force Base. (Lincoln Airport, 2017)

Through a written agreement, ARFF (Aircraft Rescue and Firefighting) is provided to Lincoln's Airport by the Nebraska Air National Guard (NANG). As the airport and the Lincoln Airport Authority are entities of the City of Lincoln, NANG is a mutual aid resource to the city specifically for the provision of ARFF. Naturally, the NANG has jurisdiction during military aircraft incidents. However, for all other incidents LF&R has overall jurisdictional responsibility utilizing NANG as a specialized resource.

Some aircraft emergency areas are at greater than normal risk due to their proximity to the airport. Shown are the inner and outer approach zones, turning radius and transition zones. Neighborhoods at greatest risk include portions of the Highlands Neighborhood, West Downtown, West A Street Neighborhoods, and the Oak Lake Neighborhood. Though aircraft events have been historically rare, LF&R has responded to aircraft emergencies at and around the airport. See Appendix E for Airport Zoning Map.

WATER. Like other transportation features, waterways increase exposure to incidents. Waterways can present access issues and may require specialized equipment. Whereas waterways can present a hazard to communities through the transportation of commodities, The City of Lincoln currently has no waterway where commercial transportation activities occur. However, waterways do exist in the community and present an increased level of risk, as shown in Appendix E: Lakes, Streams, and Creeks.

Most of Lincoln's waterways border industrial and commercial areas, which presents a method for the dispersal and transportation of hazardous materials. LF&R frequently responds to calls where hazardous materials have been dumped or spilled in streams and creeks. Every suppression apparatus carries a complement of PPE and defensive rescue equipment for personnel working near swift water conditions.

Antelope Creek, North of “The Big X” (northeast corner of Antelope Valley Parkway and Salt Creek Roadway), with and without flooding from nearby Salt Creek:

(Lincoln Journal Star, 2017)

(Lincoln Journal Star, 2017)

CLIMATE. Conditions related to weather and the physical environment may have an impact on service delivery. Heavy amounts of snow, rain, ice, or other conditions delay responses and are considered risk factors. Events in the winter hamper and increase emergency response times.

Per U.S. climate data (2017):

	Jan	Feb	Mar	Apr	May	Jun
Average high in °F:	35	40	52	64	74	84
Average low in °F:	14	18	28	39	51	61
Av. precipitation in inch:	0.63	0.79	1.93	2.72	4.29	4.33
Average snowfall in inch:	5	6	5	1	0	0
	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Average high in °F:	89	87	79	66	50	37
Average low in °F:	66	64	53	41	28	16
Av. precipitation in inch:	3.39	3.5	3.03	1.97	1.42	0.94
Average snowfall in inch:	0	0	0	1	2	6

Annual high temperature:	63.1°F
Annual low temperature:	39.9°F
Average temperature:	51.5°F
Average annual precipitation - rainfall:	28.94 inch
Av. annual snowfall:	26 inch

DESCRIPTION OF AGENCY PROGRAMS AND SERVICES

Although officially titled “Lincoln Fire & Rescue,” LF&R is in fact a multi-faceted public safety agency. In addition to fire suppression, LF&R provides many essential services: emergency medical treatment and transport, hazardous materials (hazmat) response, rescue, and risk reduction through public engagement. To provide the best possible service, LF&R recognizes that incident prevention and mitigation are critical to public safety.

CRITICAL TASK ANALYSIS

In late 2017, LF&R thoroughly reviewed its critical task analysis (CTA), to update its emergency response needs (Appendix A). This review and hands on validation took place over the course of 3 weeks and included a medium risk scenario, administered 6 times. These CTA’s and the development of their accompanying effective response force (ERF) depict the minimum number of personnel needed to mitigate specific incident types. In addition to incident type, many outside factors can influence an ERF: weather, total system status needs, infrastructure unique to the incident, and daily staffing. These ERFs consider LF&R’s management policies and standard operating procedures.

STAFFING CONSIDERATIONS. LF&R takes several factors into consideration when determining staffing both individual apparatus and the daily complement of firefighters, in its entirety. These factors include National Fire Protection Association (NFPA) standard 1710, LF&R management policies (MPs) 209.20 and 901.16, and a daily staffing clause, as negotiated by the Lincoln Firefighters Association Local 644.

MP 209.20 (2015) addresses staffing of designated suppression apparatus:

> In order to assure that adequate personnel are available for emergency fire & rescue related incidents, the department will maintain a complement of on duty personnel so that all in service engine and truck companies have a minimum of 3 personnel assigned.

LF&R defines engine companies as:

> Fire companies whose primary functions are to pump and deliver water and perform basic firefighting at fires including search and rescue.

LF&R defines truck companies as:

> Fire companies whose primary functions are to perform the variety of services associated with truck work such as: forcible entry, ventilation, search and rescue, aerial operations for water delivery and rescue, utility control, illumination, overhaul and salvage work.

The daily staffing clause, as specified in the labor contract, as negotiated by the Lincoln Firefighters Association, Local 644 (article 36, 2018):

> LF&R make a reasonable attempt to maintain a minimum of 78 suppression personnel on duty, at any time. Suppression personnel are defined as those assigned to: EMS Supervisor (EMS1), truck company, engine company, Hazmat/Air Unit or medic units on duty.

Within the next 24 months, the daily headcount will increase to 88 personnel.

STRUCTURAL FIRE SUPPRESSION

Each request for service carries a 15% probability of being fire-based. These requests include: confirmed fires, smoke odors, and alarm activation. A confirmed fire (dispatch coded as "Fire Charlie") includes the following apparatus complement as a standard first alarm: Battalion Chief (OIC), three engine companies, two truck companies, Air 14, EMS1, and a medic unit. LF&R designates a safety officer to every working fire.

If an incident expands in magnitude or has unique characteristics that require more personnel, additional alarms will be requested. These alarms, in sequence, are as follows.

Alarm	Additional Engines	Additional Trucks	Additional Support	Planning
Second	2	n/a	All chief officers	As needed
Third	1	1	" "	" "
Fourth	2	n/a	" "	" "
Fifth	n/a	n/a	Recall all personnel	" "

When identifying these critical tasks, LF&R's hierarchy of priorities are always taken into consideration:

Interior fire attack operations are often necessary. These operations require the use of personal protective equipment (PPE). This PPE includes but is not limited to turnout gear, self-contained breathing apparatus, and a minimum 1 ¾" hose line. Interior operational risks are numerous and unpredictable including incendiary devices, low visibility, structural collapse, entrapment, entanglement, and disorientation. These operational risks require additional personnel to be staged outside of the structure ready to function as a rapid intervention team (RIT). The previously mentioned "two in two out" OSHA standard requires agency compliance.

One specific advantage afforded LF&R is the ability to use medic unit personnel in multiple roles on an emergency scene, as designated by the IC: initial incident command, fire suppression, rescue, triage, and safety officer themed activities. As dynamic incidents evolve and situational needs change, these personnel can be reassigned to complement patient care and transport. Consistent operational evolution has enhanced our ability to fulfill ever expanding objectives.

STRATEGY AND TACTICS. Structure fires require the initial incident commander (IC) decide what attack strategy is appropriate. These strategies are defined as follows:

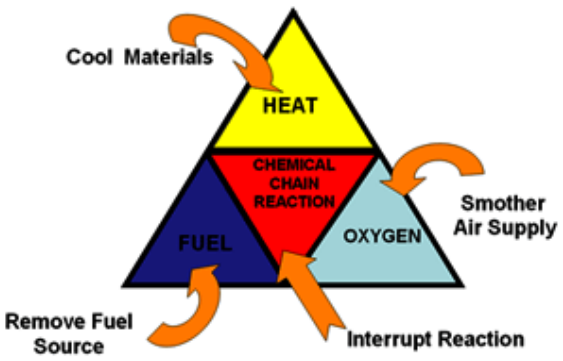
> Offensive attack, an aggressive interior fire attack. Its main purpose is rapid extinguishment. When successful it results in incident stabilization, resulting preservation of life, and property conservation.

Defensive attack, marked by a situation that does not allow for interior attack. These situations include substantial fire progression, signs of imminent structural collapse, or any situation that tips the tactical balance from reward to risk.

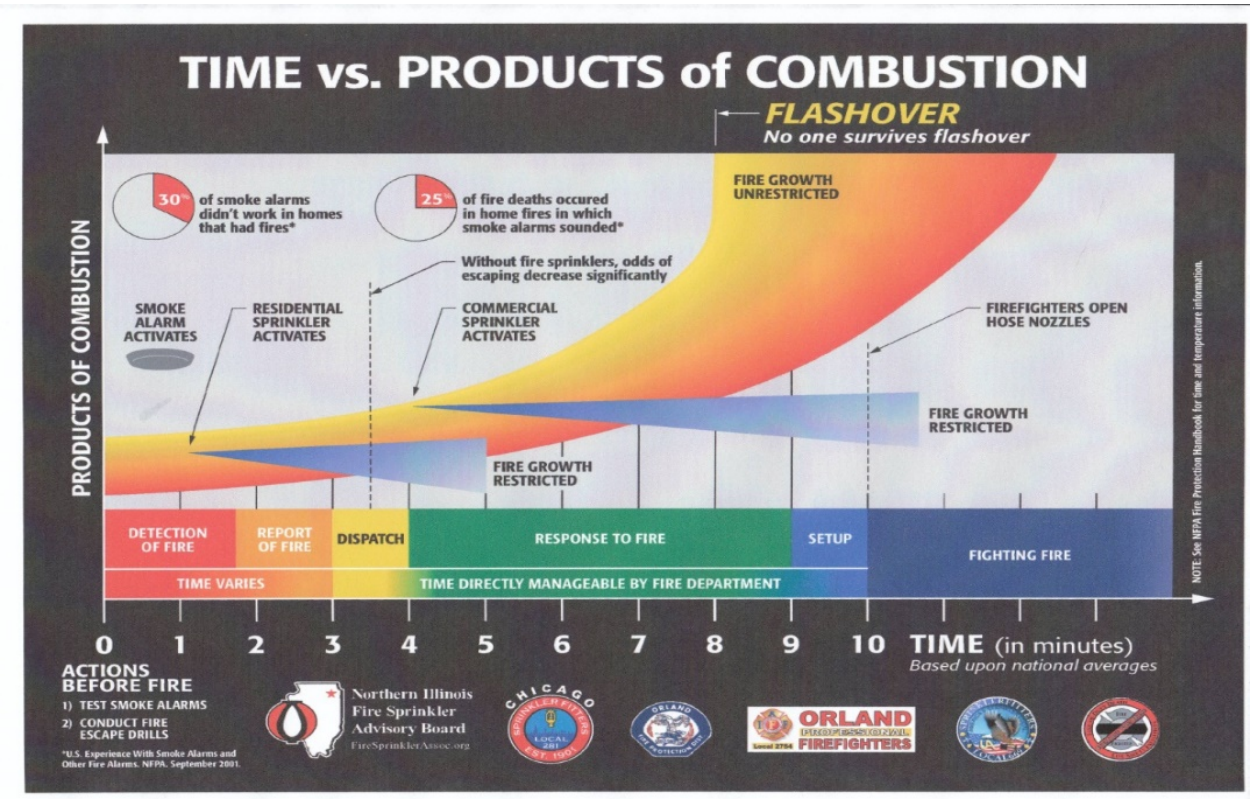
Transitional attack, a hybrid tactic. An example of transitional attack is a structure fire where the initial engine company applies water to an interior fire from an exterior location, with the goal of rapid extinguishment.

FIRE BEHAVIOR: The study of fire behavior indicates the burning process occurs in four clearly defined stages. Each of these stages are characterized by different temperatures and atmospheric compositions within a structure. A firefighter may encounter one or all the following stages of fire as defined by IFSTA (1998):

Ignition Stage. The first stage of any fire. When heat is applied to a combustible material, oxidation occurs, resulting in the release of heat and of combustible gases. The rate of oxidation is then increased, resulting in ignition: a chemical chain reaction of burning and heat release. This combination of events as depicted below, is known as the fire tetrahedron. During this stage, fire is limited to the initial material of ignition, and is greatly influenced by its surface to mass ratio. Ex: an example, a log takes a greater amount of heat over time to generate ignition than sawdust.



Growth Stage. The second phase of fire. During this stage, oxygen and fuel exist in amounts sufficient to support significant fire growth. Characteristics can include room temperatures meeting or exceeding 1300 degrees Fahrenheit.



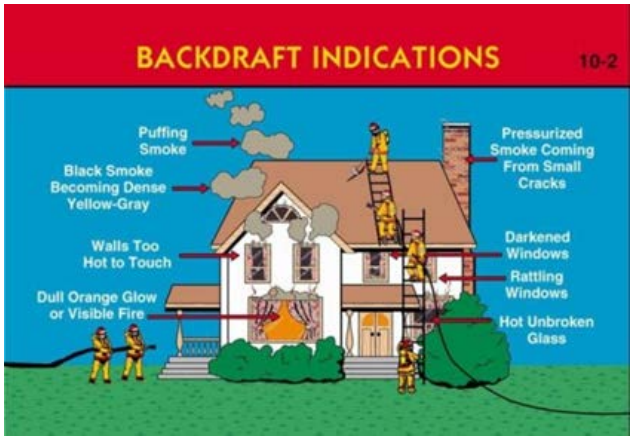
Flashover. A transitional event, this a major turning point in fire department response, in respect to ERF. When a fire is confined to a space, this event transpires when combustible gases, released during the growth sage, rise and form superheated layers. As the volume of each gas layer increases, they begin to bank towards the floor, heating all combustible objects in the area.

Flashover is critical for two reasons. First, unprotected occupants are unlikely to survive. Second, flashover increases the rate of combustion, increasing the needed ERF for fire suppression. As well, a greater amount of water will then be needed to extinguish an ever-increasing volume of fire.

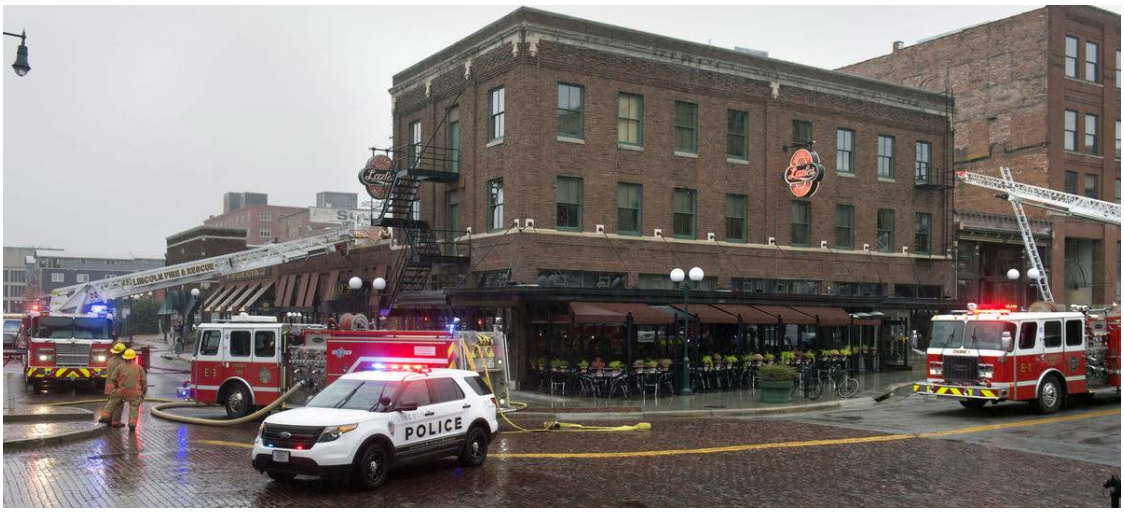
Fully Developed Stage. This stage is marked by all combustible contents in a room achieving ignition and involvement in fire, burning at their highest potential temperature. Large volumes of released gas tend to seek out venting spaces and areas of low pressure. Like fluids, these gasses continuously attempt to equalize their pressures.The La Mexicana and Lincoln Public Schools District Offices fires, in their fully developed stages:

Decay Stage. The final stage of fire, characterized by embers in the absence of visible flame. The enclosed area will completely fill with dense smoke, gasses, and products of combustion at a temperature that can exceed 1,000 degrees Fahrenheit. The fire tetrahedron is now inhibited by lack of available oxygen.

Backdraft. An instantaneous and explosive event. It transpires when oxygen is rapidly reintroduced into an area as previously defined in the decay stage.



EXTINGUISHMENT. LF&R's goal at structure fires is to arrive and intervene in the narrow time frame preceding flashover, with the goal of containing a fire to its area of origin. To maximize property conservation, incident stabilization, and life safety initiatives, fire attack must be initiated prior to flashover and before fire spreads past its room of origin.



(Lincoln Journal Star, 2017)

(Lincoln Journal Star, 2015)

EMERGENCY MEDICAL SERVICE

Each system response carries an 81% probability of being medical in nature. Of these, three major categories have been identified: cardiac arrest, medical emergencies, and traumatic emergencies. Like fire incidents, each type of medical emergency carries its own CTA, and accompanying ERF.

Since 1994, LF&R's EMS operations have operated under independent oversight. The now named Lincoln/Lancaster County Emergency Medical Services Oversight Agency (EMSOA), is governed by a thirteen-member board that employs a medical director and ensures that quality emergency medical services are maintained in the Lincoln/Lancaster County area.

All LF&R personnel performing patient care at an EMS incident use emergency medical protocols for guiding patient care. These protocols have been jointly established by LF&R and EMSOA.

Each medical response is designated as Alpha, Bravo, Charlie, Delta, or Echo. Alpha is prioritized as the least critical. Echo is prioritized as most critical, and typically reserved for cardiac or respiratory arrest.

All emergency ambulance transport, as dispatched within the city limits, is provided by LF&R. When needed, LF&R also provides Advanced Life Support (ALS) assistance and transport, in the form of mutual aid, to several agencies in our secondary response area. These agencies are volunteer in nature and function at either a Basic Life Support (BLS) or first responder level of patient care.

LF&R strives to staff all engine companies with a paramedic. Truck companies are typically staffed by EMTs and medic units are staffed by a paramedic and an EMT. All personnel function as an EMT, at a minimum, and maintain licensure through the Nebraska Department of Health and Human Services (DHHS). Paramedics are required to maintain registration through the National Registry of Emergency Medical Technicians (NREMT) and licensure with the Nebraska DHHS.

MEDICAL/TRAUMA EMERGENCIES. For medical emergencies, LF&R's standard response includes the closest available engine company and medic unit. When the primary response apparatus is staffed BLS, the next closest ALS engine and/or EMS1 will be dispatched as a complement to the initial responding unit if ALS intervention is deemed necessary.

(Lincoln Journal Star, 2016)

Cardiac Arrest. Responses involving cardiac arrest are unique in comparison to medical and traumatic emergencies. Unless the event transpires in a public place, rapid transport is not a priority. LF&R's focus is high quality BLS care, including initiation of compressions, ventilation, rhythm analysis, and defibrillation.

Per the American Heart Association (AHA):

> Cardiac arrest – an electrical malfunction in the heart that causes an irregular heartbeat (arrhythmia) and disrupts the flow of blood to the brain, lungs and other organs – is a leading cause of death. Each year, more than 350,000 out-of-hospital cardiac arrests occur in the United States (2017).

Lincoln, like many other communities, has embraced Public Access Defibrillation (PAD) to increase the likelihood of survival from out-of-hospital cardiac arrest.

Beginning in September 2015, the combined city emergency response system participates in a community health themed smartphone application service called PulsePoint (Manna, 2015). Per its own description:

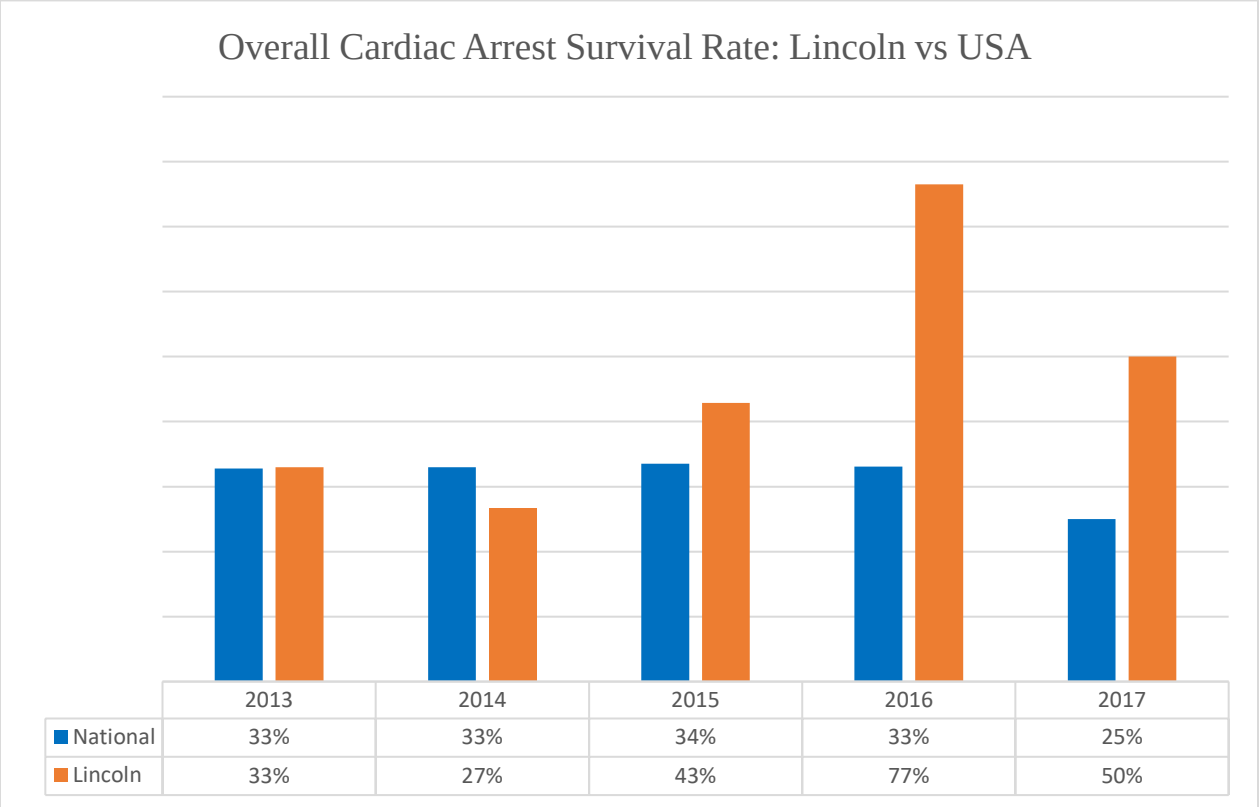
> PulsePoint empowers individuals, within covered communities, with the ability to provide life-saving assistance to victims of cardiac arrest. Application users who have indicated they are trained in cardiopulmonary resuscitation (CPR) are notified if someone nearby is having a cardiac emergency and may require CPR. If the medical emergency is in a public place, the application uses sophisticated location-based services to alert trained citizens in the immediate vicinity of the need for CPR. The application also directs these citizen rescuers to the exact location of the closest public access Automated External Defibrillator (AED).

Early CPR and defibrillation are recognized by the AHA, in its “chain of survival,” as the two most significant factors needed to survive a cardiac or respiratory arrest. Initially successful treatment of an arrest is defined by the return of spontaneous circulation (ROSC). A ROSC becomes far less likely when CPR and defibrillation are delayed.

In September of 2013, LF&R became the first EMS Service in Nebraska to join the Cardiac Arrest Registry to Enhance Survivability (CARES). CARES was developed to help communities determine standard outcome measures for out-of-hospital cardiac arrest. This allows initiation of quality improvement efforts and benchmarking capabilities to improve care and increase survival.

All cardiac arrest survival statistics LF&R provides are derived from the cardiac arrest registry to enhance survival (CARES). When compared to all CARES members, over 580 EMS agencies in 23 states, the survival statistics are broken down into two areas: The first of these is Utstein Criteria which is defined as a witnessed cardiac arrest in which the initial cardiac rhythm was deemed shockable. The second is overall survival percentage.

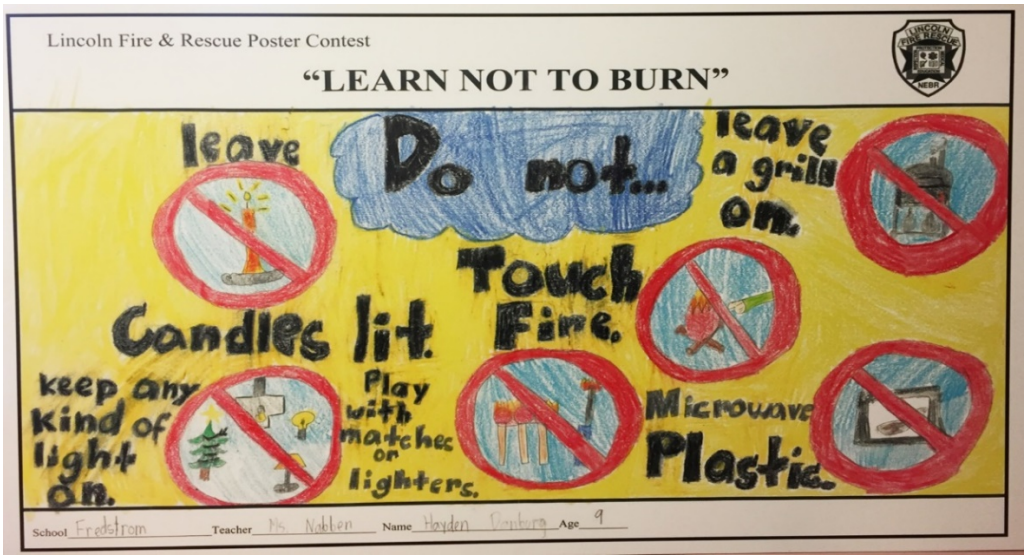
The following depicts the city vs the United States, by cardiac arrest survival rate. These patients have successfully survived to hospital discharge. LF&R's goal is to maintain a survival rate greater than the national average.



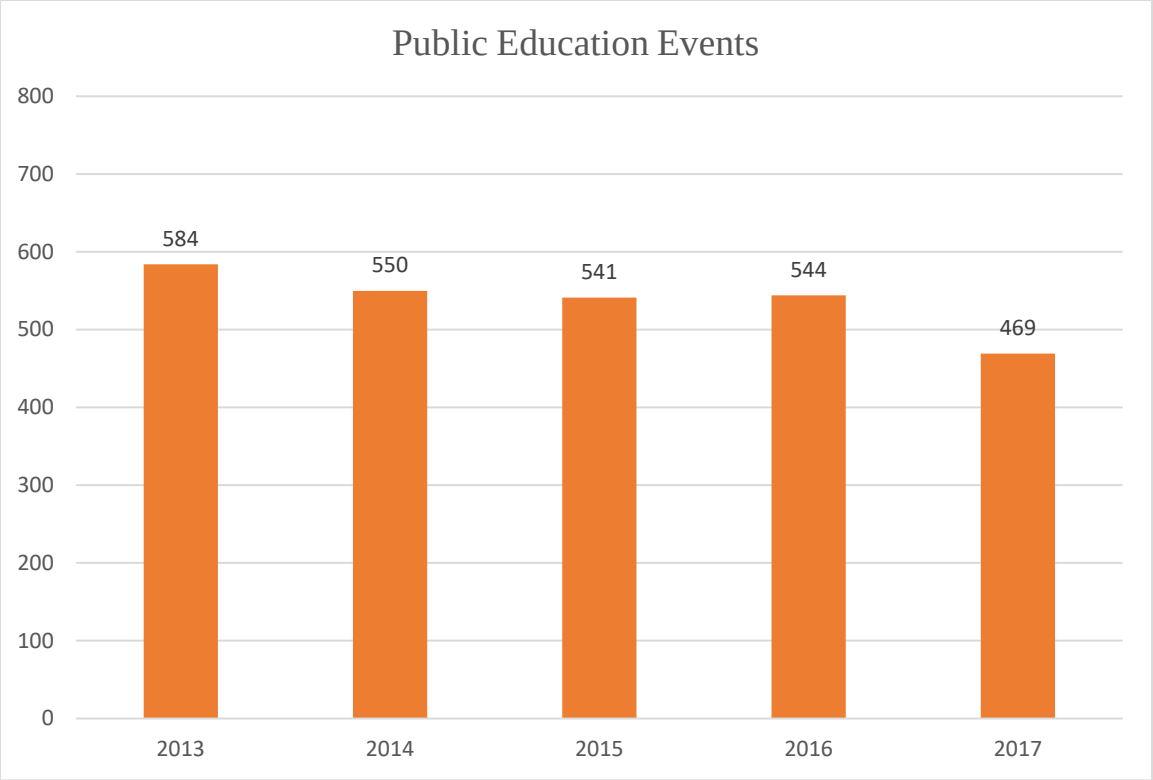
	2013	2014	2015	2016	2017
National	33%	33%	34%	33%	25%
Lincoln	33%	27%	43%	77%	50%

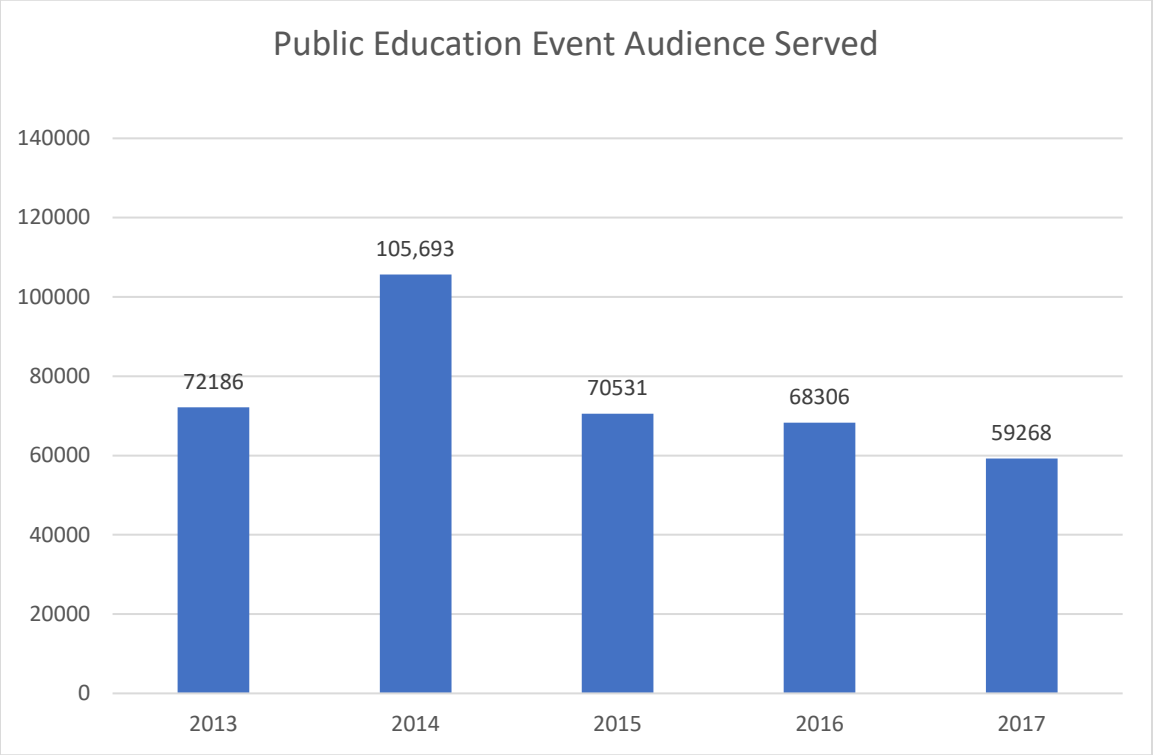
PUBLIC FIRE EDUCATION

LF&R facilitates many public education events. These include: CPR instruction, rig demonstrations, station tours, visits to child care facilities and schools, public demonstrations of our mobile fire safe house, and participation in the Boy Scout's Fire Explorer program. Notably, LF&R hosts an annual Learn Not to Burn poster contest for elementary students. In 2017, the winner received a ride to school in LF&R Engine 10.



(Lincoln Journal Star, 2017)


Public Education Events
800
700
600
500
400
300
200
100
0
584
550
541
544
469
2013
2014
2015
2016
2017


Public Education Event Audience Served
140000
120000
100000
80000
60000
40000
20000
0
72186
105,693
70531
68306
59268
2013
2014
2015
2016
2017

SMOKE DETECTOR INSTALLATION. Upon request through LF&R's website, or if deemed necessary during a response, LF&R will install, free of charge, new smoke detectors and replacement batteries for existing detectors. These installations also include specialized equipment for the hearing and visually impaired community. Each station maintains a cache of detectors and batteries that are replenished upon request, after installation. LF&R began tracking this metric in 2014.

http://lincoln.ne.gov/city/fire/services/smokeindex.htm

From 2014-2017, LF&R has installed 483 smoke detectors.

(Lincoln Journal Star, 2016)

WATER RESCUE

LF&R's water rescue team serves Lincoln, Lancaster County, and the surrounding area. Each team member is supplied a complement of specialty water specific PPE. A response includes on duty team members, a specialty response trailer, containing a cache of equipment, housed at LF&R's Station 1. During a water rescue incident, a team coordinator will assist the OIC in the tactical decision-making process. Like fire suppression incidents, water rescue can be labor intensive, requiring specially trained personnel.

Historically, the team has responded to a variety of rescue, recovery, and specialty incidents. Specialty incidents include several recovery possibilities: weapons used in the commission of crimes, items concealed in large bodies of water, and human bodies. Nebraska's extremes in weather require dive operations in water with zero visibility, surface ice, and temperatures near freezing.

RESCUE ALARM

LF&R defines a rescue alarm as a multiple vehicle or a multiple patient accident, requiring extrication. Like a structural firefighting operation, a rescue alarm can be labor-intensive, with an initial response of two medic units, two engine companies, and two truck companies. These incidents can require the use of specialized training with both suppression and specialized equipment such as hydraulic tools, pneumatic bags, vehicle stabilization equipment, and powered saws.

A subset of a rescue alarm, a technical rescue, is an incident that requires the use of specific training and specialized tools and equipment to remove a person or persons from an entrapment. LF&R personnel assigned to trucks 1, 5, 7, and 8 are trained in technical rescue operations which includes rope rescue, confined space rescue, structural collapse, and trench rescue.

HAZARDOUS MATERIALS

Each systemic incident carries a 5% chance of being “HAZMAT” in nature. Loosely defined, these incidents deal with a substance that poses a danger to health or the environment around it if improperly released.

All personnel with LF&R are required to be trained to NFPA 472 Hazardous Materials Operations Level. In addition to this, LF&R has three stations designated as HAZMAT response, 2, 9, and 14. Personnel assigned to these stations are trained to the hazardous materials technician level. Station 14 also houses a specialty HAZMAT response unit, HAZMAT 14. When deployed, Engine 14 personnel respond in this apparatus while Engine 14 is removed from service.

LF&R further defines hazmat incidents by level 1, 2, or 3.

HAZMAT Level 3 carries a low risk designation and includes spills, leaks, ruptures and/or fires involving hazardous materials that can be contained, extinguished and/or abated utilizing equipment, supplies and resources immediately available to the fire department. Level 3 incidents typically do not require the evacuation of civilians and require a response of the closest engine company.

An example would be 10 gallons of a liquid or less than 20 pounds of a solid and known hazardous material.

HAZMAT level 2 carries a moderate risk designation and includes incidents that can only be identified, tested, sampled, contained, extinguished and/or abated utilizing the resources of the LF&R hazmat response team. These incidents can require the use of specialized PPE and equipment designed to identify materials by hazard. Citizen evacuation may be required within a defined area, depending on the identified threat level, and requires a greater level of response: HAZMAT 14, Engine 2 or 9, OIC, one engine, and one truck.

An example would be a hazardous materials release of more than 10 gallons, but less than 50 gallons of a flammable or combustible liquid.

HAZMAT Level 1 carries a high-risk designation: spills, leaks, or ruptures that can be contained or abated utilizing the highly specialized equipment and supplies available to environmental or industrial response personnel. Level 1 incidents will likely require significant evacuation and decontamination and require a significant response in addition to a Level 2 response: 2 additional engine companies, 1 additional truck company, and all on duty personnel designated as Hazardous Materials Technician.

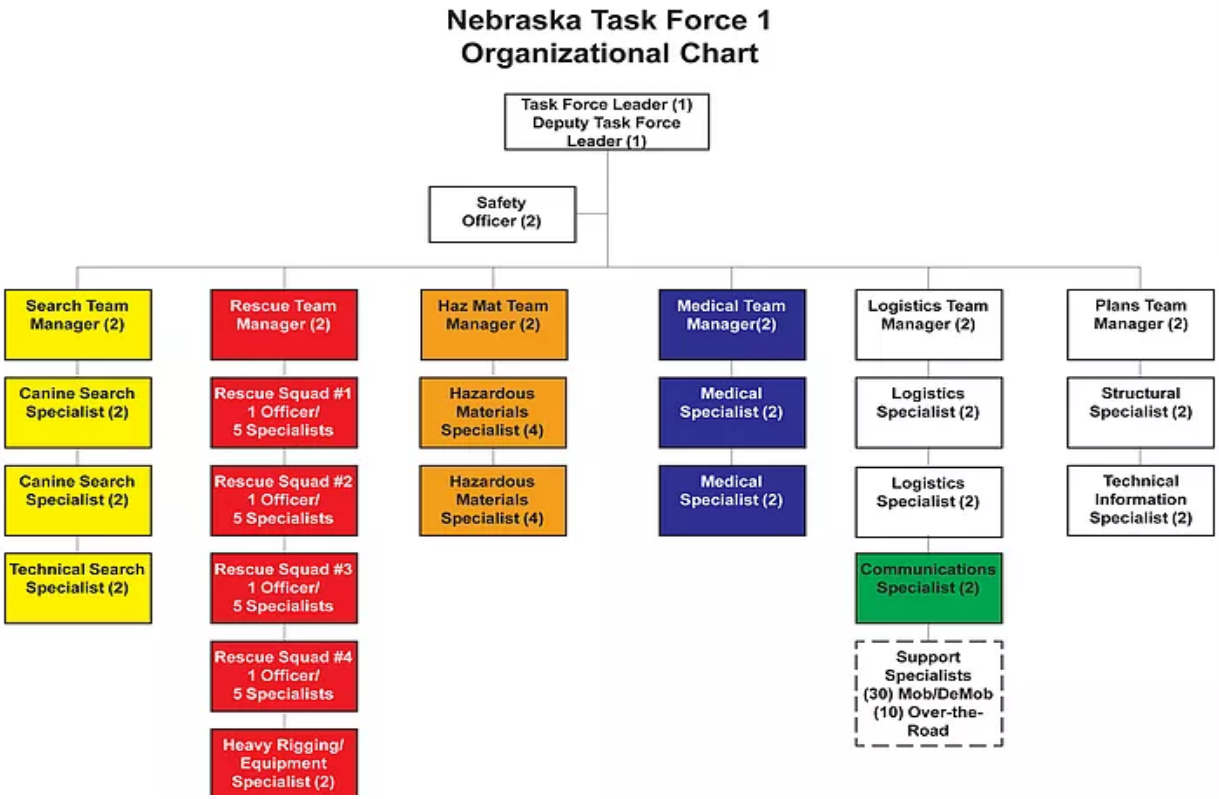
Fires involving hazardous materials can be allowed to burn if water is identified as hazardous to the incident, there is a threat of container failure; and/or an explosion, detonation, or boiling liquid expanding vapor explosion (BLEVE) has occurred.

An example would be a major release of flammable, corrosive, toxic vapors, or biological agent.

URBAN SEARCH AND RESCUE

LF&R is the host agency for Nebraska Task Force One (NEFT1), a FEMA sponsored Urban Search and Rescue (US&R) program. As one of only 28 fire departments host a US&R team, many LF&R members participate. Due to its location in the United States, NETF1 has an extensive history of responses (City of Lincoln, 2017a).

https://www.nebraskataskforce1.com/



RECENT US&R DEPLOYMENTS:

Incident	Response Type	Location	Year
Hurricane Florence	IST Members	North Carolina	2018
Hurricane Lane	IST Members	Hawaii	2018
Hurricane Maria	IST Members	Puerto Rico	2017
Grain Elevator Explosion	Members in Support	South Sioux City, NE	2018
Hurricane Irma	Full Team	Eglin Air Force Base, Florida	2017
Hurricane Harvey	Full Team	Katy, Texas	2017
Building Collapse	Members in Support	Omaha, Nebraska	2014
Colorado Flooding	Full Team	Boulder, Colorado	2013
Oklahoma Tornado's	Full Team	Moore, Oklahoma	2013
Missouri Tornado	Members in Support	Joplin, Missouri	2011
Haiti Earthquake	IST Members	Herndon, Virginia	2010
Presidential Inauguration	Members in Support	Washington DC	2009
Iowa Tornado	Search Component	Little Sioux, Iowa	2008
Hurricane Dolly	Type III Team	San Antonio, Texas	2008
Hurricane Gustave	Type III Team	Atlanta, Georgia	2008
Hurricane Ike	Type III Team	Jacksonville, Florida	2008
Kansas Tornado	Full Team	Greensburg, Kansas	2007
Hurricane Dean	Full Team	Fort Worth, Texas	2007
Hurricane Katrina	Type III Team	Gulfport, Mississippi	2005
Hurricane Katrina	Full Team	New Orleans, Louisiana	2005
Hurricane Francis	Members in Support	Florida	2004
Space Shuttle Columbia Crash	Search Component	Houston, Texas	2003
2002 Winter Olympics	Full Team	Salt Lake City, Utah	2002
Pentagon Attack	IST Members	Washington DC	2001
World Trade Center Attack	Full Team	New York, New York	2001
Tornado Response	Members in Support	Oklahoma & Kansas	1999
Grain Elevator Explosion	Full Team	Wichita, Kansas	1998
Hurricane Bertha	Members in Support	Puerto Rico	1996
Atlanta Olympics	members in Support	Atlanta, Georgia	1996
Hurricane Response	Members in Support	San Juan, Puerto Rico	1996
Federal Building Bombing	Members in Support	Oklahoma City, Oklahoma	1995
Hurricane Opal	Full Team	Pensacola, Florida	1995
Hurricane Emily	Members in Support	North Carolina	

RECENT ACCOMPLISHMENTS IN PURSUIT OF OUTCOMES

EMS

- Implementation of peaking medic unit
- Peaking medic unit becoming a full-time medic unit
- Addition of I-Gel airway device
- Addition of CPAP in EMS protocols
- Implementation of Operative IQ, which aids in tracking, ordering and distribution of supplies
- Implemented EMS supply vending machines for faster resupply and better tracking
- Introduction of VividTrac visual airway device
- Implemented in-house ambulance remount program with EVT trained technicians

Fire Response and/or Special Operations

- Replaced all front-line truck companies and several engine companies
- Stihl chainsaws on engine companies
- Addition of Blue Tree modems all apparatus
- Placed high-rise kits on all engine companies
- Added compact CO detectors to all engine company BLS bags

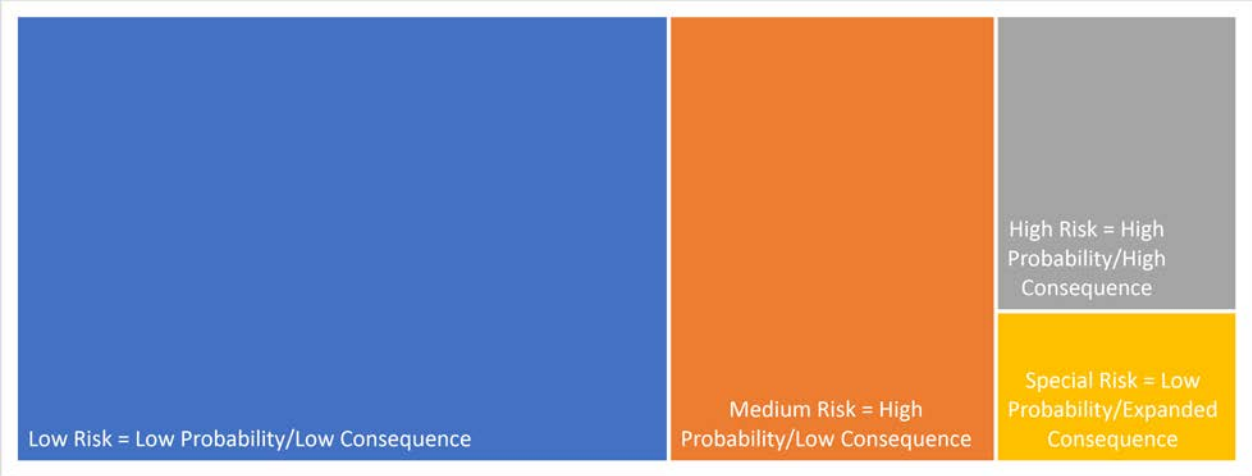
Administration

- Live video streaming from Battalion 1
- Citywide Automatic Vehicle Location (AVL) system
- Implemented Omega Fireview Dashboard
- Added PowerDMS document management system
- Implemented a Virtual Quartermaster System
- Implementation of PulsePoint in the Lincoln EMS/911 system
- Maintained continuous accredited status by the Center for Public Safety Excellence (CPSE).

ALL HAZARD RISK ASSESSMENT

STRUCTURAL RISK

LF&R assigns risk to assist to determine resource concentration and distribution needs. This risk is defined by event frequency and estimated consequence:



In late 2017, LF&R made the decision to begin classifying all structures in the city by assessed risk. This serves several internal purposes by defining risk by individual FPZ, right-sizing apparatus deployment to an incident, and simplifying both resource concentration within FPZs and future planning. If a FPZ increases in risk, the apparatus concentration within will be reevaluated. Although not yet instituted, this will be incorporated into LF&R's risk-based dispatch protocol.

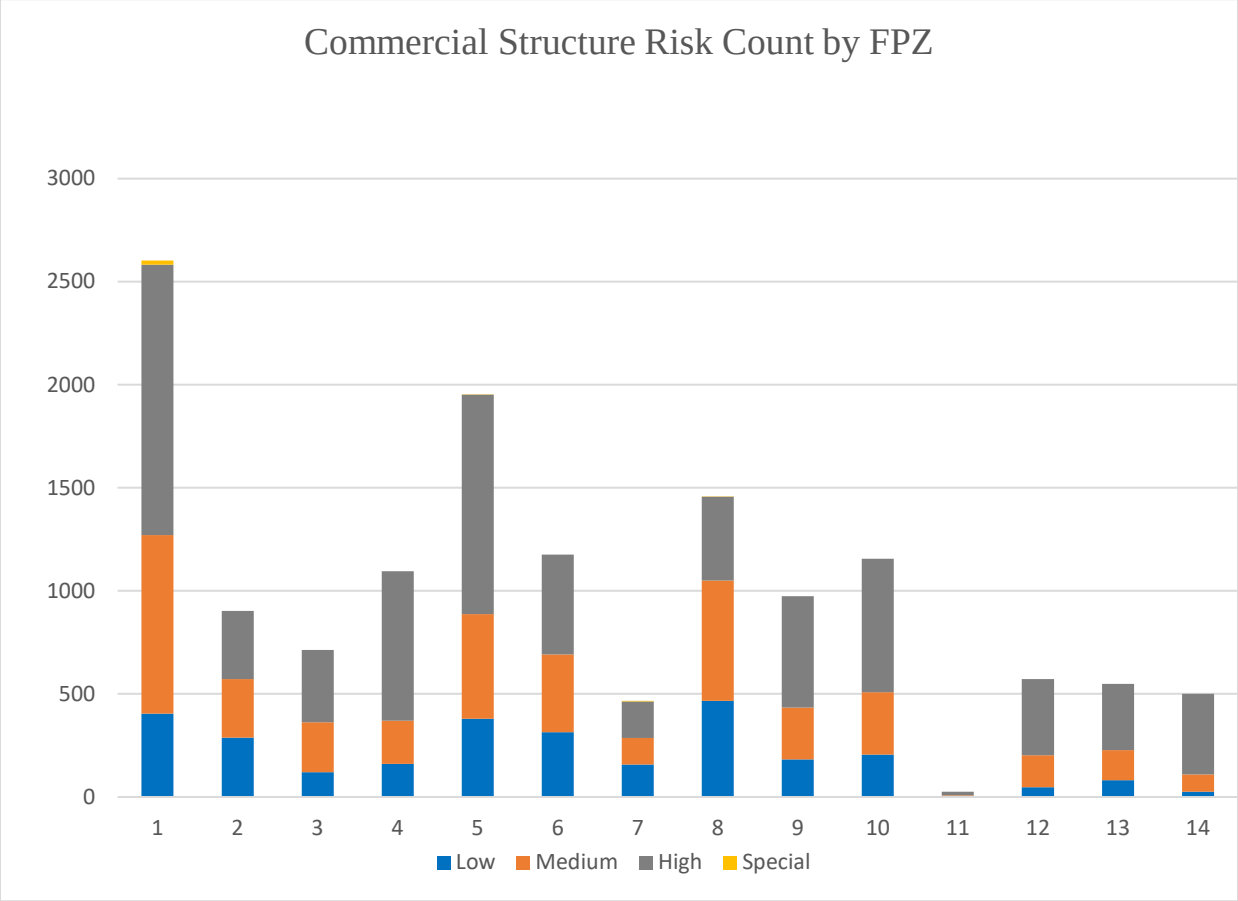
As shown, a matrix has been developed, to describe the risk evaluation process. Although quite specific, this matrix is designed to be flexible. As an example, when evaluating a property, a company officer can suggest a facility be assigned a different level of assigned risk, if certain criteria is met: a functioning or non-functioning alarm or suppression system, water supply access issues, change in occupancy, and structural usage. When instituted, LF&R will use the following 4 defined levels of risk:

RISK BASED RESPONSE MATRIX

Low Risk	
Medium Risk	
High Risk	
Special Risk	
Criteria:	
Low Risk	1k - 3999 Sq. Ft, 2 handlines or less
Medium Risk	4k – 9999 Sq. Ft, 4 handlines or less
High Risk	>10k Sq. Ft, <6 stories, 6 handlines or less
Special Risk	High risk criteria and >6 stories, or significant historical, community, or economic impact

*Handlines are “soft” criteria.

COMMERCIAL STRUCTURE RISK COUNT BY FPZ



WEATHER

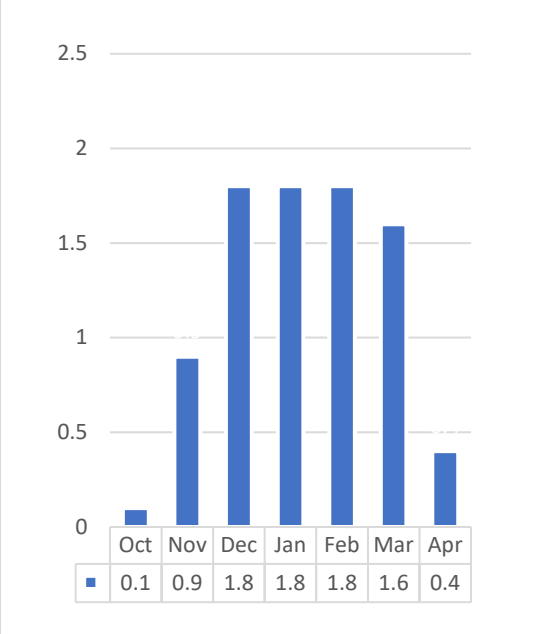
Severe winter storm - High/Special Risk: Winter storms vary in size and strength and can be accompanied by strong winds creating blizzard conditions and dangerous wind chill. There are three categories of winter storms:

Blizzard – Most dangerous of all winter storms, it combines low temperatures, heavy snowfall and winds of at least 35 miles per hour.

Heavy Snow Storm – A storm which drops four or more inches of snow in a 12-hour period.

Ice Storm – Occurs when moisture falls and freezes immediately upon impact.

Average days of snowfall exceeding one inch and monthly snowfall by year, 1997-2017 (National Weather Service, n.d.):



YEAR	JAN	FEB	MAR	APR	MAY
2017	3.2	2.0	0.6	0.0	0.0
2016	5.8	7.3	T	0.0	0.0
2015	3.9	12.4	0.5	0.0	0.0
2014	3.7	7.4	0.7	0.5	0.0
2013	6.2	5.5	7.4	0.6	2.7
2012	1.6	12.3	0.0	0.0	0.0
2011	15.6	9.4	2.6	T	0.0
2010	7.1	7.4	1.6	0.0	0.0
2009	5.6	8.1	T	T	0.0
2008	4.9	5.1	1.1	T	0.0
2007	10.0	6.4	7.1	0.0	0.0
2006	T	0.7	9.9	0.0	0.0
2005	10.5	4.6	T	T	0.0
2004	15.3	13.5	T	0.0	0.0
2003	8.8	13.0	1.7	4.6	0.0
2002	11.1	1.7	14.8	T	0.0
2001	5.5	14.2	0.2	0.0	0.0
2000	0.5	7.6	T	T	0.0
1999	4.6	9.4	6.8	T	0.0
1998	5.5	1.0	17.9	T	0.0
1997	5.8	8.3	T	11.1	0.0

History/Actual Risk: According to Professor Ken Dewey, a Climatologist in the Applied Climate Science group of the School of Natural Resources at the University of Nebraska Lincoln, ranked the October 1997 snowstorm as being a "once in a 200-year snowstorm."

*October 1997 snow storm (Lincoln Journal Star)

> Officially, the snowstorm dropped 13.2 inches in Lincoln, and no October before or since has seen more than seven inches of snow. Snowfall totals in south-central Nebraska approached two feet. Lincoln suffered the largest loss of trees ever from a natural event in that 1997 storm, according to Bob Weyhrich, city forester. The city spent up to $1.5 million to replant 5,000 trees it lost along streets and on other public property. More than half of Lincoln Electric Systems' customers were without power, some for as long as eight days. The week that followed was one of the single-largest efforts undertaken by the utility. And LES spent nearly $4.3 million to recover. (Hicks, 2017b)

Thunderstorm - High to Special Risk: The National Weather Service (n.d.) considers a thunderstorm severe if it produces hail of at least 1 inch in diameter, has winds of at least 58 miles per hour, or produces a tornado.

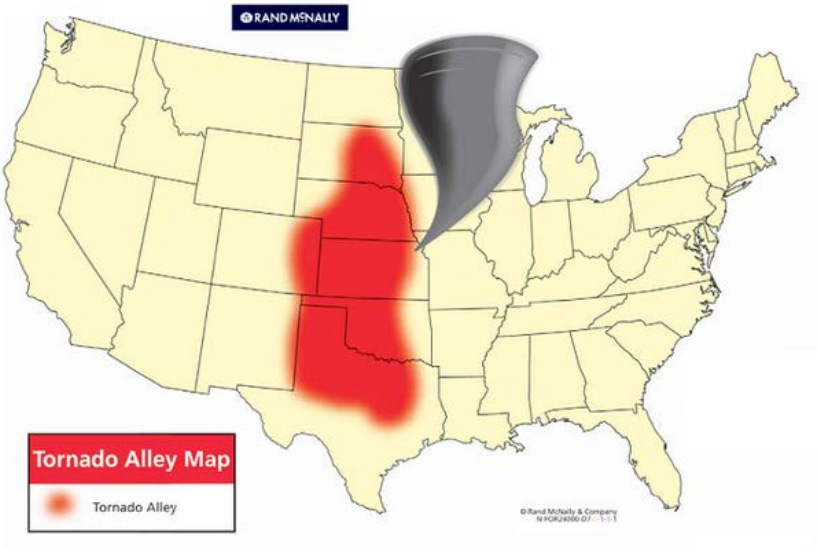
History/Actual Risk: Thunderstorms in the Midwest are common. However, they can be difficult to predict. Thunderstorms as an event produce three major concerns: lightning, flooding, and tornados.

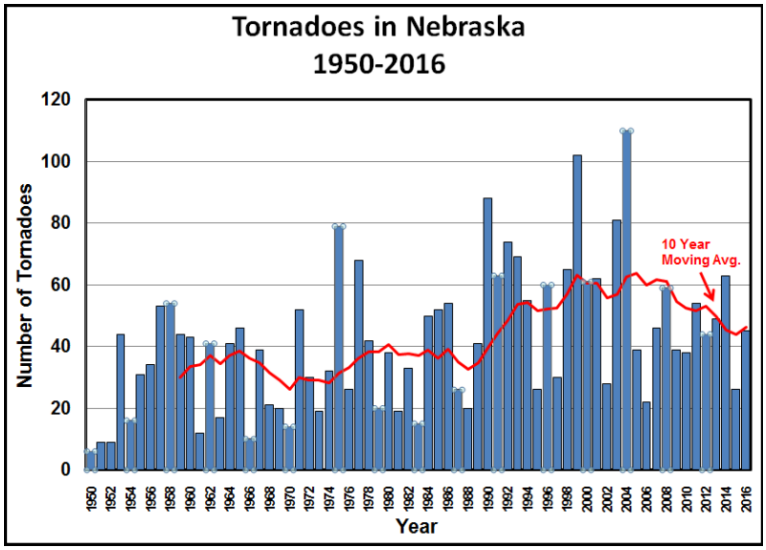
Lightning - High Risk: Per the National Weather Service (n.d.), The United States sees roughly 25 million lightning flashes, annually.

History/Actual Risk: While lightning fatalities have decreased over the past 30 years, lightning continues to be one of the top weather killers in the U.S. In addition, lightning injures many more people than it kills and leaves some victims with life-long health problems. Though lightning strikes peak in summer, people are struck year-round. In the U.S., an average of 49 people is killed each year by lightning. (National Weather Service, n.d.)

*Lightning over Lincoln's Haymarket Park baseball stadium (Lincoln Journal Star)

Tornado - Special Risk: A tornado is a violently rotating column of air in contact with the ground that is capable of destroying anything in its path and hurling objects through the air like deadly missiles. They can produce winds in excess of 200 MPH, be over one mile wide and stay on the ground for over 50 miles. Although tornadoes occur in many parts of the world, they are found most frequently in the United States. In an average year, 1,200 tornadoes cause 70-75 fatalities and 1,500 injuries across the nation. (National Weather Service, n.d.)





History/Actual Risk: Lincoln has not suffered a fatal tornadic event within recent history. However, in the region most notably, a F4 rated tornado that struck the town of Hallam on May 22, 2004. Final damage estimates exceeded $12 million. LF&R was on scene to assist with the emergency response immediately after the event. Per 10/11Now.com (2017):

> The 2.5 mile-wide F4 twister struck on the evening of May 22, 2004, killing a 73-year-old woman and injuring 37 others. The tornado stayed on the ground for more than 10 minutes and covered a path of 52 miles. That storm system spawned 19 confirmed tornadoes, leveling 158 homes and damaging dozens of others. Gage, Saline, Lancaster and Cass counties were designated federal disaster areas.

*2004 Hallam Tornado (Lincoln Journal Star)

Flooding: High Risk - Floods are a rising or overflowing of a tributary or body of water that covers land not usually under water. Flood prone areas are usually defined by the 100-year floodplain where it is probable that there is a one percent chance of flooding per year.

Should Salt Creek/Oak areas overtop exceed their levees, close to ten percent of Lincoln's population and property could be at risk from flooding. Overtopping of the banks where there are no levees (Salt, Oak, and major tributaries) could easily affect more than ten percent.

Lincoln, NE floodplain and Antelope Valley project maps can be found in Appendix E.

History/Actual Risk: Lincoln has experienced numerous floods in its history. To mitigate this risk a long term comprehensive plan, known as The Antelope Valley Project, began in 1999. Thus far, 800 homes, 200 businesses, and nearly 50 acres of UNL's downtown campus are now outside of a designated 100-year flood event as a result of the actions taken under the plan. (City of Lincoln, n.d.)

Earthquake: Special Risk - Lincoln is at risk of an earthquake, albeit, the risk is historically low. Although a fault line does exist in Nebraska, it is not located in direct proximity to Lincoln

History/Actual Risk: Lincoln has yet to incur damage from an earthquake. Over the last four decades, earthquakes have happened all over the state, but never anything greater than a 4.3 magnitude. Often, earthquakes cause little damage, limited to waking one up from sleep. Per Matt Joeckel, the director of the Conservation and Survey Division at UNL:

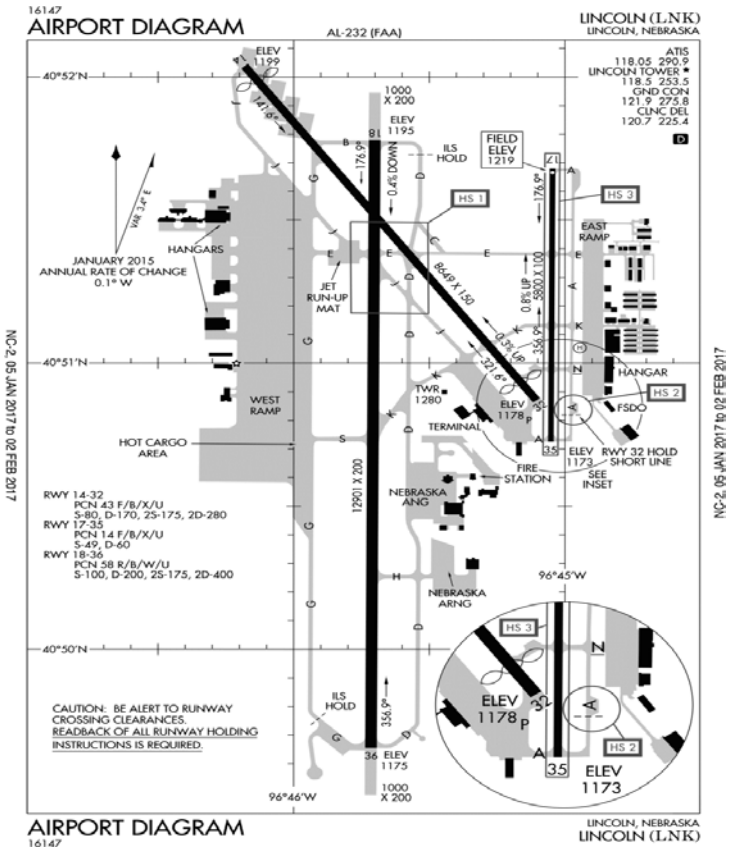
> We could see these events in Lincoln. But, it's impossible to know when and where they might hit. Perhaps what the only thing that's disconcerting about this is, in effect, how little we know about the geologic structure underneath Nebraska. (Jensen, 2018)

*Recorded seismic events in Nebraska, 1978-2018 (Jensen, 2018)

AIR ACCIDENT: Special Risk – LF&R defines an air accident as an incident where an aircraft encounters a catastrophic event.

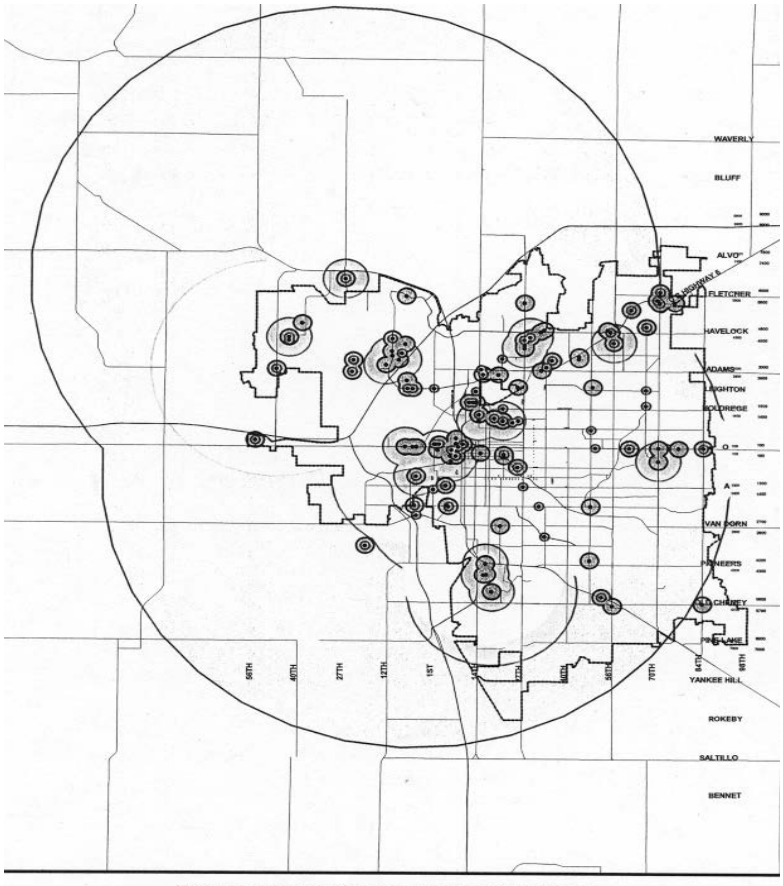
Lincoln's Airport services a wide variety of military, civilian, and commercial aircraft. The aircraft routinely make approaches to the various runways over parts of the City of Lincoln and much of the County of Lancaster. Due to the length of the runway, which is the third longest in the United States, Lincoln is a likely candidate for emergency landings by any aircraft.

History/Actual Risk**:** Lincoln has yet to suffer a significant aircraft emergency. Therefore, historical data relating to commercial and civil aviation accidents is nearly non-existent in Lincoln. This, and the fact that Lincoln is a low traffic airport in comparison to its peers, makes assessing risk theoretical.



HAZARDOUS MATERIALS INCIDENT: Varying Risk - Due to its proximity to major rail and interstate shipping routes, Lincoln does carry a marked risk for a significant HAZMAT incident. As well, UNL's main campus holds numerous chemical, biological and radiological hazards in its research facilities. Based on concentration, a major spill, associated with a fire which produces a toxic cloud, could easily affect more than ten percent of Lincoln's population.

History/Actual Risk**:** Lincoln has yet to incur a catastrophic loss from a HAZMAT incident.



Hazardous Chemical Storage and Vulnerable Zones
Lancaster County, Nebraska

TERRORISM/SOCIAL DISTURBANCES: Varying Risk - As the capital city of Nebraska, Lincoln and has several key features which make it a potential target to acts of terrorism. These include political, state, and federal facilities located within the primary response area: the Nebraska State Capitol Building, The Nebraska State Legislature, Federal Building, and Governor's Residence. Lincoln is southeast Nebraska's epicenter for citizens as a public venue for sporting events and recreation activities that attract large crowds. Lincoln has also been a hotbed for public demonstrations, most recently a Keystone XL Pipeline protest. LF&R works in conjunction with local and state law enforcement agencies, proactively, to help mitigate these risks.

History/Actual Risk: Lincoln has yet to experience a significant event of this type.

*Keystone XL Pipeline Protest (Lincoln Journal Star, 2017)

CURRENT DEPLOYMENT AND PERFORMANCE 2013-2017

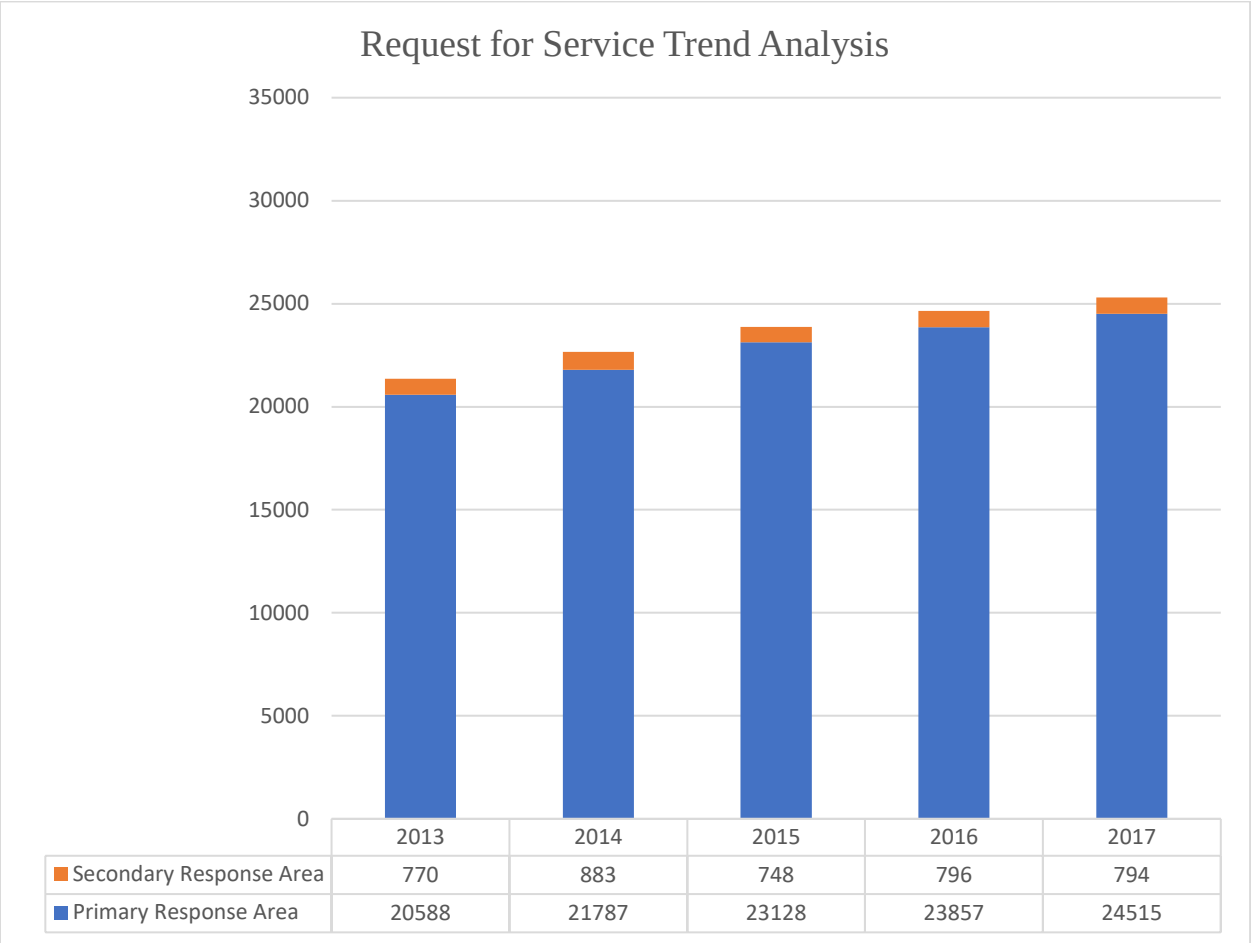
As previously described, LF&R deploys its complement of emergency resources from 14 individual stations, and Lincoln's Municipal Service Center (MSC). The MSC is a comprehensive facility, housing multiple city departments. LF&R's reserve suppression apparatus, rehabilitation unit, and divisions of Logistics, Training, EMS, and NETF1 are housed at the MSC.

Resource distribution within the primary and secondary response areas is an ongoing consideration with multiple caveats: paramedic staffing, physical resource location, and call concentration. LF&R is making a concerted effort to increase its paramedic staffing through its recruitment efforts. LF&R's current deployment sees 50 percent of all suppression apparatus staffed with either 3 or 4 personnel. As previously described, the balance will begin shifting in the favor of 4-person staffing, as new stations and their accompanying apparatuses are added.

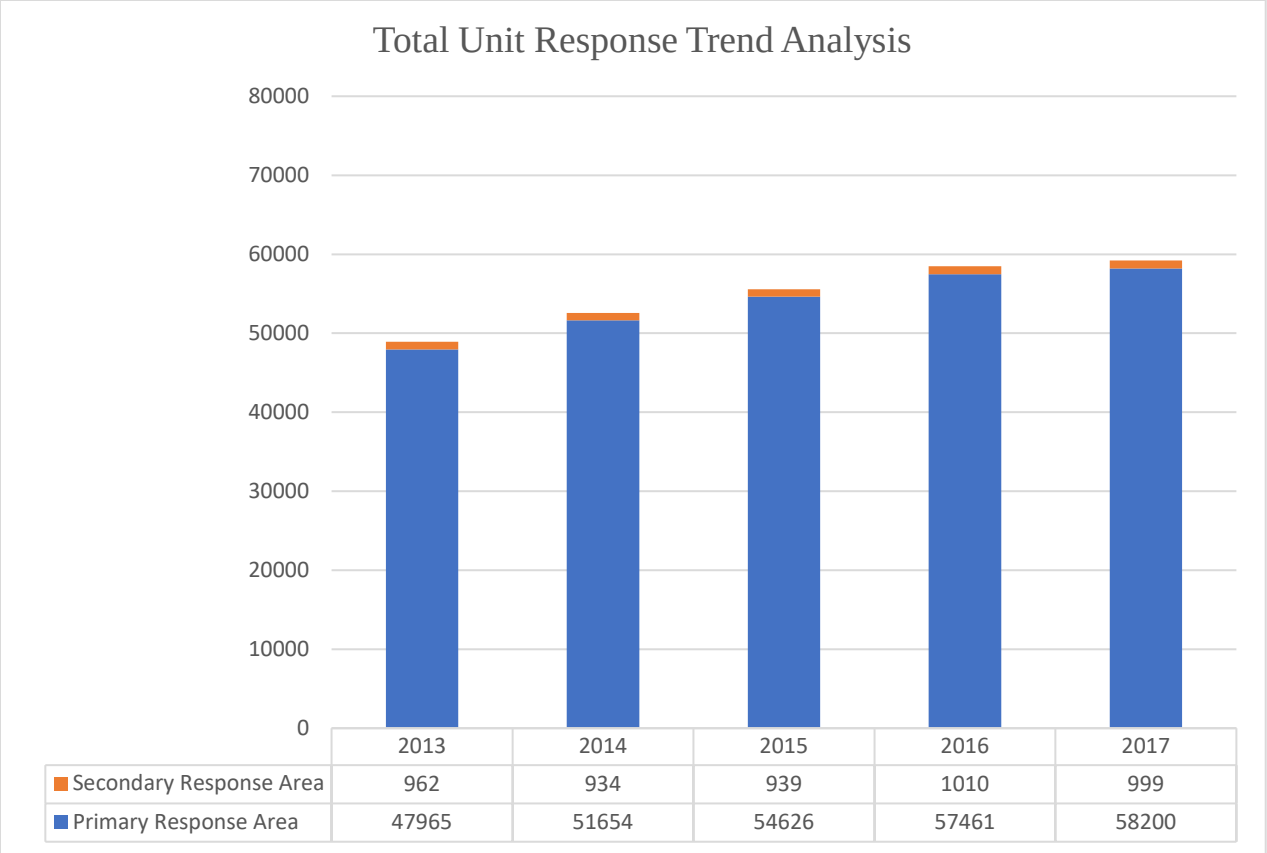
*LF&R on scene of a grain elevator entrapment, secondary response area, Raymond, NE (Lincoln Journal Star, 2017)

TREND ANALYSES

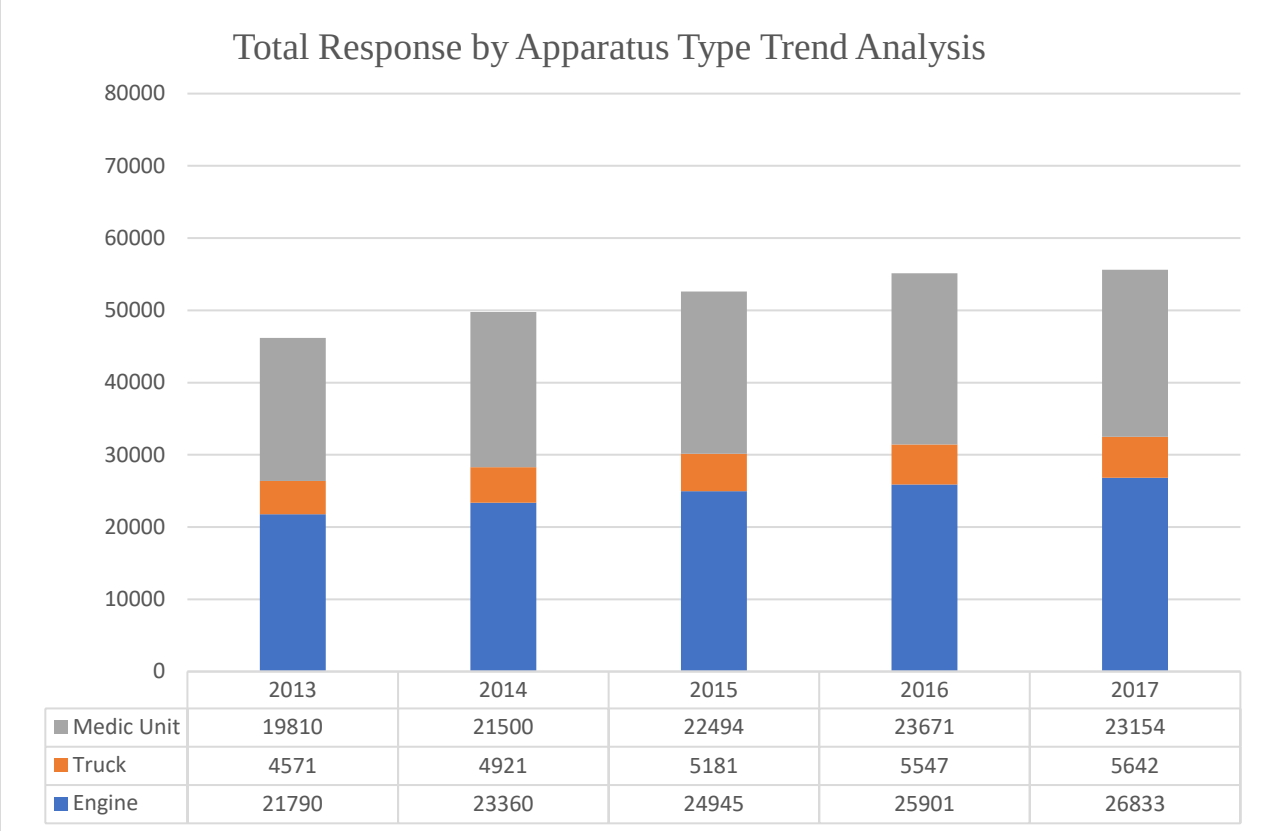
Probability analysis projects a steady increase in all demands for future service. Resource distribution will continue to improve as new apparatuses are inserted into the system and new stations are placed online. As an accredited agency, LF&R maintains constant situational awareness of the emergency response system and deployment statistics therein. To objectively use this data, LF&R performs numerous trend analyses, to view from every conceivable angle:



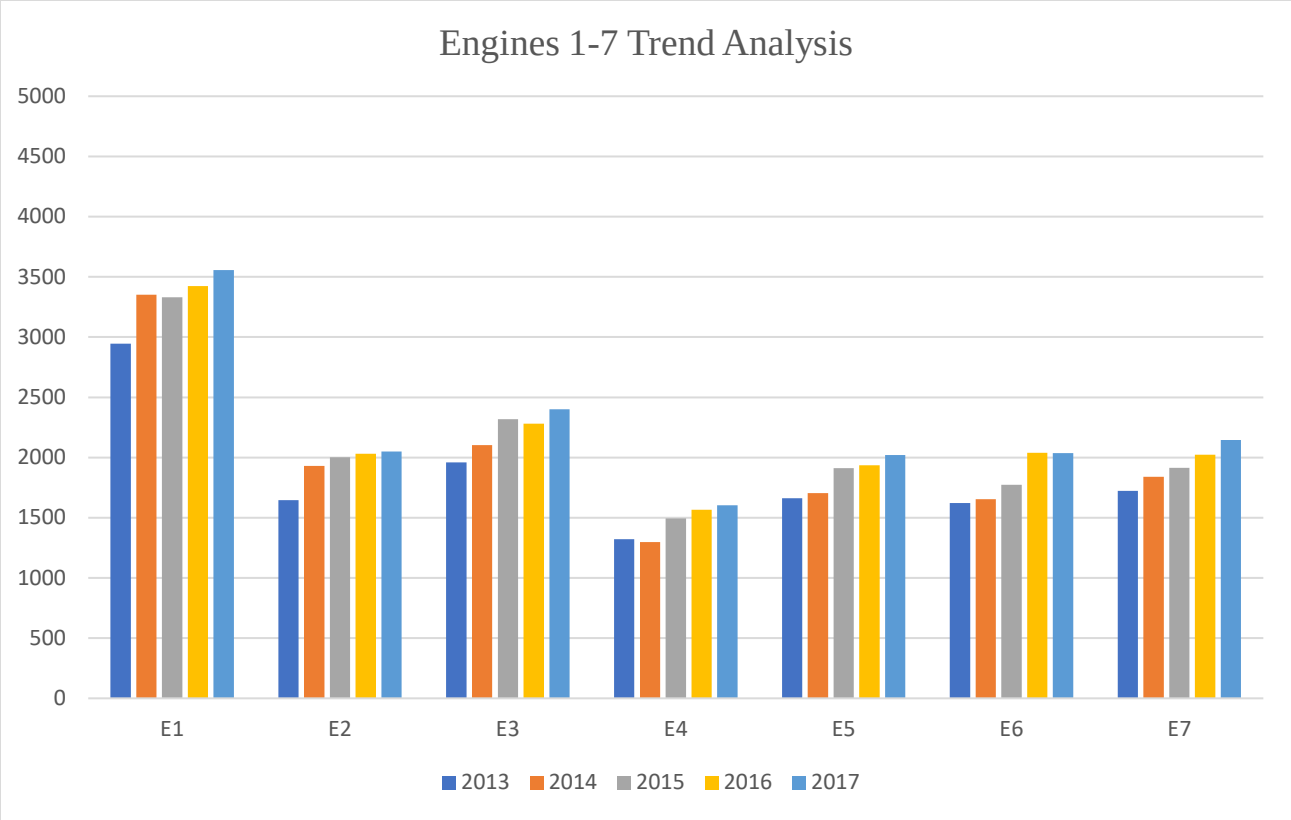
	2013	2014	2015	2016	2017
Secondary Response Area	770	883	748	796	794
Primary Response Area	20588	21787	23128	23857	24515

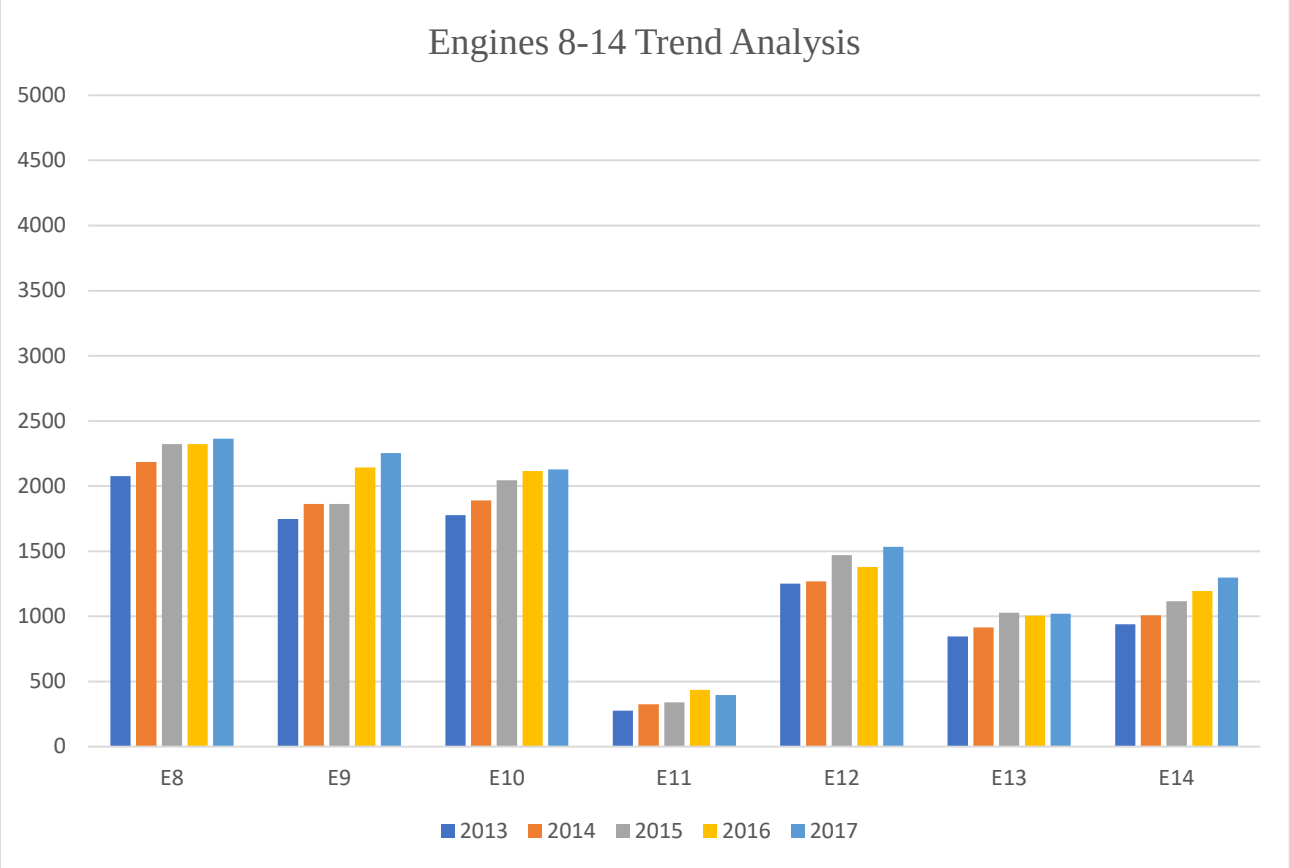


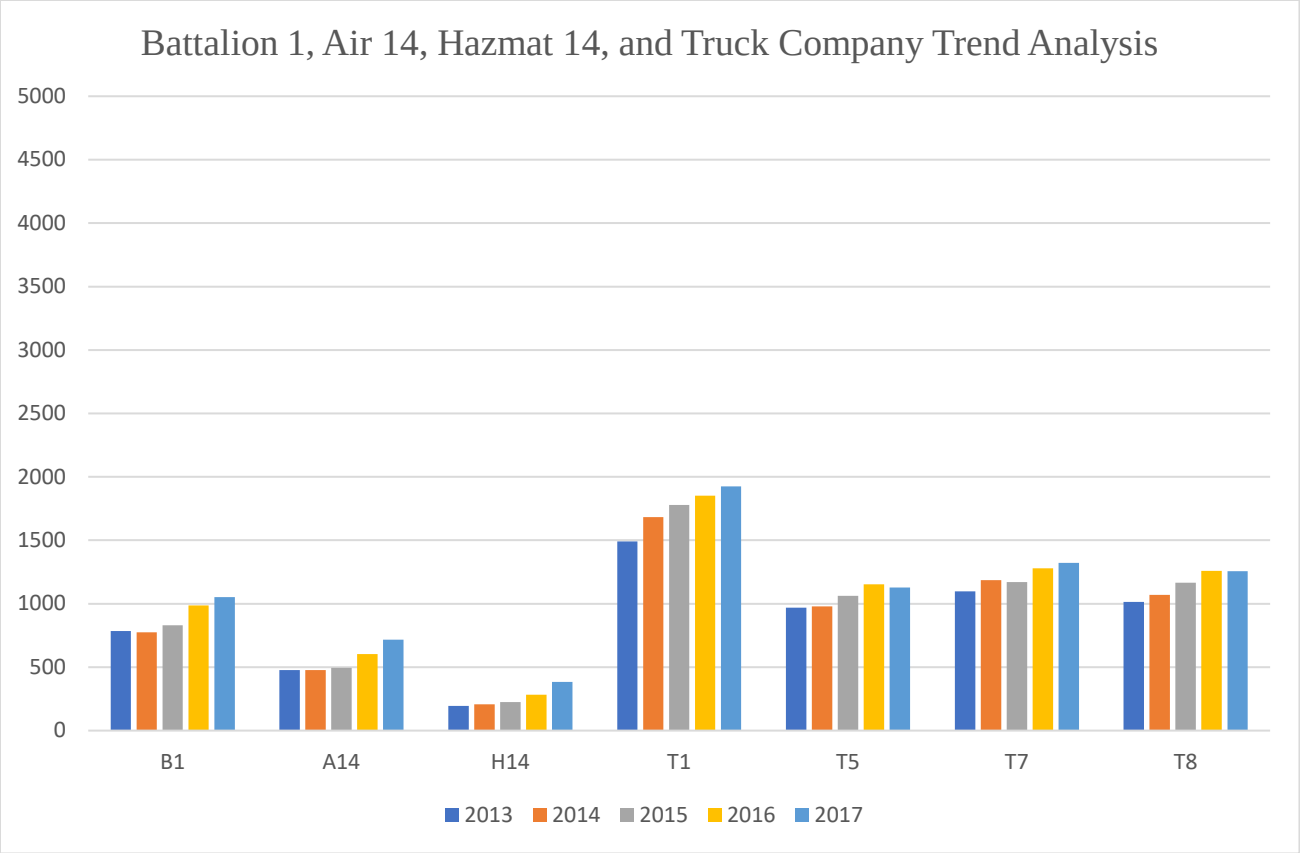
	2013	2014	2015	2016	2017
Secondary Response Area	962	934	939	1010	999
Primary Response Area	47965	51654	54626	57461	58200

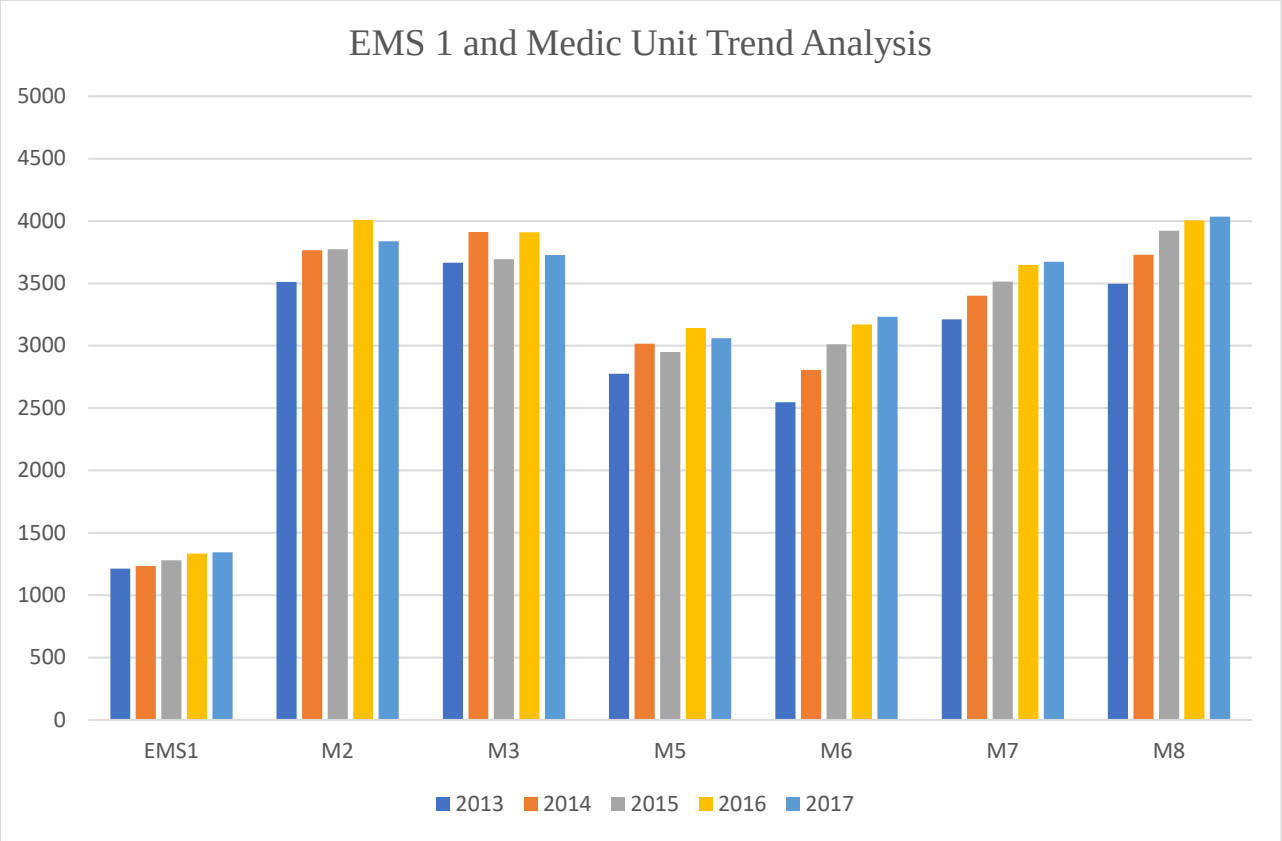


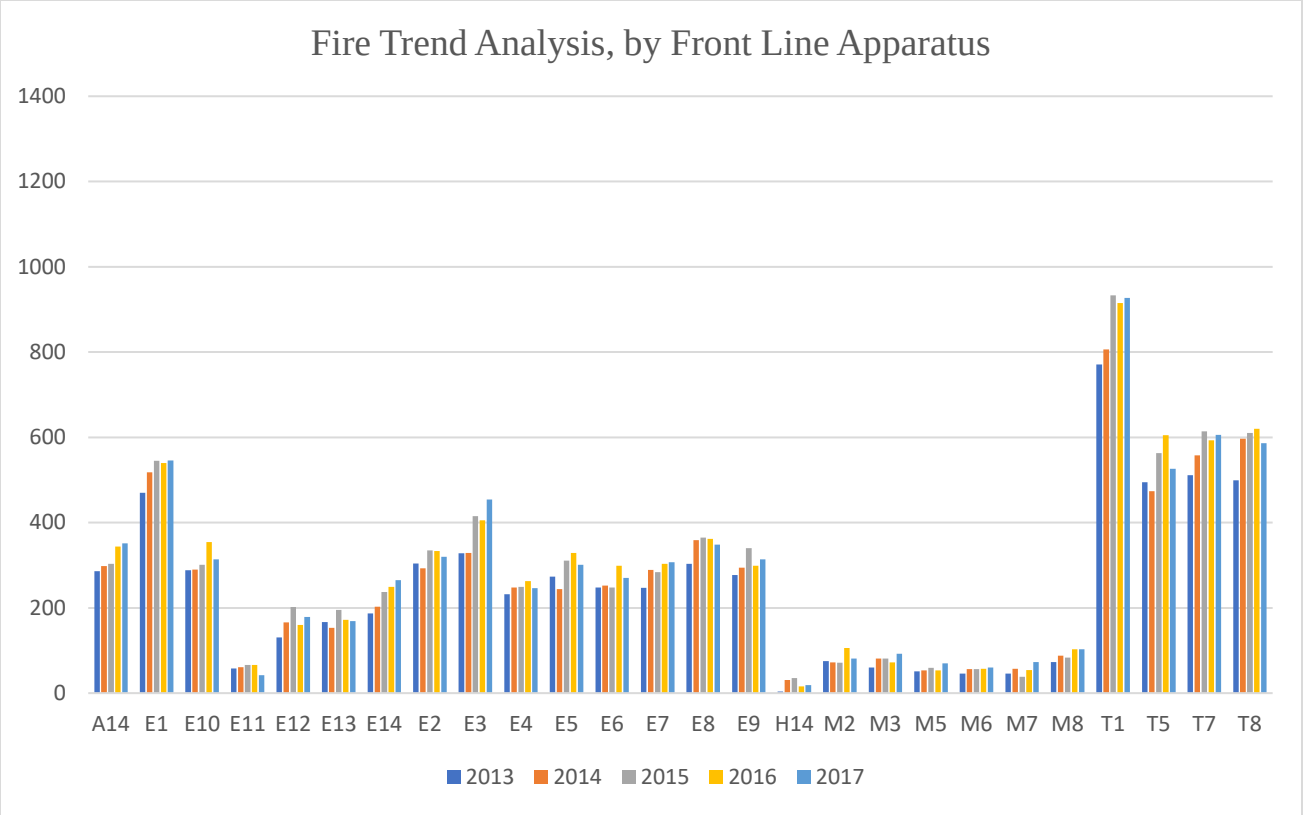
	2013	2014	2015	2016	2017
Medic Unit	19810	21500	22494	23671	23154
Truck	4571	4921	5181	5547	5642
Engine	21790	23360	24945	25901	26833

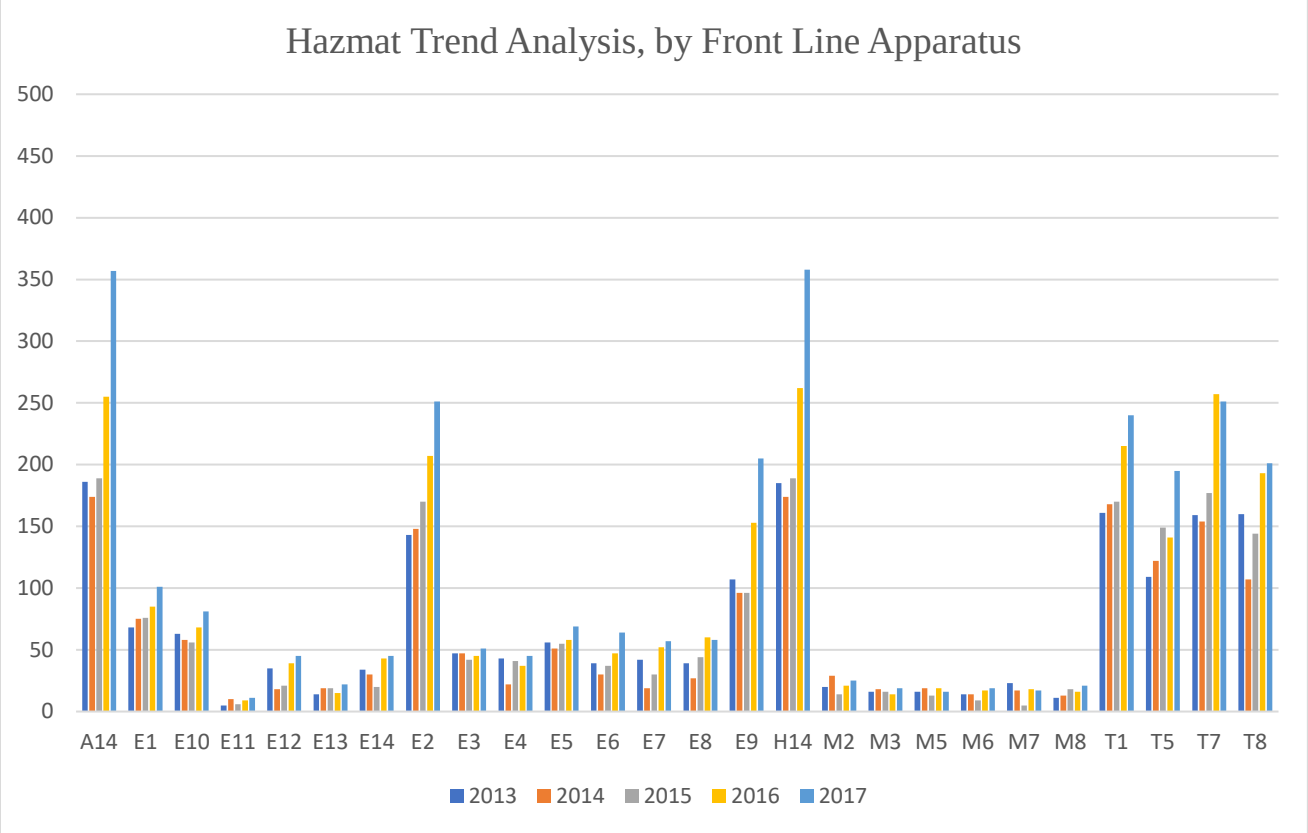

Engines 1-7 Trend Analysis
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
E1
E2
E3
E4
E5
E6
E7
2013
2014
2015
2016
2017

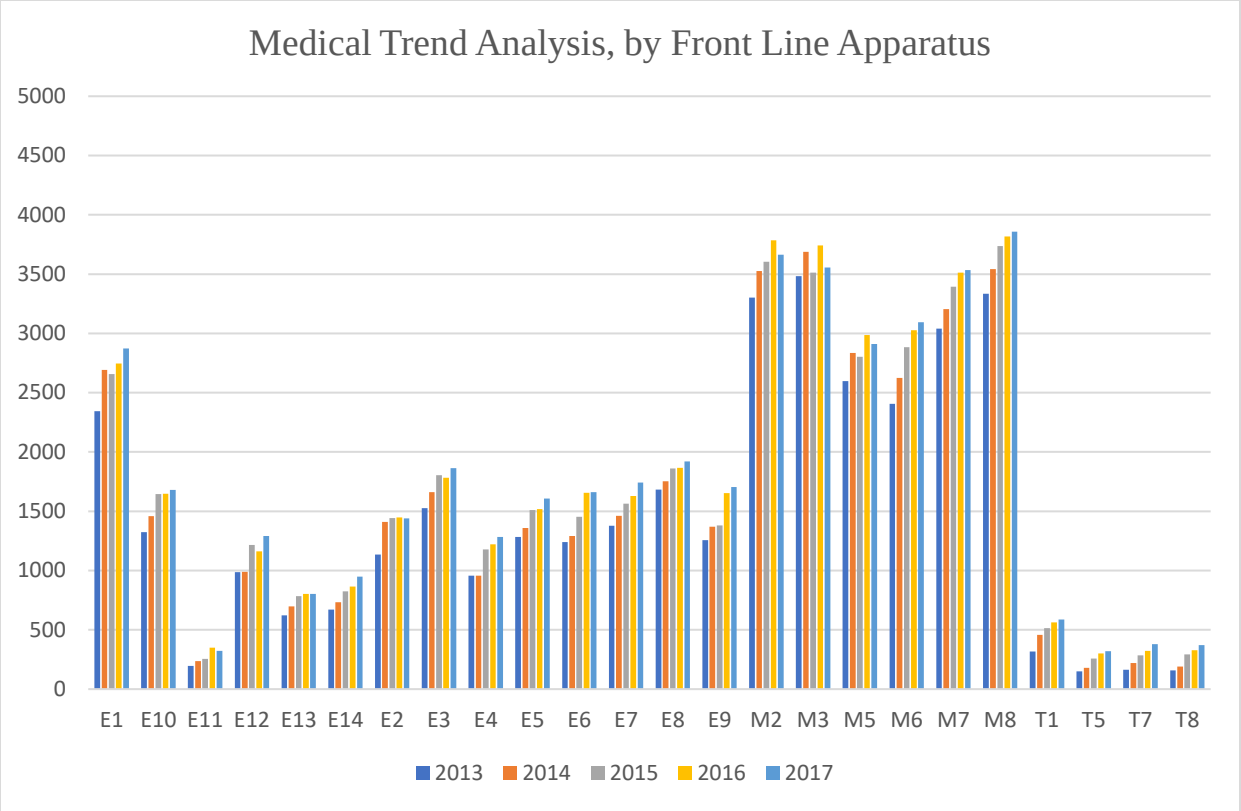

Engines 8-14 Trend Analysis
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
E8
E9
E10
E11
E12
E13
E14
2013
2014
2015
2016
2017

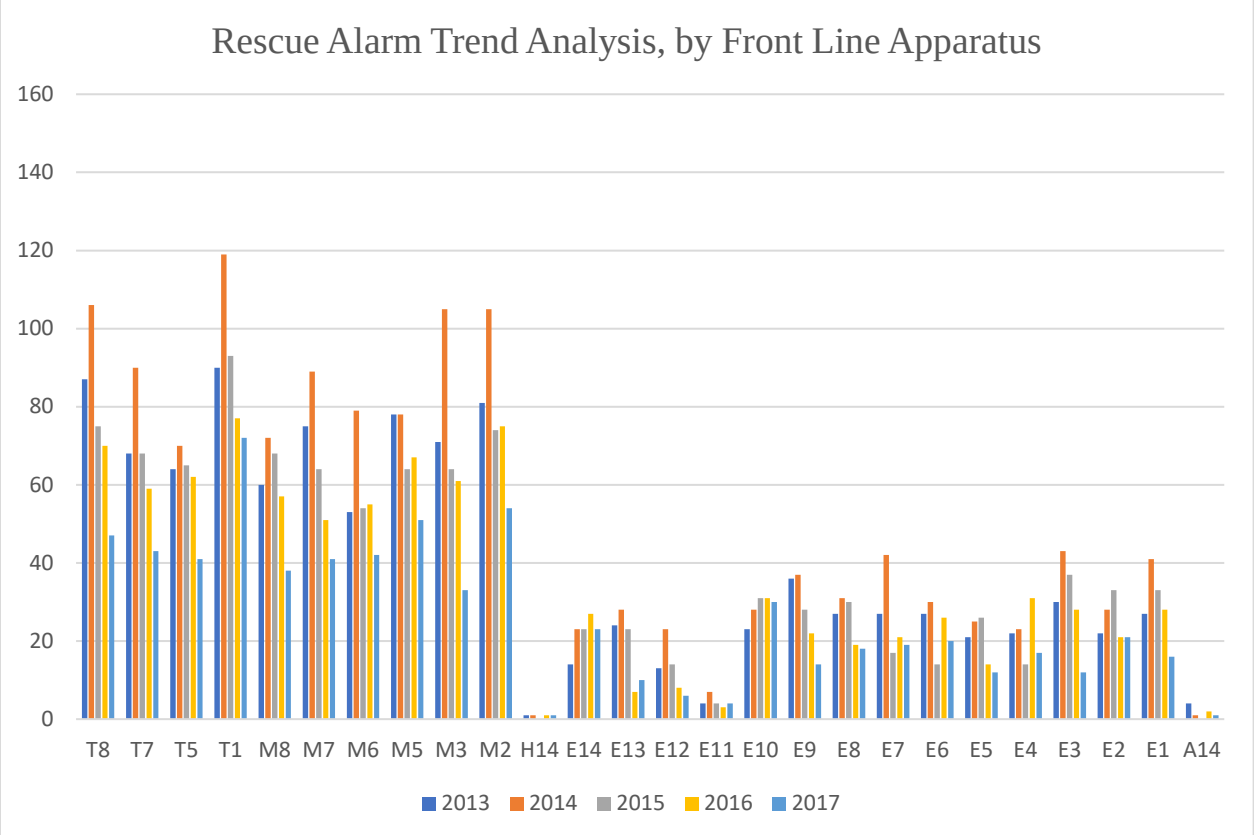

Battalion 1, Air 14, Hazmat 14, and Truck Company Trend Analysis
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
B1
A14
H14
T1
T5
T7
T8
2013
2014
2015
2016
2017

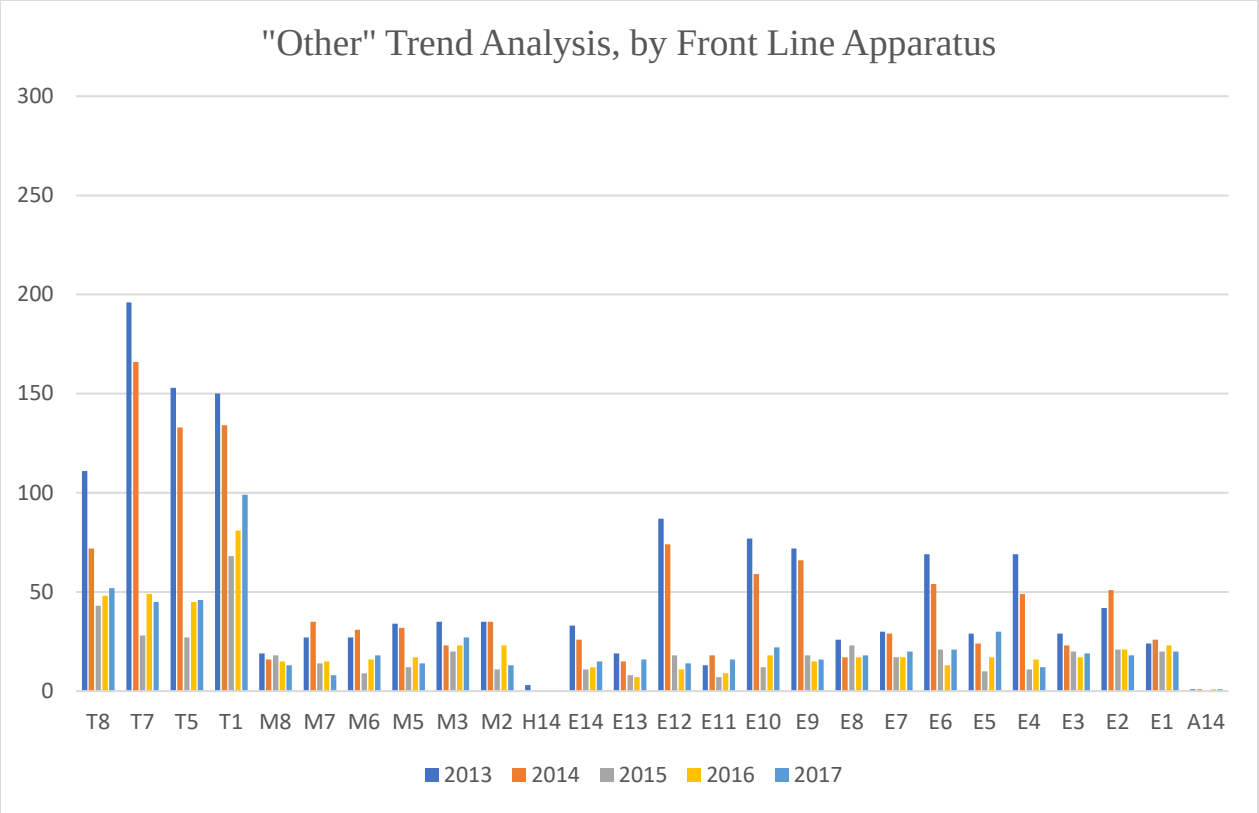

EMS 1 and Medic Unit Trend Analysis
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
EMS1
M2
M3
M5
M6
M7
M8
2013
2014
2015
2016
2017

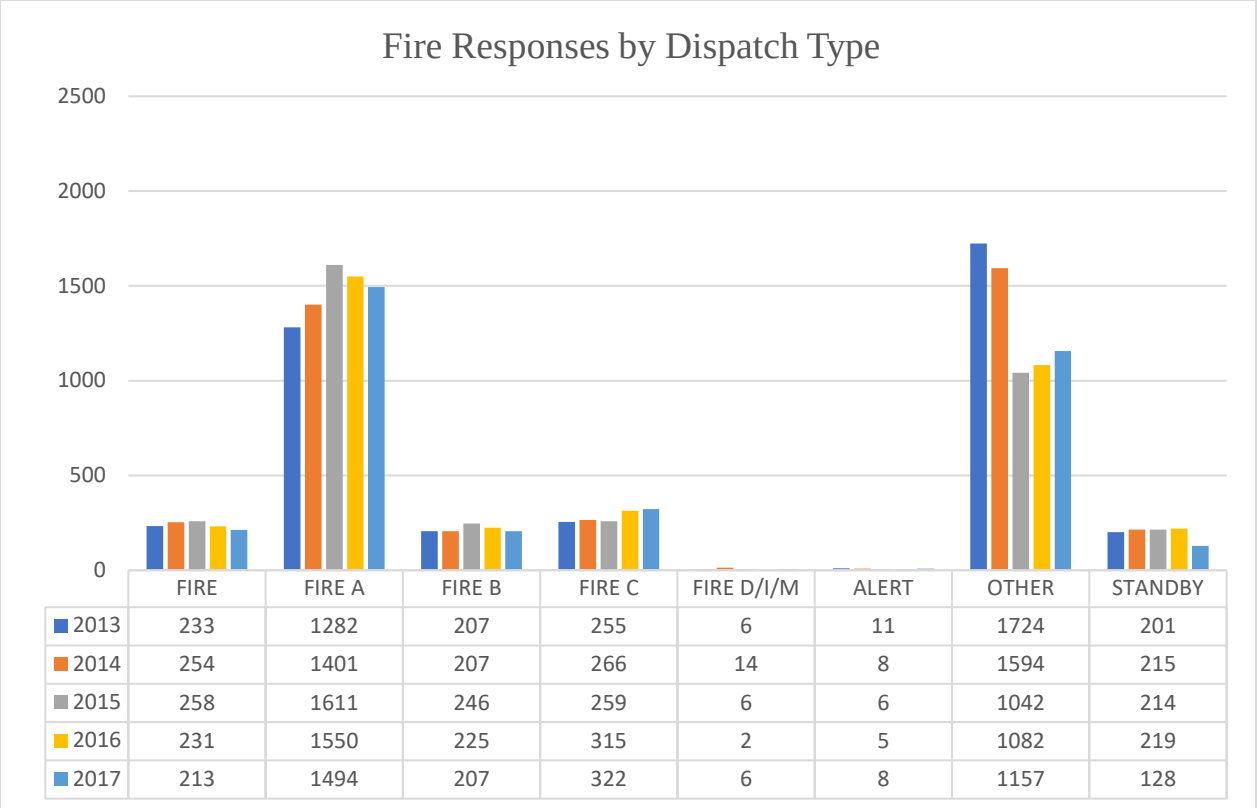

Fire Trend Analysis, by Front Line Apparatus
1400
1200
1000
800
600
400
200
0
A14 E1 E10 E11 E12 E13 E14 E2 E3 E4 E5 E6 E7 E8 E9 H14 M2 M3 M5 M6 M7 M8 T1 T5 T7 T8
2013 2014 2015 2016 2017


Hazmat Trend Analysis, by Front Line Apparatus
500
450
400
350
300
250
200
150
100
50
0
A14 E1 E10 E11 E12 E13 E14 E2 E3 E4 E5 E6 E7 E8 E9 H14 M2 M3 M5 M6 M7 M8 T1 T5 T7 T8
2013 2014 2015 2016 2017


Medical Trend Analysis, by Front Line Apparatus
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
E1 E10 E11 E12 E13 E14 E2 E3 E4 E5 E6 E7 E8 E9 M2 M3 M5 M6 M7 M8 T1 T5 T7 T8
2013 2014 2015 2016 2017


Rescue Alarm Trend Analysis, by Front Line Apparatus
160
140
120
100
80
60
40
20
0
T8 T7 T5 T1 M8 M7 M6 M5 M3 M2 H14 E14 E13 E12 E11 E10 E9 E8 E7 E6 E5 E4 E3 E2 E1 A14
2013 2014 2015 2016 2017

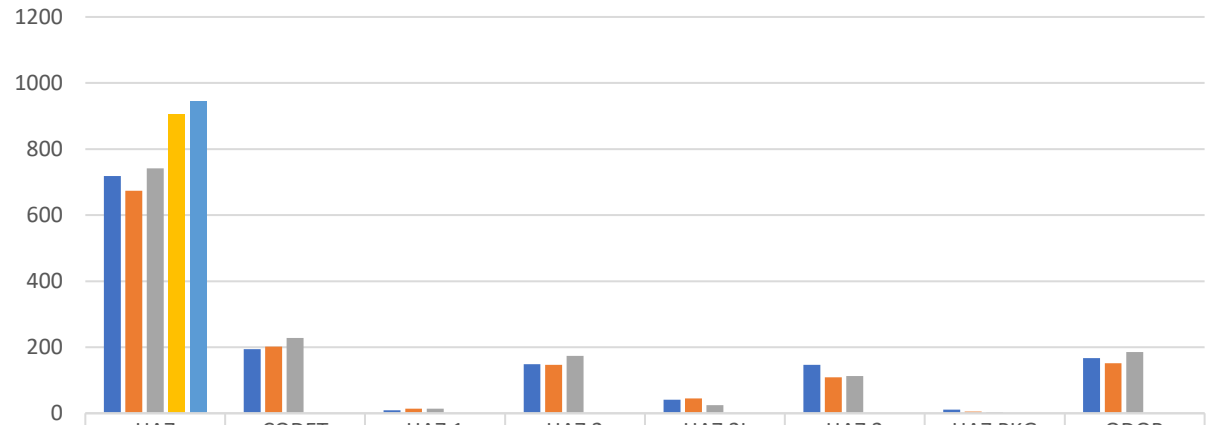




	FIRE	FIRE A	FIRE B	FIRE C	FIRE D/I/M	ALERT	OTHER	STANDBY
2013	233	1282	207	255	6	11	1724	201
2014	254	1401	207	266	14	8	1594	215
2015	258	1611	246	259	6	6	1042	214
2016	231	1550	225	315	2	5	1082	219
2017	213	1494	207	322	6	8	1157	128

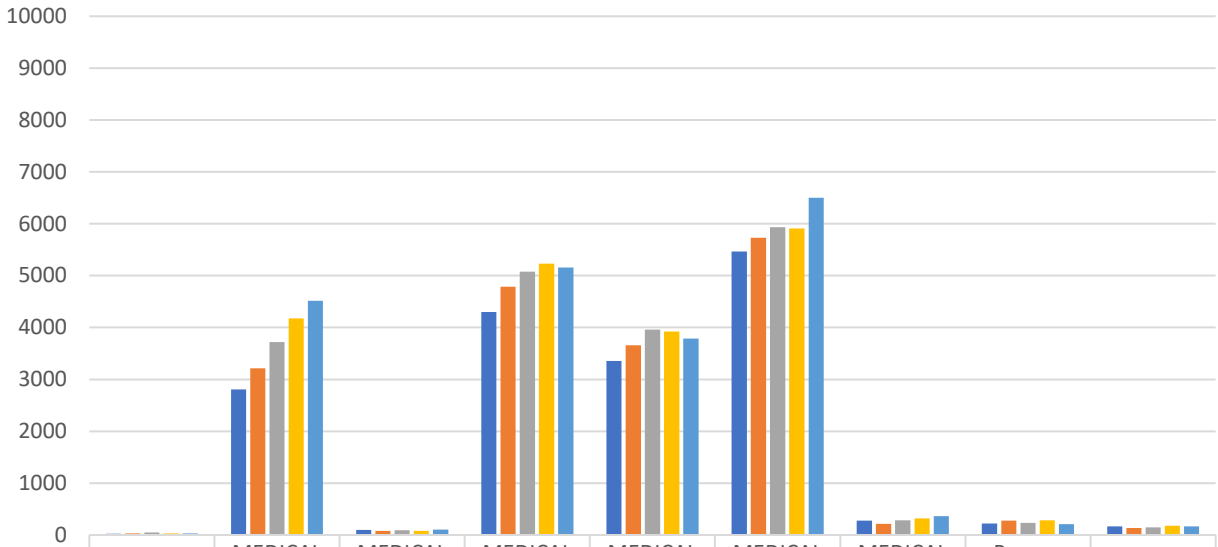
Hazmat Response by Dispatch Type, 2013-2017

(All responses were reclassified as HAZ in 2016, HAZ for 2013-2015 is a sum of all calls)



	HAZ	CODET	HAZ 1	HAZ 2	HAZ 2I	HAZ 3	HAZ PKG	ODOR
2013	718	194	9	149	41	147	11	167
2014	674	202	14	147	45	109	5	152
2015	742	228	14	174	25	113	3	185
2016	905	0	0	0	0	0	0	0
2017	944	0	0	0	0	0	0	0

Medical Response by Dispatch Type 2013-2017

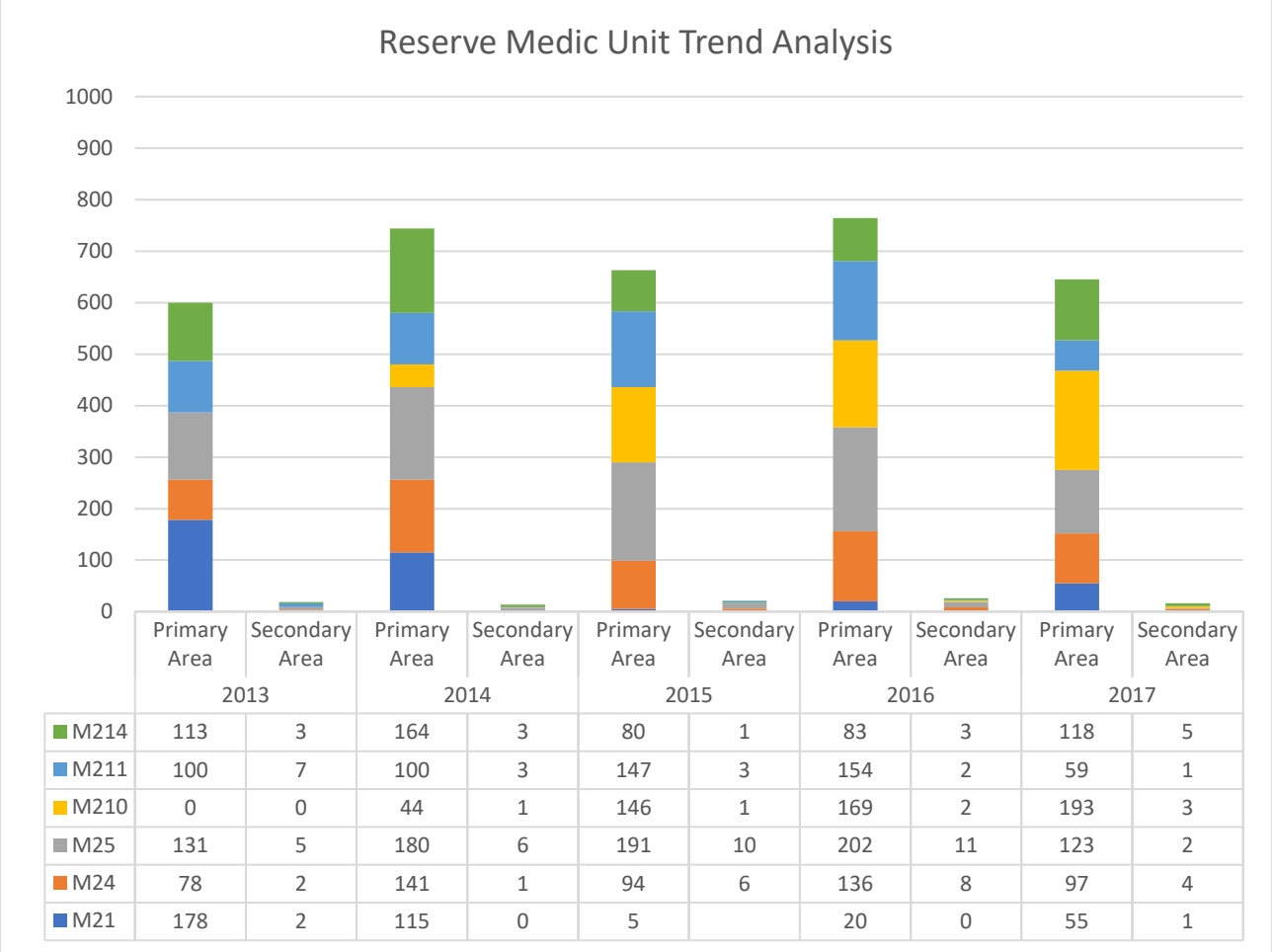


	MEDICAL	MEDICAL Alpha	MEDICAL ALS	MEDICAL Bravo	MEDICAL Charlie	MEDICAL Delta	MEDICAL Echo	Rescue Alarm	Omega
2013	27	2808	98	4300	3355	5465	276	224	167
2014	31	3211	80	4788	3657	5730	218	279	133
2015	48	3722	89	5074	3962	5934	284	235	146
2016	31	4178	81	5228	3923	5906	322	283	177
2017	29	4515	107	5157	3785	6502	365	208	163

TOTAL INCIDENTS, SECONDARY RESPONSE AREA

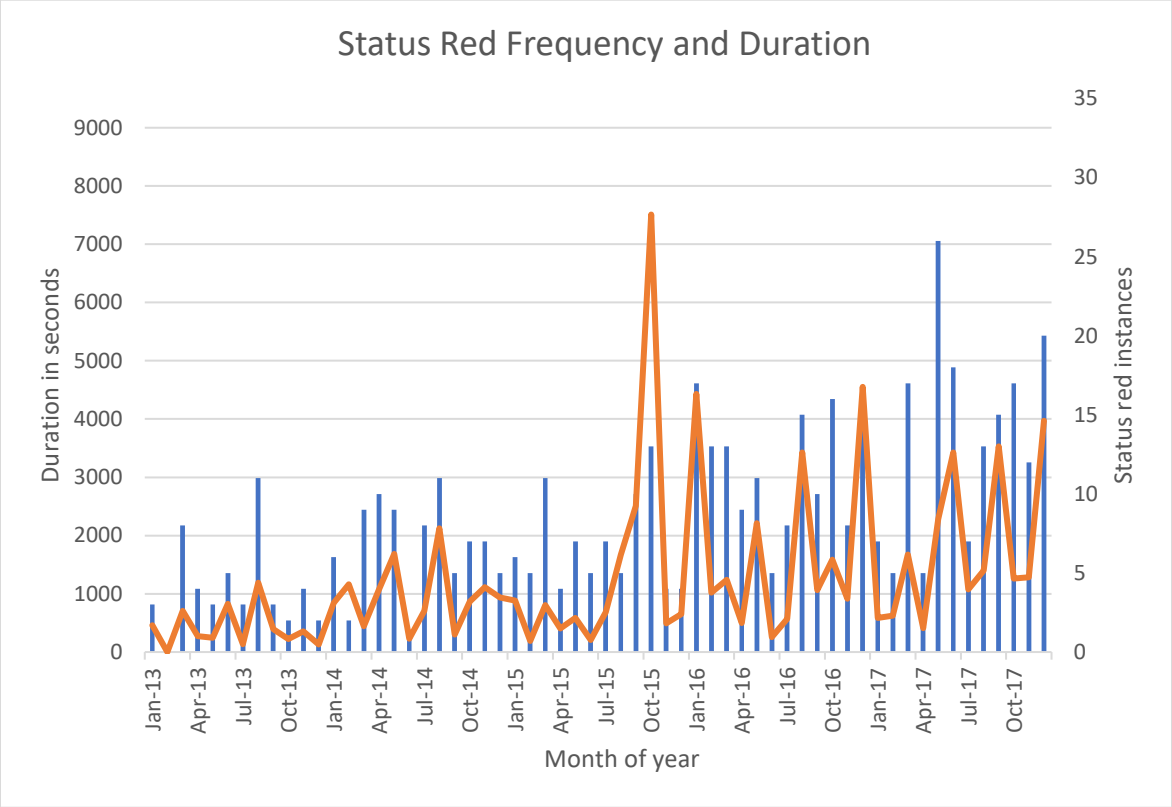
Year	Apparatus	Fire	HazMat	Medical	Rescue Alarm	Other	Total
2017	Battalion	0	3	10	1	1	15
	Engine	8	5	37	3	0	53
	Other	0	0	1	0	0	1
	HazMat	3	1	0	0	0	4
	Medic	10	11	748	34	5	808
	EMS1	0	2	84	7	1	94
	Truck	5	2	9	3	3	22
	W	0	0	1	0	0	1
	Total	27	24	890	48	10	999
2016	Battalion	0	1	28	1	0	30
	Engine	12	1	28	5	1	47
	HazMat	2	0	0	0	0	2
	Medic	5	9	731	65	6	816
	EMS1	1	2	80	20	0	103
	Truck	4	0	5	2	0	11
	W	0	0	1	0	0	1
	Total	24	13	873	93	7	1010
2015	Battalion	1	0	15	4	1	21
	Engine	14	1	24	7	5	51
	HazMat	4	0	0	0	0	4
	Medic	5	2	670	61	6	744
	EMS1	1	0	83	18	2	104
	Truck	9	0	1	4	0	14
	Total	35	3	793	94	14	939
2014	Battalion	4	0	14	4	1	23
	Engine	8	0	21	12	3	44
	HazMat	1	0	0	0	0	1
	Medic	20	10	608	93	5	736
	EMS1	0	2	78	29	0	109
	Truck	6	1	3	10	1	21
	Total	39	13	724	148	10	934
2013	Battalion	1	0	29	Rescue alarms	1	31
	Engine	12	1	19	were classified	6	38
	Medic	9	4	660	as "other"	82	755
	EMS1	2	0	86	in 2013.	30	118
	Truck	10	0	4		6	20
	Total	34	5	798		125	962
Total		157	58	4078	383	166	4842

Reserve Medic Unit Responses. Designed to supplement the EMS system, reserve medic units are placed in service when the system status is stressed beyond normal capacity: when only one primary medic unit is available (system status 1), no primary medic unit is available (system status zero), or an incident is initiated with no medic unit available (system status red). When these medic units are committed to a response, their co-located engine company may be removed from service.



	2013		2014		2015		2016		2017	
	Primary Area	Secondary Area	Primary Area	Secondary Area	Primary Area	Secondary Area	Primary Area	Secondary Area	Primary Area	Secondary Area
M214	113	3	164	3	80	1	83	3	118	5
M211	100	7	100	3	147	3	154	2	59	1
M210	0	0	44	1	146	1	169	2	193	3
M25	131	5	180	6	191	10	202	11	123	2
M24	78	2	141	1	94	6	136	8	97	4
M21	178	2	115	0	5		20	0	55	1

Status Red Frequency and Duration



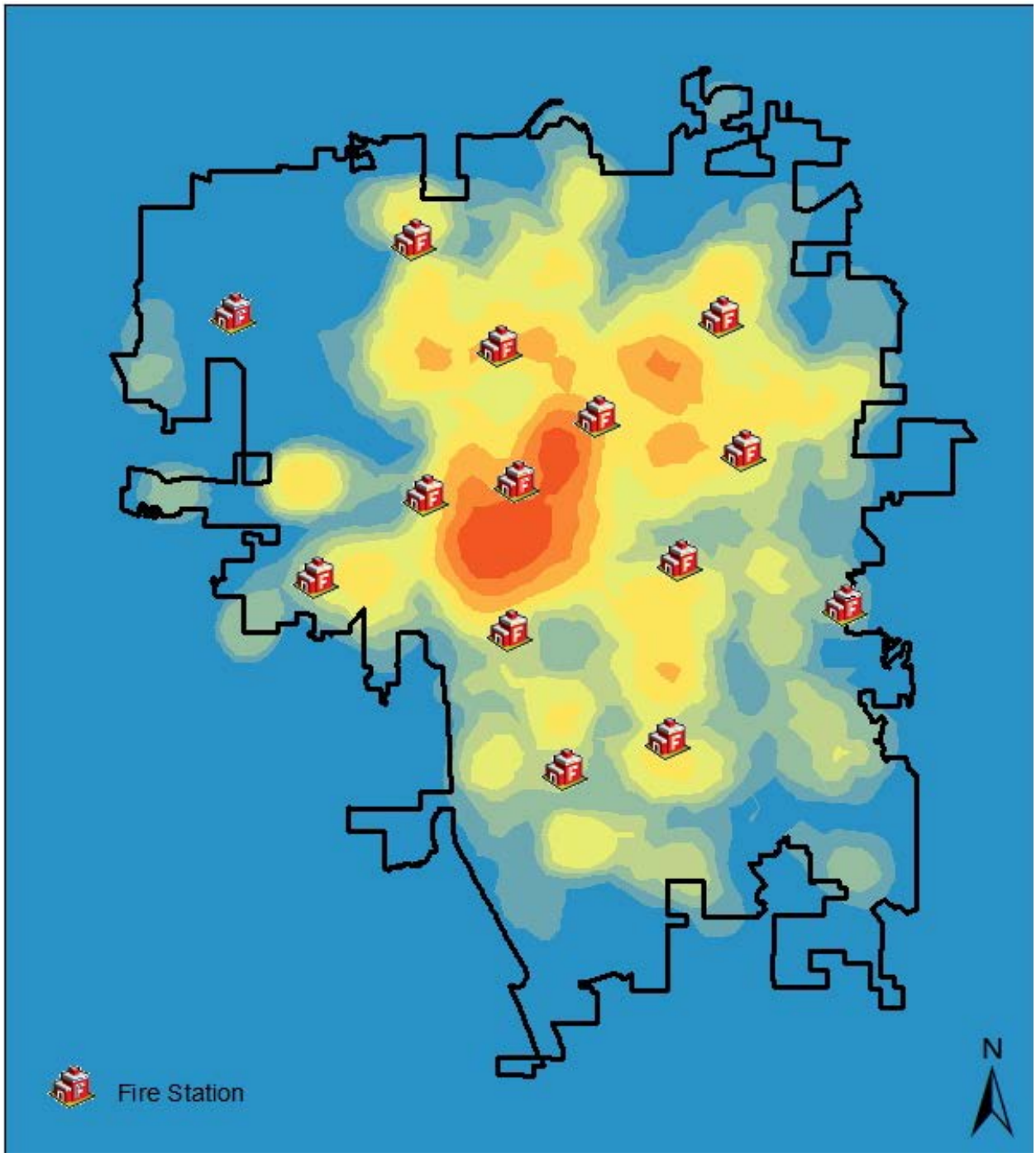
Medic 1. Beginning in 2014 and ending in 2018, Medic 1 was routinely placed into service on Thursday, Friday, and Saturday, from the hours of 1000 to 1900, as a peak demand unit. These hours were dynamic and altered to facilitate EMS coverage during special events: UNL football games, road races, public demonstrations, extreme weather, or other events that can stress the system beyond its normal capacity.

Year	Primary Response Area	Secondary Response Area
2017	922	3
2016	985	11
2015	964	8
2014	114	1
2013	Medic 1 was placed	online in late 2014

Effective June 2018, Medic 1 was placed into service as a primary response apparatus.

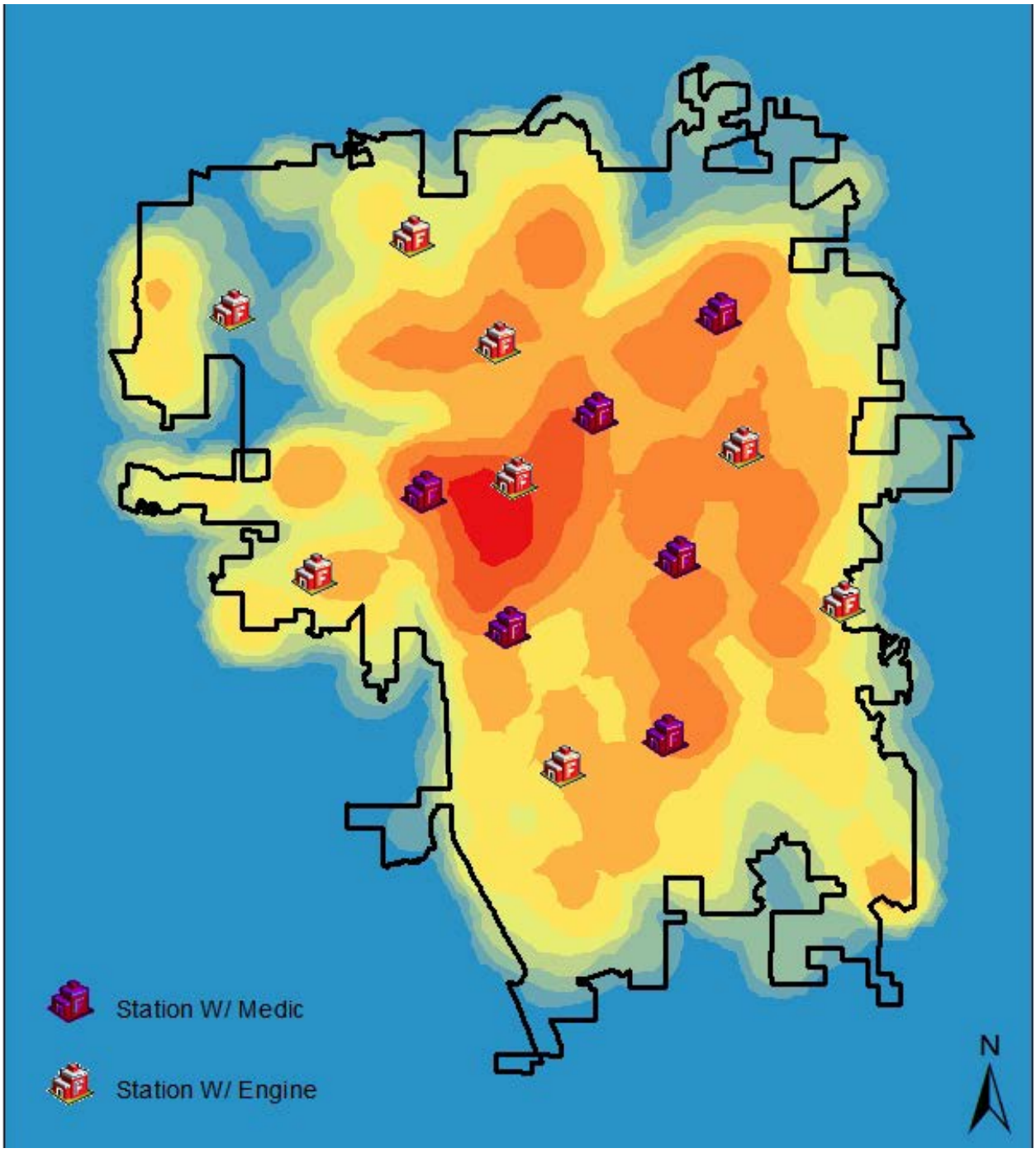
HEATMAPS

Fire Response Heatmap, Primary Response Area, 2013-2017



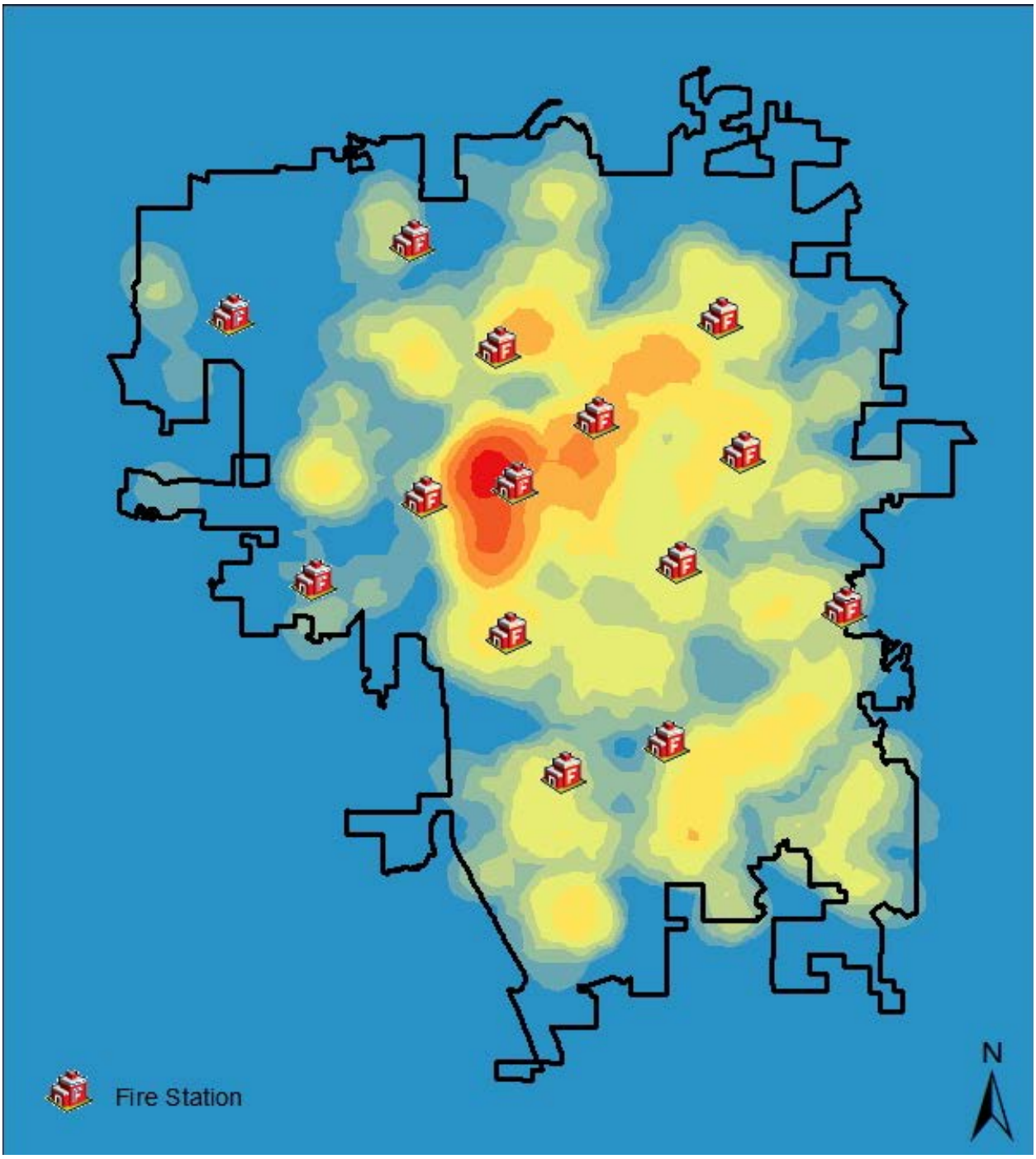
(Map created by Phil Dush, 2/2018)

Medical Response Heatmap, Primary Response Area, 2013-2017



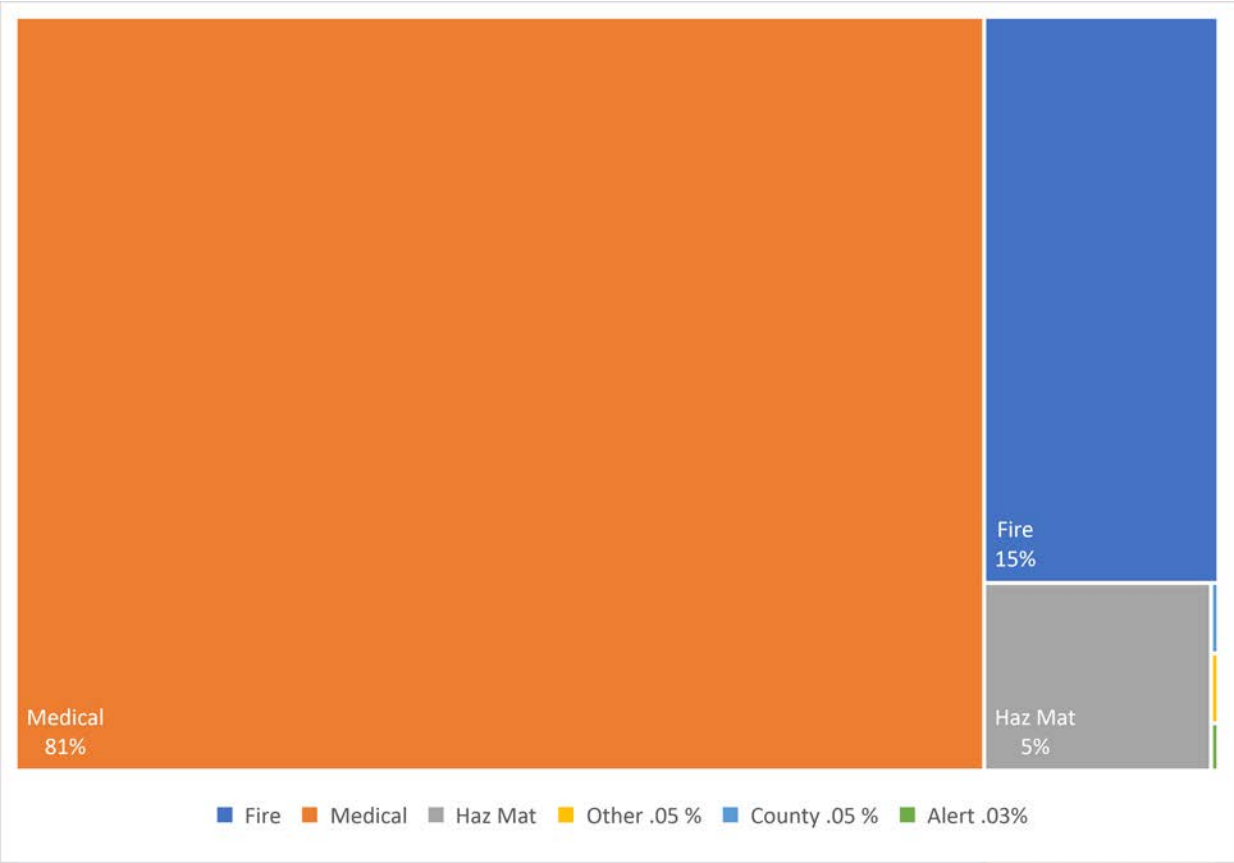
(Map created by Phil Dush, 2/2018)

Hazmat Response Heatmap, Primary Response Area, 2013-2017



(Map created by Phil Dush, 2/2018)

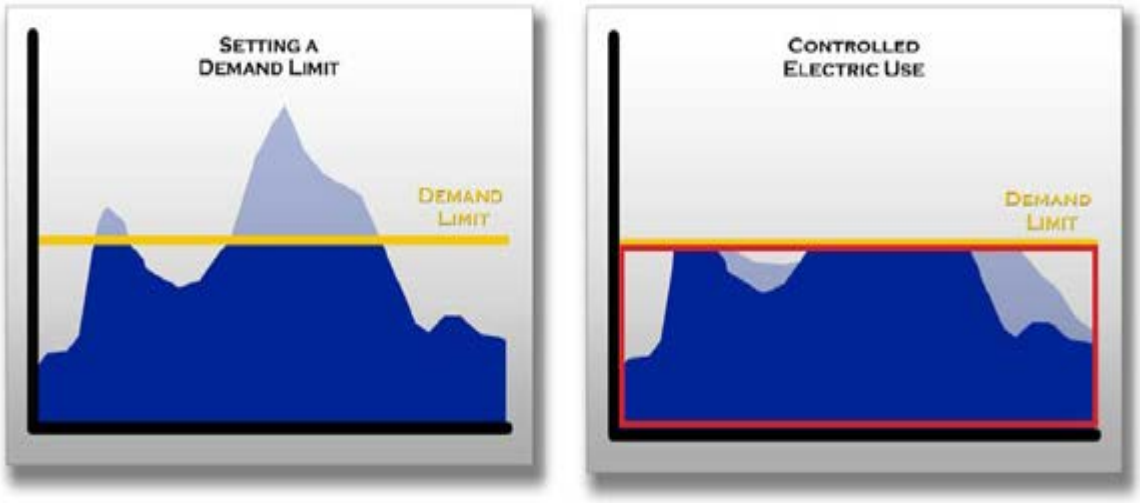
PROBABILITY. LF&R also studies system wide event frequency. An event that occurs often is highly probable. An event occurring annually is unlikely. Through analysis of total response volume from 2013-2017, the following probability per dispatch exists:

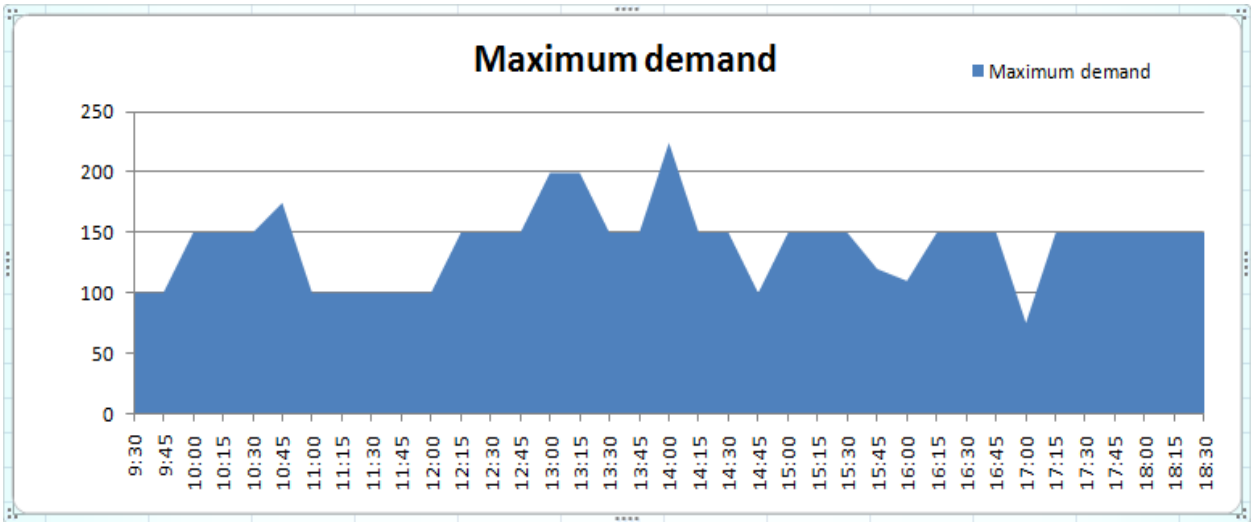


*All other calls (rescue, alert, and secondary response area) =.13%, total.

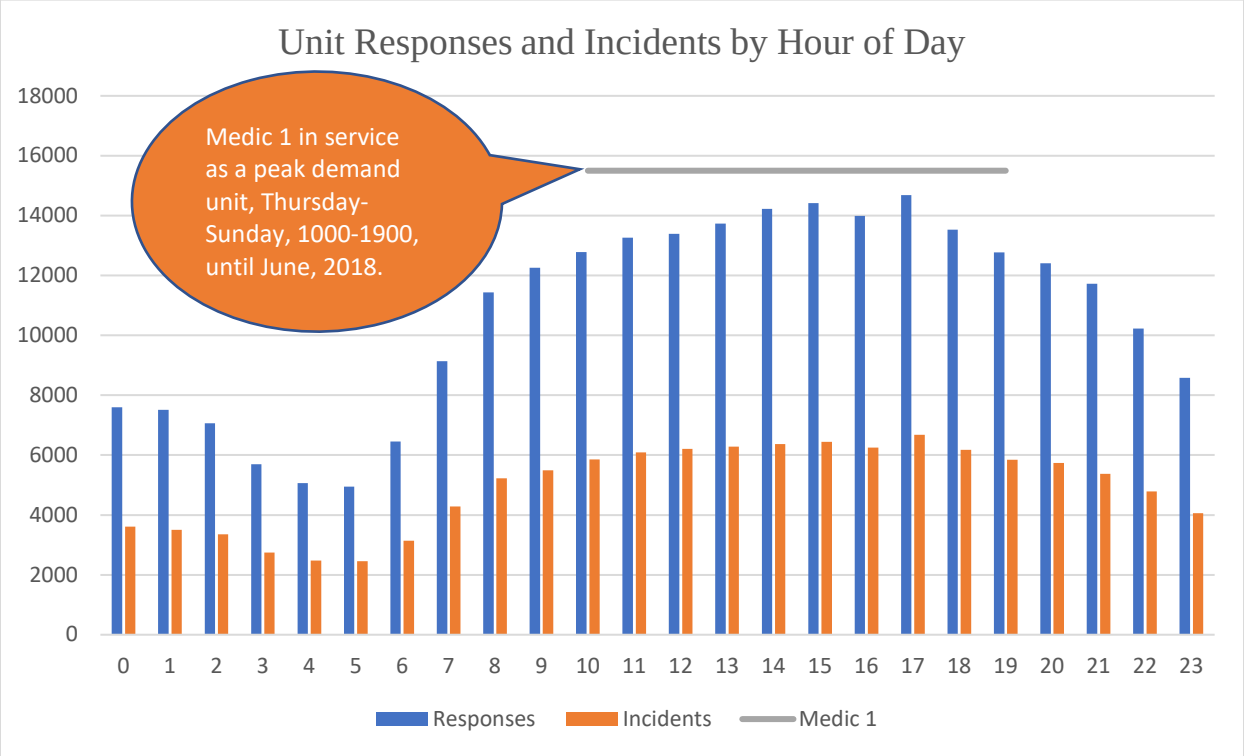
FREQUENCY AND PEAK LOAD. Through analysis of call frequency, LF&R strives to efficiently meet service demands. Identification of peak demand times is an important consideration as this identifies system demand for service.

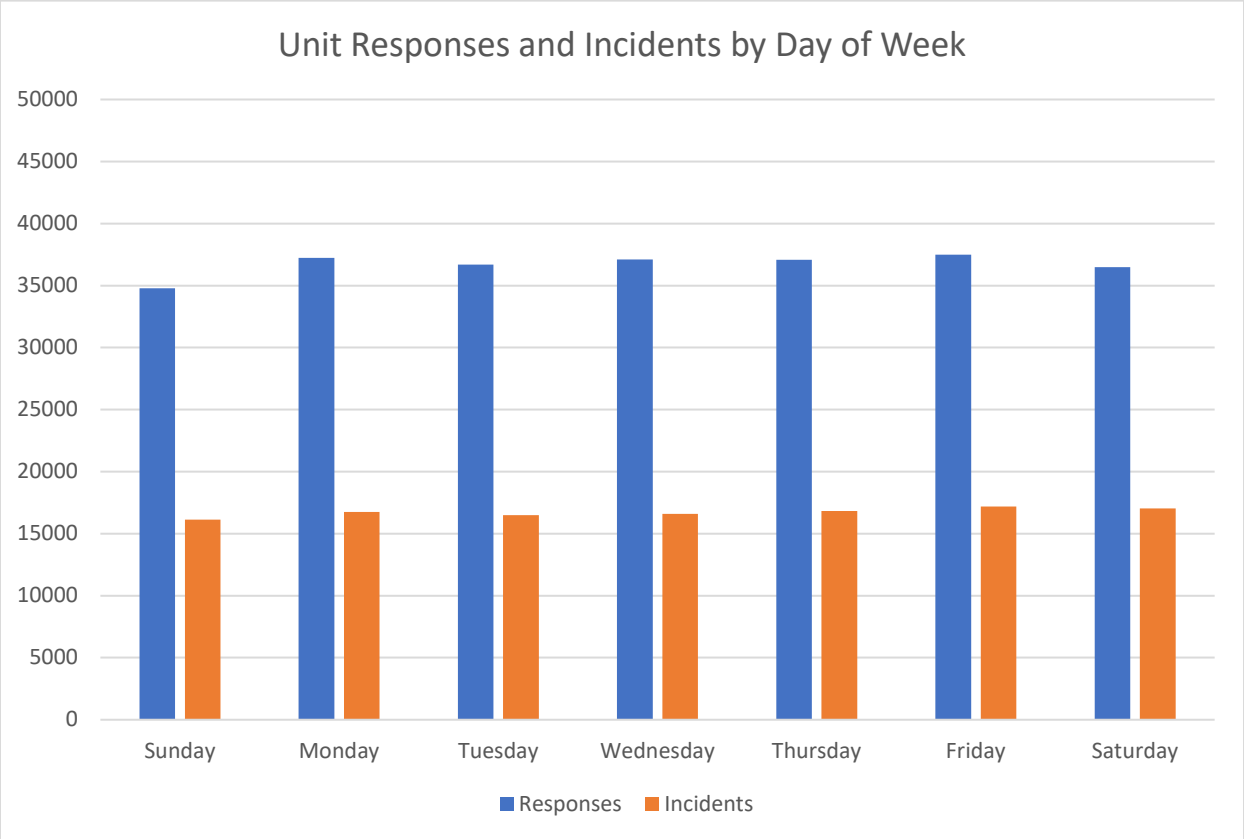
Like the electric utility model (as shown below), LF&R routinely evaluates and analyzes call frequency by: time of day, day of the week, day of month, and month of the year. This affords LF&R the ability to help predict future response trends. These trends assist in determining future staffing needs, peak demand unit placement, and demand-based staffing modeling.

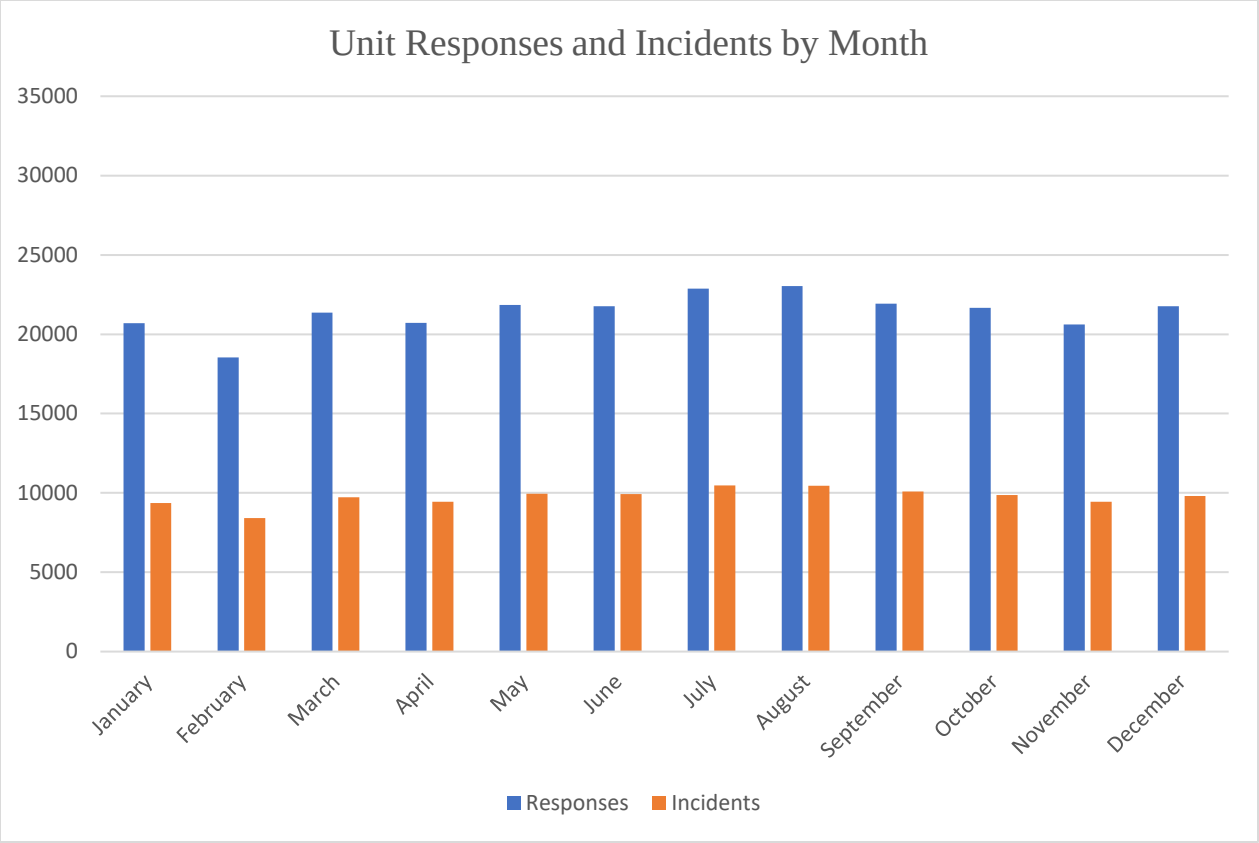




EMERGENCY RESPONSE CALENDAR ANALYSIS






Unit Responses and Incidents by Month
35000
30000
25000
20000
15000
10000
5000
0
January
February
March
April
May
June
July
August
September
October
November
December
Responses
Incidents

EVALUATION OF CURRENT DEPLOYMENT AND PERFORMANCE

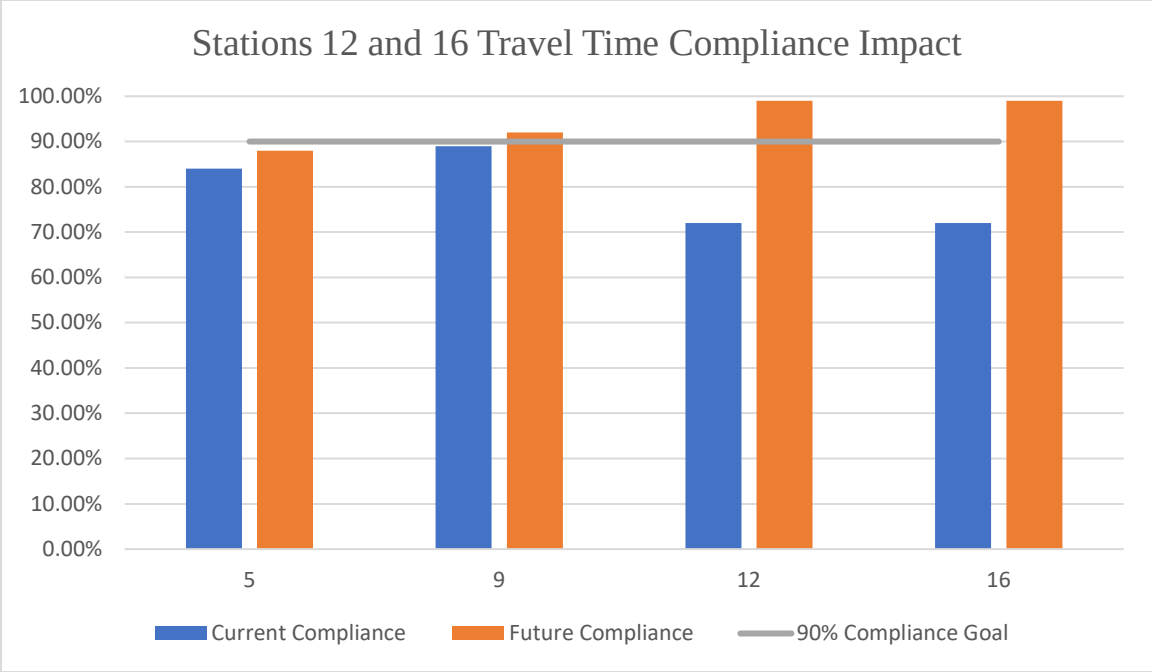
LF&R consistently evaluates system performance. To accomplish this, four individual areas are assessed: distribution, concentration, reliability, and comparability. The goal is to analyze areas based on risk within that area and specifically identify if the risk profile is high outside of current capability.

As shown in the documentation of area characteristics, the first level of distribution assessment is completing both a geographical and demographical study of each primary response area. Next, LF&R breaks down each individual apparatus by: goal vs actual travel time 90th percent compliance, square miles exceeding defined travel times, and road miles exceeding defined travel times.

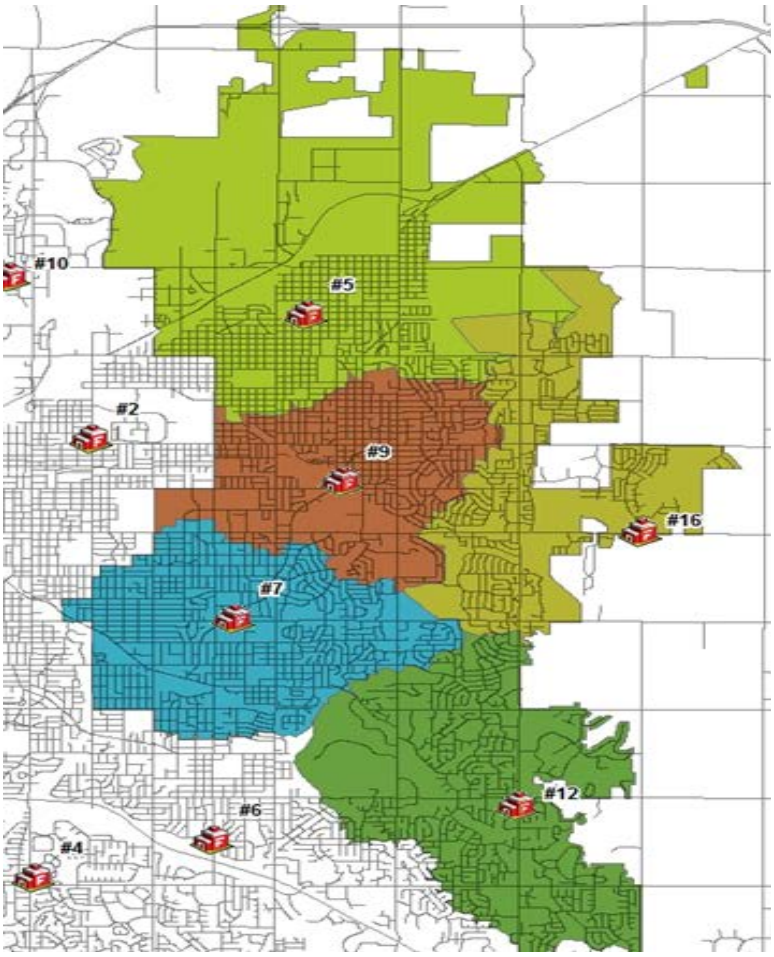
LF&R completed a geographic comparison study in 2013, which focused on the primary response area, specifically portions that fall outside of a 4-minute response time, by primary response apparatus, at an average travel speed of 35 miles/hour (53.1 feet/second). It concluded with three station relocation/optimization options.

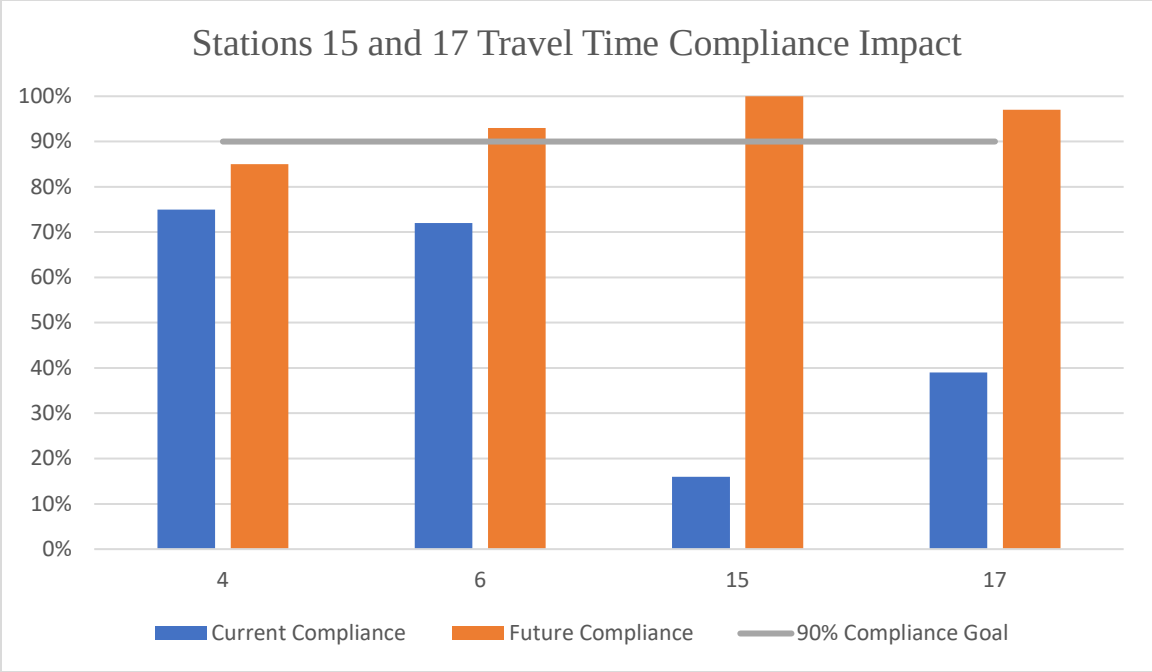
Post City Council review, LF&R successfully received, through a public safety sales tax issue, funds to introduce new fire stations into the city. This plan includes relocating Stations 10, 11, and 12, and adding 2 new Stations, 15 and 16, located in the general areas of 70th & Pine Lake Road and 98th and O Streets, respectively.

As proposed, Station 10 will move north and east, 12 will move south, and 11 will move west. Construction on these projects began in 2017 (Hicks, 2017). In its initial planning phase, a new Station 17 would locate in the general area of 40th and Yankee Hill Road. An opening date for Station 17 has not yet been determined.

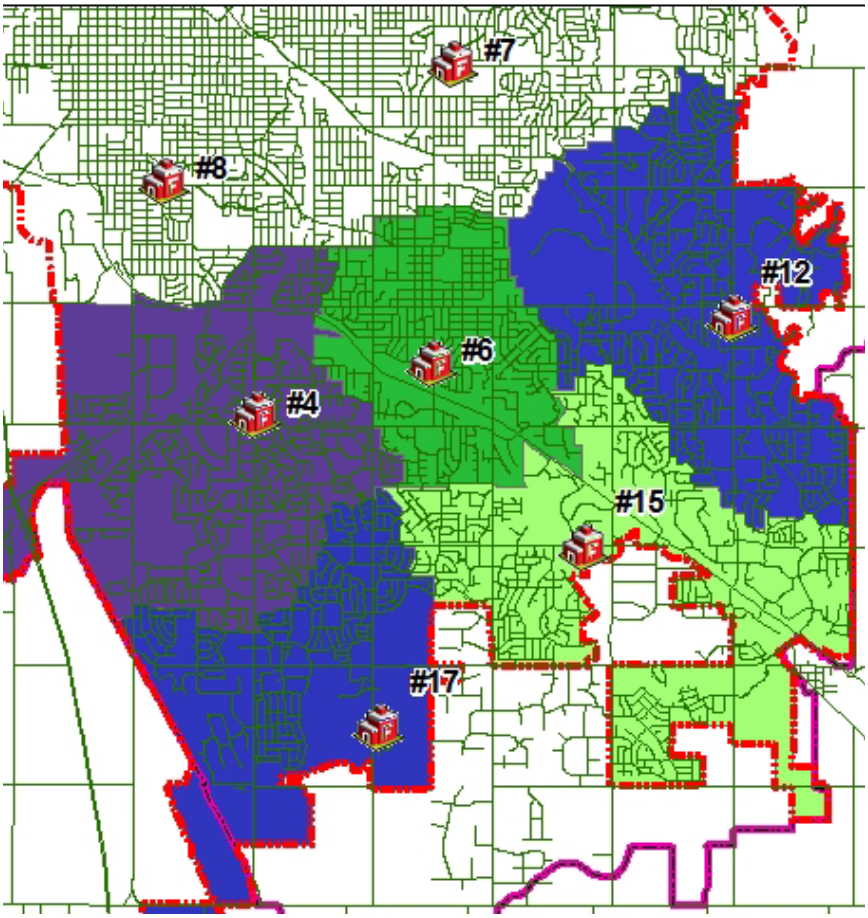


*Station 16 current compliance represents the area without a station in place



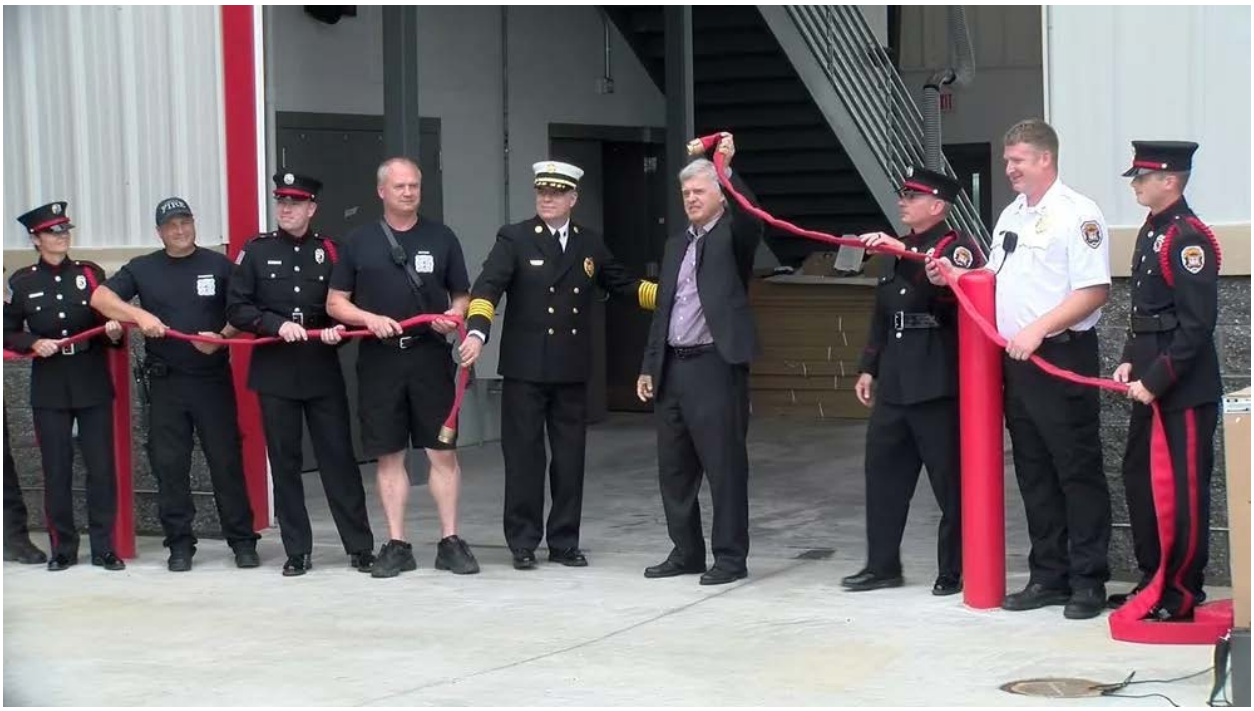


*15 and 17 current compliance represents these areas without stations in place



In recent years, there has been significant residential and commercial growth in the FPZ covered by Station 11. Before its relocation in June 2018, Station 11 was located within the Lincoln Airport's property, although it no longer provided ARFF services to the airport. This growth and change in Station 11's response, necessitated a new location. Before relocation, Engine 11 traversed nearly 2 miles of a sparsely populated industrial area to reach its current location, near a main thoroughfare. This area encompasses a nearly non-existent population density and subsequent requests for service. Unofficial estimates suggest an average improvement in travel time of three minutes.

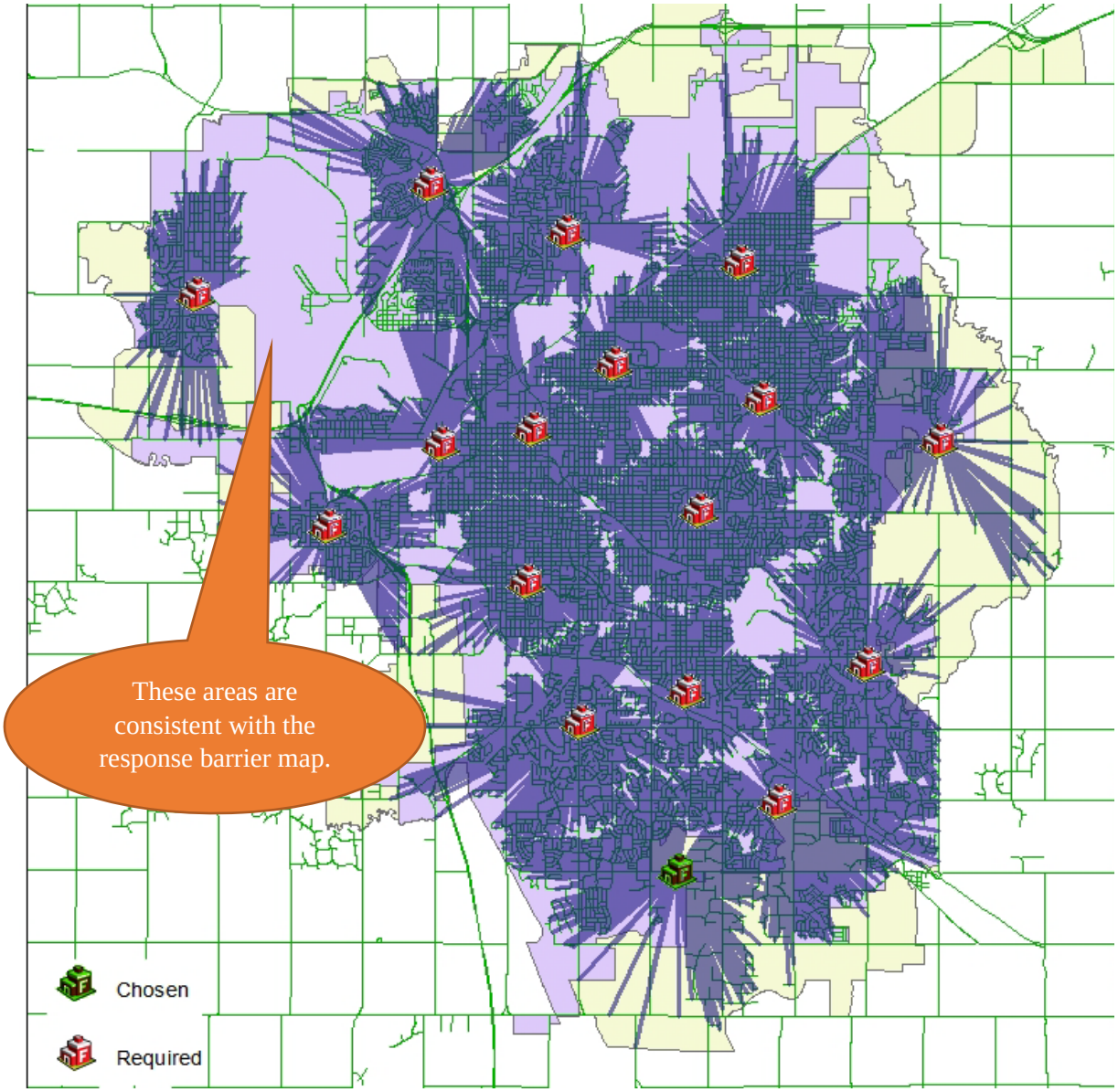
*Chiefs Despain and Borer at Station 11's groundbreaking ceremony (Lincoln Journal Star, 2017)



*Chiefs Despain and Gegg, Mayor Beutler, Engine 11 staff, and members of LF&R's honor guard at Station 11's grand opening ceremony (Channel 8 Eyewitness News, 2018)

*Construction progress on the new LF&R Station 15 as of 8/30/2018

Future four minute travel time coverage based upon Lincoln's street network, with the addition of LF&R Stations 15, 16, and 17, and the relocation of Stations 10, 11, and 12:

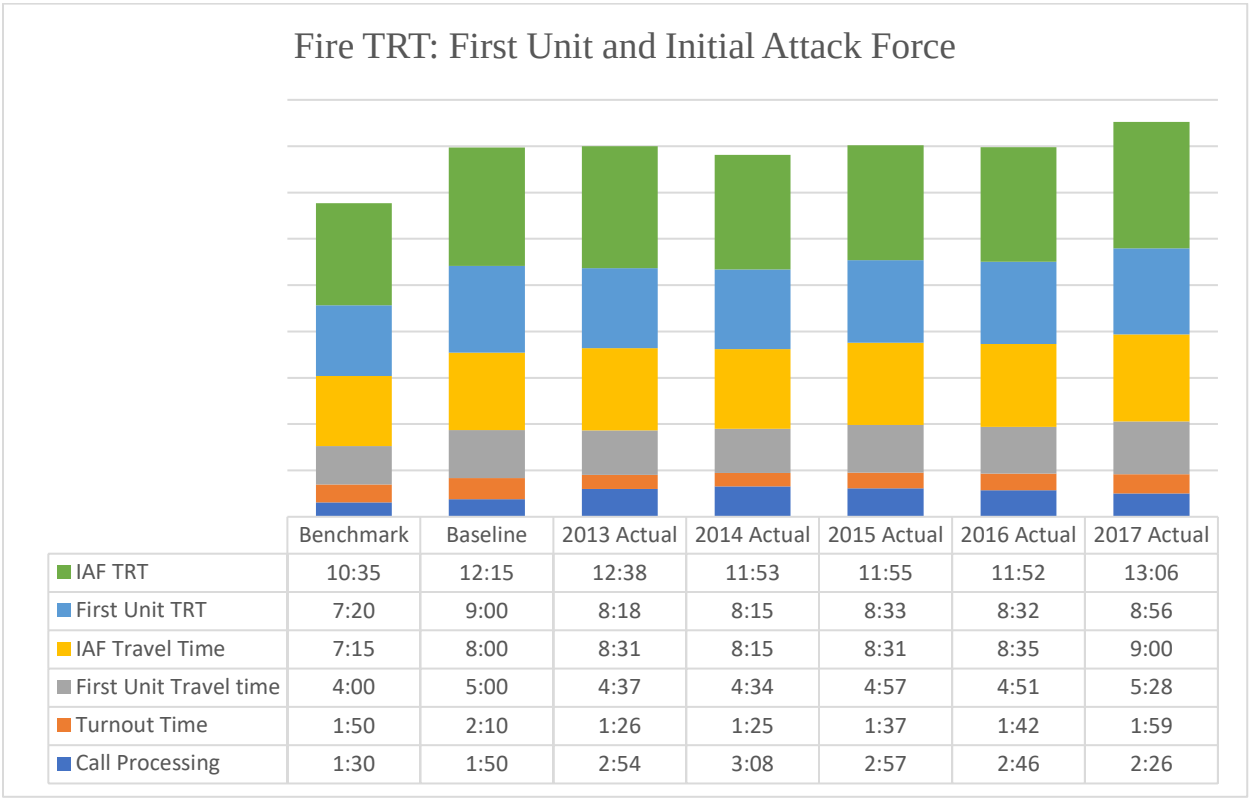


MEASURING SYSTEM RELIABILITY

LF&R measures reliability by the following metrics: total response time (TRT), unit commitment factor (UCF), travel time compliance by primary response apparatus, and reliability within primary response areas, by their assigned primary response apparatus. A recently instituted metric, UCF was instituted through research supplied by Joe Powers from the Henrico County, VA Division of Fire.

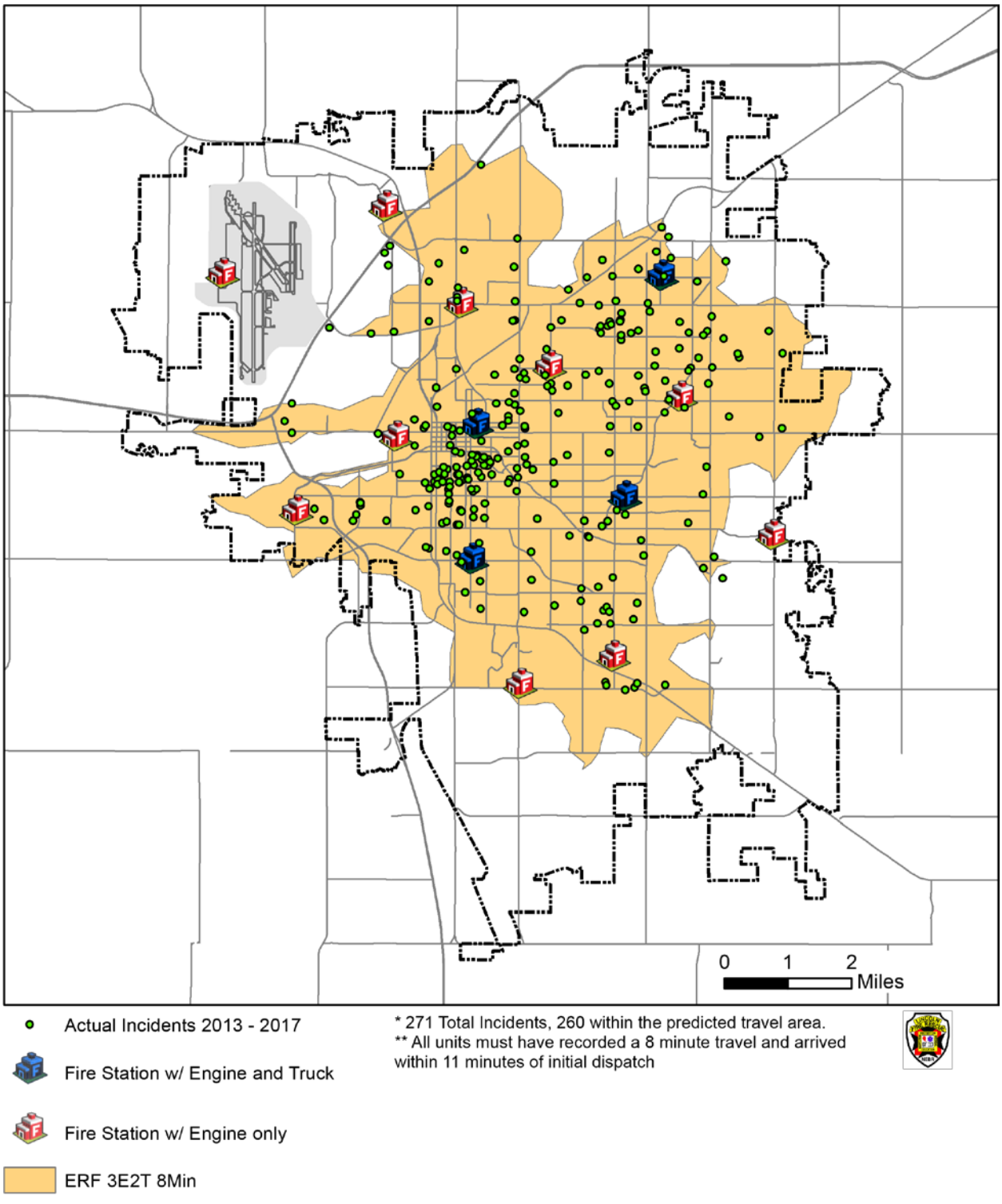
LF&R defines TRT as the sum of call processing by dispatch, turnout time (the time between dispatch and response), and travel time. LF&R further measures TRT by an initial attack force (IAF), effective response force (ERF), and first unit responses within primary response districts.

TOTAL RESPONSE TIME

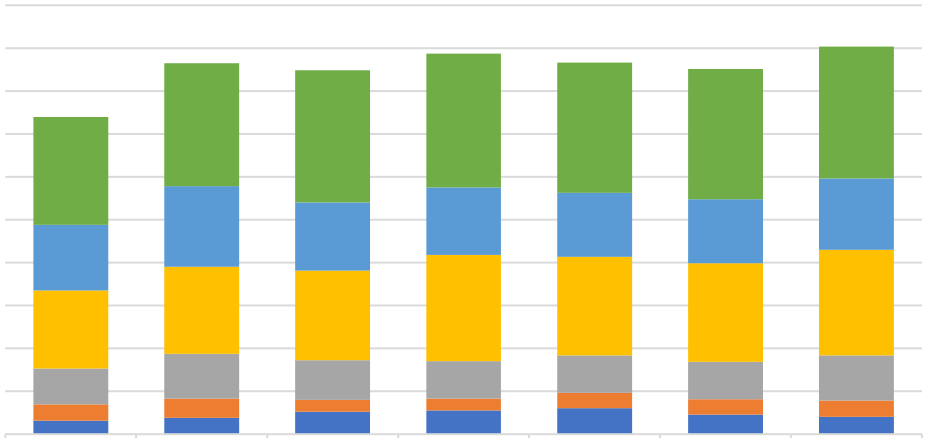


	Benchmark	Baseline	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
IAF TRT	10:35	12:15	12:38	11:53	11:55	11:52	13:06
First Unit TRT	7:20	9:00	8:18	8:15	8:33	8:32	8:56
IAF Travel Time	7:15	8:00	8:31	8:15	8:31	8:35	9:00
First Unit Travel time	4:00	5:00	4:37	4:34	4:57	4:51	5:28
Turnout Time	1:50	2:10	1:26	1:25	1:37	1:42	1:59
Call Processing	1:30	1:50	2:54	3:08	2:57	2:46	2:26

The following represents LF&R's 2013-2017 3 Engine/2 Truck Company ERF coverage ability, and actual incidents, by a travel time not exceeding 8 minutes:

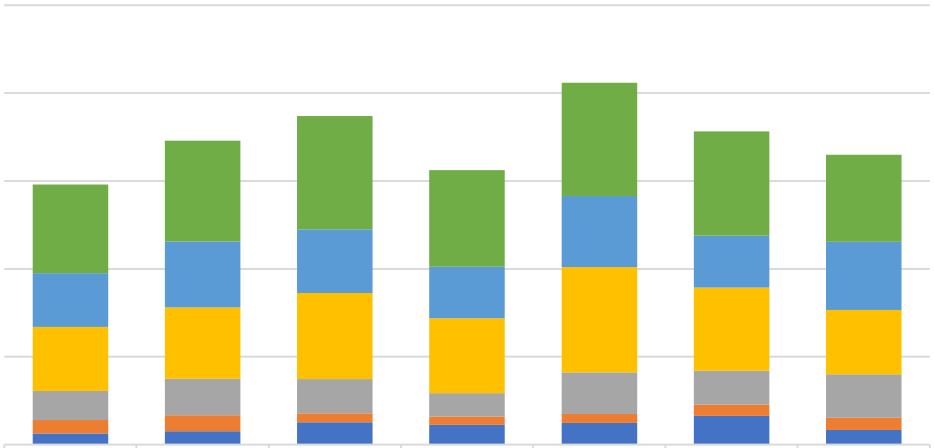


Fire TRT: First Unit and Effective Response Force



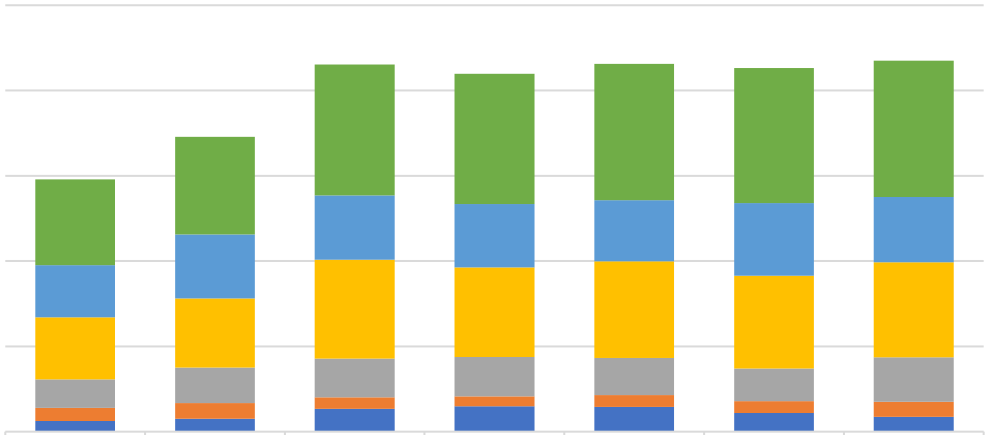
	Benchmark	Baseline	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
ERF TRT	12:05	13:45	14:47	14:58	14:36	14:36	14:45
First Unit TRT	7:20	9:00	7:37	7:34	7:09	7:09	7:59
ERF Travel	8:45	9:45	10:02	11:53	11:02	11:02	11:49
First Unit Travel	4:00	5:00	4:26	4:10	4:12	4:12	5:03
Turnout	1:50	2:10	1:21	1:21	1:42	1:42	1:50
Call Processing	1:30	1:50	2:30	2:39	2:55	2:12	1:57

Rescue TRT: First Unit and Effective Response Force



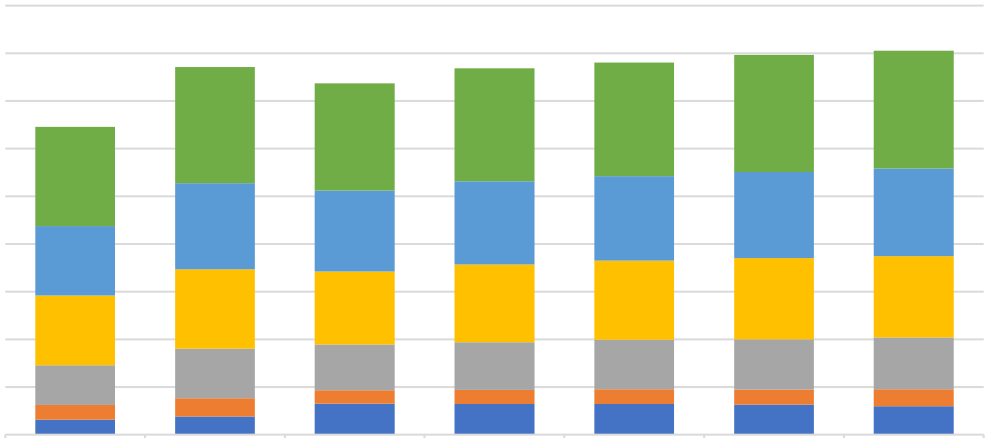
	Benchmark	Baseline	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
ERF TRT	12:05	13:45	15:29	13:12	15:26	14:15	11:53
First Unit TRT	7:20	9:00	8:43	7:00	9:44	7:04	9:20
ERF Travel	8:45	9:45	11:44	10:15	14:23	11:24	8:46
First Unit Travel	4:00	5:00	4:40	3:10	5:41	4:37	5:57
Turnout	1:50	2:10	1:13	1:10	1:12	1:31	1:39
Call Processing	1:30	1:50	3:04	2:41	2:58	3:56	2:01

Hazmat TRT: First Unit and Effective Response Force



	Benchmark	Baseline	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
ERF TRT	12:05	13:45	18:24	18:19	19:09	18:59	19:10
First Unit TRT	7:20	9:00	9:05	8:56	8:37	10:14	9:12
ERF Travel	8:45	9:45	13:54	12:36	13:37	13:03	13:22
First Unit Travel	4:00	5:00	5:28	5:32	5:11	4:37	6:15
Turnout	1:50	2:10	1:36	1:25	1:41	1:39	2:08
Call Processing	1:30	1:50	3:13	3:33	3:29	2:38	2:04

Medical TRT: First Unit and Effective Response Force



	Benchmark	Baseline	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
ERF TRT	10:00	11:40	10:49	11:22	11:26	11:48	11:52
First Unit TRT	7:00	8:40	8:08	8:23	8:30	8:40	8:50
ERF Travel	7:00	8:00	7:22	7:50	7:57	8:11	8:11
First Unit Travel	4:00	5:00	4:36	4:48	5:00	5:03	5:12
Turnout	1:30	1:50	1:20	1:24	1:28	1:31	1:43
Call Processing	1:30	1:50	3:08	3:06	3:06	3:02	2:52

*Medical call data includes: Engines and Trucks Responding to Bravo-Echo, Medic Units to Charlie-Echo

TRAVEL TIME COMPLIANCE. Engine companies are defined as the "first due" apparatus within an individual response zone. As defined by LF&R MP101.03, travel time for the first due apparatus is 4 minutes, 90% of the time. Under ideal conditions, future fire station location and relocation will in part be based on apparatus travel and established response goals.

The following represents response coverage ability of each first due engine company, at a 4-minute travel time, within its primary response zone. Using the previously mentioned calculation, it is likely a travel distance exceeding 2.41 miles will also exceed a 4-minute response. These areas are highlighted red in the Response Areas Outside 4 Minutes Map found in Appendix E.

Engine company 90th percentile travel time, within its primary response area:

Engine	Travel Time in Seconds	Compliance Percentage	Square Miles Outside Travel Time	Road Miles Outside Travel Time
1	222	93.35	0.04	0.71
2	272	84.66	0.43	0.27
3	264	83.75	2.42	10.95
4	284	80.07	3.63	20.63
5	293	78.98	6.55	22.31
6	342	67.62	2.98	38.49
7	269	84.94	0	0
8	247	89	0.41	0.69
9	251	87.91	0.3	4.03
10	308	69.94	1.44	10.79
11	456	17.65	4	8.59
12	321	67.09	3.35	30.03
13	451	50.7	1.26	6.02
14	375	39.38	5.06	38.71

Individual truck company distribution is defined and at times measured differently that engine companies, due to an effective ratio of 2:7. Truck companies do function as the primary response apparatus, when the co-located engine company is unable to respond, or as prescribed by call type. This is consistent with the engine company travel time expectation of four minutes. When assigned to a combined ERF of IAF, travel time for these apparatus is six minutes, 90% of the time, due to their larger geographical distribution.

The following represents the response coverage ability of each first due truck company, at a six-minute travel time within its primary response zones. The areas exceeding six minutes are highlighted red in the Response Areas Outside 6 Minutes Map found in Appendix E.

Truck company 90th percentile travel time, within its primary response area:

Truck	Travel Time in Seconds	Compliance Percentage	Square Miles Outside Travel Time	Road Miles Outside Travel Time
1	455	83.61	19.53	157.32
5	333	91.11	7.64	43.5
7	438	76.67	10.46	134.13
8	463	69.09	8.44	71.21

Unlike engine and truck companies, medic unit response time standards are defined by LMC § 7.08.050**:**

> In the provision of emergency ambulance service within the corporate limits of the City, the City or its contractor, when dispatched by the 911 Center pursuant to an emergency call and where the condition of the patient is life-threatening (presumptively meets the classification Delta or Echo), shall respond to the site to which dispatched within eight minutes and no seconds from the time of dispatch, for at least 90 percent of the responses, and, to the extent possible, shall make reasonable attempts to arrive at the site to which dispatched within six minutes and no seconds of the time of dispatch. See Appendix E for Response Areas Outside 8 Minutes Map.

Medic unit 90th percentile travel time, within its primary response area:

Medic	Travel Time	Compliance	Square Miles Exceeding Travel Time	Road Miles Exceeding Travel Time
2	451	86.28%	1.88	8.48
3	458	88.43%	13.46	102.8
5	436	87.75%	4.76	21.37
6	436	87.75%	1.88	8.48
7	414	90.86%	0.00	0.00
8	414	91.09%	2.70	5.15

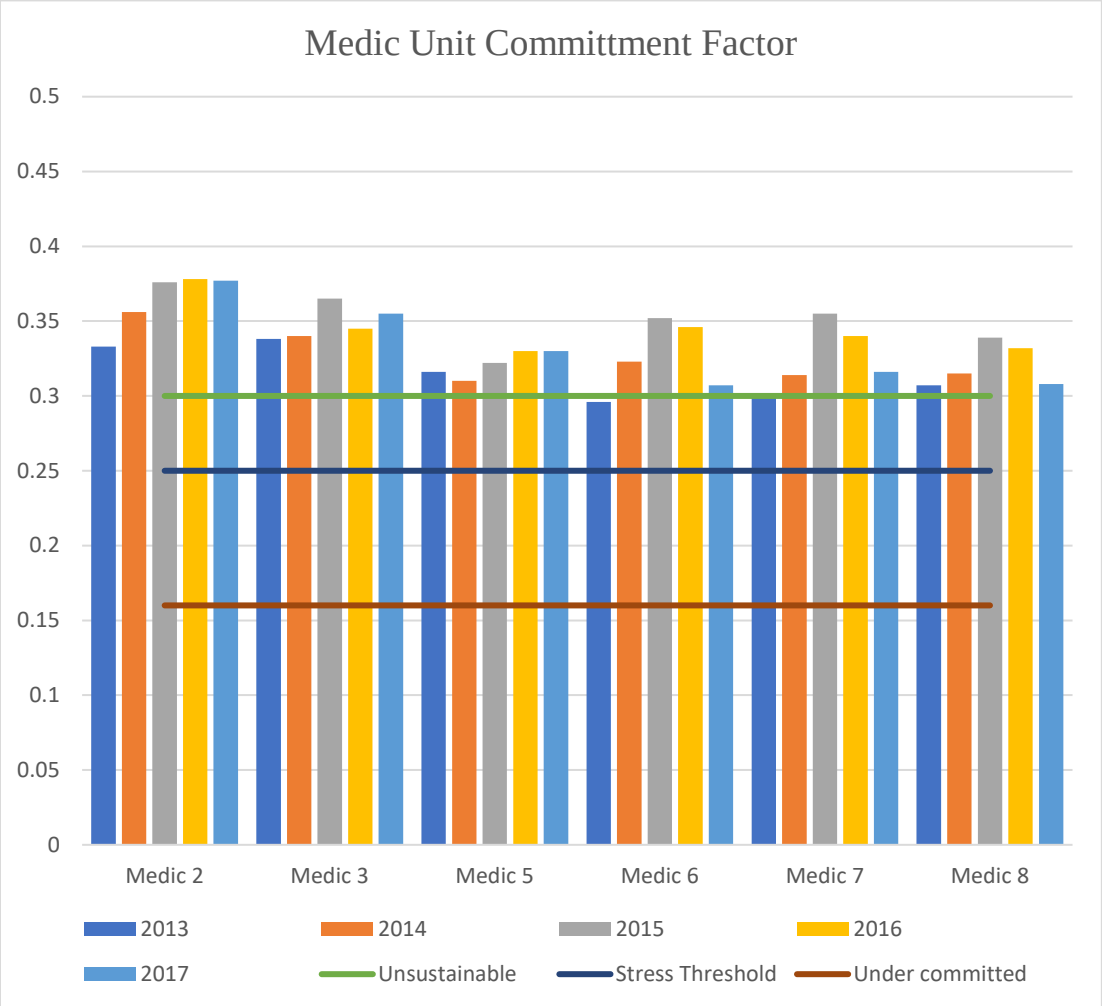
UNIT COMMITMENT FACTOR. As defined by Powers (2016), UCF is the total amount of time an apparatus is committed to response in a year, divided by the total time in that year. LF&R began tracking UCF in 2013 and considers it a more reliable metric than total response volume. For example, an apparatus is committed to a single response for four hours while another apparatus responds three times, in the same time frame, for a total committed time of two hours. Using this metric, the first mentioned apparatus is doubly committed, thus reducing reliability in its primary response area.

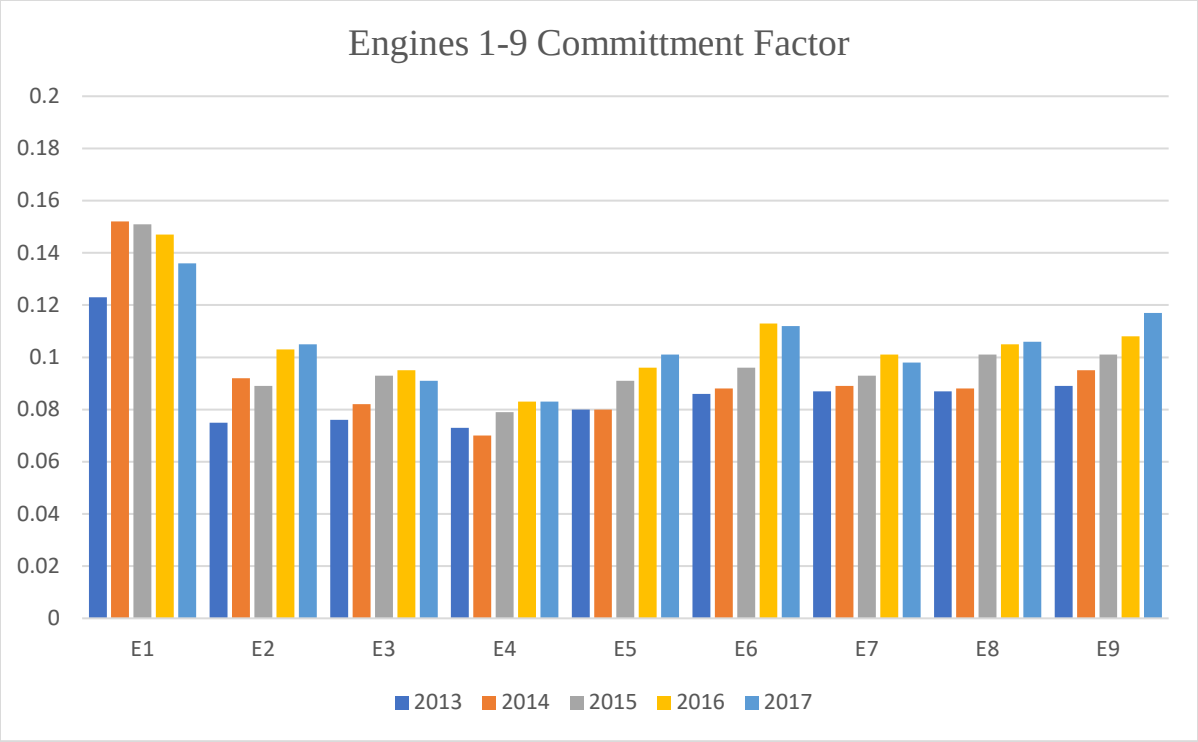
UCF benchmarks and thresholds are unestablished for engine and truck companies. However, for medic units, LF&R uses the following criteria, to evaluate individual UCF (Powers, 2016):

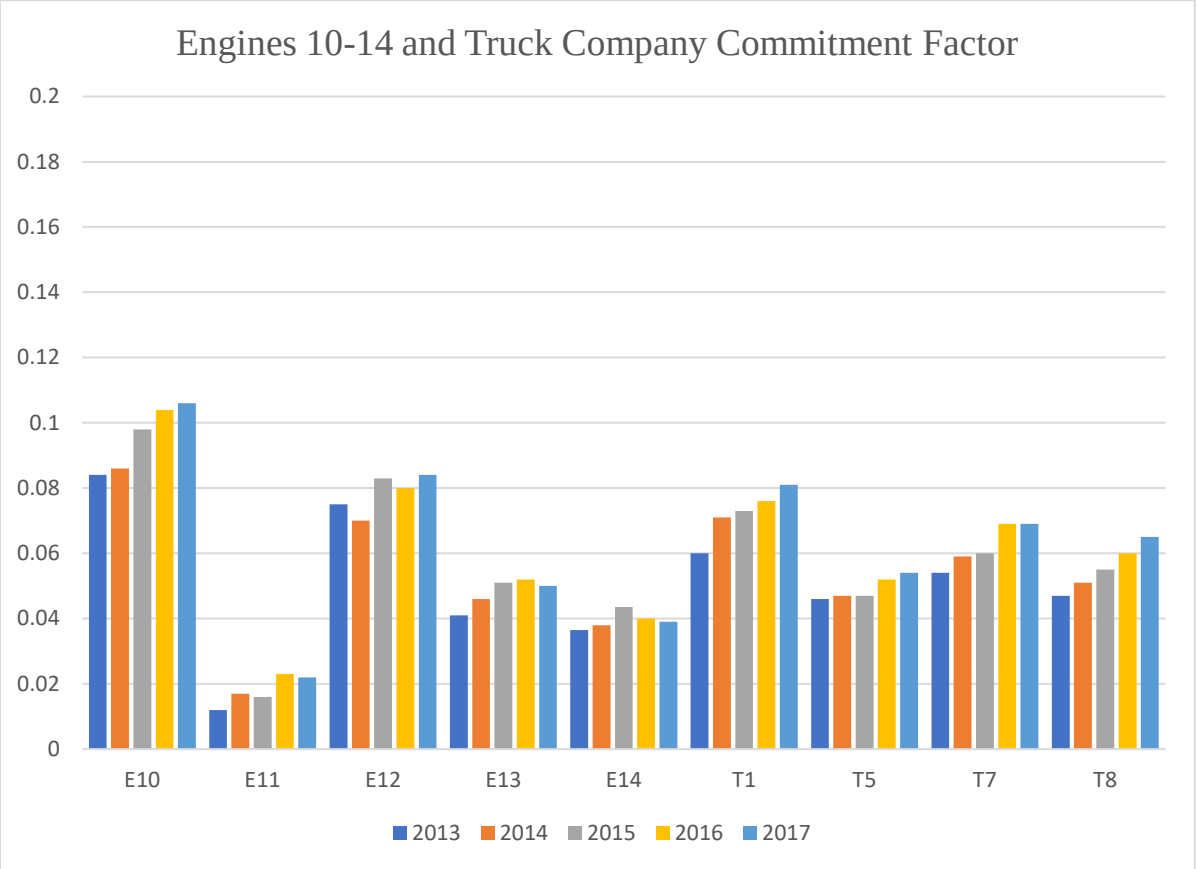
> Under committed <0.16. These units should be evaluated for more efficient use as additional operating capacity is available.
>
> Ideal range ≥016, ≤0.24. In this range, firefighters have a greater likelihood of maintaining training requirements, physical fitness, and are likely to meet TRT goals. These units are available for primary area response between 84% and 76% of the time.
>
> System Stress Threshold = .25. When exceeded, reliability begins to decrease as apparatus from other areas are more frequently used for coverage. First-due units are available for response in their primary area 75% of the time, and TRT goals are likely met.

Evaluation range ≥ 0.26, ≤0.29. The primary response area is less reliable as TRT increases. The primary response apparatus is now available from 71%-74% of the time. This range is closely monitored, and trends are routinely analyzed.

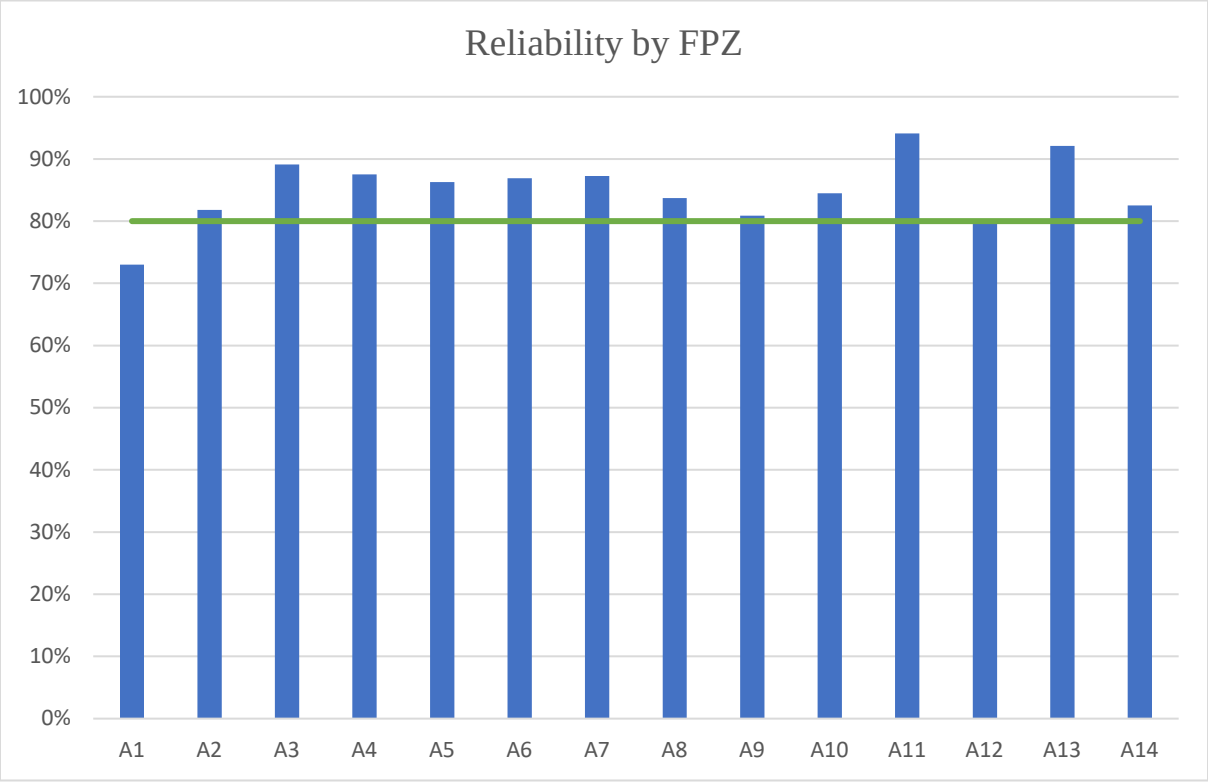
Unsustainable threshold ≥ 0.3. The proverbial "line in the sand." When exceeded, the primary response apparatus is unavailable to respond at least 30% of the time. Firefighters assigned to units exceeding 0.3 may show signs of physical and mental fatigue, commit errors with greater frequency, and less consistently fulfill training and physical fitness obligations.




Engines 1-9 Committment Factor
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
E1
E2
E3
E4
E5
E6
E7
E8
E9
2013
2014
2015
2016
2017

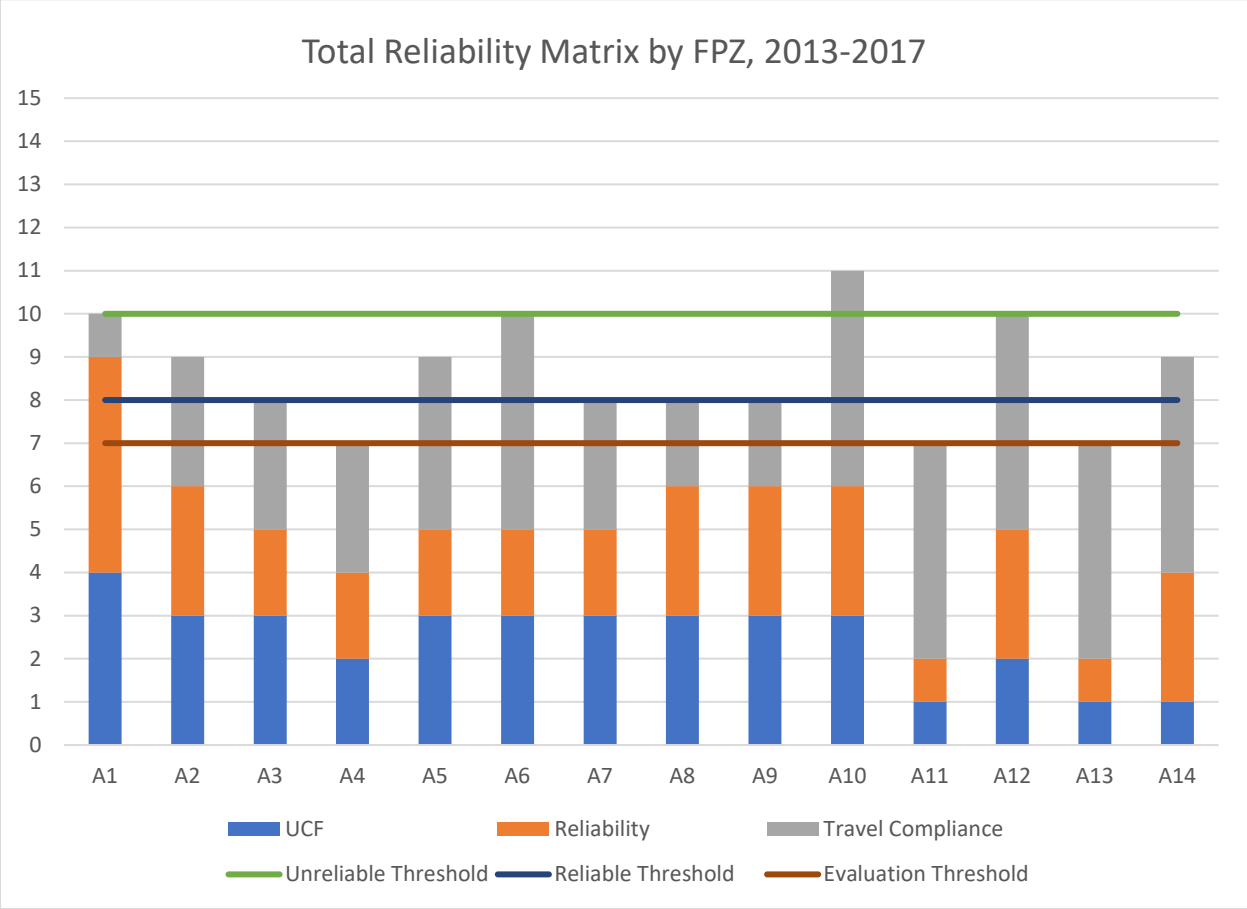

Engines 10-14 and Truck Company Commitment Factor
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
E10
E11
E12
E13
E14
T1
T5
T7
T8
2013
2014
2015
2016
2017

RELIABILITY. LF&R measures what percentage a primary response area is served by its assigned primary response apparatus, as opposed to an apparatus responding from another area. This metric affords LF&R the ability to determine reliability on a smaller scale than total system response. As UCFs increase and decrease, the ability of an apparatus to serve its assigned area can change. Reliability will also decrease any time a primary response apparatus vacates its area for many reasons: training, refueling, response to another area, retrieving personnel, and meetings.



*There is a margin of error when analyzing data from the GIS System vs Total System Data. 1.83% of the time, a response is not Geocoded.

TOTAL RELIABILITY MATRIX. This stacked metric, new to LF&R in 2018, affords a broad picture of multiple data sets. LF&R recognizes that to accurately depict system health, multiple factors must be weighed. This matrix, as shown below, assigns scoring based on three individual factors, and weighs them, equally. Scores can range from 3 to 15: 3 = totally reliable, 15 = totally unreliable. LF&R has identified a score 10 as its upper acceptable limit.



*Total Reliability Matrix, as developed by Nicholas R Cunningham, 2/2018.

*Theoretically, A6, A10, A11, and A14 will all realize totals under the reliable threshold after the movement of Stations 10, 11, 12, and the addition of Stations 15 and 16. As shown above, these will improve travel compliance and reliability. *Methodology: N<7 = Reliable, 7≤N≤10= Somewhat Reliable, 10<N≤13=Somewhat Unreliable, N>13=Unreliable

Total Reliability Matrix assigned scoring methodology:

Unit Commitment Factor	Reliability	Travel Compliance
N >.3=5	N<75%=5	N<75%=5
N>.12=4	N>75%=4	N>75%=4
N>.09=3	N>80%=3	N>80%=3
N>.06=2	N>85%=2	N>85%=2
N<.06=1	N>90%=1	N>90%=1

LF&R recognizes that for the last 5 years, individual medic unit UCF and travel times are steadily increasing while reliability is decreasing. All current recruitment efforts are focused on acquiring paramedic trained personnel to staff new ambulances, when available. As consistent with national trends, LF&R also suffers consistent paramedic turnover, in the form of returning to a BLS level of service. This has made EMT-B firefighter recruitment unnecessary.

RESISTANCE

As described in the SOC manual, LF&R is striving towards streamlining its deployment to ensure the most necessary resources are deployed to an incident. As shown in the All Hazard Risk Assessment, LF&R is moving towards a risk-based dispatch model. The institution of this model, as proposed, is in 2019

ABSORBTION

As shown in the Local Emergency Operations Agreement (LEOP), mutual aid systems are in place, if the system is stressed beyond its normal operating capacity. As well, LF&R uses a web-based system called Telestaff, to initiate employee callback, in case of a large-scale event. Recently, this has been used, successfully, for several multi-alarm fires.

RESTORATION

LF&R consistently strives to return to service in a normal operating capacity, as soon as possible. As described in the SOC manual, LF&R uses restoration and absorption hand in hand. Call back is used to staff extra apparatus during times of system stress. This allows LF&R to maintain a normal level of service during heavy system use, even if primary apparatuses are used for lengthy periods.

PLAN FOR MAINTAINING AND IMPROVING RESPONSE CAPABILITIES

1. LF&R will evaluate, monthly, its UCF, eight-minute response time compliance, turnout time compliance, and total response time compliance.
2. LF&R will evaluate, quarterly, UCF and ERF, for changes and potential for system improvement.
3. LF&R's ability to provide emergency services will be enhanced with the institution of risk-based dispatch protocol, upon installation of a geo-aware CAD system. This improved level of service will consider occupancy type, size, suppression system status, and extenuating features, as identified.
4. LF&R will reevaluate any performance gaps, quarterly, to maintain a continuous trend analysis.
5. LF&R will quarterly review and revaluate all 90^{th} percentile performance benchmarks to ensure they are accurate and adequate and address desired outcomes.
6. LF&R will, annually, reassess primary response area demographics: density, age, income, occupancy, income, etc. These metrics will assist in determining future risk.
7. LF&R will, biennially, as consistent with the budgeting process, address gaps in performance and determine any applicable solutions: distribution, deployment, or financial. These metrics are shown in the evaluation of current deployment and performance and will evaluate both individual primary response areas and total system impact.

8. LF&R will continue to maintain a relationship with the city planning department to determine future risks, and city development, to analyze future service demands, and zoning changes.
9. LF&R will consistently reevaluate its identified performance budget indicators (LNKStat). These indicators were arrived on with citizen input during a 2017 community stakeholder project. They include:
    a. LF&R ambulances will have a total response time of 8 minutes or less 90% of the time to emergent medical incidents.
    b. LF&R will stop fires at the room or area of origin for at least 80% of structure fires.
    c. LF&R will maintain a cardiac survival rate equal to or higher than the national average.
    d. LF&R will save/salvage property and contents which are lost to fire at a rate higher than the cost of annual operation.
    e. LF&R will maintain a per capita cost of operation equal or lower than the regional average.
    f. LF&R will achieve a CPR fraction of at least 80%.
    g. LF&R will maintain an ISO classification of 2 or better.
    h. LF&R will maintain its status as an accredited agency through the Center for Public Safety Excellence. See Appendix E for 2018 Performance Budget Indicators.

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APPENDIX A, CRITICAL TASK ANALYSIS

FIRE

Special Risk/High Rise Structure Fire ERF

Task	ERF	Apparatus
Incident Command	1	Battalion 1
Safety Officer	1	EMS 1
Fire attack	4	1st/2nd Engine Companies
Water supply/FDC	1	1st/2nd Engine Companies
Fire pump operation	1	1st/2nd Engine Companies
Staging (2 floors below)	3	3rd Engine Company
RIT	3	4th Engine Company
Report to staging	3	5th Engine Company
Establish BASE	3	6th Engine Company
Search	3	1st Truck
Search	3	2nd Truck
Ventilation/ground support	3	3rd Truck
Total:	29	11 Apparatus

Special Risk/High Rise IAF

Task	ERF	Apparatus
Incident Command	1	1st Engine Company
Fire pump operation	1	1st Engine Company
Fire Attack	4	1st/2nd Engine Companies
Water Supply/FDC	1	3rd Arriving Apparatus
Ventilation profile/ground support	3	3rd Arriving Apparatus
Primary Search	6	4th/5th Arriving Apparatus
IRIC	3	6th Arriving Apparatus
Total:	18	6 Apparatus

High Risk Structure Fire ERF

Task	ERF	Apparatus
Incident Command	1	Battalion Chief
Safety Officer	1	EMS 1
Fire attack	4	1st/2nd Engine Companies
Water supply/FDC	1	1st/2nd Engine Companies
Fire pump operation	1	1st Engine Companies
Rapid intervention	3	3rd Engine Company
Aerial tower operation	1	1st Truck Company
Primary search	2	1st Truck Company
Ventilation/forcible entry	3	2nd Truck Company
Total:	17	7 Apparatus

High Risk Structure Fire IAF

Task	ERF	Apparatus
Incident Command	1	1st Engine Company
Fire attack	3	1st/2nd Engine Companies
Water supply/FDC	1	1st/2nd Engine Companies
Fire pump operation	1	1st Engine Company
Primary Search	3	3rd Arriving Apparatus
IRIC	3	4th Arriving Apparatus
Total:	12	4 Apparatus

Medium Risk Structure Fire ERF

Task	ERF	Apparatus
Incident Command	1	Battalion Chief
Safety Officer	1	EMS Supervisor
Fire attack	4	1st /2nd Engine Companies
Fire pump operation	1	1st Engine Company
Water supply/FDC	1	2nd Engine Company
Rapid intervention/utilities	3	3rd Engine Company
Primary search	2	1st Truck Company
Aerial tower operation	1	1st Truck Company
Ventilation/Forcible Entry	3	2nd Truck Company
Total:	17	7 Fire Apparatus

Medium Risk Structure Fire IAF

Task	ERF	Apparatus
Incident Command	1	1st Engine Company
Fire attack	1	1st Engine Company
Fire pump operation/water supply	1	1st Engine Company
Primary Search/Rescue	2	2nd arriving apparatus
Total:	5	2 Fire Apparatus

*The IAF at a medium risk structure can include medic unit personnel, if they are the first or second arriving apparatus

Low Risk Structure Fire ERF

Task	ERF	Apparatus
Incident Command	1	Battalion Chief
Fire attack	1	1st/2nd Engine Companies
Water supply/FDC	1	1st/2nd Engine Companies
Fire pump operation	1	1st Engine Company
Rapid intervention/utilities	3	1st/2nd Engines Companies
Ventilation/Search	3	1st Truck Company
Total:	7	4 apparatus

Low Risk Structure Fire IAF

Task	ERF	Apparatus
Incident command	1	1st Engine Company
Fire attack	1	1st Engine Company
Fire pump operation	1	1st Engine Company
Total:	3	1 Fire Apparatus

HAZMAT

High Risk Hazardous Materials ERF

Task	ERF	Apparatus
Incident Command	1	Battalion Chief
Isolate and Deny Entry	3	1st Engine or Truck
Hazmat Group Supervisor	1 (1 HMT)	Engine 2, 9, or HM14
Safety Officer	1 (1 HMT)	Engine 2, 9 or HM-14
Offensive Control Tactics (2 Entry, 2 Back-up)	4 (4 HMT)	Engine 2, 9 or HM-14
Decontamination	2	1st Engine or Truck
Total:	12 (6 HMT)	4

High Risk Hazardous Materials IAF (Also 1st Due)

Task	ERF	Apparatus
Incident Command	1	1st Engine Company
Isolate and Deny Entry/Emergency Decon	2	1st Engine Company
Total:	3	1

Low Risk Hazardous Materials IAF/ERF

Tasks	ERF	Apparatus
Incident Command	1	1st Engine Company
Mitigation	2	1st Engine Company
Total	3	1

RESCUE

Rescue Alarm ERF

Task	ERF	Apparatus
Incident Command	1	Battalion Chief
Hose line deployment	1	1st Engine
Fire Pump operation	1	1st Engine
Triage	1	1st Engine
Scene Stabilization	3	1st Truck
Extrication/Patient Movement	3	2nd Truck
Care and treatment patients	3	2nd Engine
Transport	2	1st Medic Unit
Transport	2	2nd Medic Unit
EMS Group Supervisor	1	EMS1
Total:	18	4

Rescue Alarm IAF

Task	ERF	Apparatus
Initial Command	1	1st arriving apparatus
Triage	1	1st arriving apparatus
Initial Scene Stabilization	1	1st arriving apparatus
Care and Treatment of Patients	3	2nd arriving apparatus
Total:	6	2

Rescue Alarm 1st Due

Task	ERF	Apparatus
Initial Command	1	1st arriving apparatus
Triage	1	1st arriving apparatus
Initial Scene Stabilization	1	1st arriving apparatus
Total:	3	1

EMS

Medical High Risk/Cardiac arrest IAF

Task	Firefighters	Apparatus
Chest compressions	1	1st arriving apparatus
Ventilation	1	1st arriving apparatus
Cardiac monitor/scene control	1	1st arriving apparatus
Total:	3	1

Medical High Risk/Cardiac Arrest ERF

Task	Firefighters	Apparatus
Airway, breathing, circulation evaluation, vital signs	1	1st arriving apparatus
Cardiac monitor/scene control	1	1st arriving apparatus
Chest Compressions	1	1st arriving apparatus
LUCAS application	1	Medic unit
ALS intervention	1	Medic unit
Direction of care	1	EMS1
Total:	6	3

Medical and Traumatic Injury Low - Moderate Risk IAF

Task	Firefighters	Apparatus
Patient assessment	1	1st arriving apparatus
Cardiac monitor application/vital signs	1	1st arriving apparatus
BLS/ALS intervention	1	1st arriving apparatus
Total:	3	1

Medical and Traumatic Injury Low - Moderate Risk ERF

Task	Firefighters	Apparatus
Scene management, notation	1	1st arriving apparatus
Patient assessment	1	1st arriving apparatus
Vital signs, cardiac monitor	1	1st arriving apparatus
Patient movement/transport	2	Medic unit
Total:	5	2

Traumatic Injury – High Risk IAF

Task	Firefighters	Apparatus
Airway, breathing, circulation evaluation	1	1st arriving apparatus
Bleeding Control/shock management	1	1st arriving apparatus
Spinal immobilization	1	1st arriving apparatus
Total:	3	1

Traumatic Injury – High Risk ERF

Task	Firefighters	Apparatus
Airway, breathing, circulation evaluation, vital signs	1	1st arriving apparatus
Bleeding control/shock management	1	1st arriving apparatus
Airway management	1	1st arriving apparatus
Spinal immobilization	1	Medic unit
Rapid sequence intubation	1	Medic unit
Direction of care	1	EMS1
Total	6	3

APPENDIX B, HANDS ON VALIDATION

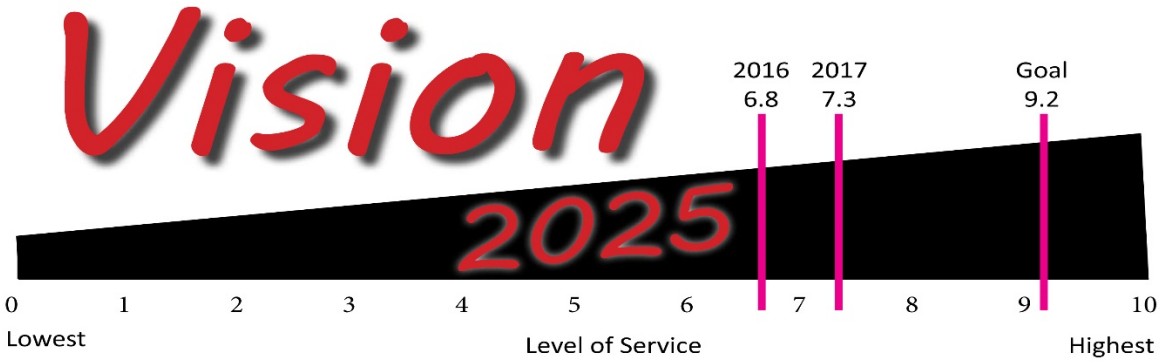
In winter 2016 - 2017, LF&R engaged in a cardiac arrest themed hands on CTA, to establish average benchmark times by calculating the 90th percentile. This CTA measures the critical tasks of the first arriving apparatus, universal to either ALS or BLS level patient care, in seconds:

Chest compressions	Initial rhythm analysis	Initial shock (when applicable)	Airway adjunct placement	Ventilation initiation
10	29	46	55	56
End tidal capnography circuit placement	Second rhythm analysis	Second shock (when applicable)	Third analysis	Third shock (when applicable)
39	172	189	314	332

In spring 2017, LF&R facilitated a critical task analysis for a fire determined as medium risk. This scenario was facilitated six times over the course of three consecutive weekends. Like the cardiac arrest scenario, its intent was to establish 90th percentile time benchmarks by events deemed critical at a fire.

	ERF on scene	FDC supplied	1 3/4 hoseline deployment	H20 to first engine	2 1/2 hoseline deployment	RIT establishment
Scenario 1	17	73	271	232	320	447
Scenario 2	16	125	292	179	389	406
Scenario 3	18	570	180	240	460	230
Scenario 4	18	175	270	179	275	380
Scenario 5	16	240	150	266	230	210
Scenario 6	19	145	332	203	402	336
90th Percentile	18.5	405	312	253	431	426.5
		Primary search performed	Aerial tower placement	PPV established	Forcible entry in place	Total time in seconds
Scenario 1	17	340	282	310		447
Scenario 2	16	190	272		370	507
Scenario 3	18	120	170	210	115	570
Scenario 4	18	195	180	250	477	477
Scenario 5	16	167	140	240	329	329
Scenario 6	19	279	204	180	366	402
90th Percentile	18.5	309.5	277	286	434.2	538.5
* Rit includes laddering 2 sides of the structure and establishing the necessary cache						

APPENDIX C, VISION 2025



Fire

Contain Fires to Room of Origin 80% of the Time or Better

Limit Civilian Fire Deaths to 1 or Less Per Year

ISO Rating of 2 or Better

Keep Downward Pressure on Fire Insurance Costs

Keep Property and Tax Rates Stable Through Reduced Fire Loss, Thus Preventing Blight and Adverse Property Valuation

Strictly Enforce Fire Prevention Codes

Promote Fire Sprinklers in all New and Remodeled Construction

Arrive at Fires within 7 Minutes & 20 Seconds
(Total Response Time)

Rescue

Maintain Cardiac Survival Rate at or Above National Average

Rescue Victims of Entrapment within 10 Minutes 90% of the Time

Arrive at EMS Calls within 7 Minutes
(Total Response Time)

Ambulance Arrival on EMS Calls within 8 Minutes
(Dispatch to Arrival)

EMS Program Continues to Explore Best Practices for Definitive Patient Care and Quality of Life

Able to Provide Mutual Aid / Automatic Aid when Needed

Support

Prevent or Mitigate Severity and Frequency of Incidents

Maintain Positive Employee Morale

Promote a Positive Reputation within the Community, Region and Nation

Stations and Equipment are Efficient and Look Professional

Provide Rapid and Accurate Public Information and Media Messaging

Maintain a Cost Per Capita Equal or Less Than Regional Comparative Average

Dedicate Funding and Resources to the Research of Best Practices and More Efficient Provision of Service

CLASS 2 ISO

INTERNATIONALLY ACCREDITED AGENCY CFAI 2014-2019

Mission Statement

Our mission is to protect lives, property, and the environment through the highest level of professionalism while working efficiently as a team with the community and the resources provided.

Version 18-3

APPENDIX D, SERVICE LEVEL OBJECTIVES

FIRE

The department's response and deployment standards are based upon metropolitan population density, and the fire suppression demands of the community. Fourteen fire stations provide citywide coverage with 18 front-line suppression apparatus. Daily staffing provides a complement of at least 3 personnel per suppression apparatus (one officer, one fire apparatus operator, and one firefighter), however at least 50% of all units must maintain staffing of at least 4 personnel. Department staffing is dictated by a minimum staffing agreement in union contract. The targeted service level objectives in the standards of cover benchmark statements are based on industry standards and with community expectations, as identified earlier in this report in Category II – Assessment and Planning. The objectives have been accepted by the fire department management and the Mayor's office. The department's benchmark service level objectives are as follows:

FIRST DUE BENCHMARK. For 90 percent of all emergent fire suppression incidents, the benchmark total response time goal for the arrival of the **first due unit**, staffed with at least 1 firefighter, 1 fire apparatus operator, and 1 officer shall be: **seven minutes and twenty seconds**. The first due unit shall be capable of: providing 500 gallons of water and 1,250 gallons per minute (gpm) pumping capacity; establishing command, securing an uninterrupted water supply; establishing and advancing an attack line flowing a minimum of 150 gpm in a defensive or transitional capacity; containing the fire; and rescuing immediately at-risk victims. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

INITIAL ATTACK FORCE BENCHMARK. For 90 percent of all emergent fire suppression incidents, the benchmark total response time goal for the arrival of the **Initial Attack Force (IAF)**, comprised of 6 firefighters shall be: **ten minutes and thirty-five seconds**. In addition to the duties identified for the first due unit, the initial attack force shall be capable of: establishing and advancing an attack line flowing a minimum of 150 gpm in an offensive capacity; containing the fire; conducting a primary search, rescue of at-risk victims, and establishment of a rapid intervention team. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public. *In LF&R's impending risk-based dispatch protocol, fires known as low risk will consider this IAF as its ERF; a complement of two engine companies, and one truck company.*

EFFECTIVE RESPONSE FORCE BENCHMARK. For 90 percent of all emergent fire suppression incidents, the benchmark total response time goal for the arrival of the **Effective Response Force (ERF)**, comprised of 17 firefighters, shall be: **twelve minutes and five seconds**. The effective response force for emergent fire suppression incidents shall be capable of: establishing command; identification and assignment of a safety officer, establishment of primary and secondary fire attack lines, search and rescue, ventilation, forcible entry, aerial tower operation, utility control, establishment of the rapid intervention team. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

In LF&R's impending risk-based dispatch protocol, fires known as medium risk will consider this current ERF as standard; a complement of three engine companies, and two truck companies.

The department's baseline statements reflect actual performance during 2013 to 2017. In 2018, LF&R revalidated the benchmark goals from the NFPA 1710 standard to more credible performance goals. The department does not rely on the use of automatic or mutual aid from neighboring fire departments to provide its effective response force.

FIRST DUE BASELINE. For 90 percent of all emergent fire suppression incidents, the baseline total response time performance for the arrival of the **first due unit**, staffed with at least 1 firefighter, 1 fire apparatus operator, and 1 officer is: **7 minutes and 52 seconds**. The first due unit is capable of: providing 500 gallons of water and 1,250 gallons per minute (gpm) pumping capacity; establishing command, securing an uninterrupted water supply; establishing and advancing an attack line flowing a minimum of 150 gpm in a defensive or transitional capacity; containing the fire; and rescuing immediately at-risk victims. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

INITIAL ATTACK FORCE BASELINE. For 90 percent of all emergent fire suppression incidents, the baseline total response time performance for the arrival of the Initial Attack Force (IAF), comprised of 6 firefighters is: **12 minutes and 23 seconds**. In addition to the duties identified for the first due unit, the IAF is capable of: establishing and advancing an attack line flowing a minimum of 150 gpm in an offensive capacity; containing the fire; primary search, rescue of fire victims, and establishment of the rapid intervention team. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public. *In LF&R's impending risk-based dispatch protocol, fires known as low risk will consider this IAF as its ERF; a complement of two engine companies, and one truck company.*

ERF BASELINE. For 90 percent of all emergent fire suppression incidents, the baseline total response time for the arrival of the Effective Response Force (ERF), comprised of 17 firefighters is: **15 minutes and 8 seconds**. The ERF for emergent fire suppression incidents is capable of: establishing command; identification and assignment of a safety officer, establishment of primary and secondary fire stack lines, search and rescue, ventilation, forcible entry, aerial tower operation, utility control, establishment of the rapid intervention team. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public. *In LF&R's impending risk-based dispatch protocol, fires known as medium risk will consider this current ERF as standard; a complement of three engine companies, and two truck companies.*

The department's actual baseline service level performance for emergent fire incidents is as follows:

(Emergent) Fire Suppression - 90th Percentile Times - Baseline Performance		**Benchmark Goal**	**2013-2017**	**2017**	**2016**	**2015**	**2014**	**2013**
Alarm Handling	Pick-up to Dispatch	1:30	02:30	01:57	02:12	02:55	02:39	02:30
Turnout Time	Turnout Time	1:50	01:40	01:50	01:42	01:42	01:21	01:21
Travel Time	Travel Time 1st Unit **Distribution**	4:00	04:35	05:03	04:12	05:02	04:10	04:26
	Travel Time Initial Attack Force	7:15	08:39	09:00	08:35	08:31	08:15	08:31
	Travel Time ERF **Concentration**	8:45	11:45	11:49	11:02	12:25	11:53	10:02
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	7:20	07:52	07:59	07:09	08:43	07:34	07:37
			n=583	n=124	n=116	n=110	n=113	n=120
	Total Response Time Initial Attack Force	10:35	12:23	13:06	11:52	11:55	11:53	12:38
	Total Response Time ERF **Concentration**	12:05	15:08	14:45	14:36	16:13	14:58	14:47
			n=554	n=119	N=111	n=105	n=104	n=115

LF&R is generating good results in terms of outcomes; confinement of fire to the room of origin almost 80% of the time, low fire fatalities, and property saved far exceeding that of the operating budget. While the organizational outcomes are meeting the needs of our community, LF&R as an organization feels it can continue to improve outcomes while being more efficient.

LF&R is implementing a myriad of strategies and processes aimed at improving response time performance for emergent fire suppression incidents. Relocated and additional stations and companies will directly impact response times through better placement, additional capacity, as well as increased reliability.

Investments made to technology, such as the CAD geo-server, will enable the department to implement a risk-based response strategy as well as closest unit dispatching. This will decrease travel time and also impact unit reliability through a more efficient response profile.

LF&R has developed a list of priorities for fire suppression program improvement:

- Collectively work with the LLECC to develop strategies to streamline call processing.
- Continue to identify inefficiencies in response profiles and adjust.
- Continue to construct the four remaining stations and evaluate their impact on system performance.
- Begin to implement risk based dispatching model as planned in early 2019.
- Implement closest unit dispatching by 2020.
- Continue to use the new station matrix for the identification of need for new stations giving the City of Lincoln and LF&R time to plan for their implementation.

EMS

The department's response and deployment standards are based upon metropolitan population density, and the emergency medical demands of the community. Fourteen fire stations provide citywide coverage with 18 front-line apparatus acting as quick response units. Daily staffing provides a complement of at least three personnel per apparatus (one officer, one fire apparatus operator, and one firefighter), however at least 50% of all units must maintain staffing of at least four personnel. There are seven front-line ambulances which are staffed with 2 personnel (one driver and one paramedic). There is a single EMS supervisor on duty always. There are five reserve ambulances which can be staffed if needed. Department staffing is dictated by a minimum staffing agreement in union contract. The targeted service level objectives in the standards of cover benchmark statements are based on industry standards and with community expectations, as identified earlier in this report in Category II – Assessment and Planning. The objectives have been accepted by the fire department management and the Mayor's office. The department's benchmark service level objectives are as follows:

FIRST DUE BENCHMARK. For 90 percent of all emergent medical incidents, the benchmark total response time goal for the arrival of the **first due unit**, staffed with at least 1 firefighter, 1 fire apparatus operator, and 1 officer shall be: **seven minutes**. The first due unit shall be capable of: providing CPR, airway/ventilations, patient assessment, BLS/ALS interventions, bleeding control, shock management, spinal immobilization, vital signs, and cardiac monitor. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

EFFECTIVE RESPONSE FORCE BENCHMARK. For 90 percent of all emergent medical incidents, the benchmark total response time goal for the arrival of the **Effective Response Force (ERF)**, comprised of 5 firefighters, shall be: **ten minutes**. The effective response force for emergent medical incidents shall be capable of: CPR, airway/ventilations, patient assessment, BLS/ALS interventions, bleeding control, shock management, spinal immobilization, vital signs, application of the cardiac monitoring, rapid sequence intubation, and application of the LUCAS device. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public

The department's baseline statements reflect actual performance during 2013 to 2017. In 2018, LF&R revalidated the benchmark goals from the NFPA 1710 standard to more credible performance goals. The department does not rely on the use of automatic or mutual aid from neighboring fire departments to provide its effective response force.

FIRST DUE BASELINE. For 90 percent of all emergent medical incidents, the baseline total response time performance for the arrival of the **first due unit**, staffed with at least 1 firefighter, 1 fire apparatus operator, and 1 officer is: **eight minutes and thirty seconds**. The first due unit is capable of: providing CPR, airway/ventilations, patient assessment, BLS/ALS interventions, bleeding control, shock management, spinal immobilization, vital signs, and cardiac monitor. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

ERF BASELINE. For 90 percent of all emergent medical incidents, the baseline total response time performance for the arrival of the **Effective Response Force (ERF)**, comprised of 5

firefighters, is: **eleven minutes and 28 seconds**. The effective response force for emergent medical incidents is capable of: CPR, airway/ventilations, patient assessment, BLS/ALS interventions, bleeding control, shock management, spinal immobilization, vital signs, application of the cardiac monitoring, rapid sequence intubation, and application of the LUCAS device. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

The department's actual baseline service level performance for emergent fire incidents is as follows:

(Emergent) EMS - 90th Percentile Times - Baseline Performance		**Benchmark Goal**	**2013-2017**	**2017**	**2016**	**2015**	**2014**	**2013**
Alarm Handling	Pick-up to Dispatch	1:30	3:04	2:52	3:02	3:06	3:06	3:08
Turnout Time	Turnout Time 1st Unit	1:30	01:31	01:43	01:31	01:28	01:24	01:20
Travel Time	Travel Time 1st Unit **Distribution**	4:00	04:56	05:12	05:03	05:00	04:48	04:36
	Travel Time ERF **Concentration**	7:00	07:56	08:11	08:11	07:57	07:50	07:22
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	7:00	08:30	08:50	08:40	08:30	08:23	08:08
			n=36,281	n=7,063	n=7,290	n=7,790	n=7,013	n=7,125
	Total Response Time ERF (Medic Unit) **Concentration**	10:00	11:28	11:52	11:48	11:26	11:22	10:49
			n=36,219	n=7,055	n=7,269	n=7,780	n=6,992	n=7,123

LF&R is experiencing outcomes exceeding national standards as is indicated by cardiac save rates and STEMI performance. While the outcomes are proof of an effective EMS program, it is LF&R's goal to maintain these outcomes while increasing efficiency.

Decreasing performance trends are noted in the data for emergent EMS calls, specifically in terms of travel time performance as well as the amount of time required for the assembly of the

ERF. Additionally, call processing performance is missing its intended benchmark goal. LF&R is implementing a myriad of strategies and processes aimed at improving response time performance for emergent EMS incidents.

Relocated and additional stations and companies will directly impact response times through better placement, additional capacity, as well as increased reliability. Additionally, the new stations allow for more deployment options of ambulances. There is potential that a more effective and efficient deployment model may be achieved.

Investments made to technology, such as the CAD geo-server, will enable the department to implement a risk-based response strategy as well as closest unit dispatching. This will decrease travel time and also impact unit reliability through a more efficient response profile.

LF&R has developed a list of priorities for fire suppression program improvement:

- Collectively work with the LLECC to develop strategies to streamline call processing.
- Continue to identify inefficiencies in response profiles and adjust.
- Continue to construct the four remaining stations and evaluate their impact on system performance.
- Evaluate the deployment locations of LF&R ambulances after construction of the new stations as new options will exist.
- Evaluate the impact of an 8th peaking ambulance.
- Begin to implement risk based dispatching model as planned in early 2019.
- Implement closest unit dispatching by 2020.
- Evaluate the impact of a 40-hour EMS supervisor.
- Continue to use the new station matrix for the identification of need for new stations giving the City of Lincoln and LF&R time to plan for their implementation.

HAZMAT

The department's response and deployment standards are based upon metropolitan population density, and the hazardous materials (hazmat) response demands of the community. Fourteen fire stations provide citywide hazmat operations level coverage with 18 front-line suppression apparatus. Hazmat technician level operations is provided by an on-duty team at three station locations. Personnel assigned to Stations 2, 9, and 14 are comprised of technician level responders. Daily staffing provides a complement of at least 3 operations level personnel per suppression apparatus (one officer, one fire apparatus operator, and one firefighter), however at least 50% of all units must maintain staffing of at least 4 personnel. Department staffing is dictated by a minimum staffing agreement in union contract. The targeted service level objectives in the standards of cover benchmark statements are based on industry standards and with community expectations, as identified earlier in this report in Category II – Assessment and Planning. The objectives have been accepted by the fire department management and the Mayor's office. The department's benchmark service level objectives are as follows:

LOW RISK FIRST DUE BENCHMARK. Low risk hazardous materials incidents within the primary jurisdiction are considered non-emergent and no benchmark goal exists for these calls for service. These are single unit responses staffed with a minimum of 3 operations level personnel; one officer, one fire apparatus operator, and one firefighter. The 1st due unit shall be capable of; establishing command, and containment.

HIGH RISK FIRST DUE BENCHMARK. For 90 percent of all high risk hazardous materials incidents, the benchmark total response time goal for the arrival of the **first due unit**, staffed with at least 1 firefighter, 1 fire apparatus operator, and 1 officer shall be: **seven minutes and twenty seconds**. The first due unit shall be capable of: establishing command, scene evacuation/initial stabilization, fire pump operation. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

HIGH RISK EFFECTIVE RESPONSE FORCE BENCHMARK. For 90 percent of all high risk hazardous materials incidents, the benchmark total response time goal for the arrival of the **Effective Response Force (ERF)**, comprised of 12 (6 certified as HAZMAT technician level) firefighters, shall be: **twelve minutes and five seconds**. The effective response force for high risk hazardous materials incidents shall be capable of: establishing command; fire pump operation, scene evacuation/initial stabilization, decontamination, assignment of hazmat group supervisor and safety officer, deployment of offensive control tactics. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

The department's baseline statements reflect actual performance during 2013 to 2017. In 2018, LF&R revalidated the benchmark goals from the NFPA 1710 standard to more credible performance goals. The department does not rely on the use of automatic or mutual aid from neighboring fire departments to provide its effective response force.

HIGH RISK FIRST DUE BASELINE. For 90 percent of all high risk hazardous materials incidents, the baseline total response time performance for the arrival of the **first due unit**, staffed with at least 1 firefighter, 1 fire apparatus operator, and 1 officer is: **nine minutes and forty-seven seconds**. The first due unit is capable of: establishing command, scene evacuation/initial stabilization, fire pump operation. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

HIGH RISK EFFECTIVE RESPONSE FORCE BASELINE. For 90 percent of all high risk hazardous materials incidents, the baseline total response time performance for the arrival of the **Effective Response Force (ERF)**, comprised of comprised of 12 (6 certified as HAZMAT technician level firefighters, is: **eighteen minutes and fifty-eight seconds**. The effective response force for high risk hazardous materials incidents is capable of: establishing command; fire pump operation, scene evacuation/initial stabilization, decontamination, assignment of hazmat group supervisor and safety officer, deployment of offensive control tactics. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

The department's actual baseline service level performance for emergent fire incidents is as follows:

Hazmat (High Risk)- 90th Percentile Times - Baseline Performance		**Benchmark Goal**	**2013-2017**	**2017**	**2016**	**2015**	**2014**	**2013**
Alarm Handling	Pick-up to Dispatch	1:30	03:13	02:04	02:38	03:29	03:33	03:13
Turnout Time	Turnout Time 1st Unit	1:50	01:47	02:08	01:39	01:41	01:25	01:36
Travel Time	Travel Time 1st Unit **Distribution**	4:00	05:41	06:15	04:37	05:11	05:32	05:28
	Travel Time ERF **Concentration**	8:45	13:39	13:22	13:03	13:37	12:36	13:54
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	7:20	09:47	09:12	10:14	08:37	08:56	09:05
			n=174	N=41	n=30	n=30	n=30	n=43
	Total Response Time ERF **Concentration**	12:05	18:58	19:10	18:59	19:09	18:19	18:24
			n=116	n=26	n=16	n=24	n=26	n=24

In terms of outcomes the hazardous materials program is meeting community needs. At the same time LF&R recognizes that efficiencies can be realized within the hazardous materials program.

Response time performance for call processing, travel, first due unit, and assembly of the ERF are lacking. LF&R is implementing a myriad of strategies and processes aimed at improving response time performance for high risk hazmat incidents. Relocated and additional stations and companies will directly impact response times through better geographical placement, additional capacity, and increased reliability.

Investments made to technology, such as the CAD geo-server, will enable the department to implement a risk-based response strategy as well as closest unit dispatching. This will decrease travel time and also impact unit reliability through a more efficient response profile.

LF&R has developed a list of priorities for hazardous materials program improvement:

- Collectively work with the LLECC to develop strategies to streamline call processing.
- In 2018 all LF&R apparatus now carry air monitoring equipment. LF&R will leverage these ne assets and evaluate downsizing some hazmat responses as all units have more capability. Continue to identify inefficiencies in response profiles and adjust.
- Continue to construct the four remaining stations and evaluate their impact on system performance.
- Begin to implement risk based dispatching model as planned in early 2019.
- Implement closest unit dispatching by 2020.
- Continue to use the new station matrix for the identification of need for new stations giving the City of Lincoln and LF&R time to plan for their implementation.
- As many hazmat incidents require an ERF that is substantially less that the model described in this document, identification of more definitive call types will separate ERF’s may substantially increase efficiency.

TECHNICAL RESCUE

The department's response and deployment standards are based upon metropolitan population density, and the technical rescue demands of the community. Fourteen fire stations provide citywide coverage with 18 front-line suppression apparatus. Daily staffing provides a complement of at least 3 personnel per suppression apparatus (one officer, one fire apparatus operator, and one firefighter), however at least 50% of all units must maintain staffing of at least 4 personnel. Department staffing is dictated by a minimum staffing agreement in union contract. The targeted service level objectives in the standards of cover benchmark statements are based on industry standards and with community expectations, as identified earlier in this report in Category II – Assessment and Planning. The objectives have been accepted by the fire department management and the mayor's office. The department's benchmark service level objectives are as follows:

FIRST DUE BENCHMARK. For 90 percent of all technical rescue incidents, the benchmark total response time goal for the arrival of the **first due unit**, staffed with at least 1 firefighter, 1 fire apparatus operator, and 1 officer shall be: **seven minutes and twenty seconds**. The first due unit shall be capable of: establishing command, initiation of patient triage, and fire protection. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

EFFECTIVE RESPONSE FORCE BENCHMARK. For 90 percent of all technical rescue incidents, the benchmark total response time goal for the arrival of the **Effective Response Force (ERF)**, comprised of 18 firefighters, shall be: **twelve minutes and five seconds**. The ERF for technical rescue incidents shall be capable of: establishing command; initiation and completion of patient triage, fire protection, patient treatment and packaging, stabilization, extrication, and the control or removal of hazards. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

The department's baseline statements reflect actual performance during 2013 to 2017. In 2018, LF&R revalidated the benchmark goals from the NFPA 1710 standard to more credible performance goals. The department does not rely on the use of automatic or mutual aid from neighboring fire departments to provide its effective response force.

FIRST DUE BASELINE. For 90 percent of all technical rescue incidents, the baseline total response time performance for the arrival of the **first due unit**, staffed with at least 1 firefighter, 1 fire apparatus operator, and 1 officer is: **nine minutes and three seconds**. The first due unit is capable of: establishing command, initiation of patient triage, and fire protection. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

EFFECTIVE RESPONSE FORCE BASELINE. For 90 percent of all technical rescue incidents, the baseline total response time performance for the arrival of the **Effective Response Force (ERF)**, comprised of 18 firefighters, is: **fourteen minutes and forty-five seconds**. The ERF for technical rescue incidents are capable of: establishing command; initiation and completion of patient triage, fire protection, patient treatment and packaging, stabilization, extrication, and the control or removal of hazards. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the general public.

The department's actual baseline service level performance for emergent fire incidents is as follows:

Technical Rescue - 90th Percentile Times - Baseline Performance		**Benchmark Goal**	**2013-2017**	**2017**	**2016**	**2015**	**2014**	**2013**
Alarm Handling	Pick-up to Dispatch	1:30	03:02	02:01	03:56	02:58	02:41	03:04
Turnout Time	Turnout Time 1st Unit	1:20	01:30	01:39	01:31	01:12	01:10	01:13
Travel Time	Travel Time 1st Unit **Distribution**	4:00	05:42	05:57	04:37	05:41	03:10	04:40
	Travel Time ERF **Concentration**	8:45	11:37	08:46	11:24	14:23	10:15	11:44
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	7:20	09:03	09:20	07:04	09:44	07:00	08:43
			n=56	n=8	n=7	n=9	n=16	n=16
	Total Response Time ERF **Concentration**	12:05	14:45	11:53	14:15	15:26	13:12	15:29
			n=52	n=7	n=7	n=7	n=16	n=15

The technical rescue program is currently meeting the needs of the community. However, LF&R currently believes that efficiencies in program delivery are possible. LF&R has developed a new outcome to measure the performance of the technical rescue program. The new indicator is: *Rescue of victims from entrapment within 10 minutes 90% of the time.*

LF&R is implementing different strategies and processes aimed at improving response time performance for technical rescue incidents. Relocated and additional stations and companies will directly impact response times through better geographical placement, additional capacity, and increased reliability.

Investments made to technology, such as the CAD geo-server, will enable the department to implement a risk-based response strategy as well as closest unit dispatching. This will decrease travel time and impact unit reliability through a more efficient response profile.

LF&R has developed a list of priorities for fire suppression program improvement:

- Collectively work with the LLECC to develop strategies to streamline call processing.
- Continue to identify inefficiencies in response profiles and adjust.
- Continue to construct the four remaining stations and evaluate their impact on system performance.
- Begin to implement risk based dispatching model as planned in early 2019.
- Implement closest unit dispatching by 2020.
- Continue to use the new station matrix for the identification of need for new stations giving the City of Lincoln and LF&R time to plan for their implementation.
- Evaluate call types in which an alternative ERF may be more appropriate.

APPENDIX E, EMBEDDED DOCUMENTS

ISO REPORT

Public Protection Classification
(PPC™)
Summary Report

Lincoln

NEBRASKA

Prepared by

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Report Created September 2017

Effective January 1, 2018

Background Information

Introduction

ISO collects and evaluates information from communities in the United States on their structure fire suppression capabilities. The data is analyzed using our Fire Suppression Rating Schedule (FSRS) and then a Public Protection Classification (PPC™) grade is assigned to the community. The surveys are conducted whenever it appears that there is a possibility of a PPC change. As such, the PPC program provides important, up-to-date information about fire protection services throughout the country.

The FSRS recognizes fire protection features only as they relate to suppression of first alarm structure fires. In many communities, fire suppression may be only a small part of the fire department's overall responsibility. ISO recognizes the dynamic and comprehensive duties of a community's fire service, and understands the complex decisions a community must make in planning and delivering emergency services. However, in developing a community's PPC grade, only features related to reducing property losses from structural fires are evaluated. Multiple alarms, simultaneous incidents and life safety are not considered in this evaluation. The PPC program evaluates the fire protection for small to average size buildings. Specific properties with a Needed Fire Flow in excess of 3,500 gpm are evaluated separately and assigned an individual PPC grade.

A community's investment in fire mitigation is a proven and reliable predictor of future fire losses. Statistical data on insurance losses bears out the relationship between excellent fire protection – as measured by the PPC program – and low fire losses. So, insurance companies use PPC information for marketing, underwriting, and to help establish fair premiums for homeowners and commercial fire insurance. In general, the price of fire insurance in a community with a good PPC grade is substantially lower than in a community with a poor PPC grade, assuming all other factors are equal.

ISO is an independent company that serves insurance companies, communities, fire departments, insurance regulators, and others by providing information about risk. ISO's expert staff collects information about municipal fire suppression efforts in communities throughout the United States. In each of those communities, ISO analyzes the relevant data and assigns a PPC grade – a number from 1 to 10. Class 1 represents an exemplary fire suppression program, and Class 10 indicates that the area's fire suppression program does not meet ISO's minimum criteria.

ISO's PPC program evaluates communities according to a uniform set of criteria, incorporating nationally recognized standards developed by the National Fire Protection Association and the American Water Works Association. A community's PPC grade depends on:

- **Needed Fire Flows**, which are representative building locations used to determine the theoretical amount of water necessary for fire suppression purposes.
- **Emergency Communications**, including emergency reporting, telecommunicators, and dispatching systems.
- **Fire Department**, including equipment, staffing, training, geographic distribution of fire companies, operational considerations, and community risk reduction.
- **Water Supply**, including inspection and flow testing of hydrants, alternative water supply operations, and a careful evaluation of the amount of available water compared with the amount needed to suppress fires up to 3,500 gpm.

Data Collection and Analysis

ISO has evaluated and classified over 46,000 fire protection areas across the United States using its FSRS. A combination of meetings between trained ISO field representatives and the dispatch center coordinator, community fire official, and water superintendent is used in conjunction with a comprehensive questionnaire to collect the data necessary to determine the PPC grade. In order for a community to obtain a grade better than a Class 9, three elements of fire suppression features are reviewed. These three elements are Emergency Communications, Fire Department, and Water Supply.

A review of the **Emergency Communications** accounts for 10% of the total classification. This section is weighted at **10 points,** as follows:

- Emergency Reporting 3 points
- Telecommunicators 4 points
- Dispatch Circuits 3 points

A review of the **Fire Department** accounts for 50% of the total classification. ISO focuses on a fire department's first alarm response and initial attack to minimize potential loss. The fire department section is weighted at **50 points,** as follows:

- Engine Companies 6 points
- Reserve Pumpers 0.5 points
- Pump Capacity 3 points
- Ladder/Service Companies 4 points
- Reserve Ladder/Service Trucks 0.5 points
- Deployment Analysis 10 points
- Company Personnel 15 points
- Training 9 points
- Operational considerations 2 points
- Community Risk Reduction 5.5 points (in addition to the 50 points above)

A review of the **Water Supply** system accounts for 40% of the total classification. ISO reviews the water supply a community uses to determine the adequacy for fire suppression purposes. The water supply system is weighted at **40 points,** as follows:

- Credit for Supply System 30 points
- Hydrant Size, Type & Installation 3 points
- Inspection & Flow Testing of Hydrants 7 points

There is one additional factor considered in calculating the final score – **Divergence**.

Even the best fire department will be less than fully effective if it has an inadequate water supply. Similarly, even a superior water supply will be less than fully effective if the fire department lacks the equipment or personnel to use the water. The FSRS score is subject to modification by a divergence factor, which recognizes disparity between the effectiveness of the fire department and the water supply.

The Divergence factor mathematically reduces the score based upon the relative difference between the fire department and water supply scores. The factor is introduced in the final equation.

PPC Grade

The PPC grade assigned to the community will depend on the community's score on a 100-point scale:

PPC	Points
1	90.00 or more
2	80.00 to 89.99
3	70.00 to 79.99
4	60.00 to 69.99
5	50.00 to 59.99
6	40.00 to 49.99
7	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99
10	0.00 to 9.99

The classification numbers are interpreted as follows:

- Class 1 through (and including) Class 8 represents a fire suppression system that includes an FSRS creditable dispatch center, fire department, and water supply.
- Class 8B is a special classification that recognizes a superior level of fire protection in otherwise Class 9 areas. It is designed to represent a fire protection delivery system that is superior except for a lack of a water supply system capable of the minimum FSRS fire flow criteria of 250 gpm for 2 hours.
- Class 9 is a fire suppression system that includes a creditable dispatch center, fire department but no FSRS creditable water supply.
- Class 10 does not meet minimum FSRS criteria for recognition, including areas that are beyond five road miles of a recognized fire station.

New PPC program changes effective July 1, 2014

We have revised the PPC program to capture the effects of enhanced fire protection capabilities that reduce fire loss and fire severity in Split Class 9 and Split Class 8B areas (as outlined below). This new structure benefits the fire service, community, and property owner.

New classifications
Through ongoing research and loss experience analysis, we identified additional differentiation in fire loss experience within our PPC program, which resulted in the revised classifications. We based the differing fire loss experience on the fire suppression capabilities of each community. The new PPC classes will improve the predictive value for insurers while benefiting both commercial and residential property owners. Here are the new classifications and what they mean.

Split classifications
When we develop a split classification for a community — for example 5/9 — the first number is the class that applies to properties within 5 road miles of the responding fire station and 1,000 feet of a creditable water supply, such as a fire hydrant, suction point, or dry hydrant. The second number is the class that applies to properties within 5 road miles of a fire station but beyond 1,000 feet of a creditable water supply. We have revised the classification to reflect more precisely the risk of loss in a community, replacing Class 9 and 8B in the second part of a split classification with revised designations.

What's changed with the new classifications?
We've published the new classifications as "X" and "Y" — formerly the "9" and "8B" portion of the split classification, respectively. For example:

- A community currently displayed as a split 6/9 classification will now be a split 6/6X classification; with the "6X" denoting what was formerly classified as "9".
- Similarly, a community currently graded as a split 6/8B classification will now be a split 6/6Y classification, the "6Y" denoting what was formerly classified as "8B".
- Communities graded with single "9" or "8B" classifications will remain intact.

Prior Classification	New Classification
1/9	1/1X
2/9	2/2X
3/9	3/3X
4/9	4/4X
5/9	5/5X
6/9	6/6X
7/9	7/7X
8/9	8/8X
9	9

Prior Classification	New Classification
1/8B	1/1Y
2/8B	2/2Y
3/8B	3/3Y
4/8B	4/4Y
5/8B	5/5Y
6/8B	6/6Y
7/8B	7/7Y
8/8B	8/8Y
8B	8B

What's changed?
As you can see, we're still maintaining split classes, but it's how we represent them to insurers that's changed. The new designations reflect a reduction in fire severity and loss and have the potential to reduce property insurance premiums.

Benefits of the revised split class designations

- To the fire service, the revised designations identify enhanced fire suppression capabilities used throughout the fire protection area
- To the community, the new classes reward a community's fire suppression efforts by showing a more reflective designation
- To the individual property owner, the revisions offer the potential for decreased property insurance premiums

New water class
Our data also shows that risks located more than 5 but less than 7 road miles from a responding fire station with a creditable water source within 1,000 feet had better loss experience than those farther than 5 road miles from a responding fire station with no creditable water source. We've introduced a new classification —10W — to recognize the reduced loss potential of such properties.

What's changed with Class 10W?
Class 10W is property-specific. Not all properties in the 5-to-7-mile area around the responding fire station will qualify. The difference between Class 10 and 10W is that the 10W-graded risk or property is within 1,000 feet of a creditable water supply. Creditable water supplies include fire protection systems using hauled water in any of the split classification areas.

What's the benefit of Class 10W?
10W gives credit to risks within 5 to 7 road miles of the responding fire station and within 1,000 feet of a creditable water supply. That's reflective of the potential for reduced property insurance premiums.

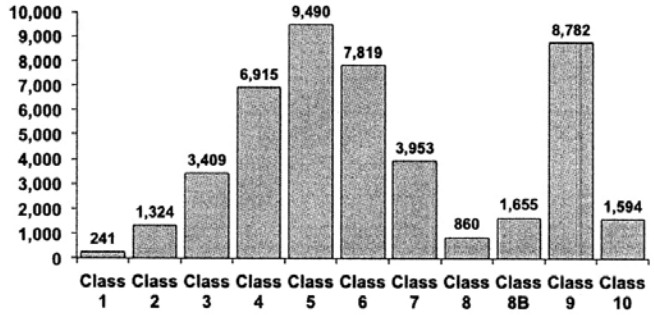
What does the fire chief have to do?
Fire chiefs don't have to do anything at all. The revised classifications went in place automatically effective July 1, 2014 (July 1, 2015 for Texas).

What if I have additional questions?
Feel free to contact ISO at 800.444.4554 or email us at PPC-Cust-Serv@iso.com.

Distribution of PPC Grades

The 2017 published countrywide distribution of communities by the PPC grade is as follows:

Countrywide



Assistance

The PPC program offers help to communities, fire departments, and other public officials as they plan for, budget, and justify improvements. ISO is also available to assist in the understanding of the details of this evaluation.

The PPC program representatives can be reached by telephone at (800) 444-4554. The technical specialists at this telephone number have access to the details of this evaluation and can effectively speak with you about your questions regarding the PPC program. What's more, we can be reached via the internet at www.isomitigation.com/talk/.

We also have a website dedicated to our Community Hazard Mitigation Classification programs at www.isomitigation.com. Here, fire chiefs, building code officials, community leaders and other interested citizens can access a wealth of data describing the criteria used in evaluating how cities and towns are protecting residents from fire and other natural hazards. This website will allow you to learn more about the PPC program. The website provides important background information, insights about the PPC grading processes and technical documents. ISO is also pleased to offer Fire Chiefs Online — a special, secured website with information and features that can help improve your PPC grade, including a list of the Needed Fire Flows for all the commercial occupancies ISO has on file for your community. Visitors to the site can download information, see statistical results and also contact ISO for assistance.

In addition, on-line access to the FSRS and its commentaries is available to registered customers for a fee. However, fire chiefs and community chief administrative officials are given access privileges to this information without charge.

To become a registered fire chief or community chief administrative official, register at www.isomitigation.com.

PPC Review

ISO concluded its review of the fire suppression features being provided for Lincoln. The resulting community classification is **Class 02/2X**.

If the classification is a single class, the classification applies to properties with a Needed Fire Flow of 3,500 gpm or less in the community. If the classification is a split class (e.g., 6/XX):

- The first class (e.g., "6" in a 6/XX) applies to properties within 5 road miles of a recognized fire station and within 1,000 feet of a fire hydrant or alternate water supply.
- The second class (XX or XY) applies to properties beyond 1,000 feet of a fire hydrant but within 5 road miles of a recognized fire station.
- Alternative Water Supply: The first class (e.g., "6" in a 6/10) applies to properties within 5 road miles of a recognized fire station with no hydrant distance requirement.
- Class 10 applies to properties over 5 road miles of a recognized fire station.
- Class 10W applies to properties within 5 to 7 road miles of a recognized fire station with a recognized water supply within 1,000 feet.
- Specific properties with a Needed Fire Flow in excess of 3,500 gpm are evaluated separately and assigned an individual classification.

FSRS Feature	Earned Credit	Credit Available
Emergency Communications		
414. Credit for Emergency Reporting	**3.00**	**3**
422. Credit for Telecommunicators	**3.20**	**4**
432. Credit for Dispatch Circuits	**3.00**	**3**
440. Credit for Emergency Communications	**9.20**	**10**
Fire Department		
513. Credit for Engine Companies	**5.33**	**6**
523. Credit for Reserve Pumpers	**0.48**	**0.50**
532. Credit for Pump Capacity	**3.00**	**3**
549. Credit for Ladder Service	**2.69**	**4**
553. Credit for Reserve Ladder and Service Trucks	**0.50**	**0.50**
561. Credit for Deployment Analysis	**5.56**	**10**
571. Credit for Company Personnel	**11.11**	**15**
581. Credit for Training	**8.34**	**9**
730. Credit for Operational Considerations	**2.00**	**2**
590. Credit for Fire Department	**39.01**	**50**
Water Supply		
616. Credit for Supply System	**29.29**	**30**
621. Credit for Hydrants	**2.94**	**3**
631. Credit for Inspection and Flow Testing	**4.00**	**7**
640. Credit for Water Supply	**36.23**	**40**
Divergence	**-2.51**	--
1050. Community Risk Reduction	**3.70**	**5.50**
Total Credit	**85.63**	**105.50**

Emergency Communications

Ten percent of a community's overall score is based on how well the communications center receives and dispatches fire alarms. Our field representative evaluated:

- Communications facilities provided for the general public to report structure fires
- Enhanced 9-1-1 Telephone Service including wireless
- Computer-aided dispatch (CAD) facilities
- Alarm receipt and processing at the communication center
- Training and certification of telecommunicators
- Facilities used to dispatch fire department companies to reported structure fires

	Earned Credit	Credit Available
414. Credit Emergency Reporting	**3.00**	3
422. Credit for Telecommunicators	**3.20**	4
432. Credit for Dispatch Circuits	**3.00**	3
Item 440. Credit for Emergency Communications:	**9.20**	**10**

Item 414 - Credit for Emergency Reporting (3 points)

The first item reviewed is Item 414 "Credit for Emergency Reporting (CER)". This item reviews the emergency communication center facilities provided for the public to report fires including 911 systems (Basic or Enhanced), Wireless Phase I and Phase II, Voice over Internet Protocol, Computer Aided Dispatch and Geographic Information Systems for automatic vehicle location. ISO uses National Fire Protection Association (NFPA) 1221, *Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems* as the reference for this section.

Item 410. Emergency Reporting (CER)	Earned Credit	Credit Available
A./B. Basic 9-1-1, Enhanced 9-1-1 or No 9-1-1 For maximum credit, there should be an Enhanced 9-1-1 system, Basic 9-1-1 and No 9-1-1 will receive partial credit.	**20.00**	**20**
1. E9-1-1 Wireless Wireless Phase I using Static ALI (automatic location identification) Functionality (10 points); Wireless Phase II using Dynamic ALI Functionality (15 points); Both available will be 25 points	**25.00**	**25**
2. E9-1-1 Voice over Internet Protocol (VoIP) Static VoIP using Static ALI Functionality (10 points); Nomadic VoIP using Dynamic ALI Functionality (15 points); Both available will be 25 points	**25.00**	**25**
3. Computer Aided Dispatch Basic CAD (5 points); CAD with Management Information System (5 points); CAD with Interoperability (5 points)	**15.00**	**15**
4. Geographic Information System (GIS/AVL) The PSAP uses a fully integrated CAD/GIS management system with automatic vehicle location (AVL) integrated with a CAD system providing dispatch assignments. The individual fire departments being dispatched do not need GIS/AVL capability to obtain this credit.	**15.00**	**15**
Review of Emergency Reporting total:	**100.00**	**100**

Item 422- Credit for Telecommunicators (4 points)

The second item reviewed is Item 422 "Credit for Telecommunicators (TC)". This item reviews the number of Telecommunicators on duty at the center to handle fire calls and other emergencies. All emergency calls including those calls that do not require fire department action are reviewed to determine the proper staffing to answer emergency calls and dispatch the appropriate emergency response. The 2013 Edition of NFPA 1221, *Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems,* recommends that ninety-five percent of emergency calls shall be answered within 15 seconds and ninety-nine percent of emergency calls shall be answered within 40 seconds. In addition, NFPA recommends that eighty percent of emergency alarm processing shall be completed within 60 seconds and ninety-five percent of alarm processing shall be completed within 106 seconds of answering the call.

To receive full credit for operators on duty, ISO must review documentation to show that the communication center meets NFPA 1221 call answering and dispatch time performance measurement standards. This documentation may be in the form of performance statistics or other performance measurements compiled by the 9-1-1 software or other software programs that are currently in use such as Computer Aided Dispatch (CAD) or Management Information System (MIS).

Item 420. Telecommunicators (CTC)	Earned Credit	Credit Available
A1. Alarm Receipt (AR) Receipt of alarms shall meet the requirements in accordance with the criteria of NFPA 1221	**20.00**	**20**
A2. Alarm Processing (AP) Processing of alarms shall meet the requirements in accordance with the criteria of NFPA 1221	**20.00**	**20**
B. Emergency Dispatch Protocols (EDP) Telecommunicators have emergency dispatch protocols (EDP) containing questions and a decision-support process to facilitate correct call categorization and prioritization.	**0.00**	**20**
C. Telecommunicator Training and Certification (TTC) Telecommunicators meet the qualification requirements referenced in NFPA 1061, *Standard for Professional Qualifications for Public Safety Telecommunicator,* and/or the Association of Public-Safety Communications Officials - International (APCO) *Project 33.* Telecommunicators are certified in the knowledge, skills, and abilities corresponding to their job functions.	**20.00**	**20**
D. Telecommunicator Continuing Education and Quality Assurance (TQA) Telecommunicators participate in continuing education and/or in-service training and quality-assurance programs as appropriate for their positions	**20.00**	**20**
Review of Telecommunicators total:	**80.00**	**100**

Item 432 - Credit for Dispatch Circuits (3 points)

The third item reviewed is Item 432 "Credit for Dispatch Circuits (CDC)". This item reviews the dispatch circuit facilities used to transmit alarms to fire department members. A "Dispatch Circuit" is defined in NFPA 1221 as "A circuit over which an alarm is transmitted from the communications center to an emergency response facility (ERF) or emergency response units (ERUs) to notify ERUs to respond to an emergency". All fire departments (except single fire station departments with full-time firefighter personnel receiving alarms directly at the fire station) need adequate means of notifying all firefighter personnel of the location of reported structure fires. The dispatch circuit facilities should be in accordance with the general criteria of NFPA 1221. "Alarms" are defined in this Standard as "A signal or message from a person or device indicating the existence of an emergency or other situation that requires action by an emergency response agency".

There are two different levels of dispatch circuit facilities provided for in the Standard – a primary dispatch circuit and a secondary dispatch circuit. In jurisdictions that receive 730 alarms or more per year (average of two alarms per 24-hour period), two separate and dedicated dispatch circuits, a primary and a secondary, are needed. In jurisdictions receiving fewer than 730 alarms per year, a second dedicated dispatch circuit is not needed. Dispatch circuit facilities installed but not used or tested (in accordance with the NFPA Standard) receive no credit.

The score for Credit for Dispatch Circuits (CDC) is influenced by monitoring for integrity of the primary dispatch circuit. There are up to 0.90 points available for this Item. Monitoring for integrity involves installing automatic systems that will detect faults and failures and send visual and audible indications to appropriate communications center (or dispatch center) personnel. ISO uses NFPA 1221 to guide the evaluation of this item. ISO's evaluation also includes a review of the communication system's emergency power supplies.

Item 432 "Credit for Dispatch Circuits (CDC)" = 3.00 points

Fire Department

Fifty percent of a community's overall score is based upon the fire department's structure fire suppression system. ISO's field representative evaluated:

- Engine and ladder/service vehicles including reserve apparatus
- Equipment carried
- Response to reported structure fires
- Deployment analysis of companies
- Available and/or responding firefighters
- Training

	Earned Credit	Credit Available
513. Credit for Engine Companies	**5.33**	6
523. Credit for Reserve Pumpers	**0.48**	0.5
532. Credit for Pumper Capacity	**3.00**	3
549. Credit for Ladder Service	**2.69**	4
553. Credit for Reserve Ladder and Service Trucks	**0.50**	0.5
561. Credit for Deployment Analysis	**5.56**	10
571. Credit for Company Personnel	**11.11**	15
581. Credit for Training	**8.34**	9
730. Credit for Operational Considerations	**2.00**	2
Item 590. Credit for Fire Department:	**39.01**	**50**

Basic Fire Flow

The Basic Fire Flow for the community is determined by the review of the Needed Fire Flows for selected buildings in the community. The fifth largest Needed Fire Flow is determined to be the Basic Fire Flow. The Basic Fire Flow has been determined to be 3500 gpm.

Item 513 - Credit for Engine Companies (6 points)

The first item reviewed is Item 513 "Credit for Engine Companies (CEC)". This item reviews the number of engine companies, their pump capacity, hose testing, pump testing and the equipment carried on the in-service pumpers. To be recognized, pumper apparatus must meet the general criteria of NFPA 1901, *Standard for Automotive Fire Apparatus* which include a minimum 250 gpm pump, an emergency warning system, a 300 gallon water tank, and hose. At least 1 apparatus must have a permanently mounted pump rated at 750 gpm or more at 150 psi.

The review of the number of needed pumpers considers the response distance to built-upon areas; the Basic Fire Flow; and the method of operation. Multiple alarms, simultaneous incidents, and life safety are not considered.

The greatest value of A, B, or C below is needed in the fire district to suppress fires in structures with a Needed Fire Flow of 3,500 gpm or less: **14 engine companies**

a) **14 engine companies** to provide fire suppression services to areas to meet NFPA 1710 criteria or within 1½ miles.

b) **3 engine companies** to support a Basic Fire Flow of 3500 gpm.

c) **3 engine companies** based upon the fire department's method of operation to provide a minimum two engine response to all first alarm structure fires.

The FSRS recognizes that there are **13 engine companies** in service.

The FSRS also reviews Automatic Aid. Automatic Aid is considered in the review as assistance dispatched automatically by contractual agreement between two communities or fire districts. That differs from mutual aid or assistance arranged case by case. ISO will recognize an Automatic Aid plan under the following conditions:

- It must be prearranged for first alarm response according to a definite plan. It is preferable to have a written agreement, but ISO may recognize demonstrated performance.
- The aid must be dispatched to all reported structure fires on the initial alarm.
- The aid must be provided 24 hours a day, 365 days a year.

FSRS Item 512.D "Automatic Aid Engine Companies" responding on first alarm and meeting the needs of the city for basic fire flow and/or distribution of companies are factored based upon the value of the Automatic Aid plan (up to 1.00 can be used as the factor). The Automatic Aid factor is determined by a review of the Automatic Aid provider's communication facilities, how they receive alarms from the graded area, inter-department training between fire departments, and the fire ground communications capability between departments.

For each engine company, the credited Pump Capacity (PC), the Hose Carried (HC), the Equipment Carried (EC) all contribute to the calculation for the percent of credit the FSRS provides to that engine company.

Item 513 "Credit for Engine Companies (CEC)" = 5.33 points

Item 523 - Credit for Reserve Pumpers (0.50 points)

The item is Item 523 "Credit for Reserve Pumpers (CRP)". This item reviews the number and adequacy of the pumpers and their equipment. The number of needed reserve pumpers is 1 for each 8 needed engine companies determined in Item 513, or any fraction thereof.

Item 523 "Credit for Reserve Pumpers (CRP)" = 0.48 points

Item 532 – Credit for Pumper Capacity (3 points)

The next item reviewed is Item 532 "Credit for Pumper Capacity (CPC)". The total pump capacity available should be sufficient for the Basic Fire Flow of 3500 gpm. The maximum needed pump capacity credited is the Basic Fire Flow of the community.

Item 532 "Credit for Pumper Capacity (CPC)" = 3.00 points

Item 549 – Credit for Ladder Service (4 points)

The next item reviewed is Item 549 "Credit for Ladder Service (CLS)". This item reviews the number of response areas within the city with 5 buildings that are 3 or more stories or 35 feet or more in height, or with 5 buildings that have a Needed Fire Flow greater than 3,500 gpm, or any combination of these criteria. The height of all buildings in the city, including those protected by automatic sprinklers, is considered when determining the number of needed ladder companies. Response areas not needing a ladder company should have a service company. Ladders, tools and equipment normally carried on ladder trucks are needed not only for ladder operations but also for forcible entry, ventilation, salvage, overhaul, lighting and utility control.

The number of ladder or service companies, the height of the aerial ladder, aerial ladder testing and the equipment carried on the in-service ladder trucks and service trucks is compared with the number of needed ladder trucks and service trucks and an FSRS equipment list. Ladder trucks must meet the general criteria of NFPA 1901, *Standard for Automotive Fire Apparatus* to be recognized.

The number of needed ladder-service trucks is dependent upon the number of buildings 3 stories or 35 feet or more in height, buildings with a Needed Fire Flow greater than 3,500 gpm, and the method of operation.

The FSRS recognizes that there are **5 ladder companies** in service. These companies are needed to provide fire suppression services to areas to meet NFPA 1710 criteria or within 2½ miles and the number of buildings with a Needed Fire Flow over 3,500 gpm or 3 stories or more in height, or the method of operation.

The FSRS recognizes that there are **0 service companies** in service.

Item 549 "Credit for Ladder Service (CLS)" = 2.69 points

Item 553 – Credit for Reserve Ladder and Service Trucks (0.50 points)

The next item reviewed is Item 553 "Credit for Reserve Ladder and Service Trucks (CRLS)". This item considers the adequacy of ladder and service apparatus when one (or more in larger communities) of these apparatus are out of service. The number of needed reserve ladder and service trucks is 1 for each 8 needed ladder and service companies that were determined to be needed in Item 540, or any fraction thereof.

Item 553 "Credit for Reserve Ladder and Service Trucks (CRLS)" = 0.50 points

Item 561 – Deployment Analysis (10 points)

Next, Item 561 "Deployment Analysis (DA)" is reviewed. This Item examines the number and adequacy of existing engine and ladder-service companies to cover built-upon areas of the city.

To determine the Credit for Distribution, first the Existing Engine Company (EC) points and the Existing Engine Companies (EE) determined in Item 513 are considered along with Ladder Company Equipment (LCE) points, Service Company Equipment (SCE) points, Engine-Ladder Company Equipment (ELCE) points, and Engine-Service Company Equipment (ESCE) points determined in Item 549.

Secondly, as an alternative to determining the number of needed engine and ladder/service companies through the road-mile analysis, a fire protection area may use the results of a systematic performance evaluation. This type of evaluation analyzes computer-aided dispatch (CAD) history to demonstrate that, with its current deployment of companies, the fire department meets the time constraints for initial arriving engine and initial full alarm assignment in accordance with the general criteria of in NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.*

A determination is made of the percentage of built upon area within 1½ miles of a first-due engine company and within 2½ miles of a first-due ladder-service company.

Item 561 "Credit Deployment Analysis (DA)" = 5.56 points

Item 571 – Credit for Company Personnel (15 points)

Item 571 "Credit for Company Personnel (CCP)" reviews the average number of existing firefighters and company officers available to respond to reported first alarm structure fires in the city.

The on-duty strength is determined by the yearly average of total firefighters and company officers on-duty considering vacations, sick leave, holidays, "Kelley" days and other absences. When a fire department operates under a minimum staffing policy, this may be used in lieu of determining the yearly average of on-duty company personnel.

Firefighters on apparatus not credited under Items 513 and 549 that regularly respond to reported first alarms to aid engine, ladder, and service companies are included in this item as increasing the total company strength.

Firefighters staffing ambulances or other units serving the general public are credited if they participate in fire-fighting operations, the number depending upon the extent to which they are available and are used for response to first alarms of fire.

On-Call members are credited on the basis of the average number staffing apparatus on first alarms. Off-shift career firefighters and company officers responding on first alarms are considered on the same basis as on-call personnel. For personnel not normally at the fire station, the number of responding firefighters and company officers is divided by 3 to reflect the time needed to assemble at the fire scene and the reduced ability to act as a team due to the various arrival times at the fire location when compared to the personnel on-duty at the fire station during the receipt of an alarm.

The number of Public Safety Officers who are positioned in emergency vehicles within the jurisdiction boundaries may be credited based on availability to respond to first alarm structure fires. In recognition of this increased response capability the number of responding Public Safety Officers is divided by 2.

The average number of firefighters and company officers responding with those companies credited as Automatic Aid under Items 513 and 549 are considered for either on-duty or on-call company personnel as is appropriate. The actual number is calculated as the average number of company personnel responding multiplied by the value of AA Plan determined in Item 512.D.

The maximum creditable response of on-duty and on-call firefighters is 12, including company officers, for each existing engine and ladder company and 6 for each existing service company.

Chief Officers are not creditable except when more than one chief officer responds to alarms; then extra chief officers may be credited as firefighters if they perform company duties.

The FSRS recognizes **80.00 on-duty personnel** and an average of **0.00 on-call personnel** responding on first alarm structure fires.

Item 571 "Credit for Company Personnel (CCP)" = 11.11 points

Item 581 – Credit for Training (9 points)

Training	Earned Credit	Credit Available
A. Facilities, and Use For maximum credit, each firefighter should receive 18 hours per year in structure fire related subjects as outlined in NFPA 1001.	35.0(	35
B. Company Training For maximum credit, each firefighter should receive 16 hours per month in structure fire related subjects as outlined in NFPA 1001.	25.00	25
C. Classes for Officers For maximum credit, each officer should be certified in accordance with the general criteria of NFPA 1021. Additionally, each officer should receive 12 hours of continuing education on or off site.	8.00	12
D. New Driver and Operator Training For maximum credit, each new driver and operator should receive 60 hours of driver/operator training per year in accordance with NFPA 1002 and NFPA 1451.	2.17	5
E. Existing Driver and Operator Training For maximum credit, each existing driver and operator should receive 12 hours of driver/operator training per year in accordance with NFPA 1002 and NFPA 1451.	5.00	5
F. Training on Hazardous Materials For maximum credit, each firefighter should receive 6 hours of training for incidents involving hazardous materials in accordance with NFPA 472.	0.50	1
G. Recruit Training For maximum credit, each firefighter should receive 240 hours of structure fire related training in accordance with NFPA 1001 within the first year of employment or tenure.	5.00	5
H. Pre-Fire Planning Inspections For maximum credit, pre-fire planning inspections of each commercial, industrial, institutional, and other similar type building (all buildings except 1-4 family dwellings) should be made annually by company members. Records of inspections should include up-to date notes and sketches.	12.0(	12

Item 580 "Credit for Training (CT)" = 8.34 points

Item 730 – Operational Considerations (2 points)

Item 730 "Credit for Operational Considerations (COC)" evaluates fire department standard operating procedures and incident management systems for emergency operations involving structure fires.

Operational Considerations	Earned Credit	Credit Available
Standard Operating Procedures The department should have established SOPs for fire department general emergency operations	**50**	**50**
Incident Management Systems The department should use an established incident management system (IMS)	**50**	**50**
Operational Considerations total:	**100**	**100**

Item 730 "Credit for Operational Considerations (COC)" = 2.00 points

Water Supply

Forty percent of a community's overall score is based on the adequacy of the water supply system. The ISO field representative evaluated:

- the capability of the water distribution system to meet the Needed Fire Flows at selected locations up to 3,500 gpm.
- size, type and installation of fire hydrants.
- inspection and flow testing of fire hydrants.

	Earned Credit	Credit Available
616. Credit for Supply System	**29.29**	30
621. Credit for Hydrants	**2.94**	3
631. Credit for Inspection and Flow Testing	**4.00**	7
Item 640. Credit for Water Supply:	**36.23**	**40**

Item 616 – Credit for Supply System (30 points)

The first item reviewed is Item 616 "Credit for Supply System (CSS)". This item reviews the rate of flow that can be credited at each of the Needed Fire Flow test locations considering the supply works capacity, the main capacity and the hydrant distribution. The lowest flow rate of these items is credited for each representative location. A water system capable of delivering 250 gpm or more for a period of two hours plus consumption at the maximum daily rate at the fire location is considered minimum in the ISO review.

Where there are 2 or more systems or services distributing water at the same location, credit is given on the basis of the joint protection provided by all systems and services available.

The supply works capacity is calculated for each representative Needed Fire Flow test location, considering a variety of water supply sources. These include public water supplies, emergency supplies (usually accessed from neighboring water systems), suction supplies (usually evidenced by dry hydrant installations near a river, lake or other body of water), and supplies developed by a fire department using large diameter hose or vehicles to shuttle water from a source of supply to a fire site. The result is expressed in gallons per minute (gpm).

The normal ability of the distribution system to deliver Needed Fire Flows at the selected building locations is reviewed. The results of a flow test at a representative test location will indicate the ability of the water mains (or fire department in the case of fire department supplies) to carry water to that location.

The hydrant distribution is reviewed within 1,000 feet of representative test locations measured as hose can be laid by apparatus.

For maximum credit, the Needed Fire Flows should be available at each location in the district. Needed Fire Flows of 2,500 gpm or less should be available for 2 hours; and Needed Fire Flows of 3,000 and 3,500 gpm should be obtainable for 3 hours.

Item 616 "Credit for Supply System (CSS)" = 29.29 points

Item 621 – Credit for Hydrants (3 points)

The second item reviewed is Item 621 "Credit for Hydrants (CH)". This item reviews the number of fire hydrants of each type compared with the total number of hydrants.

There are a total of 11550 hydrants in the graded area.

620. Hydrants, - Size, Type and Installation	Number of Hydrants
A. With a 6 -inch or larger branch and a pumper outlet with or without 2½ -inch outlets	11250
B. With a 6 -inch or larger branch and no pumper outlet but two or more 2½ -inch outlets, or with a small foot valve, or with a small barrel	0
C./D. With only a 2½ -inch outlet or with less than a 6 -inch branch	300
E./F. Flush Type, Cistern, or Suction Point	0

Item 621 "Credit for Hydrants (CH)" = 2.94 points

Item 630 – Credit for Inspection and Flow Testing (7 points)

The third item reviewed is Item 630 "Credit for Inspection and Flow Testing (CIT)". This item reviews the fire hydrant inspection frequency, and the completeness of the inspections. Inspection of hydrants should be in accordance with AWWA M-17, *Installation, Field Testing and Maintenance of Fire Hydrants.*

Frequency of Inspection (FI): Average interval between the 3 most recent inspections.

Frequency	Points
1 year	30
2 years	20
3 years	10
4 years	5
5 years or more	No Credit

Note: The points for inspection frequency are reduced by 10 points if the inspections are incomplete or do not include a flushing program. An additional reduction of 10 points are made if hydrants are not subjected to full system pressure during inspections. If the inspection of cisterns or suction points does not include actual drafting with a pumper, or back-flushing for dry hydrants, 20 points are deducted.

Total points for Inspections = 1.60 points

Frequency of Fire Flow Testing (FF): Average interval between the 3 most recent inspections.

Frequency	Points
5 years	40
6 years	30
7 years	20
8 years	10
9 years	5
10 years or more	No Credit

Total points for Fire Flow Testing = 2.40 points

Item 631 "Credit for Inspection and Fire Flow Testing (CIT)" = 4.00 points

Divergence = -2.51

The Divergence factor mathematically reduces the score based upon the relative difference between the fire department and water supply scores. The factor is introduced in the final equation.

Community Risk Reduction

	Earned Credit	Credit Available
1025. Credit for Fire Prevention and Code Enforcement (CPCE)	**1.84**	2.2
1033. Credit for Public Fire Safety Education (CFSE)	**0.78**	2.2
1044. Credit for Fire Investigation Programs (CIP)	**1.08**	1.1
Item 1050. Credit for Community Risk Reduction	**3.70**	**5.50**

Item 1025 – Credit for Fire Prevention Code Adoption and Enforcement (2.2 points)	Earned Credit	Credit Available
Fire Prevention Code Regulations (PCR) Evaluation of fire prevention code regulations in effect.	10.00	10
Fire Prevention Staffing (PS) Evaluation of staffing for fire prevention activities.	8.00	8
Fire Prevention Certification and Training (PCT) Evaluation of the certification and training of fire prevention code enforcement personnel.	1.05	6
Fire Prevention Programs (PCP) Evaluation of fire prevention programs.	14.41	16
Review of Fire Prevention Code and Enforcement (CPCE) subtotal:	33.46	40

Item 1033 – Credit for Public Fire Safety Education (2.2 points)	Earned Credit	Credit Available
Public Fire Safety Educators Qualifications and Training (FSQT) Evaluation of public fire safety education personnel training and qualification as specified by the authority having jurisdiction.	5.00	10
Public Fire Safety Education Programs (FSP) Evaluation of programs for public fire safety education.	9.15	30
Review of Public Safety Education Programs (CFSE) subtotal:	14.15	40

Item 1044 – Credit for Fire Investigation Programs (1.1 points)	Earned Credit	Credit Available
Fire Investigation Organization and Staffing (IOS) Evaluation of organization and staffing for fire investigations.	8.00	8
Fire Investigator Certification and Training (IQT) Evaluation of fire investigator certification and training.	5.57	6
Use of National Fire Incident Reporting System (IRS) Evaluation of the use of the National Fire Incident Reporting System (NFIRS) for the 3 years before the evaluation.	6.00	6
Review of Fire Investigation Programs (CIP) subtotal:	19.57	20

Summary of PPC Review

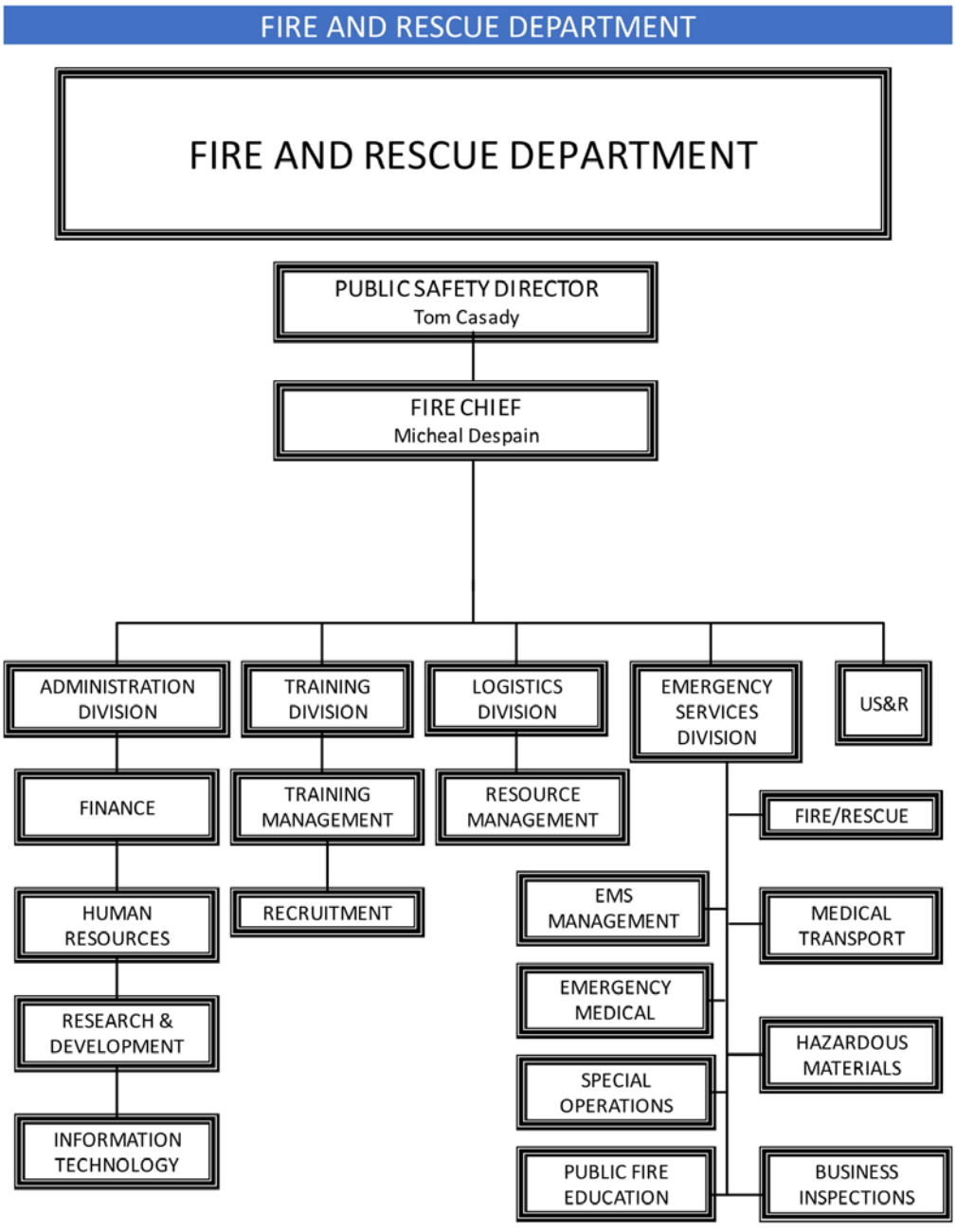
for

Lincoln

FSRS Item	Earned Credit	Credit Available
Emergency Communications		
414. Credit for Emergency Reporting	3.00	3
422. Credit for Telecommunicators	3.20	4
432. Credit for Dispatch Circuits	3.00	3
440. Credit for Emergency Communications	9.20	10
Fire Department		
513. Credit for Engine Companies	5.33	6
523. Credit for Reserve Pumpers	0.48	0.5
532. Credit for Pumper Capacity	3.00	3
549. Credit for Ladder Service	2.69	4
553. Credit for Reserve Ladder and Service Trucks	0.50	0.5
561. Credit for Deployment Analysis	5.56	10
571. Credit for Company Personnel	11.11	15
581. Credit for Training	8.34	9
730. Credit for Operational Considerations	2.00	2
590. Credit for Fire Department	39.01	50
Water Supply		
616. Credit for Supply System	29.29	30
621. Credit for Hydrants	2.94	3
631. Credit for Inspection and Flow Testing	4.00	7
640. Credit for Water Supply	36.23	40
Divergence	-2.51	--
1050. Community Risk Reduction	3.70	5.50
Total Credit	85.63	105.5

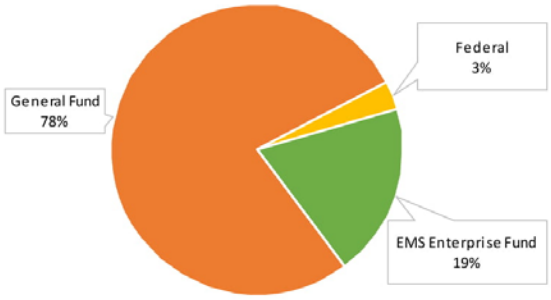
Final Community Classification = 02/2X

LF&R BUDGET 2018-2020



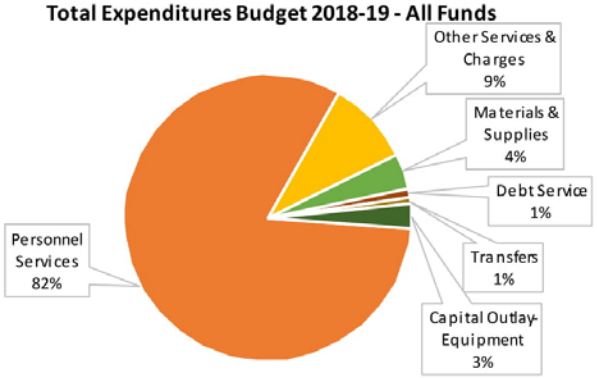
FIRE AND RESCUE DEPARTMENT

Total Funding Sources 2018-19 - All Funds



	Total Funding Sources 2018-19 - All Funds	
General Fund	$	31,057,854
Federal	$	1,267,804
EMS Enterprise Fund	$	7,679,656
Total	$	40,005,314

Total Expenditures Budget 2018-19 - All Funds



	Total Expenditures Budget 2018-19 - All Funds	
Personnel Services	$	32,868,618
Other Services & Charges	$	3,817,975
Materials & Supplies	$	1,554,775
Debt Service	$	405,100
Transfers	$	278,737
Capital Outlay-Equipment	$	1,080,109
Total	$	40,005,314

FIRE AND RESCUE DEPARTMENT

Description

Lincoln Fire and Rescue is an all hazards emergency response organization. Calls for service continue to grow at a rate three times faster than population growth, primarily due to an aging population and their higher need for medical services; however, in 2017 the largest increase in hazard response was natural gas breaches due to the unusually large amount of underground boring. Responding to medical emergencies is a service LF&R provides to the community as well as 14 rural agencies throughout and surrounding Lancaster County. The amount of property saved by responding to and extinguishing fires was more than 10 times the cost of operating the department. The cost of operation is also approximately 26% below comparable agencies in the region. Cardiac survival rate in Lincoln is routinely double the national average. The Insurance Services Office (ISO) rating for the City of Lincoln was improved from Class 3 to Class 2. LF&R also provides specialized services such as; hazardous materials response, swift water, trench, confined space, motor vehicle and ice rescue.

Significant Changes

- Funding has been added for the April 2019 opening of Station 15 and for the January 2020 opening of Station 16.
- LF&R has applied for a SAFER grant to hire up to 15 firefighter paramedics, the local match for this proposed grant is included in this budget.
- Reallocated 5.33 staff from the General Fund to the EMS Enterprise Fund and .5 Staff to Urban Search and Rescue to accurately reflect the funding source.
- $500,000 is included in each year to purchase fire apparatus and $300,000 in FY 18-19 for the purchase or remount of ambulances.

Fire and Rescue Outcome, Goals and Performance Measures

Below are key performance measures listed for the Fire and Rescue Department as they relate to the overall performance initiative Taking Charge.

Fire & Rescue Outcome, Goals and Performance Measures		2016-2017 Actual	2017-2018 Target	2018-2019 Target	2019-2020 Target
Outcome	Safetyand Security				
Goal	Timely and effective incident management				
Measure	LFR will achieve a CPR Fraction of at least 80%	93%	>85%	>85%	>85%
Outcome	Safetyand Security				
Goal	Timely and effective incident management				
Measure	LFR will stop fire at the room of origin for at least 80% of structure fires.	78.89%	77.00%	79.00%	81.00%
Outcome	Safetyand Security				
Goal	Timely and effective incident management				
Measure	LFR will maintain a cardiac survival rate equal to or higher than the national average.	50%	>35%	>35%	>35%
Outcome	Safetyand Security				
Goal	Timely and effective incident management				
Measure	LFR ambulances will have a total response time of 8 minutes or less 90% of the time to emergent medical incidents.	9:13	9:25	8:50	8:55

FIRE AND RESCUE DEPARTMENT

General Fund	Actual 2016-17	Budget 2017-18	Budget 2018-19	Budget 2019-20
Charges for Services	$ 222,912	$ -	$ 212,987	$ 219,377
Intergovernmental	$ 10,837	$ -	$ 700	$ 750
Miscellaneous	$ 27,357	$ -	$ 3,550	$ 3,628
Total Revenue	$ 261,106	$ -	$ 217,237	$ 223,755
Personnel Services	$ 24,526,149	$ 25,756,206	$ 26,484,850	$ 28,660,013
Other Services & Charges	$ 2,127,757	$ 2,252,335	$ 2,316,266	$ 2,406,435
Materials & Supplies	$ 638,701	$ 1,015,849	$ 978,906	$ 1,055,352
Debt Service	$ 482,675	$ 405,401	$ 405,100	$ 408,900
Transfers	$ 10,908	$ -	$ 278,737	$ 448,642
Capital Outlay-Equipment	$ 223,557	$ 96,931	$ 593,995	$ 593,141
Capital Outlay-Improvements	$ 177,465	$ -	$ -	$ -
Total Expenditures	$ 28,187,212	$ 29,526,722	$ 31,057,854	$ 33,572,483

Grants In Aid Fund USAR	Actual 2016-17	Budget 2017-18	Budget 2018-19	Budget 2019-20
Intergovernmental	$ 219,203	$ -	$ 1,242,606	$ 1,248,973
Total Revenue	$ 219,203	$ -	$ 1,242,606	$ 1,248,973
Personnel Services	$ 531,616	$ 645,538	$ 695,722	$ 726,296
Other Services & Charges	$ 407,336	$ 325,340	$ 325,340	$ 325,340
Capital Outlay-Equipment	$ 58,553	$ 185,114	$ 185,114	$ 185,114
Materials & Supplies	$ 48,135	$ 61,628	$ 61,628	$ 61,628
Total Expenditures	$ 1,045,640	$ 1,217,620	$ 1,267,804	$ 1,298,378

EMS Transport Fund	Actual 2016-17	Budget 2017-18	Budget 2018-19	Budget 2019-20
Charges for Services	$ 7,187,716	$ -	$ 7,804,979	$ 8,187,960
Intergovernmental	$ 21,708	$ -	$ 130,079	$ 143,850
Interest	$ 10,149	$ -	$ 10,453	$ 10,767
Miscellaneous	$ 2,967	$ -	$ 3,120	$ 3,500
Total Revenue	$ 7,222,540	$ -	$ 7,948,631	$ 8,346,077
Personnel Services	$ 4,797,343	$ 4,932,924	$ 5,688,046	$ 6,029,557
Other Services & Charges	$ 907,328	$ 1,121,080	$ 1,176,369	$ 1,206,335
Materials & Supplies	$ 411,936	$ 532,700	$ 514,241	$ 524,866
Capital Outlay-Equipment	$ 11,724	$ 26,000	$ 301,000	$ 1,000
Debt Service	$ 100,964	$ -	$ -	$ -
Transfers	$ -	$ -	$ -	$ 3,880
Total Expenditures	$ 6,229,295	$ 6,612,704	$ 7,679,656	$ 7,765,638

FIRE AND RESCUE DEPARTMENT

FIRE & RESCUE PERSONNEL SUMMARY

	FTE'S 2017-18	Budget 2017-18	Mayor's FTE'S 2018-19	Mayor's Budget 2018-19	Mayor's FTE'S 2019-20	Mayor's Budget 2019-20
GENERAL FUND						
ADMINISTRATION	8.53	591,246	7.78	578,649	6.83	546,754
EMERGENCY SERVICES	249.22	24,537,346	243.39	25,184,350	243.39	27,362,656
LOGISTICS	3.91	304,233	4.66	366,208	4.66	380,186
TRAINING	3.80	323,381	3.80	355,643	3.80	370,417
TOTAL GENERAL FUND	**265.46**	**25,756,206**	**259.63**	**26,484,850**	**258.68**	**28,660,013**
EMS ENTERPRISE FUND	**37.83**	**4,932,924**	**43.16**	**5,688,046**	**43.11**	**6,029,557**
TOTAL GRANTS-IN-AID FUND	**5.00**	**645,538**	**5.50**	**695,722**	**5.50**	**726,296**
TOTAL ALL FUNDS	**308.28**	**31,334,668**	**308.29**	**32,868,618**	**307.29**	**35,415,866**

POSITION DETAIL

	Class Code	FTE'S 2017-18	Budget 2017-18	Mayor's FTE'S 2018-19	Mayor's Budget 2018-19	Mayor's FTE'S 2019-20	Mayor's Budget 2019-20
GENERAL FUND							
EXECUTIVE SECRETARY	E0630	1.00	64,398	-	-	-	-
SENIOR OFFICE ASSISTANT	N1032	1.55	65,439	0.90	32,399	0.90	33,511
OFFICE SPECIALIST	N1034	0.90	43,171	0.90	45,301	0.90	45,301
ACCOUNT CLERK III	N1122	0.95	48,408	0.95	50,698	-	-
ACCOUNTANT	A1125	0.95	63,146	0.95	66,157	0.95	66,157
STORES CLERK	N1307			0.65	24,990	0.65	26,092
GIS ANALYST	A1524	1.00	67,070	1.00	72,771	1.00	75,140
ADMINISTRATIVE OFFICER	A1633			1.00	58,977	1.00	60,891
OFFICE OPERATIONS SPEC	C1634	1.00	56,751	1.00	60,039	1.00	60,039
FIRE SYSTEM PROGRAMMER	A3001	0.98	74,581	0.98	78,195	0.98	78,689
ASST FIRE CHIEF	W3002	0.95	125,914	0.95	133,106	0.95	133,106
FF PARAMEDIC 2912 HR	F3003	14.46	1,039,070	18.00	1,381,222	18.00	1,414,286
FIREFIGHTER 2912 HR	F3005	110.81	7,389,031	103.04	7,453,736	103.04	7,848,992
FIRE APPARATUS OPERATOR	F3006	57.00	4,330,197	57.00	4,656,895	57.00	4,670,028
FIRE CAPTAIN	F3007	60.00	5,324,126	60.00	5,705,701	60.00	5,747,124
BATTALION CHIEF	M3008	6.00	650,591	2.00	226,696	2.00	226,696
FIRE CHIEF	D3009	1.00	126,880	1.00	142,101	1.00	142,101
EMS SUPPLY SPECIALIST	C3011	0.10	5,478	0.10	5,949	0.10	6,101
BATTALION CHIEF	M3017			3.00	339,100	3.00	339,945
DIVISION CHIEF -TRAINING	M3019	0.90	99,856	-	-	-	-
FIRE CAPTAIN	F3020	1.00	83,511	2.30	208,011	2.30	212,091
FIRE EQUIPMENT MECHANIC	F3021	1.44	97,360	1.44	105,985	1.44	107,014
DIV CHIEF OF LOGISTICS	M3024	0.72	74,887	0.72	80,020	0.72	80,020
FIREFIGHTER-2080 HR	F3032	1.00	68,896	-	-	-	-
PARA-PROFESSIONAL/TECHNIC	U 4903	0.75	20,280	0.75	22,620	0.75	22,620
FIRE AIR TECH	F5100	1.00	47,098	1.00	50,713	1.00	50,713

FIRE AND RESCUE DEPARTMENT

	Class Code	FTE'S 2017-18	Budget 2017-18	Mayor's FTE'S 2018-19	Mayor's Budget 2018-19	Mayor's FTE'S 2019-20	Mayor's Budget 2019-20
GENERAL FUND							
HOLIDAY PAY			815,406		873,275	-	899,480
OUT OF GRADE PAY			825,389		959,113		987,888
STANDBY PAY			7,513		3,125		3,250
OVERTIME			629,239		1,016,263		1,736,074
FLSA OVERTIME			533,848		584,793		602,316
PERSONNEL ADJUSTMENT			1,946,743		917,712		1,728,793
WORKERS COMPENSATION			1,031,929		1,129,187		1,255,553
TOTAL GENERAL FUND		**265.46**	**25,756,206**	**259.63**	**26,484,850**	**258.68**	**28,660,013**
EMS ENTERPRISE FUND							
SENIOR OFFICE ASSISTANT	N1032	0.45	18,789	0.10	3,600	0.10	3,723
OFFICE SPECIALIST	N1034	0.10	4,796	0.10	5,034	0.10	5,034
ACCOUNT CLERK III	N1122	1.05	52,657	1.05	55,208	1.00	55,208
ACCOUNTANT	A1125	0.05	3,323	0.05	3,482	0.05	3,482
STORES CLERK	N1307	-	-	0.35	13,457	0.35	14,050
FIRE SYSTEM PROGRAMMER	A3001	0.02	1,536	0.02	1,611	0.02	1,622
ASST FIRE CHIEF	M3002	0.05	6,627	0.05	7,006	0.05	7,006
FF PARAMEDIC 2912 HR	F3003	4.54	274,569	18.00	1,227,351	18.00	1,272,384
FIREFIGHTER 2912 HR	F3005	27.23	1,697,191	18.00	1,131,986	18.00	1,181,479
BATTALION CHIEF	M3008			0.20	22,685	0.20	22,685
EMS BUSINESS MGR	A3010	1.00	80,434	1.00	84,297	1.00	84,297
EMS SUPPLY SPECIALIST	C3011	0.90	49,295	0.90	53,546	0.90	54,913
DIVISION CHIEF-TRAINING	M3019	0.10	11,096	1.00	113,231	1.00	113,231
FIRE EQUIPMENT MECHANIC	F3021	0.56	37,825	0.56	41,178	0.56	41,577
DIV CHIEF OF LOGISTICS	M3024	0.28	29,095	0.28	31,089	0.28	31,089
CAPTAIN-EMS TRAINING	F3030	1.00	89,938	1.00	96,846	1.00	96,846
PARA-PROFESSIONAL/TECHNIC	U4903	0.50	11,180	0.50	23,494	0.50	23,494
HOLIDAY PAY			86,010		123,785		127,490
OUT OF GRADE PAY			286,888		317,592		327,096
OVERTIME			365,660		400,536		384,545
FLSA OVERTIME			66,740		73,062		75,339
PERSONNEL ADJUSTMENT			326,841		133,646		243,493
WORKERS COMPENSATION			132,055		187,712		208,719
FRINGE BENEFITS			1,300,379		1,536,615		1,650,755
TOTAL EMS ENTERPRISE FUND		**37.83**	**4,932,924**	**43.16**	**5,688,046**	**43.11**	**6,029,557**
GRANTS-IN-AID FUND							
OFFICE ASSISTANT	N1030	1.00	34,265	-	-	-	-
SENIOR OFFICE ASSISTANT	N1032	-	-	1.00	37,184	1.00	38,515
ACCOUNT CLERK III	N1122	1.00	48,007	1.00	52,017	1.00	52,506
BATTALION CHIEF	M3008	-	-	0.80	90,154	0.80	90,154
FIRE CAPTAIN	F3020	1.00	90,786	0.70	66,833	0.70	66,833
USAR SPECIALIST	C3028	2.00	103,276	2.00	109,711	2.00	111,040
OVERTIME			170,000	-	174,415		174,416
PERSONNEL ADJUSTMENT			39,486	-	16,878		31,938
WORKERS COMPENSATION			19,546	-	23,921		26,598
FRINGE BENEFITS			140,172	-	124,609		134,297
TOTAL GRANTS-IN-AID		**5.00**	**645,538**	**5.50**	**695,722**	**5.50**	**726,296**
TOTAL ALL FUNDS		**308.28**	**31,334,668**	**308.29**	**32,868,619**	**307.29**	**35,415,866**

CONSTRUCTION LIMITATIONS

Agricultural (AG)	
Lot Area (Minimum)	20 Acres
Avg Lot Width	550’
Minimum Set Back	50’
Side Set Back	15’
Max Height	35’

Agricultural/Residential (AGR)	
Lot Area (Minimum)	3 Acres
Avg Lot Width	220’
Minimum Set Back	50’
Side Set Back	15’
Max Height	35’

Residential (R-1) – 1 Family	
Lot Area (Minimum)	9,000’ Sq
Avg Lot Width	60’
Minimum Set Back	30’
Side Set Back	10’
Max Height	35’

Residential (R-1) – 2 Family	
Lot Area (Minimum)	7,200’ ea
Avg Lot Width	48’ ea
Minimum Set Back	30’
Side Set Back	20’
Max Height	35’

Residential (R-1) – Other Use	
Lot Area (Minimum)	9,000’ Sq
Avg Lot Width	60’
Minimum Set Back	30’
Side Set Back	10’
Max Height	35’

Residential (R-2) – 1 Family	
Lot Area (Minimum)	6,000’ Sq
Avg Lot Width	50’
Minimum Set Back	25’
Side Set Back	5’
Max Height	35’

Residential (R-2) – 2 Family	
Lot Area (Minimum)	5,000’ ea
Avg Lot Width	40’ ea
Minimum Set Back	25’
Side Set Back	10’
Max Height	35’

Residential (R-2) – Other Use	
Lot Area (Minimum)	6,000’
Avg Lot Width	50’
Minimum Set Back	25’
Side Set Back	5’
Max Height	35’

Residential (R-3) – 1 Family	
Lot Area (Minimum)	6,000’
Avg Lot Width	50’
Minimum Set Back	20’
Side Set Back	5’
Max Height	35’

Residential (R-3) – 2 Family	
Lot Area (Minimum)	5,000’
Avg Lot Width	40’ea
Minimum Set Back	20’
Side Set Back	5’
Max Height	35’

Residential (R-3) – Other Use	
Lot Area (Minimum)	6,000’
Avg Lot Width	50’
Minimum Set Back	20’
Side Set Back	5’
Max Height	35’

Residential (R-4) – 1 Family	
Lot Area (Minimum)	5,000’
Avg Lot Width	50’
Minimum Set Back	25’
Side Set Back	5’
Max Height	35’

Residential (R-4) – 2 Family	
Lot Area (Minimum)	2,500’
Avg Lot Width	25’ea
Minimum Set Back	25’
Side Set Back	5’
Max Height	35’

Residential (R-4) – Other Use	
Lot Area (Minimum)	5,000’
Avg Lot Width	50’
Minimum Set Back	25’
Side Set Back	5’
Max Height	35’

Residential (R-5) – 1 Family	
Lot Area (Minimum)	5,000' Sq
Avg Lot Width	50'
Minimum Set Back	20'
Side Set Back	5'
Max Height	35'

Residential (R-5) – 2 Family	
Lot Area (Minimum)	2,500' ea
Avg Lot Width	25' ea
Minimum Set Back	20'
Side Set Back	5'
Max Height	35'

Residential (R-5) – Other Use	
Lot Area (Minimum)	5,000' Sq
Avg Lot Width	50'
Minimum Set Back	20'
Side Set Back	5'
Max Height	35'

Residential (R-6) – 1 Family	
Lot Area (Minimum)	4,000' Sq
Avg Lot Width	50' ea
Minimum Set Back	20'
Side Set Back	5'
Max Height	35+'

Residential (R-6) – 2 Family	
Lot Area (Minimum)	2,500' ea
Avg Lot Width	25' ea
Minimum Set Back	20'
Side Set Back	5'
Max Height	35+'

Residential (R-6) – Other Use	
Lot Area (Minimum)	4,000' Sq
Avg Lot Width	50'
Minimum Set Back	20'
Side Set Back	5'
Max Height	35+'

Residential (R-7) – 1 Family	
Lot Area (Minimum)	4,000' Sq
Avg Lot Width	50'
Minimum Set Back	20'
Side Set Back	5'
Max Height	35+'

Residential (R-7) – 2 Family	
Lot Area (Minimum)	2,000'
Avg Lot Width	25' ea
Minimum Set Back	20'
Side Set Back	5'
Max Height	35+'

Residential (R-7) – Townhouse	
Lot Area (Minimum)	2,000'
Avg Lot Width	20' ea
Minimum Set Back	20'
Side Set Back	5'
Max Height	35+'

Residential (R-7) – Multi	
Lot Area (Minimum)	700' ea
Avg Lot Width	50'
Minimum Set Back	20'
Side Set Back	7'
Max Height	35+'

Residential (R-7) – Other Use	
Lot Area (Minimum)	4,000'
Avg Lot Width	50'
Minimum Set Back	20'
Side Set Back	5'
Max Height	35+'

Residential (R-8) – 1 Family	
Lot Area (Minimum)	4,000'
Avg Lot Width	50'
Minimum Set Back	10'
Side Set Back	10'
Max Height	35'

Residential (R-8) – 2 Family	
Lot Area (Minimum)	2,000'
Avg Lot Width	25'ea
Minimum Set Back	10'
Side Set Back	10'
Max Height	35'

Residential (R-8) – Townhouse	
Lot Area (Minimum)	2,000'
Avg Lot Width	20' ea
Minimum Set Back	10'
Side Set Back	10'
Max Height	35'

Residential (R-8) – Multi

Lot Area (Minimum)	550’ ea
Avg Lot Width	50’
Minimum Set Back	10’
Side Set Back	10’
Max Height	75’

Residential (R-8) – Other Use

Lot Area (Minimum)	4,000’ ea
Avg Lot Width	50’ ea
Minimum Set Back	10’
Side Set Back	10’
Max Height	75’

Office (O-1) – Family

Lot Area (Minimum)	220’ ea
Avg Lot Width	None
Minimum Set Back	None
Side Set Back	None
Max Height	75’

Office (O-1) – Other Uses

Lot Area (Minimum)	None
Avg Lot Width	None
Minimum Set Back	None
Side Set Back	None
Max Height	75’

Suburban Office (O-2) – 1 Family

Lot Area (Minimum)	4,000’ Sq
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	10’
Max Height	25’

Suburban Office (O-2) – 2 Family

Lot Area (Minimum)	4,000’ Sq
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	10’
Max Height	25’

Suburban Office (O-2) – Other Use

Lot Area (Minimum)	None
ea	
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	10’

Office Park (O-3) – Townhouse

Lot Area (Minimum)	2,500’
Avg Lot Width	None
Minimum Set Back	30’
Side Set Back	10’
Max Height	35’

Office Park (O-3) – Multifamily

Lot Area (Minimum)	1,500’
Avg Lot Width	None
Minimum Set Back	30’
Side Set Back	15’
Max Height	35’

Office Park (O-3) – Other Use

Lot Area (Minimum)	4,000’
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	15’
Max Height	45’

Residential Transition (RT)

Lot Area (Minimum)	4,000’
Avg Lot Width	None
Minimum Set Back	10’
Side Set Back	10’
Max Height	28’

Local Business (B-1) – Dwelling

Lot Area (Minimum)	2,000’
Avg Lot Width	None
Minimum Set Back	20’
Side Set BackNone	None
Max Height	40’

Neighborhood Business (B-2) – Other

Lot Area (Minimum)	5 Acres
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	None
Max Height	40’

Commercial (B-3) – Dwelling > 1 Story

Lot Area (Minimum)	1,000’
Avg Lot Width	None
Minimum Set Back	None
Side Set Back	None

Max Height	25’

Office Park (O-3) – 1 Family

Lot Area (Minimum)	4,000’ Sq
Avg Lot Width	None
Minimum Set Back	30’
Side Set Back	15’
Max Height	35’

Office Park (O-3) – 2 Family

Lot Area (Minimum)	4,000’ ea
Avg Lot Width	None
Minimum Set Back	30’
Side Set Back	15’
Max Height	35’

Corridor Business (B-4) - Townhouse

Lot Area (Minimum)	2,000’ ea
Avg Lot Width	20’
Minimum Set Back	20’
Side Set Back	5’
Max Height	275’

Corridor Business (B-4) - Multifamily

Lot Area (Minimum)	None*
Avg Lot Width	None*
Minimum Set Back	20’
Side Set Back	5’
Max Height	275’

Corridor Business (B-4) Other Uses

Lot Area (Minimum)	None
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	5’
Max Height	275’

Max Height	45’

Corridor Business (B-4) – 1 Family

Lot Area (Minimum)	4,000’
Avg Lot Width	50’ea
Minimum Set Back	20’
Side Set Back	5’
Max Height	275’

Corridor Business (B-4) – 2 Family

Lot Area (Minimum)	2,000’
Avg Lot Width	20’
Minimum Set Back	20’
Side Set Back	5’
Max Height	275’

Employment Center (I-3)

Lot Area (Minimum)	None
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	20’
Max Height	45’*

Public Use (P)

Lot Area (Minimum)	None
Avg Lot Width	None
Minimum Set Back	None
Side Set Back	None
Max Height	None

Highway Commercial (H-1)

Lot Area (Minimum)	5,000’
Avg Lot Width	50’
Minimum Set Back	20’
Side Set Back	5’
Max Height	45’

Highway Business (H-2)	
Lot Area (Minimum)	None
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	5’
Max Height	45’

Industrial Park (I-2)	
Lot Area (Minimum)	1 Acre
Avg Lot Width	150’
Minimum Set Back	20’
Side Set Back	20’
Max Height	55’

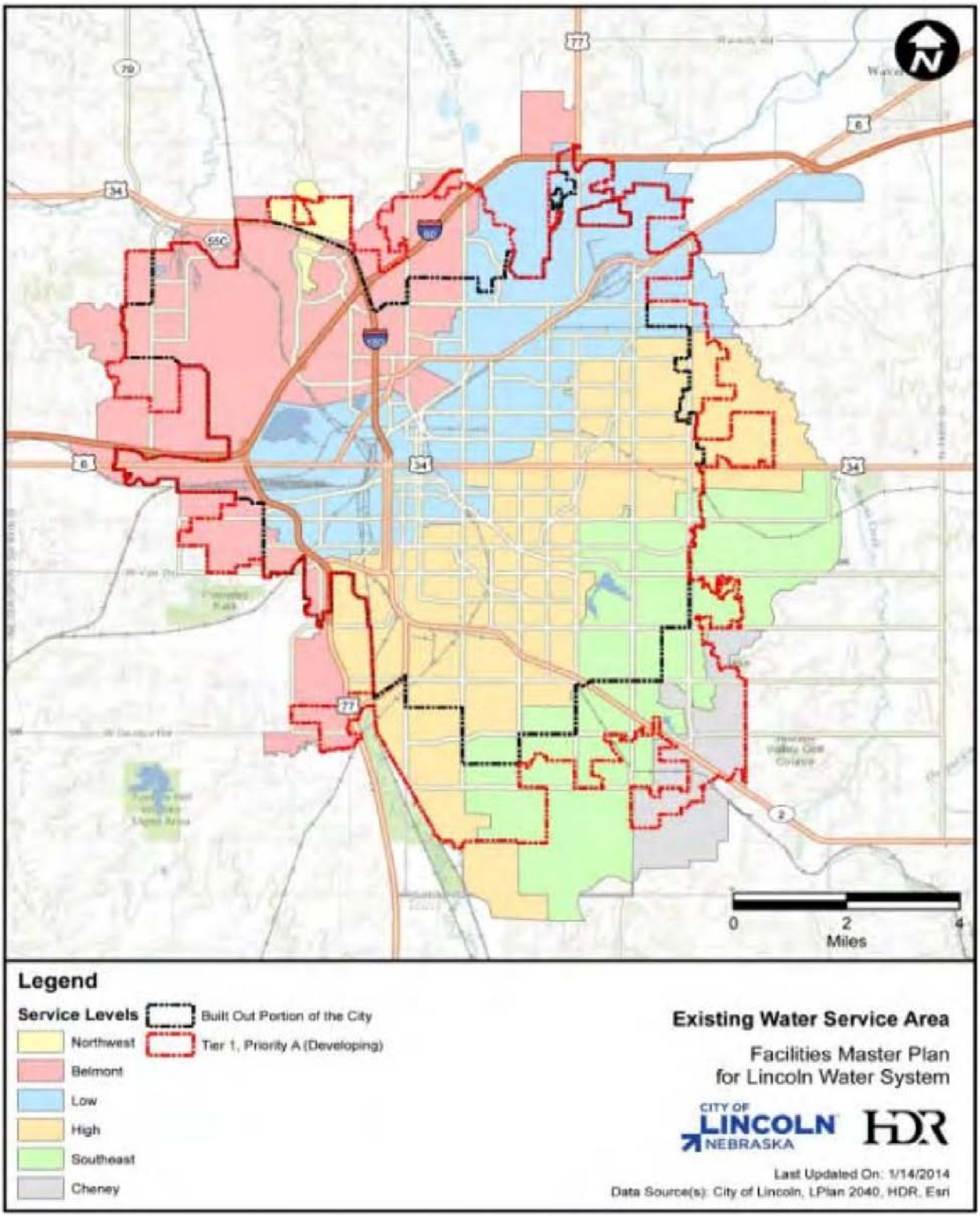
Highway Commercial (H-3)	
Lot Area (Minimum)	None
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	5’
Max Height	45’

Industrial (I-1)	
Lot Area (Minimum)	None
Avg Lot Width	None
Minimum Set Back	None
Side Set Back	5’
Max Height	75’

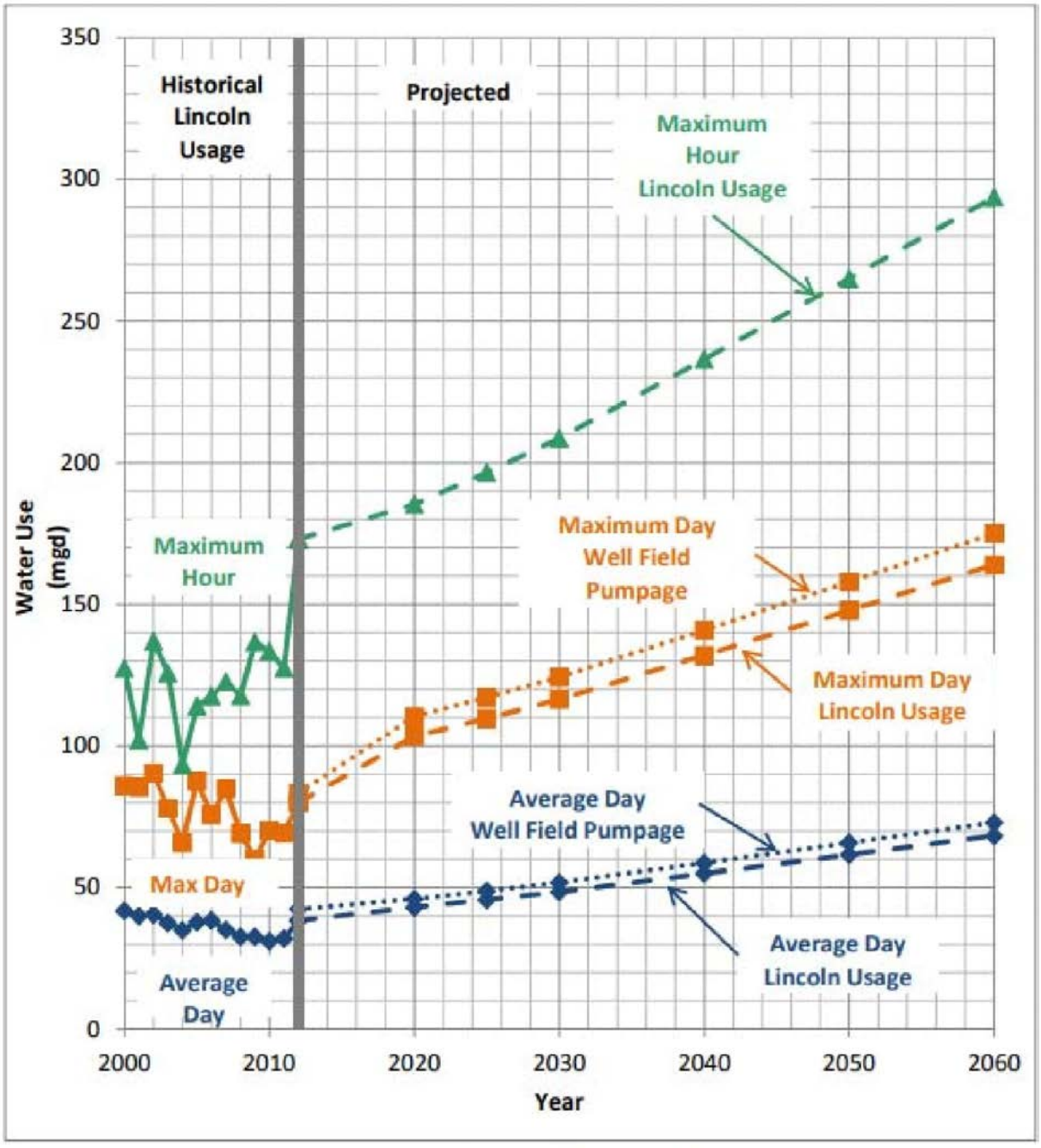
General Commercial (H-4)	
Lot Area (Minimum)	15,000
Avg Lot Width	None
Minimum Set Back	20’
Side Set Back	20’
Max Height	45’

Figure 2.11 Capitol View Construction Limitations

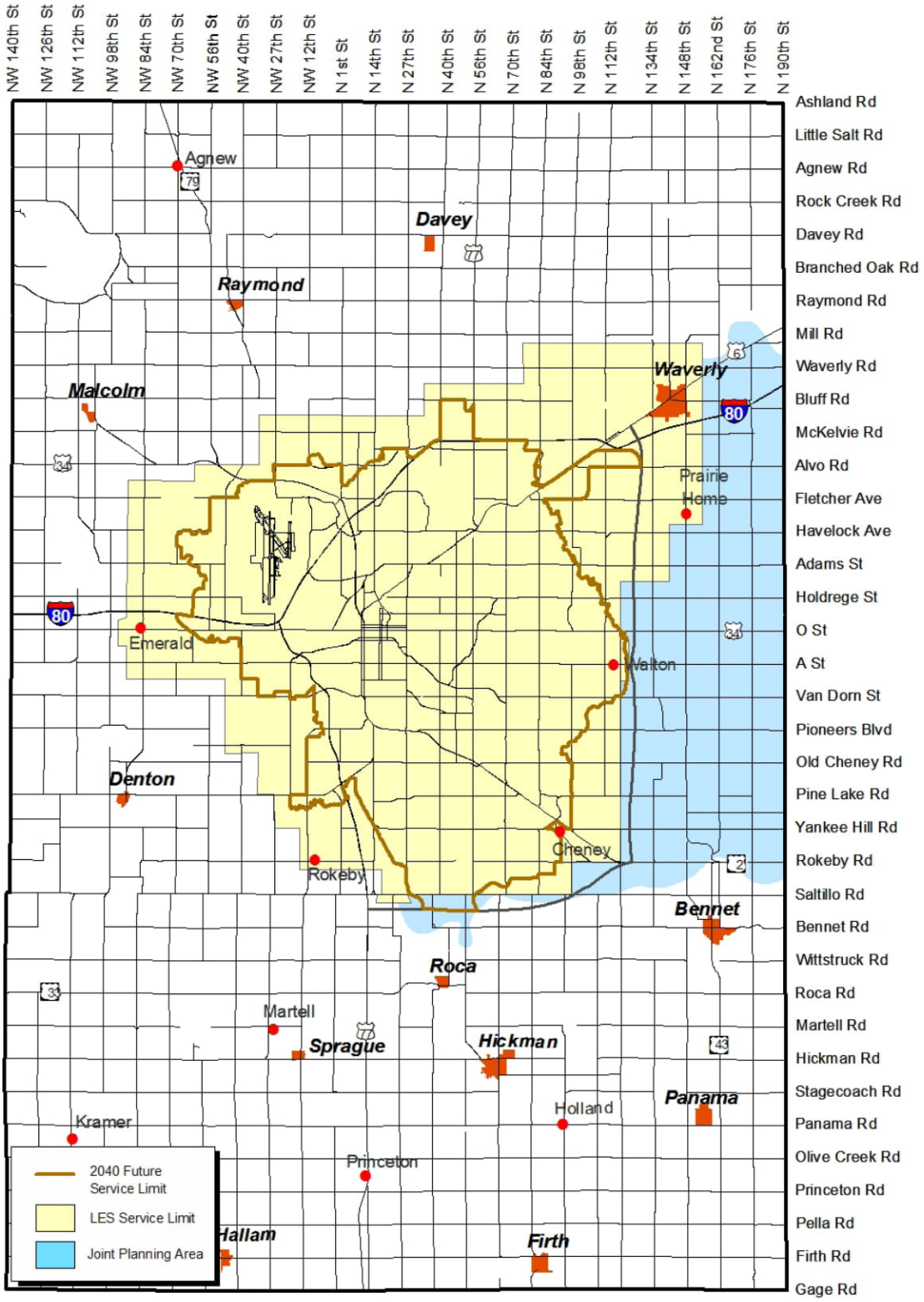
WATER PRESSURE ZONES



WELL FIELDS


Historical Lincoln Usage
Projected
Maximum Hour Lincoln Usage
Maximum Hour
Maximum Day Well Field Pumpage
Maximum Day Lincoln Usage
Average Day Well Field Pumpage
Max Day
Average Day
Average Day Lincoln Usage
Water Use (mgd)
Year
350
300
250
200
150
100
50
0
2000
2010
2020
2030
2040
2050
2060

LES AND NORRIS POWER SERVICE AREAS



NEIGHBORHOODS

40th & "A": An area from Randolph to South Streets/Normal Boulevard and from S. 33rd to S. 48th Streets.

Antelope Park: An area from "A" to South Streets and from S. 27th Street to generally west of Antelope Park.

Arnold Heights (Air Park): Located in far northwest Lincoln, this neighborhood, commonly known as Air Park, began as base housing for the adjacent Lincoln Air Force Base during the Cold War. The area originally consisted of 1,000 housing units and was annexed by Lincoln in 1966, after the base closed. All 1,000 units were originally managed by the Lincoln Housing Authority, but about half of the homes in the neighborhood have been sold to private owners. The area was also formerly known as both "Capehart Housing" when completed in 1960 (north housing) and the "Military Construction Area" when built during 1956 (south housing). Additional housing subdivisions were built in the area in the 1980s and 1990s. More recent additions include a mix of duplexes and single-family homes of various sizes, an IGA grocery store, and a strip mall. As of May 2009, the area is continually being developed.

Autumn Wood: Folkways to Fletcher. West of 27th.

Belmont: The Belmont neighborhood lies just north of Cornhusker Highway and south of Superior Street between Interstate 180 and 14th Street.

Bethany: Bethany is located along Cotner Boulevard and Holdrege Street. Originally laid out as a separate village by the Disciples of Christ, Bethany was incorporated as Bethany Heights in 1890 and annexed by Lincoln in 1922.

Capitol Beach: This area is north of West O Street, just west of Downtown, and north of BNSF Railway's Hobson Yard. It is home to Capitol Beach Lake and Lakeview Elementary School.

Capitol View: L to G, 13th to Capitol Parkway.

Clinton: Located north of 27th and O Streets, Clinton is the target of ongoing revitalization efforts by the City.

College View: College View is located along 48th Street and near Calvert Street, adjacent to and surrounding the Union College campus. Originally College View was a separate village. The area is anchored by Union College but has many buildings resembling those of a small town. This business area serves the college and surrounding neighborhood. It has an eclectic mix of mostly local businesses.

Colonial Hills: An area from Pioneers Boulevard to Old Cheney Road/Nebraska Highway and from S. 56th to S. 70th Streets. Colonial Hills also includes the area at and west of the College View Cemetery from S. 56th to S. 70th Streets.

Cripple Creek (Cripple Creek North): This neighborhood is located north of Pine Lake Road.

Country Club: An area from South Street to Nebraska Highway; generally, east of S. 20th/S. 22nd Streets and west of the Rock Island Bicycle Trail. This neighborhood includes Sheridan Boulevard in south-central Lincoln. North of Calvert/High Streets, the Sheridan Boulevard area was the first addition to Lincoln that stepped away from the "grid pattern" into the winding side streets that characterize most modern residential

areas. This area is listed under the National Registrar of Historic Places as the "Boulevards" district.

Downtown: Lincoln's business district has a mix of offices, bars, restaurants and retail.

East Campus: Located just south of the University of Nebraska's East Campus, from Holdrege to Vine and from 33rd to 48th Street, this neighborhood includes a historic district, commonly referred to as "Professors Row", and McAdams Park, which borders the Mo-Pac Bicycle Trail.

Eastridge: Developed during the city's eastward expansion and development of the Gateway Mall as the nucleus of Lincoln's retail as the department stores were closing downtown and opening there. It contains mostly single-level, ranch-style homes with build on garages.

Everett: Bound by H Street on the north, South on the South, 9th on the West, and 13th on the East.

Fallbrook: Newer, developing community, located east of the airport and north of I-80; includes office parks, housing, a gym, middle school, supermarket, and a town center. Fallbrook hosts farmers markets during seasonal months.

Family Acres: 56th to 84th. Yankee Hill to Old Cheney. Also includes Old Cheney to Pioneers from 70th to 84th. It excludes a section West of 84 near Highway 2.

Far South: Bounded by the Rock Island Bicycle Trail on the north, Mocking Bird Lane N. on the south, Densmore Park-east to S. 27th Street.

Far Southeast: One of Lincoln's newest neighborhoods, this sprawling area has developed rapidly in the late 2000s and early 2010s, extending from 84th St to the west, 98th St to the east, Pioneers Blvd to the north and Pine Lake Rd to the south.

Fox Hollow: Located in southeast Lincoln, from 70th to 84th Streets between Van Dorn Street and Pioneers Boulevard. Fox Hollow is a planned subdivision and was constructed during the 1970s to present.

Greater South: South St to Highway 2 and 33rd to 40th.

Hartley: One of Lincoln's earliest suburbs, Hartley is located east of the downtown proper, east of 27th Street and north of O Street. It is a mainly residential neighborhood of houses built 1890–1940.

Havelock: Havelock is located along Havelock Avenue, east of 56th Street in northeast Lincoln; originally a separate town. It has many shops and restaurants and its own farmers market on Tuesday afternoons.

Hawley: Located directly east of UNL's downtown campus, the Hawley Historic District was largely built in the early 20th century.

Haymarket: One of Lincoln's oldest neighborhoods, the Haymarket is a historic warehouse and industrial district. In recent decades, it has become a dining, specialty shopping, and urban living district.

High Ridge/Cushman: South and west of West O and SW 40th.

Highlands: The Highlands is a newer residential neighborhood in northwest Lincoln, located north of I-80 and near Lincoln Airport.

Hitching Post Hills: West Lincoln.

Huskerville: A now non-existent neighborhood built north of Arnold Heights. Constructed during World War II, Huskerville was once the Lincoln Army Air Field hospital area from 1942 until 1945. After the war, the area was converted into college housing and was most noted for a polio outbreak in 1952. The area was either removed or demolished in the late 1960s. The chapel, listed in the National Register of Historic Places, is all that remains of Huskerville.

Indian Village: The Indian Village neighborhood is located from Van Dorn Street on the north to Highway 2 on the south, from 9th Street on the west to 20th Street on the east.

Irvingdale: The Irvingdale neighborhood is located from South Street on the North, and Van Dorn on the South, from 9th Street from the west to 22nd Street on the east. The neighborhood has a mix of homes built in the early 1900s to more modern homes built in the 1950s, and is home to Irving Middle School, and the Stransky Park concert series.

Landon's: Fairfield north to Superior and 27th west to between 21st and 20th.

Malone: An area bounded by the old Missouri Pacific Railroad line on the north, "O" Street on the south and from N. 19th to N. 27th Streets.

Meadowlane: 66th to 84th from O Street to Vine Street and 70th to 84th from Vine Street to Holdrege Street.

Near South: Located from G Street on the north to South Street on the south, and from 13th Street from the west to 27th on the east. The neighborhood is home to many of Lincoln's grand historic homes and is currently experiencing a revitalization effort by the neighborhood association and city officials. Many homeowners are reconverting properties that were once divided into apartments back into single-family homes. The area is spotted with various homes of significant historical and architectural value.

Pester Ridge: Near South 33rd and West Denton Road. Population of 6 in 2010.

Piedmont: An area to the west of Eastridge. Bounded by S 48th to the west, S 56th to the east, A St to the south and Randolph St to the north. Includes a shopping center, drug store, automotive center, hair salon, middle school, church, park, and homes of various sizes.

Porter Ridge: An area bounded by Pine Lake Road on the north, at about Whitlock Road-west on the south and from S. 27th to S. 32nd Streets.

Riley: An area from Holdrege to "O" Streets and from N. 48th to N. 66th Streets.

Russian Bottoms: An area which encompasses both the North Bottoms and South Bottoms, originally settled by Germans from Russia.

North Bottoms: Directly north of UNL's downtown campus, the North Bottoms is an area in the floodplain of Salt Creek that holds many smaller houses now rented by a large number of UNL students. It is the northern part of an area originally settled by thousands of Volga-German immigrants from Russia.]

South Bottoms: An area south of the Haymarket stretching to approximately 'A' St. The southern part of an area originally settled by thousands of Volga-German immigrants from Russia.

Salt Valley View: An area from just north of Starview Lane to Old Cheney Road and from the BNSF Railway to N. 14th Street/Warlick Boulevard.

South 48th: A narrow band from O to Highway 2 from about 46th to 50th.

South Salt Creek: From O to Van Dorn and Salt Creek to 9th.

Southern Hills: Just north of South Pointe Mall.

Sunset Acres: From 27th street to 48th street and Superior Street to Highway 6.

Taylor Park: An area generally located around Taylor Park in east-central Lincoln. Bounded by O St to the north, A St to the south, 48th St to the west and 70th St to the east.

University Place: University Place is located along 48th Street between Leighton Avenue and Adams Street, near Nebraska Wesleyan University and UNL's East Campus. It was an incorporated community before its annexation by Lincoln in 1926. The area has its own historic shopping district and is characterized by homes with wrap around porches near the University's Old Main.

West "A": The West "A" neighborhood is from West "O" to W. Van Dorn Streets and from Salt Creek on the east to SW 27th Street on the west. West "A" also includes the area from W. "A" to W. South Streets and from SW 40th to SW 27th Streets.

West Lincoln: Located along W Cornhusker Hwy, the area was founded in 1887 and was an incorporated community before its annexation by Lincoln in 1966.

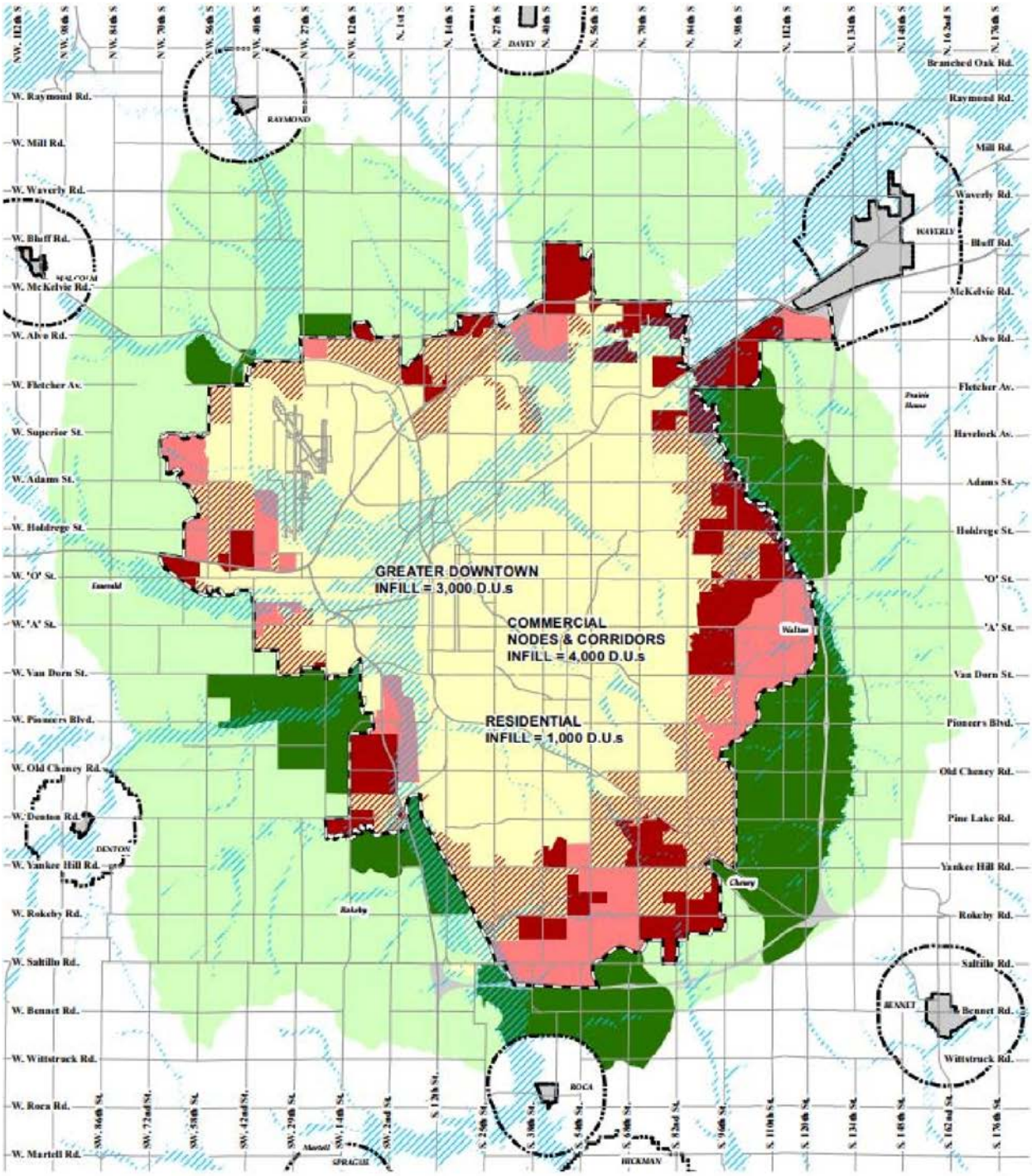
Wilderness Ridge: Located south of Pine Lake Rd and extending from 14th St to 27th, a newer neighborhood with many styles of houses and apartment complexes.

Witherbee: An area from "O" to Randolph Street and from S. 33rd to S. 56th Streets.

Woods Park (Historic Bungalow District): An area bounded by "O" Street on the north, S. 33rd Street on the east; generally, north and east of Antelope Creek. It includes a number of bungalows built around the 1910s and 1920s. The Lincoln Children's Zoo (formerly Folsom Children's Zoo) & Botanical Gardens is located near this neighborhood.

Yankee Hill: Located south of Wilderness Ridge. Borders are West Van Dorn on the north, West Old Cheney on the south, Coddington on the west and South 1st on the east.

2040 LAND GROWTH



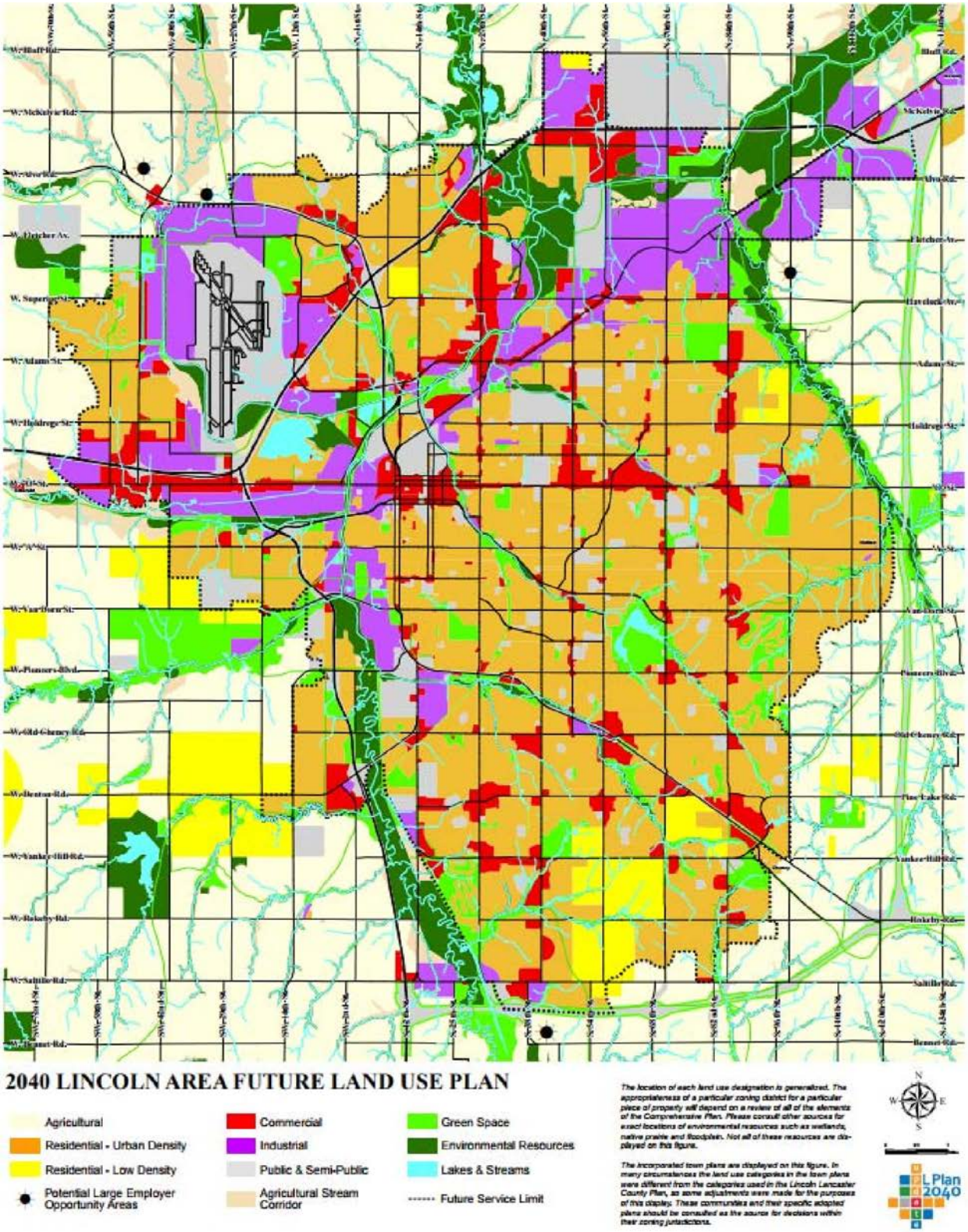
2040 PRIORITY GROWTH AREAS

Existing Lincoln City Limits and Approved Preliminary Plans (2016)
Floodplain and Flood Prone Areas
2040 Future Service Limit
Tier I, Priority A (Developing)
Tier I, Priority B (2025)
Tier I, Priority C (2040)
Tier II (2060)
Tier III

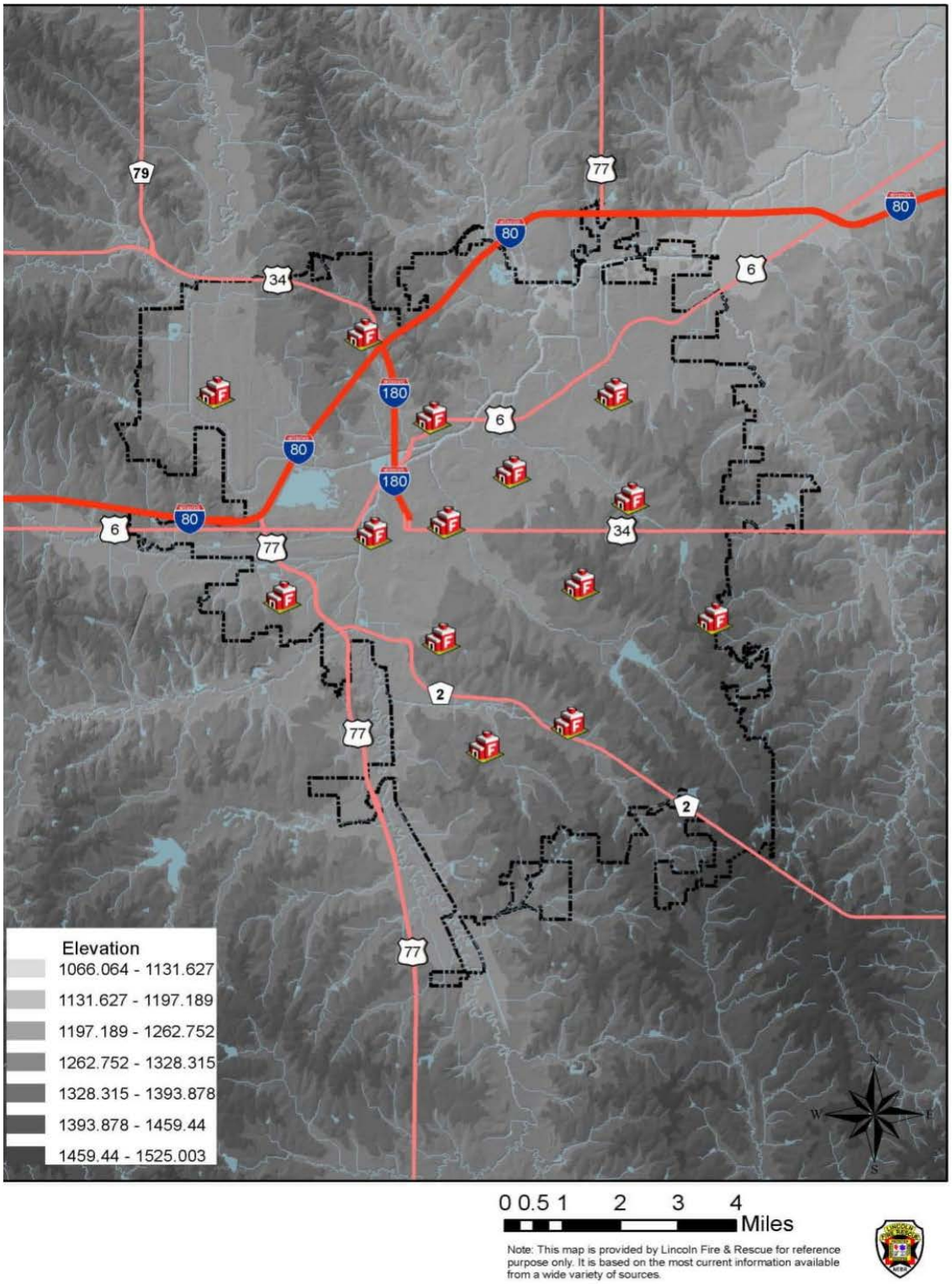
Miles 0 0.5 1 2

N W E S

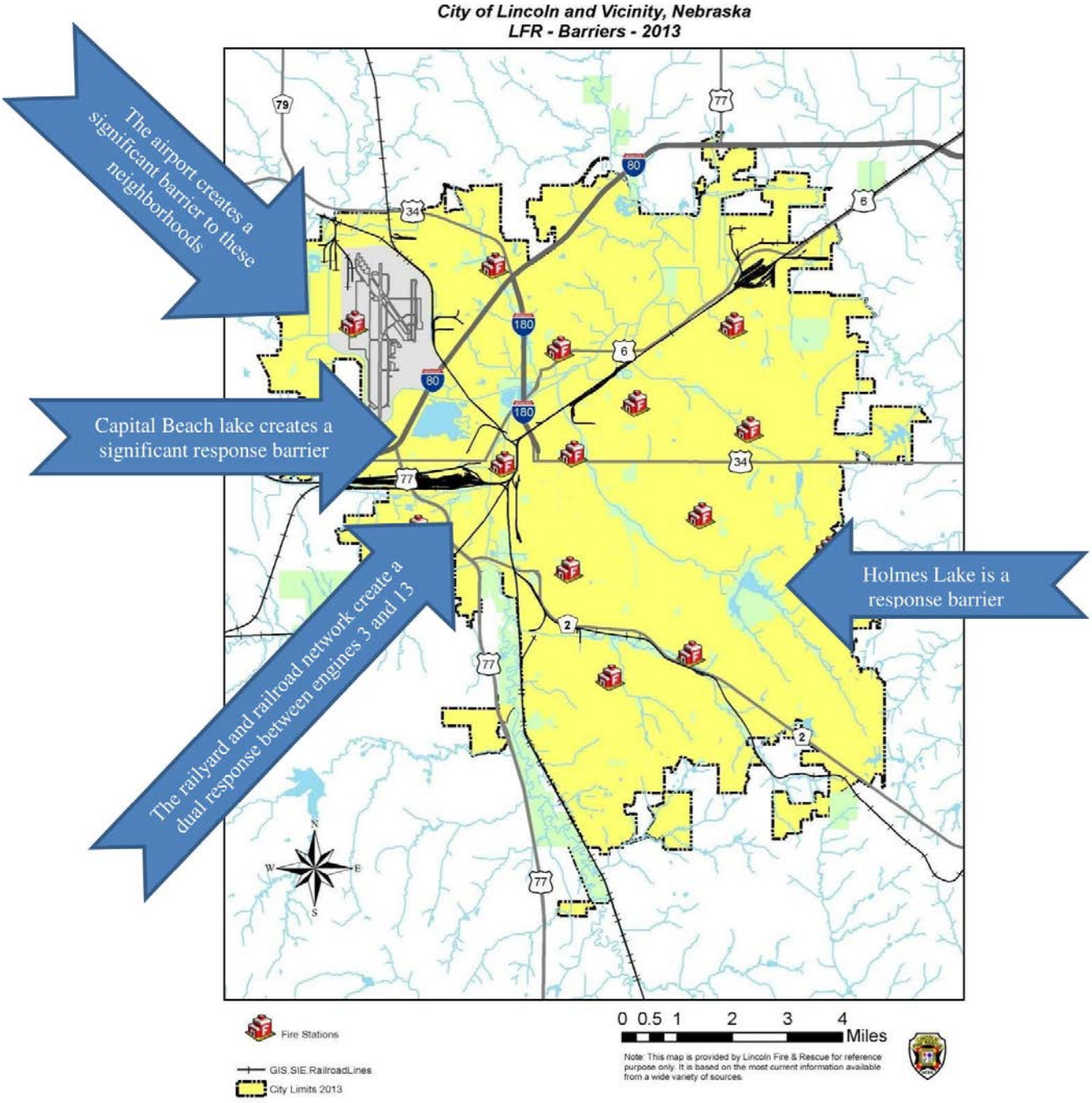
FUTURE LAND USE



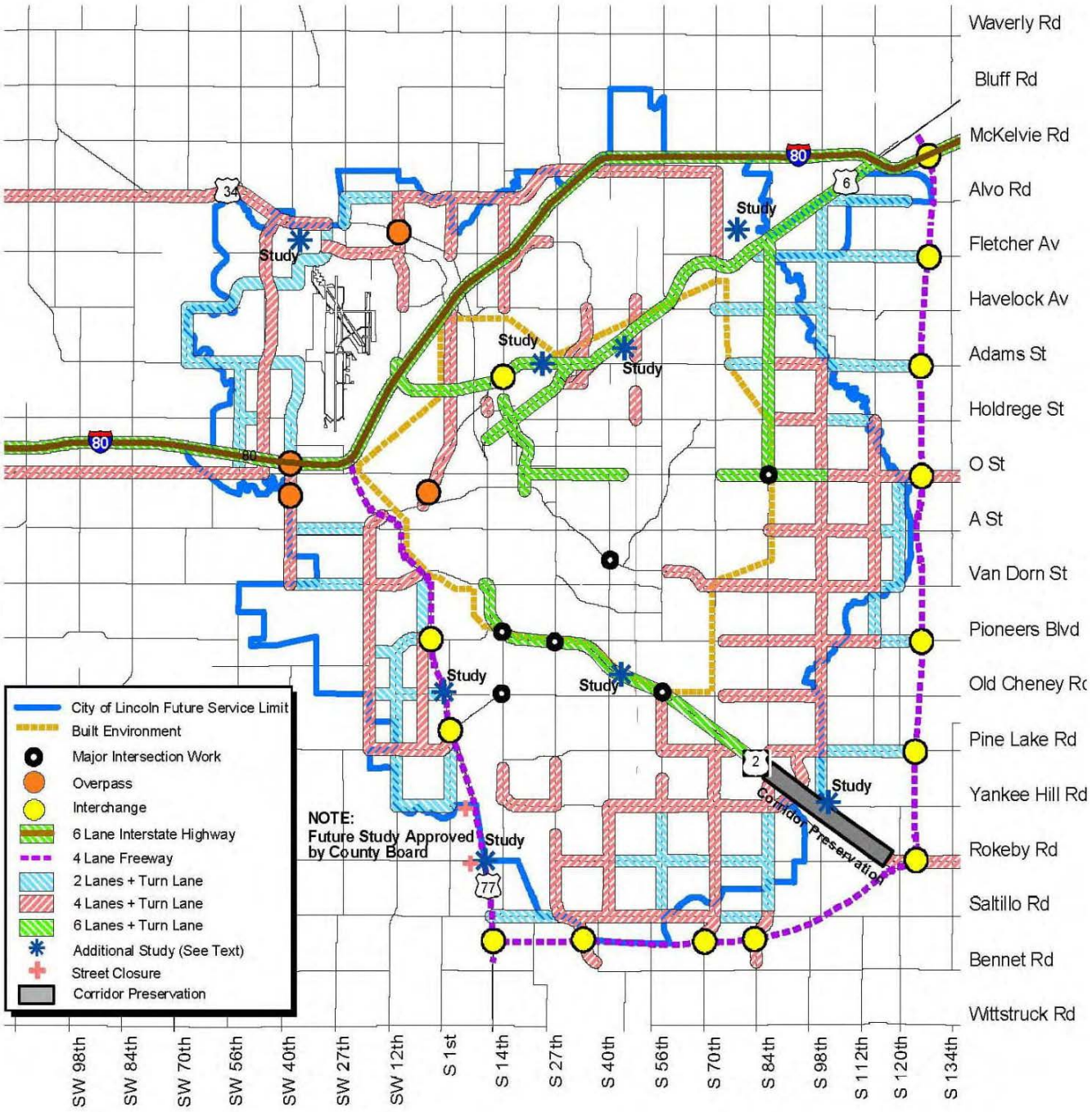
ELEVATION MAP



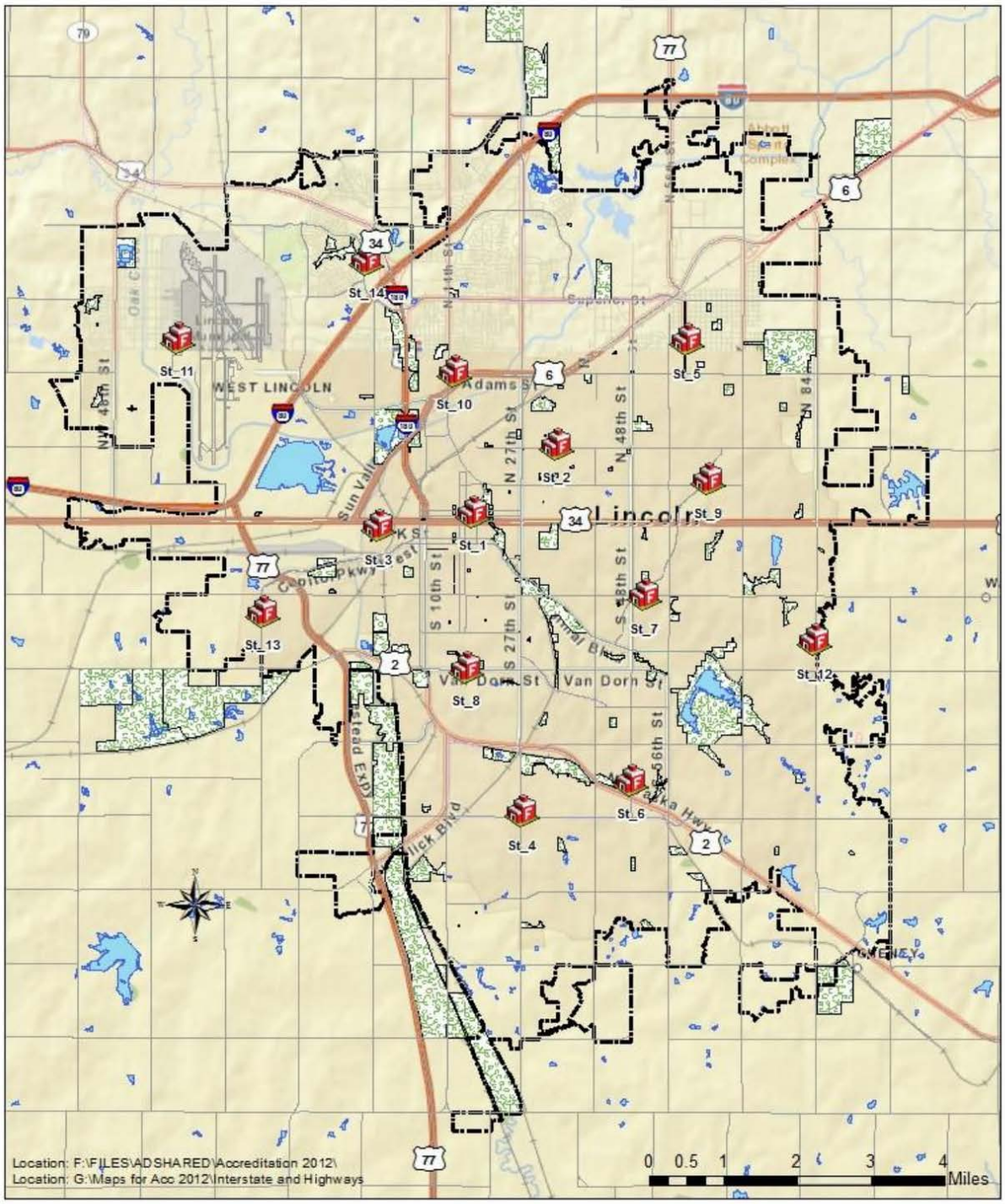
RESPONSE BARRIER MAP



FUTURE SERVICE LIMITS



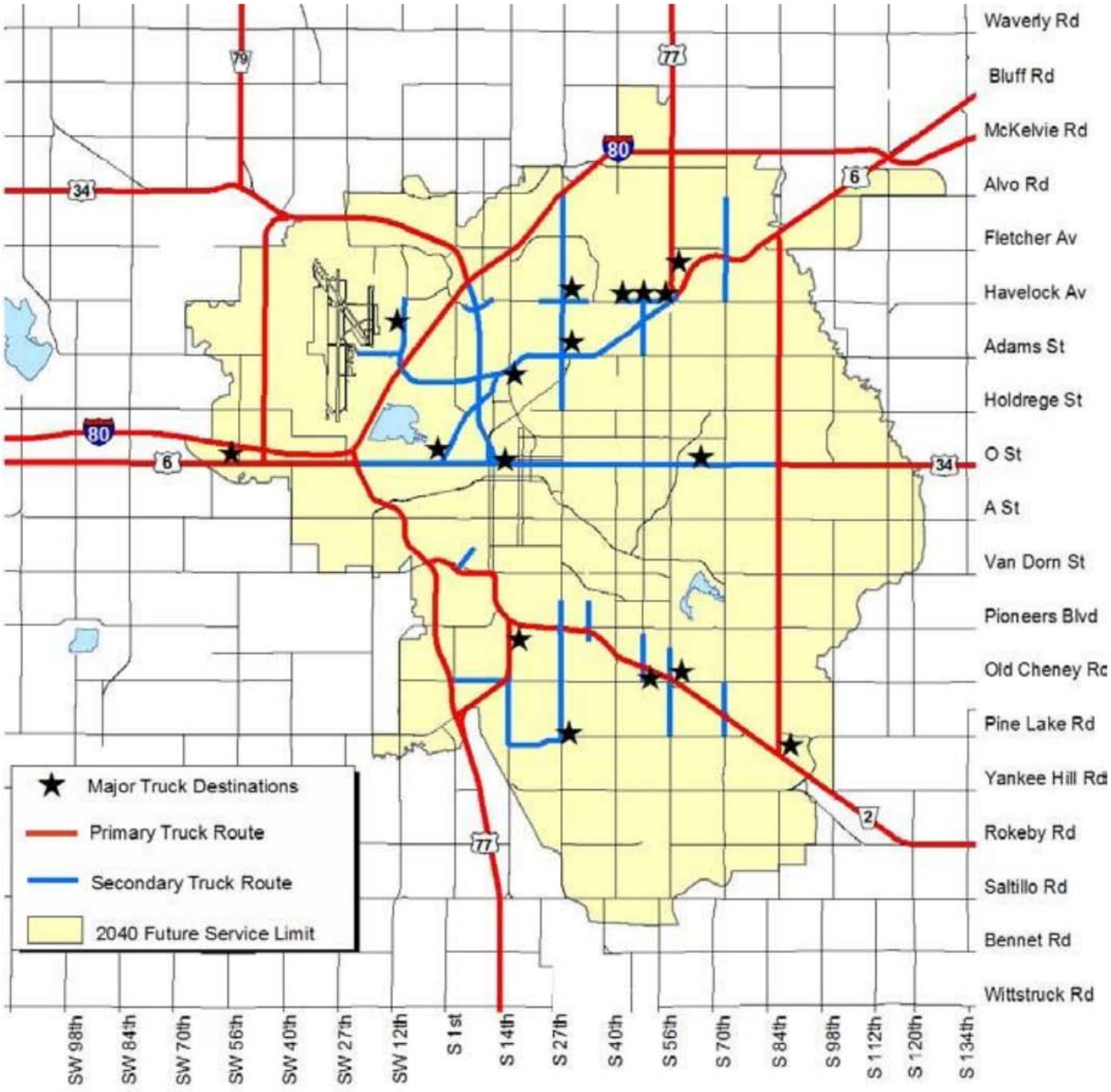
INTERSTATE AND HIGHWAY MAP



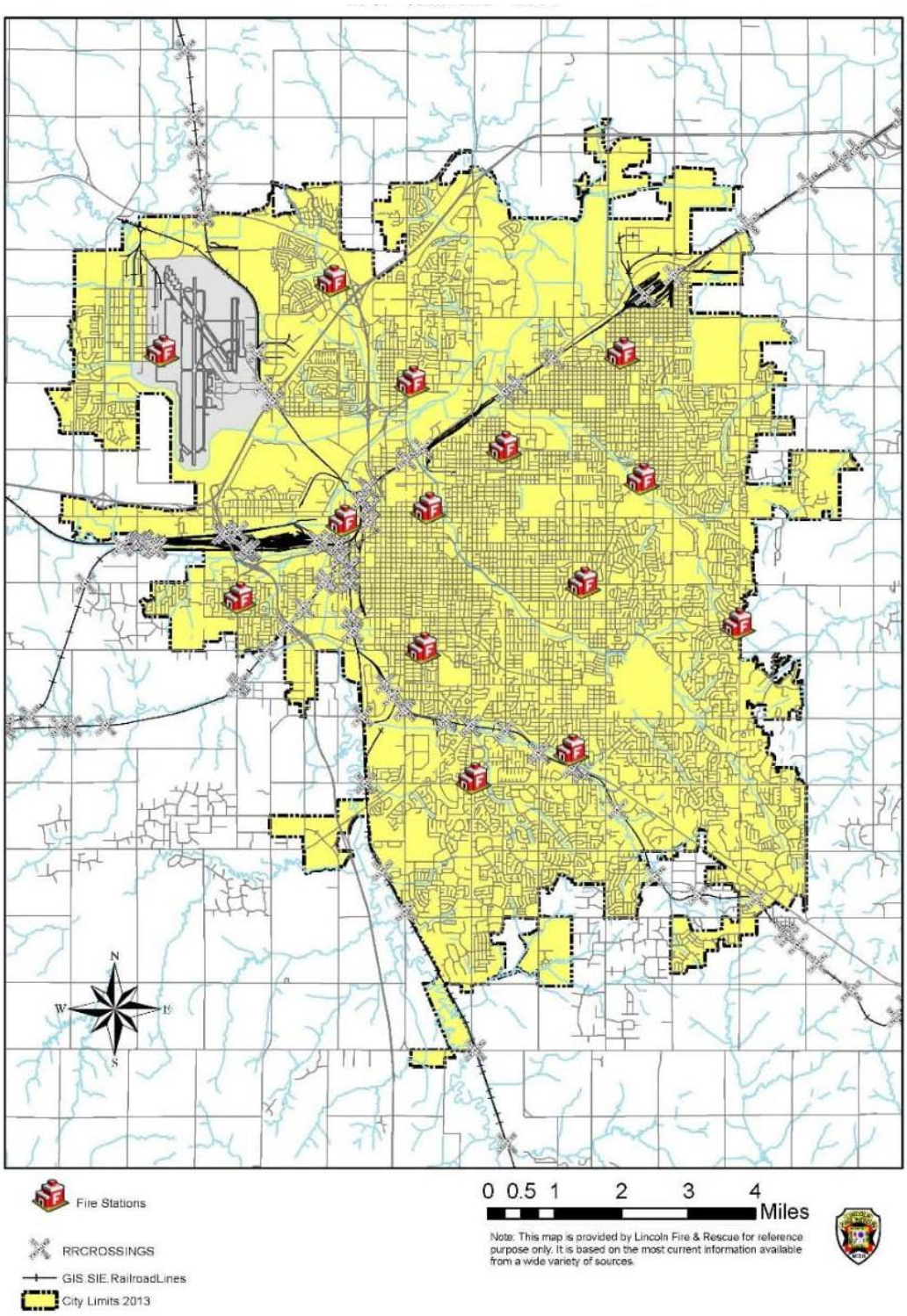
Interstates, US and State Highways
LINCOLN AND VICINITY
Lancaster County, Nebraska

Lincoln Fire & Rescue

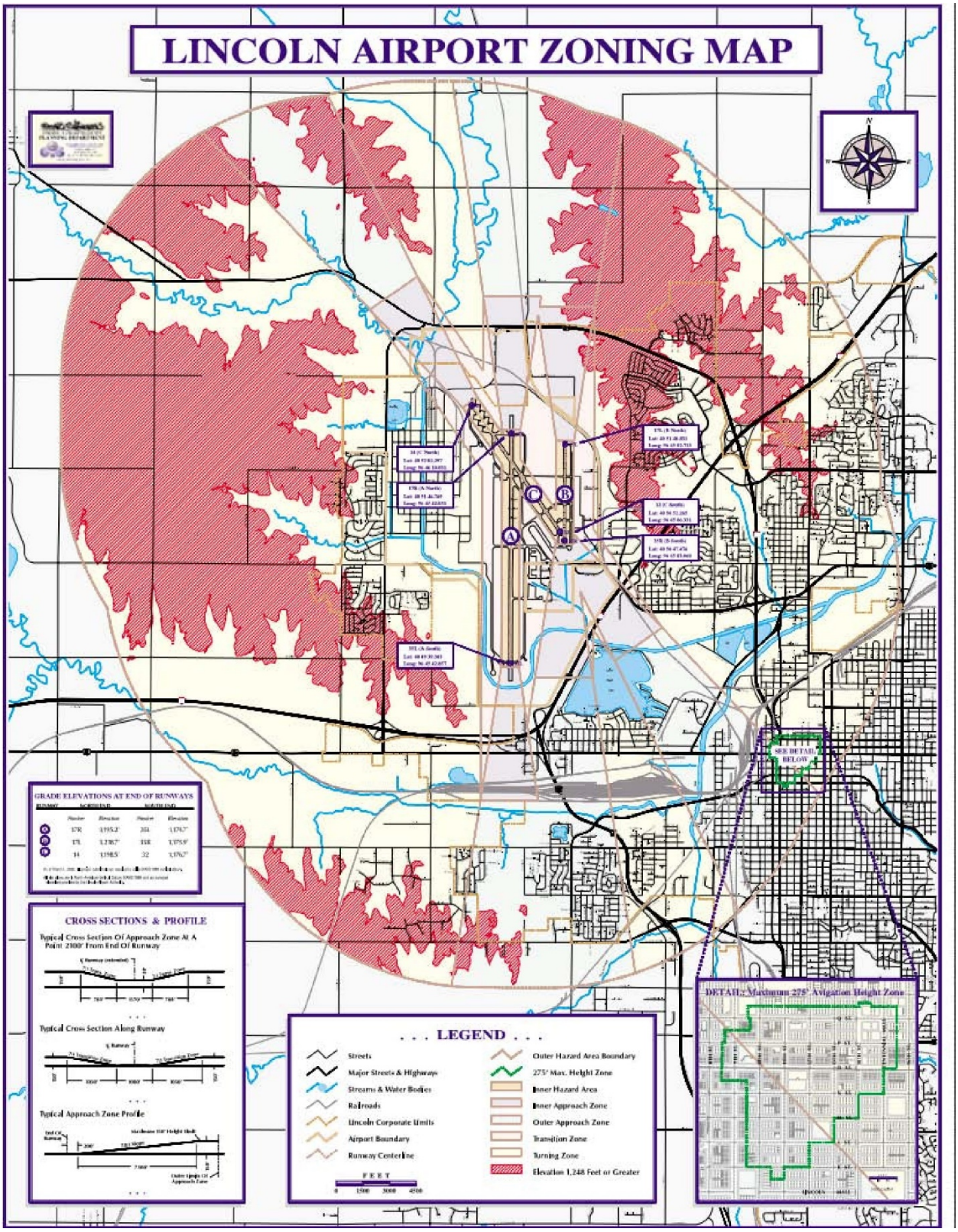
TRUCK ROUTES



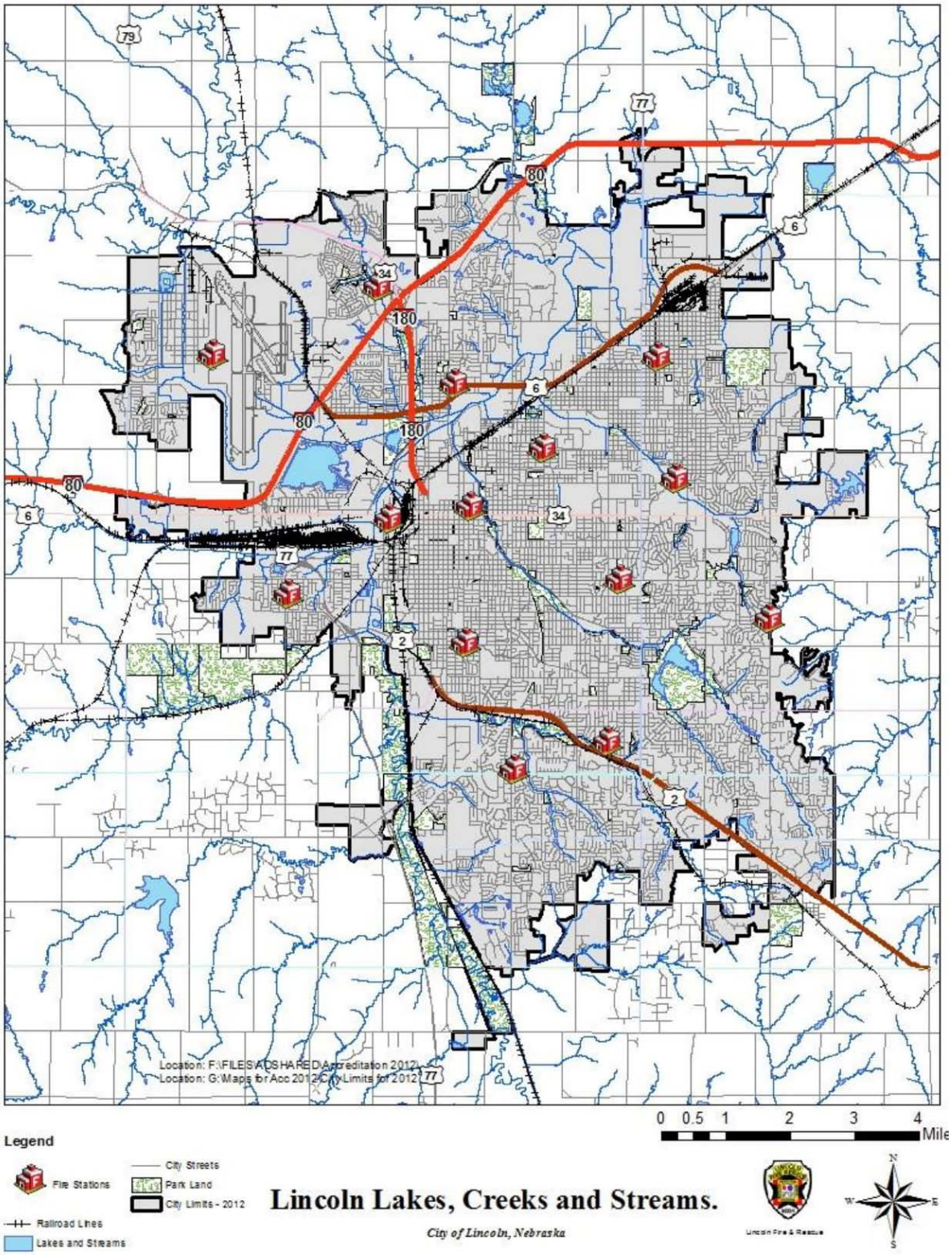
RAIL LINES


N
W
E
S
Fire Stations
RRCROSSINGS
GIS.SIE.RailroadLines
City Limits 2013
0 0.5 1 2 3 4
Miles
Note: This map is provided by Lincoln Fire & Rescue for reference purpose only. It is based on the most current information available from a wide variety of sources.

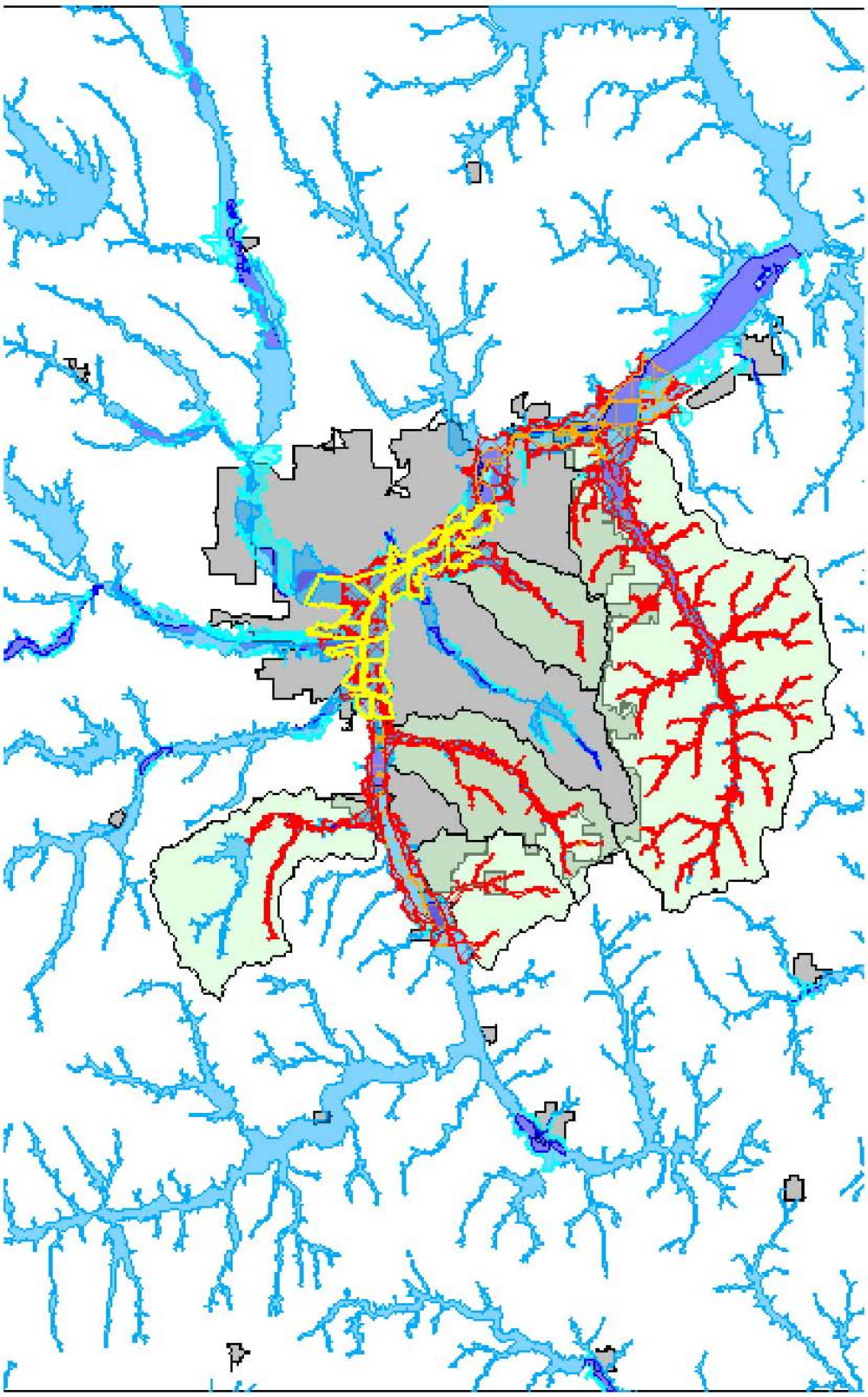
AIRPORT ZONING MAP



LAKES, STREAMS, AND CREEKS

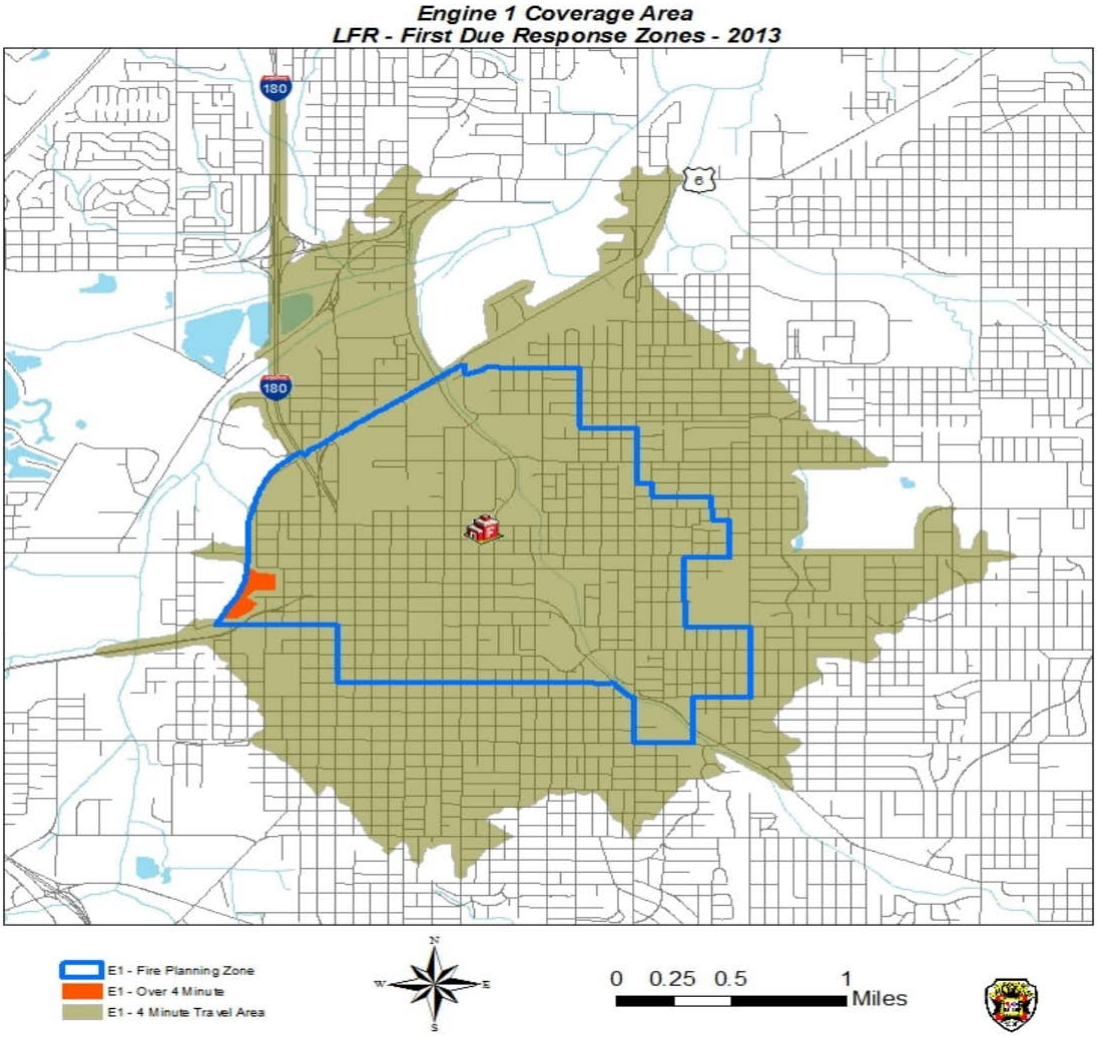


FLOODPLAIN MAP

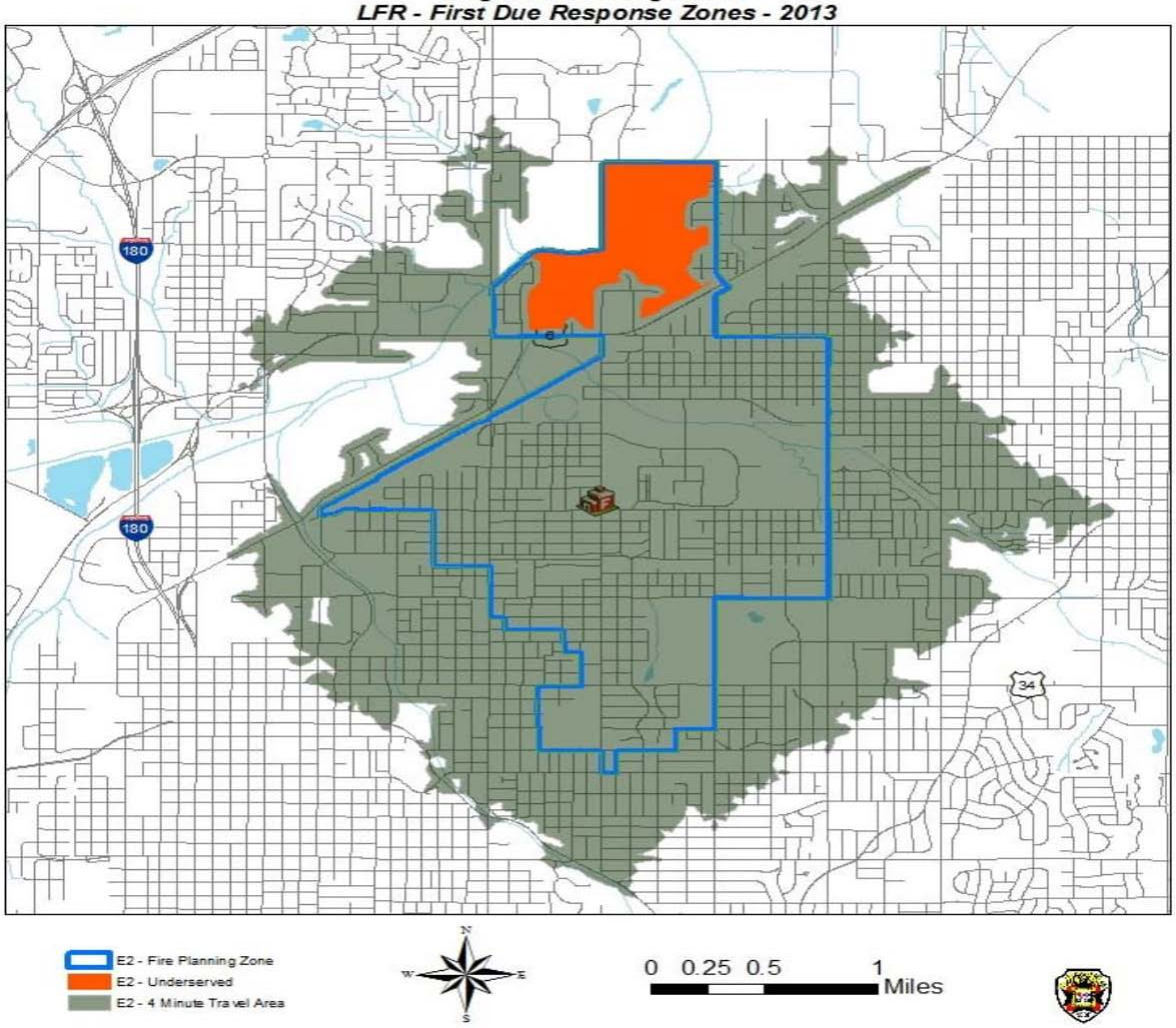


ANTELLOPE VALLEY

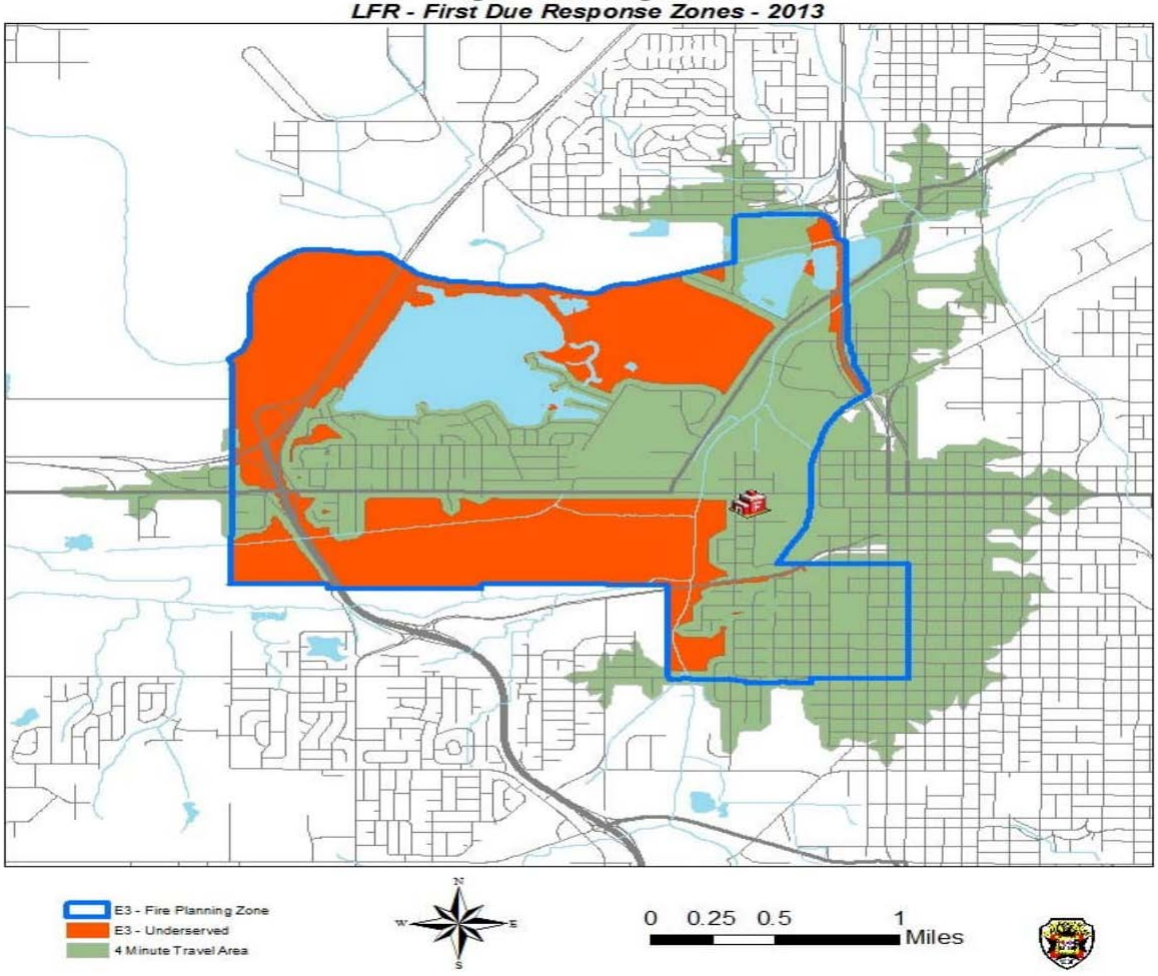
RESPONSE AREAS OUTSIDE 4 MINUTES



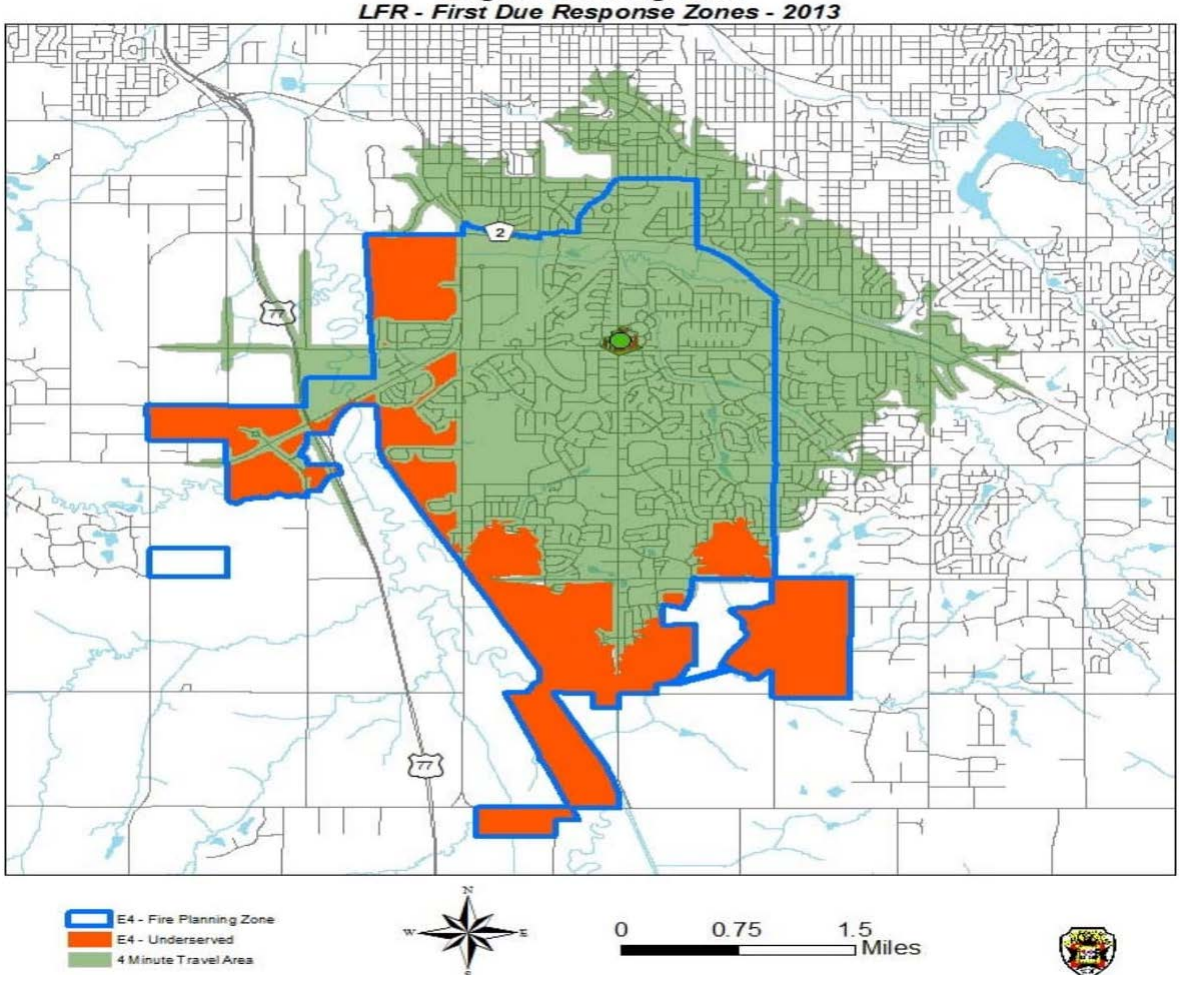
Engine 2 Coverage Area
LFR - First Due Response Zones - 2013

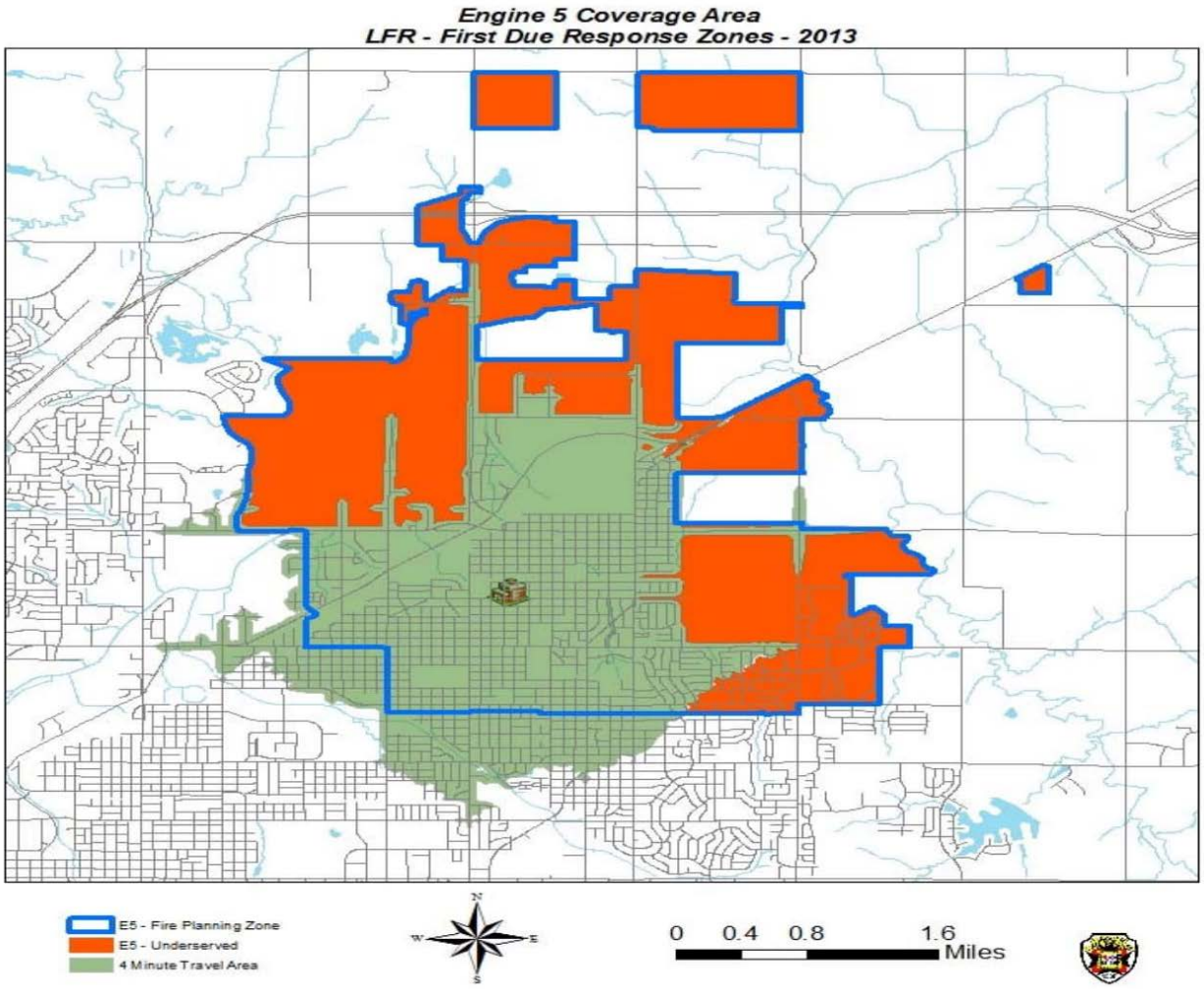


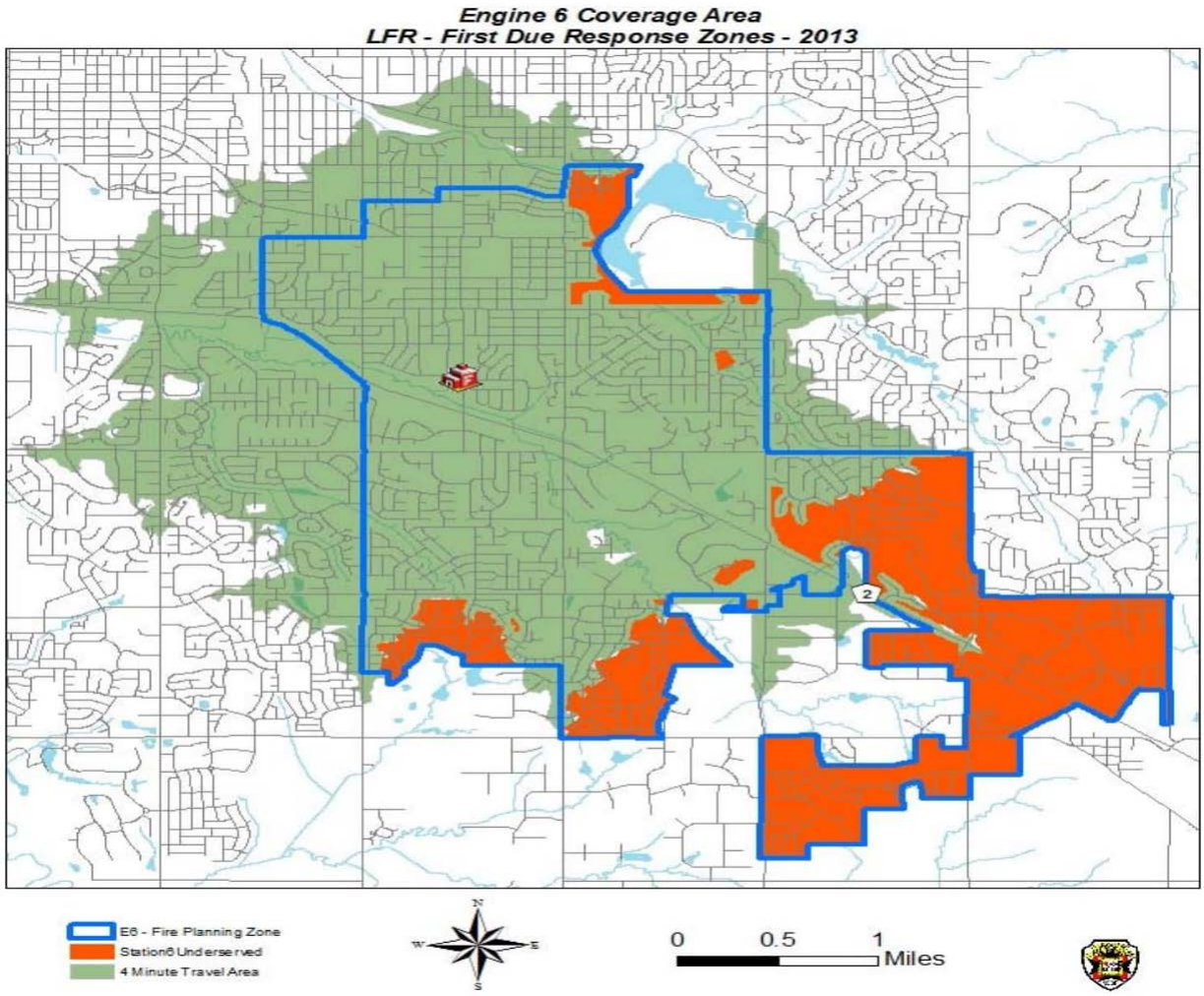
Engine 3 Coverage Area
LFR - First Due Response Zones - 2013



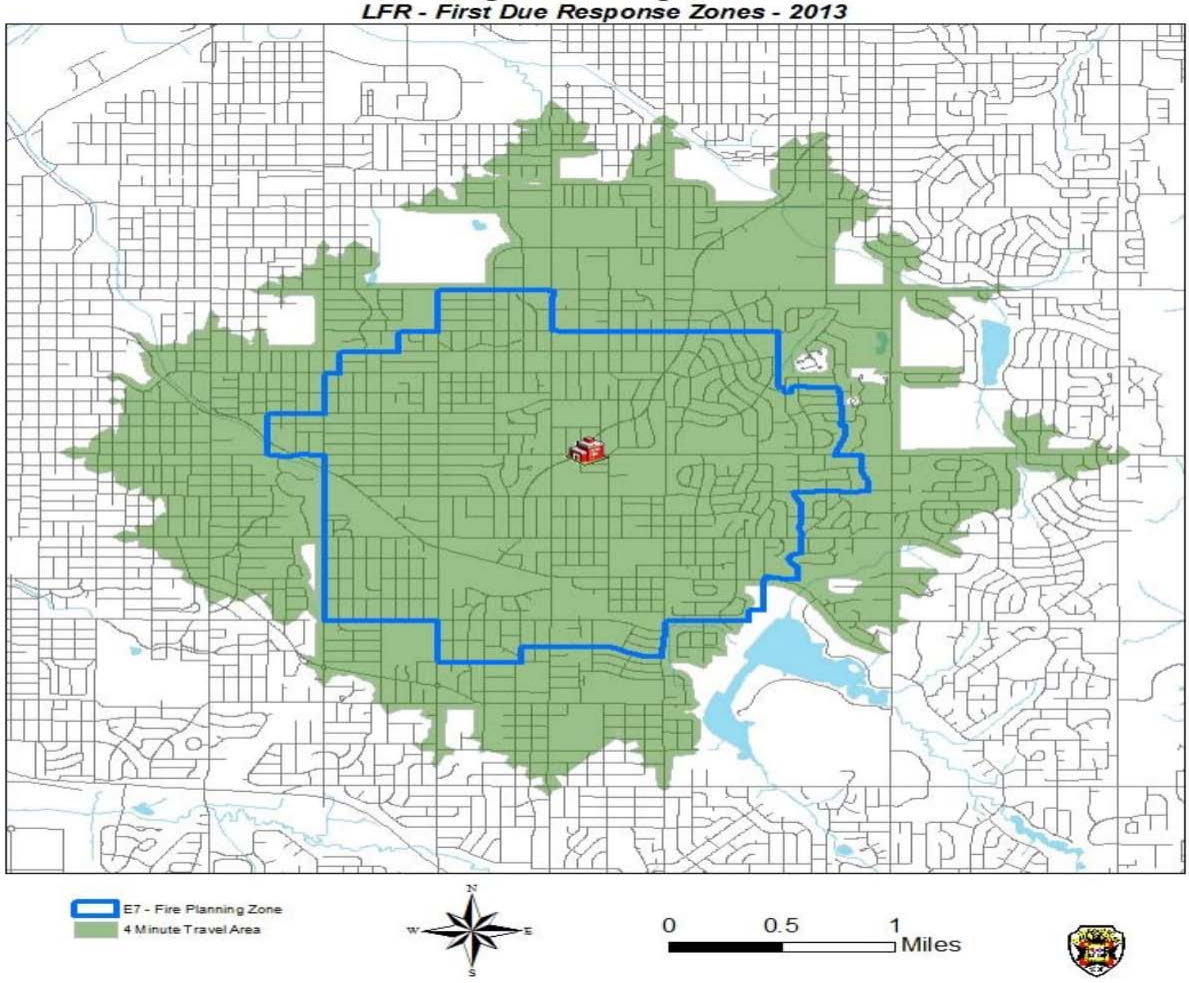
Engine 4 Coverage Area
LFR - First Due Response Zones - 2013



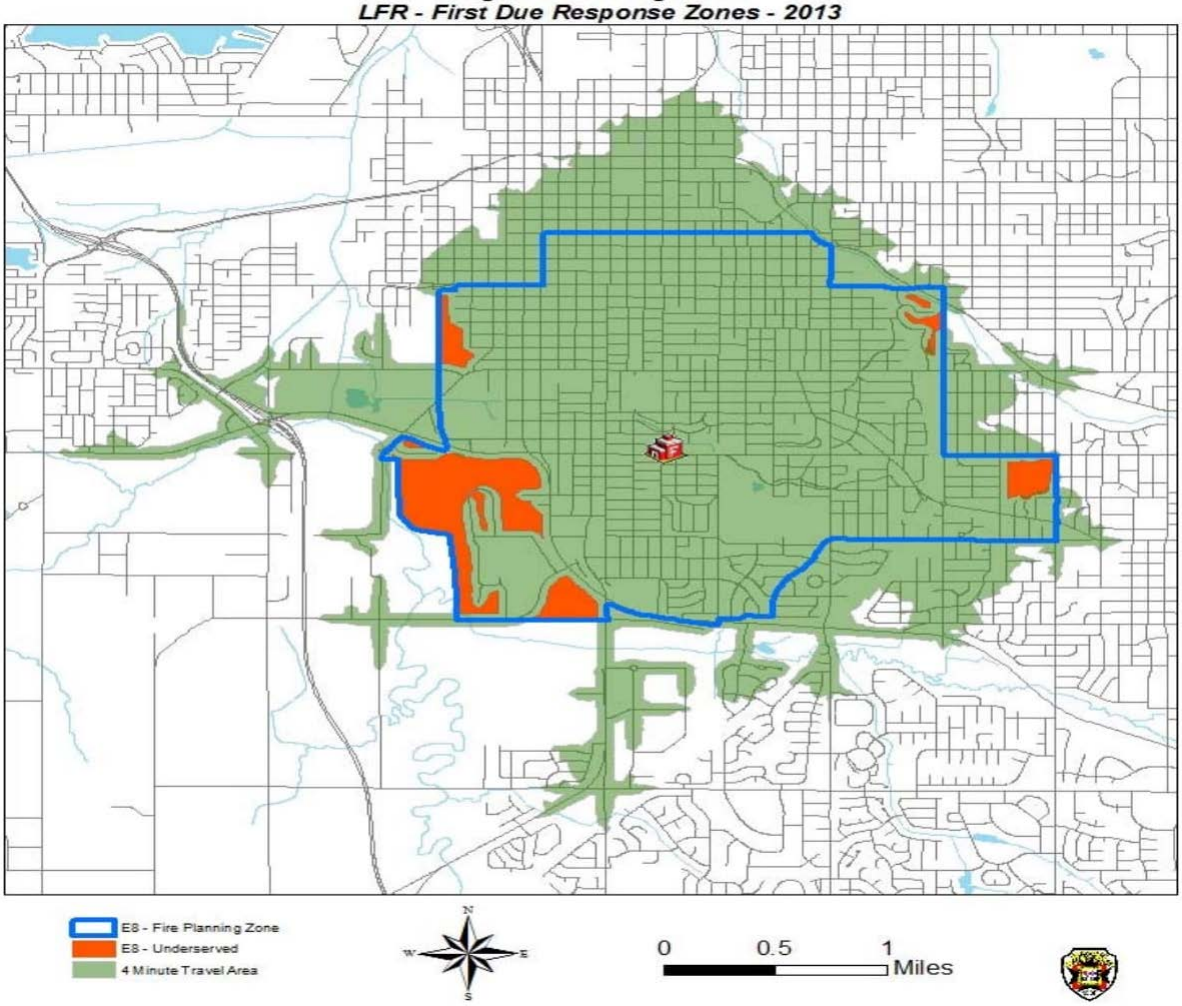

Engine 5 Coverage Area
LFR - First Due Response Zones - 2013
E5 - Fire Planning Zone
E5 - Underserved
4 Minute Travel Area
N
W
E
S
0 0.4 0.8 1.6
Miles

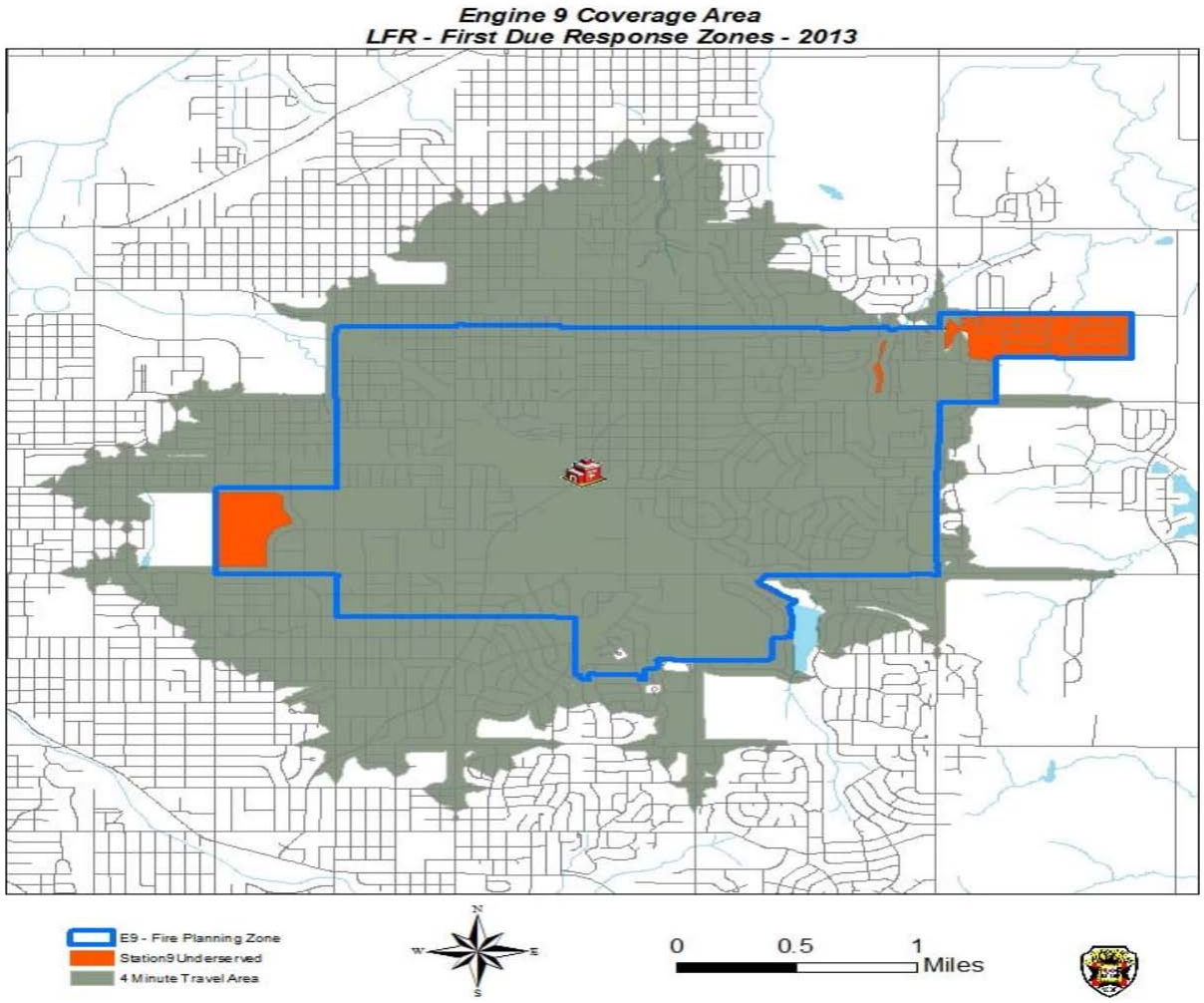

Engine 6 Coverage Area
LFR - First Due Response Zones - 2013
E6 - Fire Planning Zone
Station6 Underserved
4 Minute Travel Area
N
W
E
S
0
0.5
1
Miles

Engine 7 Coverage Area
LFR - First Due Response Zones - 2013

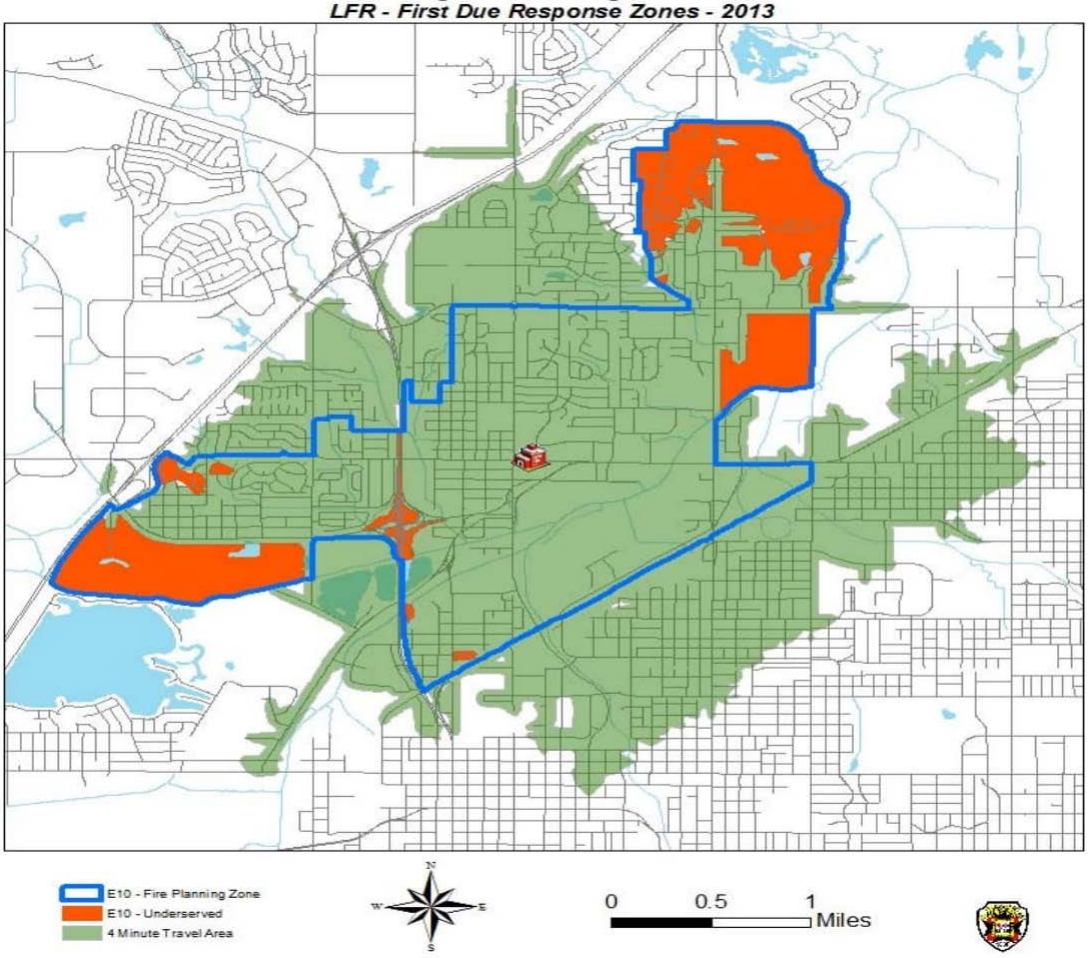


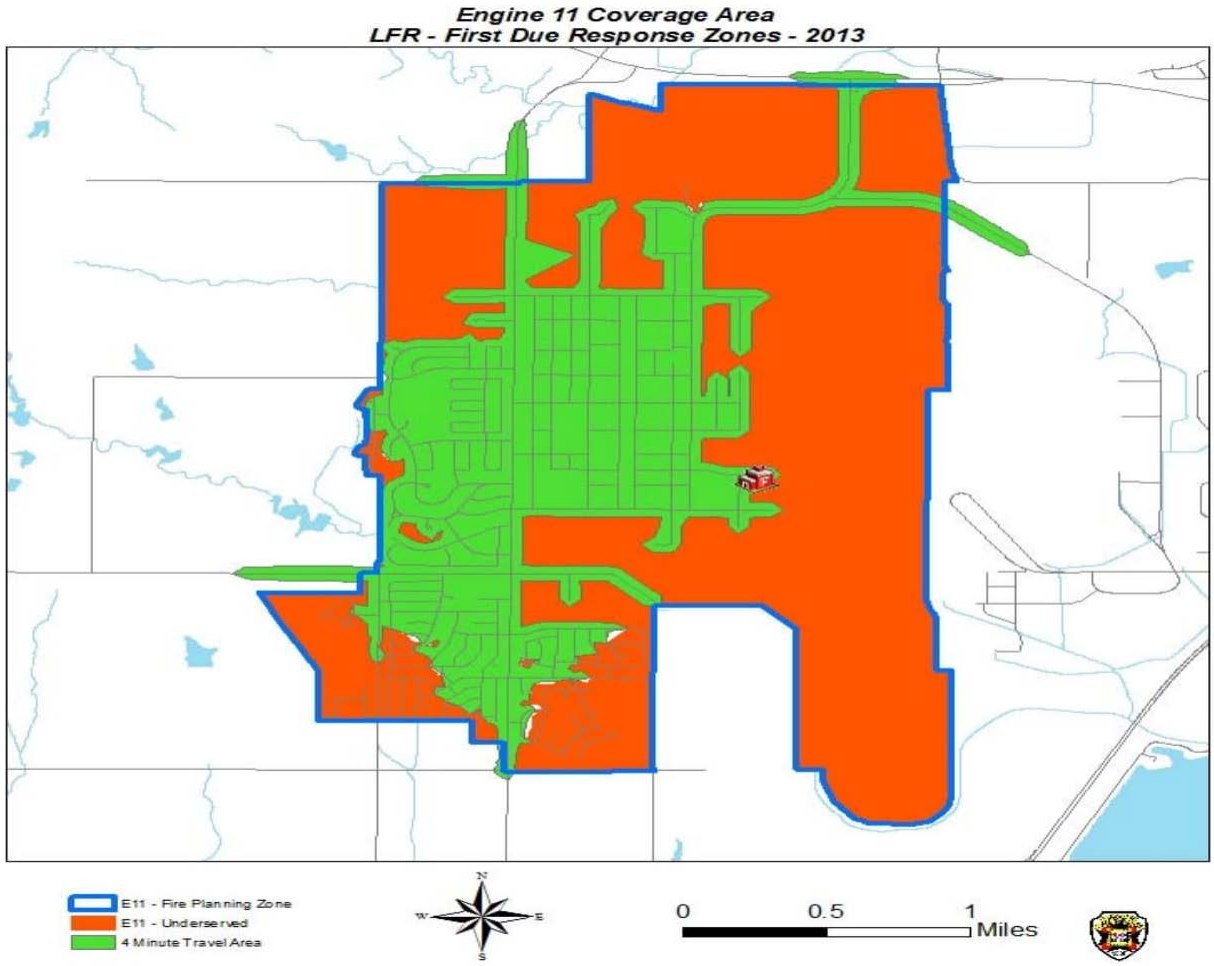
Engine 8 Coverage Area
LFR - First Due Response Zones - 2013

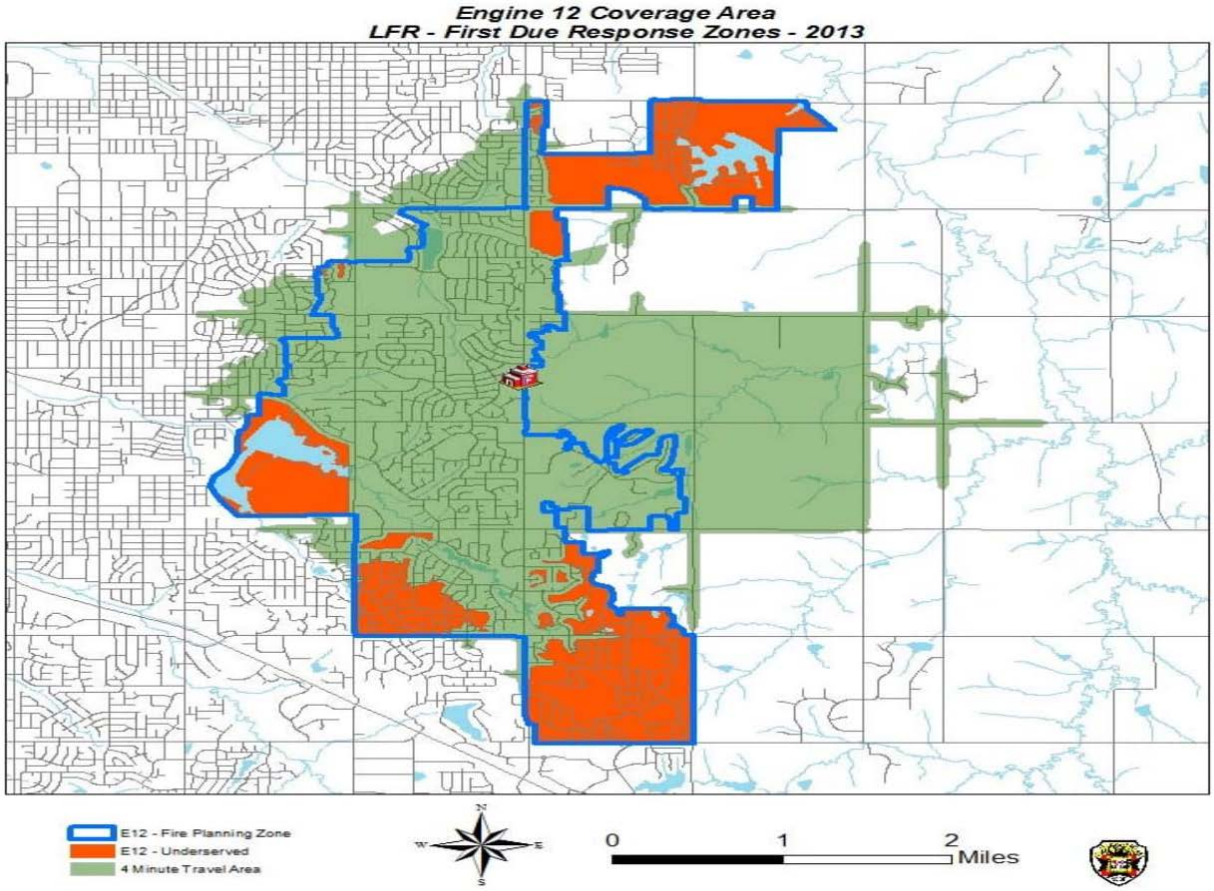



Engine 9 Coverage Area
LFR - First Due Response Zones - 2013
E9 - Fire Planning Zone
Station9Underserved
4 Minute Travel Area
N
W
E
S
0
0.5
1
Miles

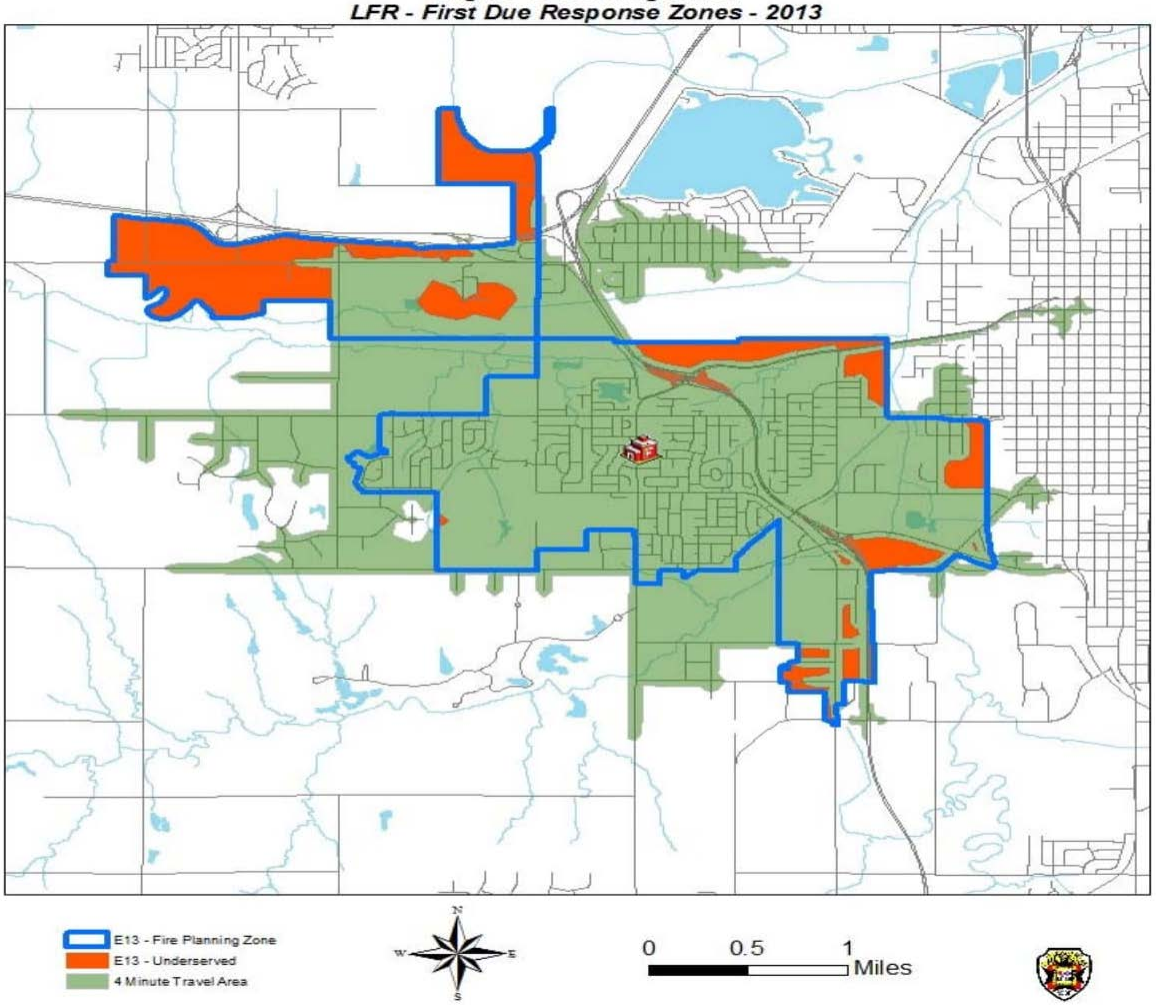
Engine 10 Coverage Area
LFR - First Due Response Zones - 2013



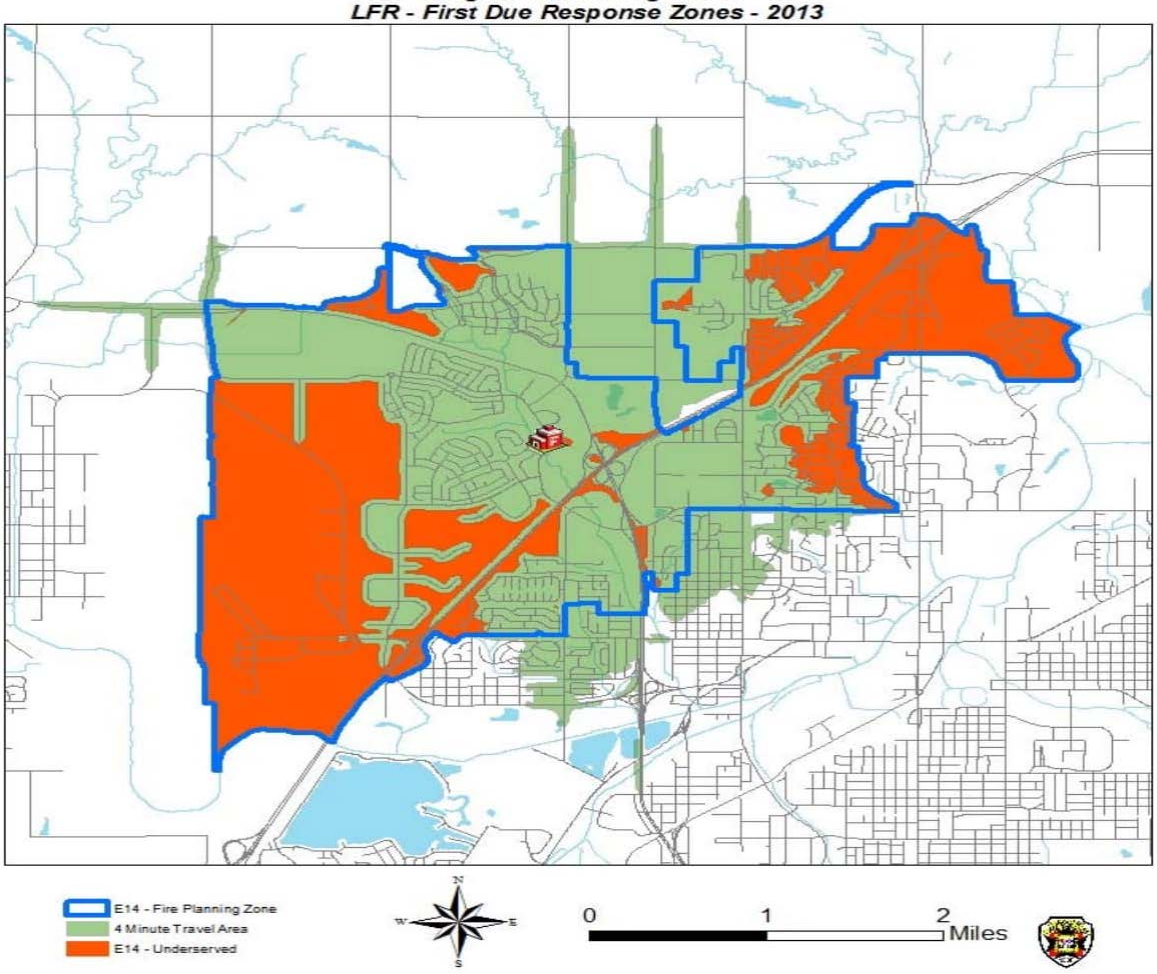

Engine 11 Coverage Area
LFR - First Due Response Zones - 2013
E11 - Fire Planning Zone
E11 - Underserved
4 Minute Travel Area
N
W
E
S
0
0.5
1
Miles


Engine 12 Coverage Area
LFR - First Due Response Zones - 2013
E12 - Fire Planning Zone
E12 - Underserved
4 Minute Travel Area
N
W
E
S
0
1
2
Miles

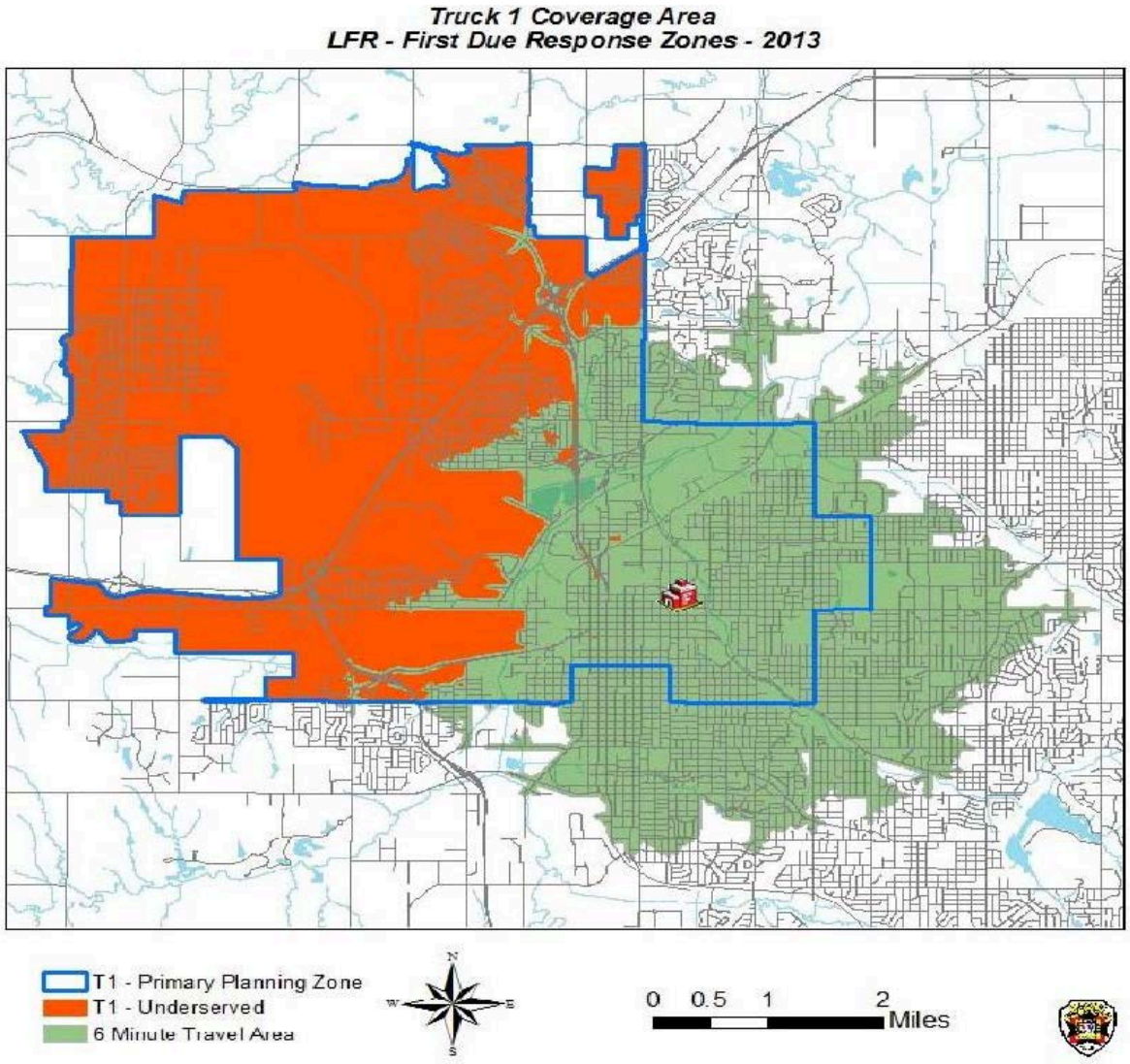
Engine 13 Coverage Area
LFR - First Due Response Zones - 2013



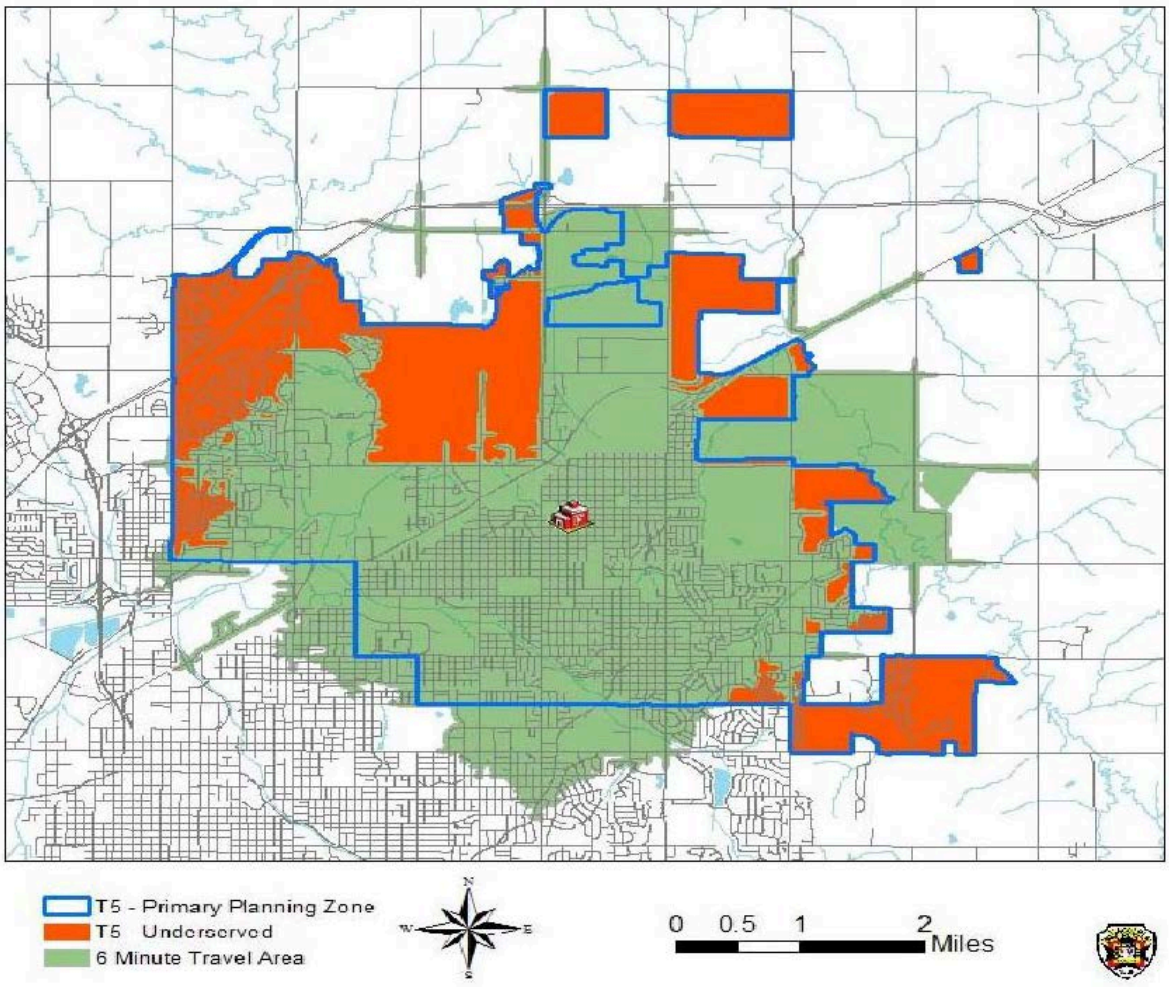
Engine 14 Coverage Area
LFR - First Due Response Zones - 2013



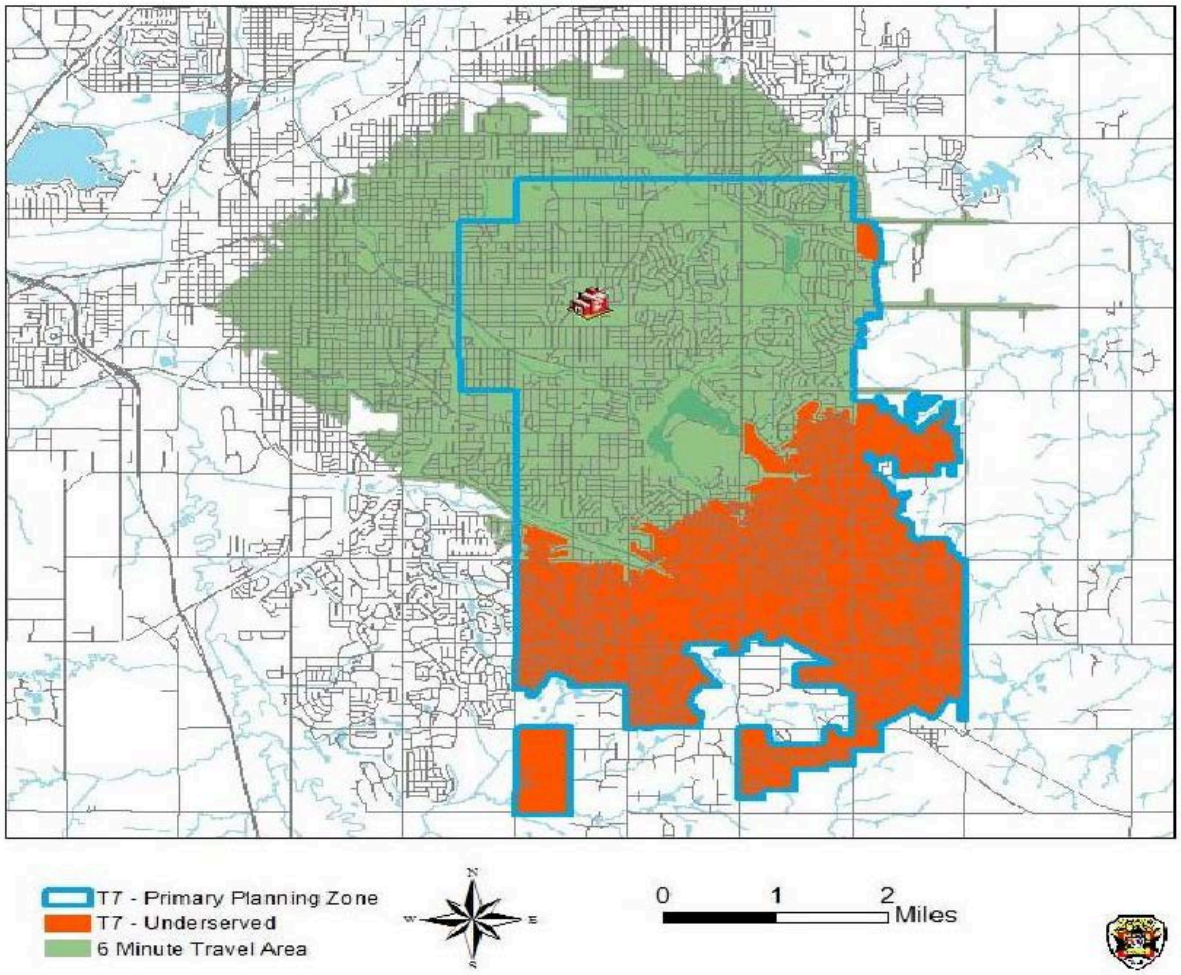
RESPONSE AREAS OUTSIDE 6 MINUTES



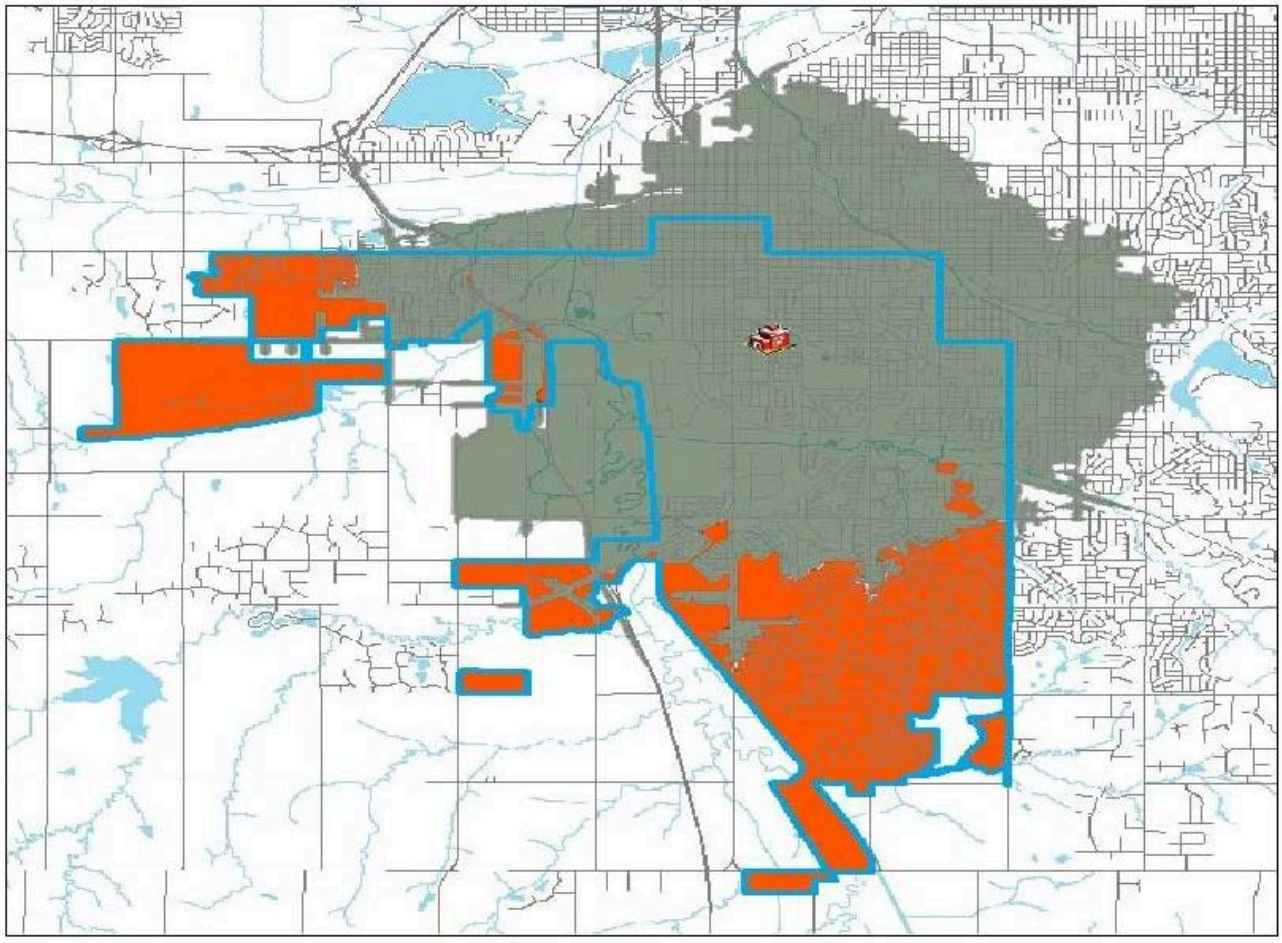
Truck 5 Coverage Area
LFR - First Due Response Zones - 2013



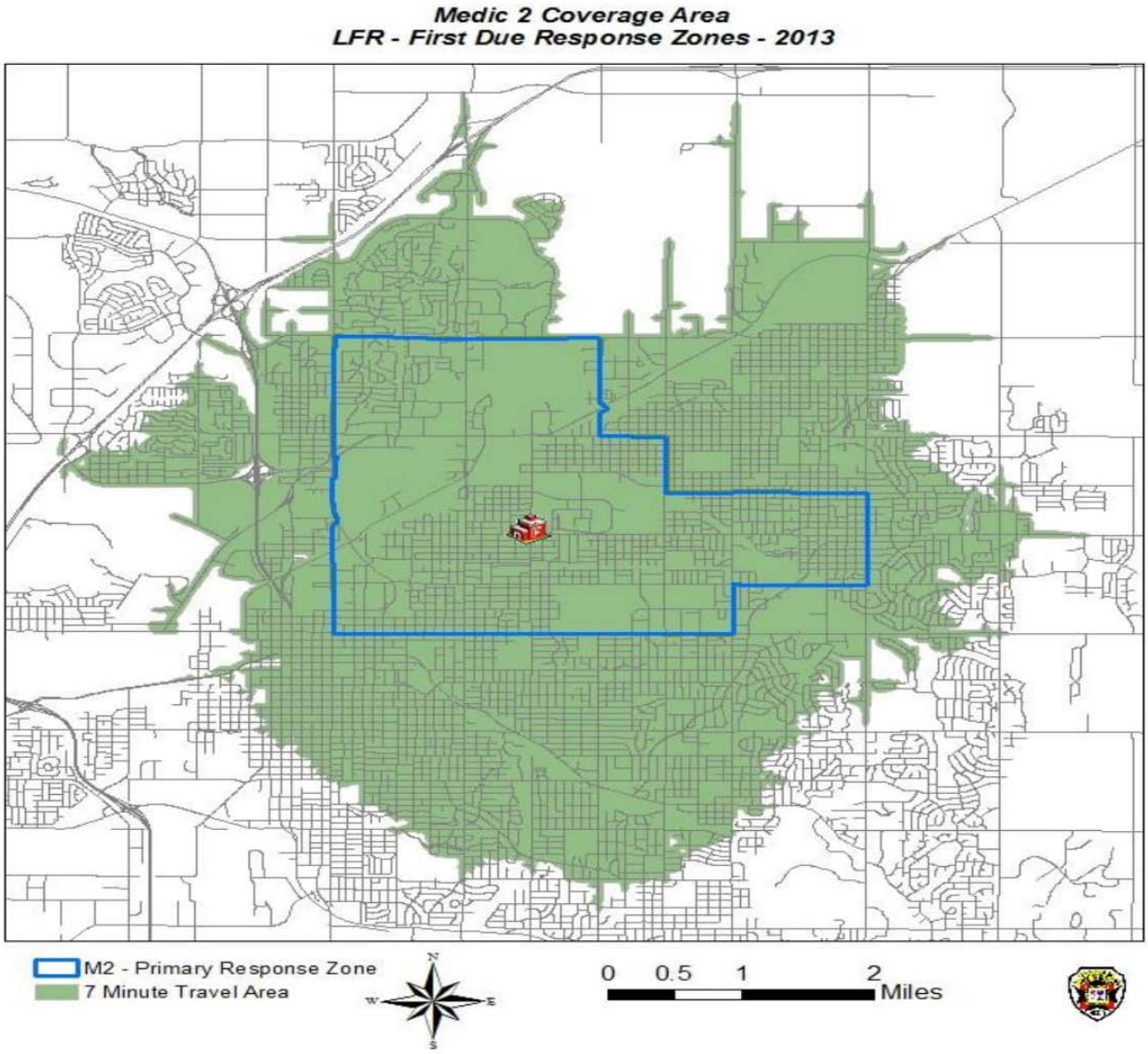
Truck 7 Coverage Area
LFR - First Due Response Zones - 2013



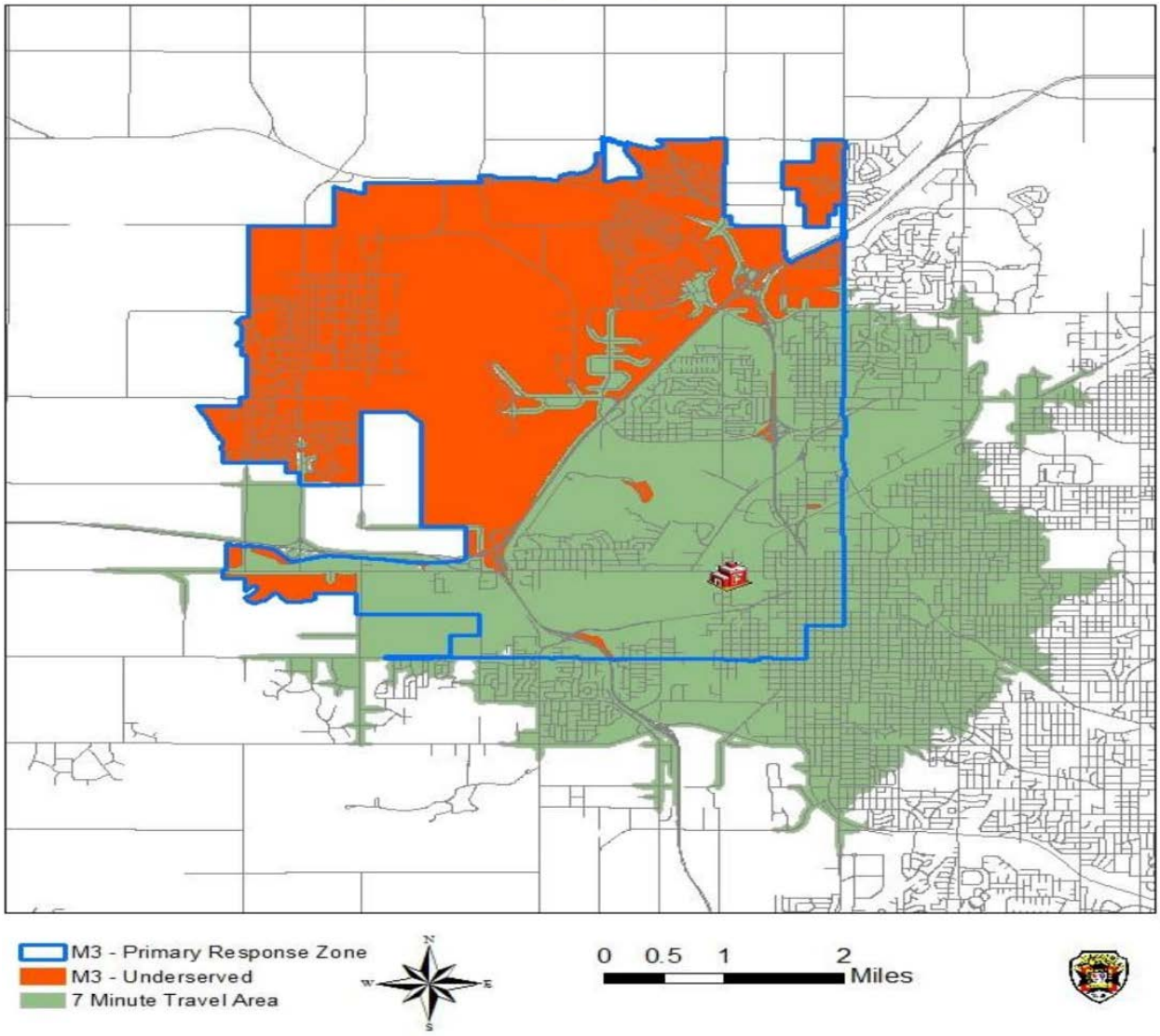
Truck 8 Coverage Area
LFR - First Due Response Zones - 2013



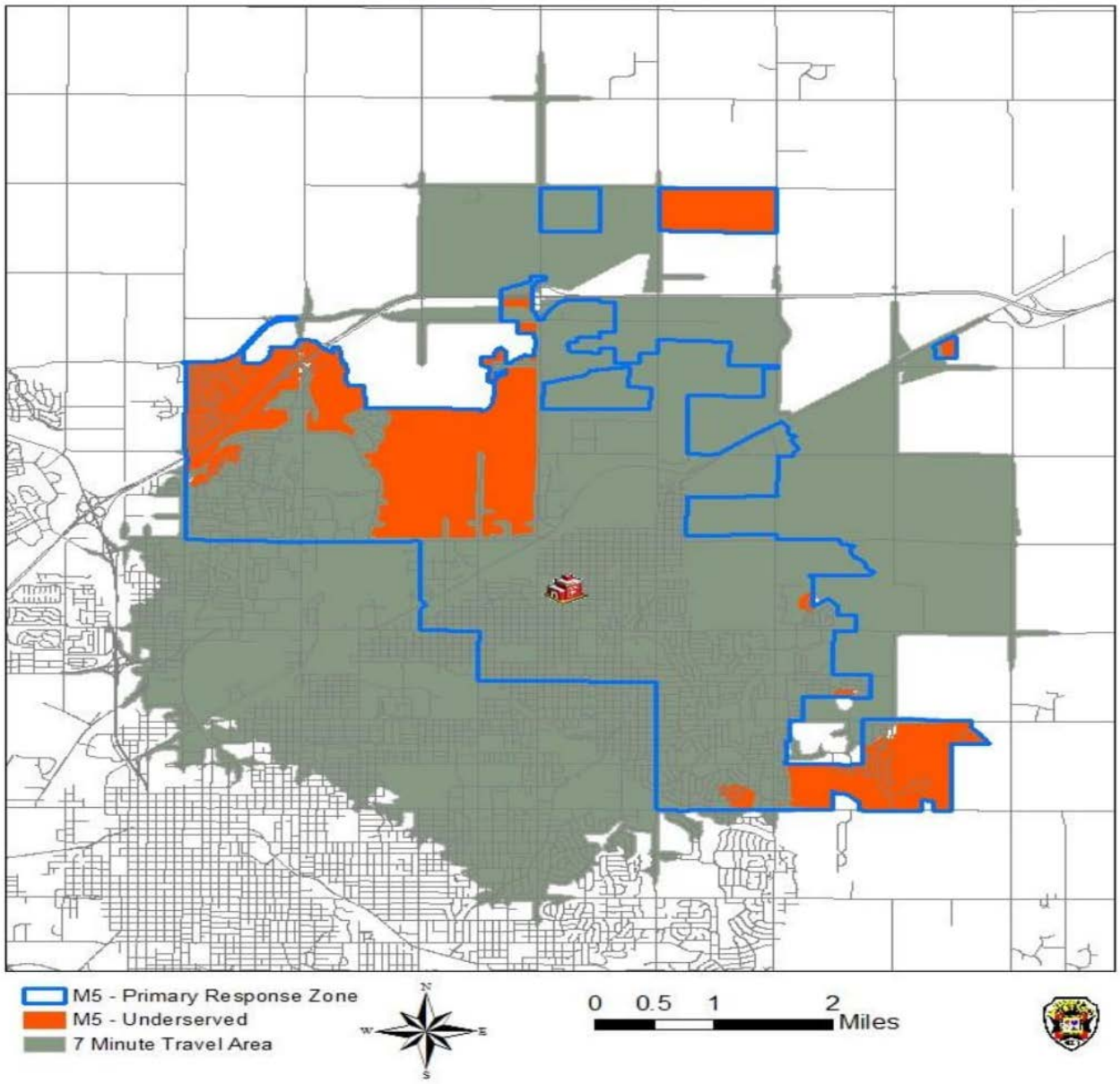
RESPONSE AREAS OUTSIDE 8 MINUTES



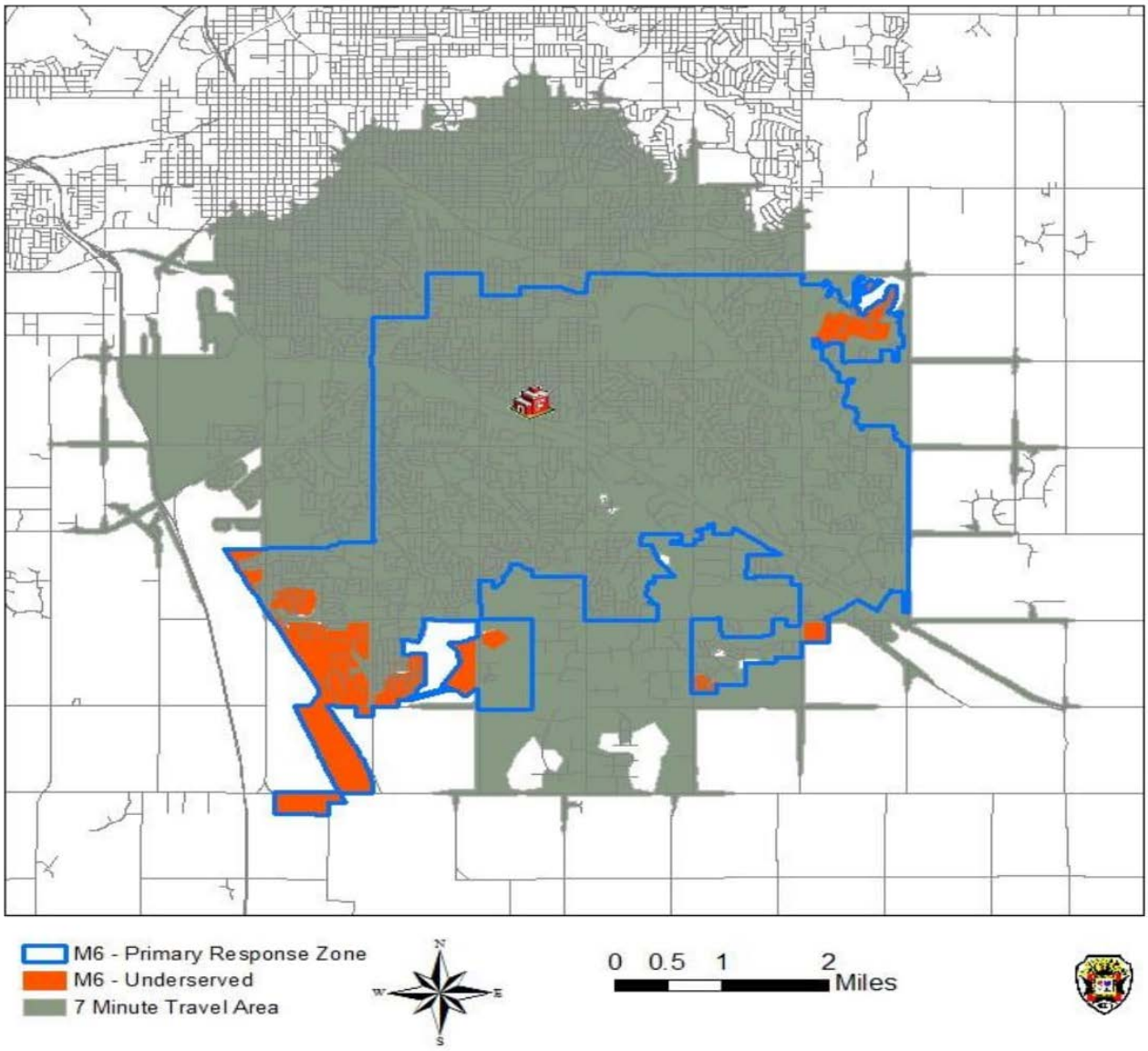
Medic 3 Coverage Area
LFR - First Due Response Zones - 2013



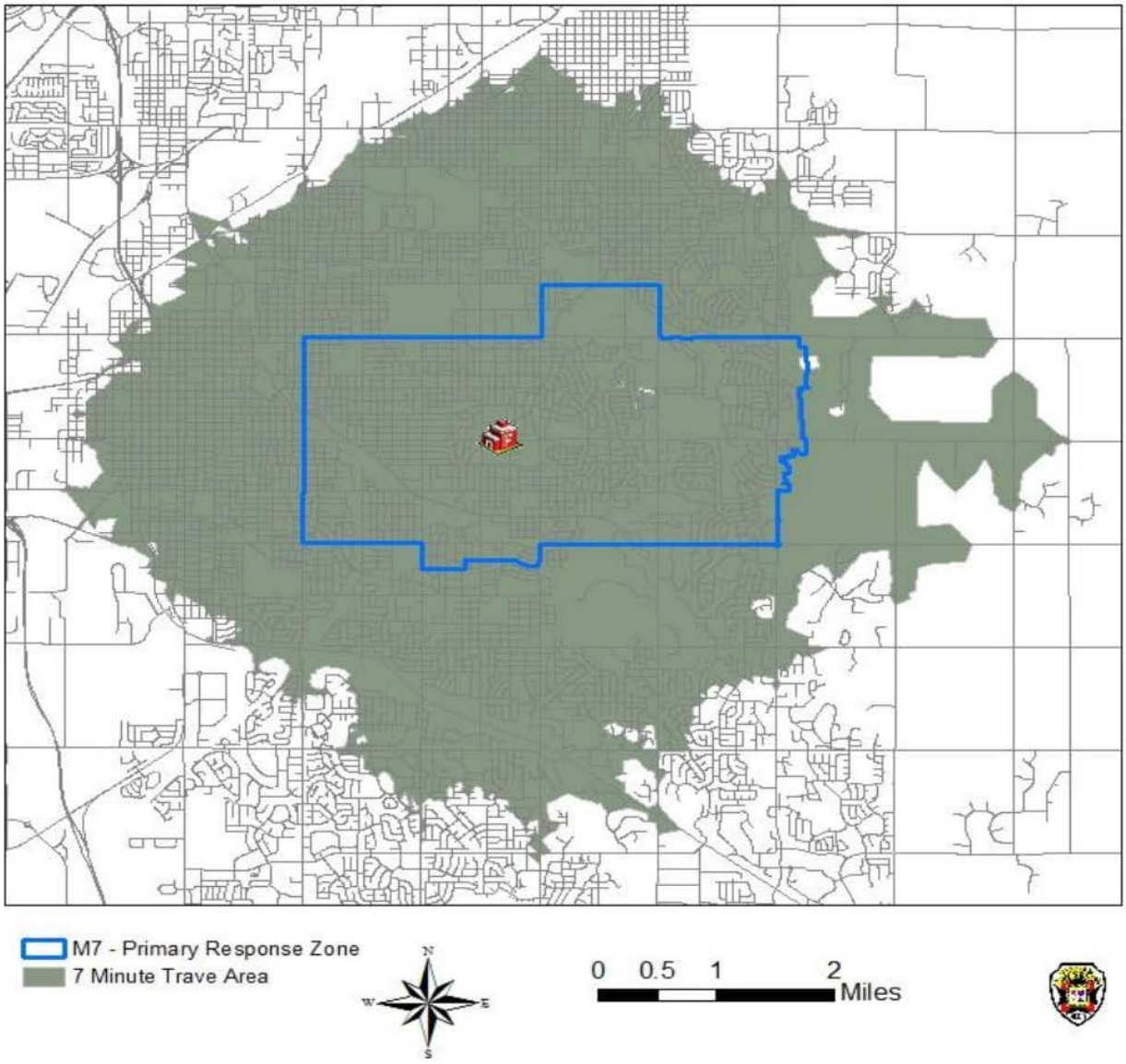
Medic 5 Coverage Area
LFR - First Due Response Zones - 2013



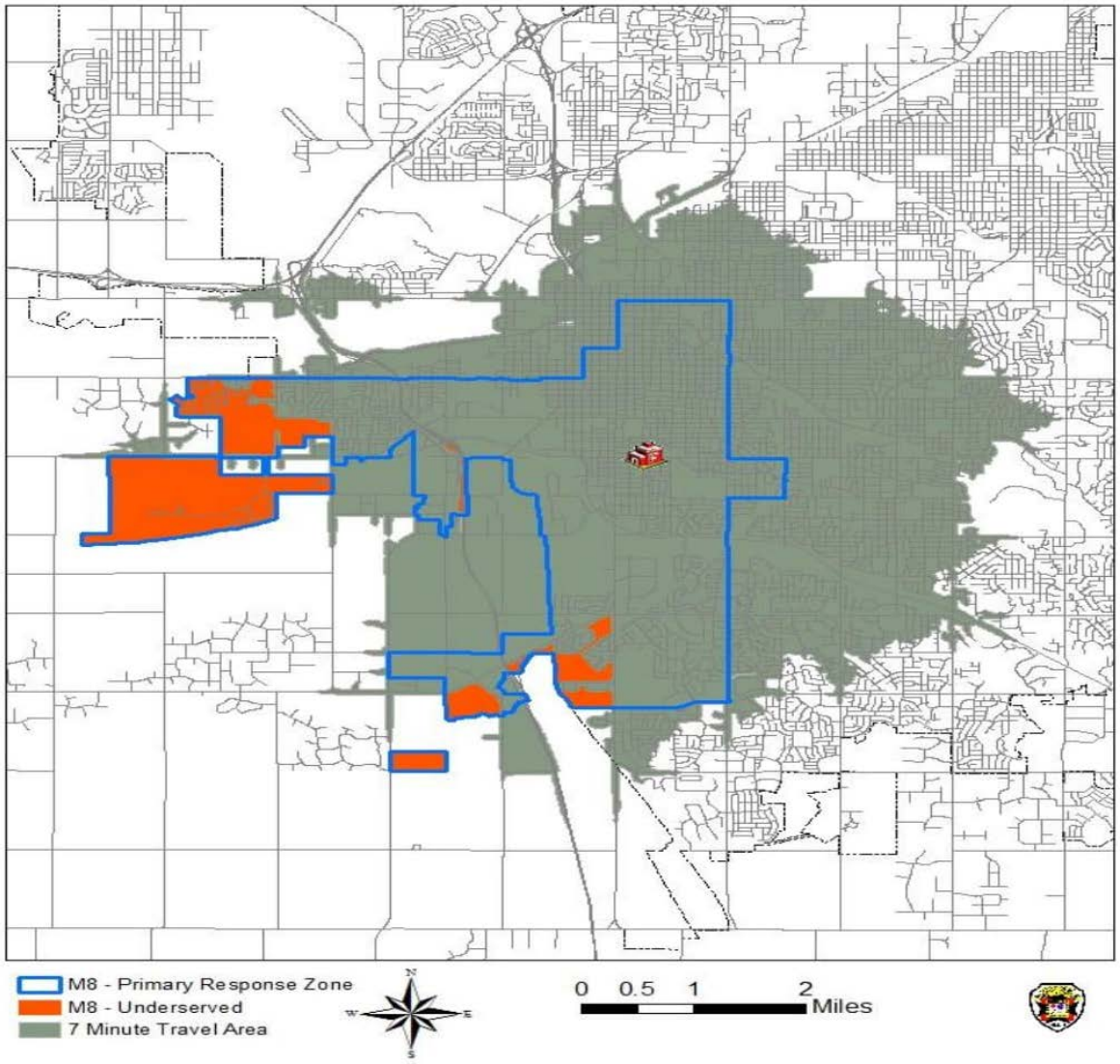
Medic 6 Coverage Area
LFR - First Due Response Zones - 2013



Medic 7 Coverage Area
LFR - First Due Response Zones - 2013



Medic 8 Coverage Area
LFR - First Due Response Zones - 2013



2018 BUDGET PERFORMANCE INDICATORS

LINCOLN FIRE & RESCUE

2018

Proposed Performance Indicators

1/9/2018

Data Ranges Noted Within

Introduction:

As the City of Lincoln moves towards a performance measurement model to ensure efficiency, Lincoln Fire & Rescue has identified a series of performance indicators that provide reliable measuring of aspects of fire and EMS service that are most important to the community. Many of these indicators were derived after a series of meetings and workshops with the 2017 Community Stakeholder Task Force. Some indicators are based on based on either best practices or tied to the City of Lincoln municipal code. These new performance indicators do not reflect the full complement of performance measurements monitored within LF&R but they are likely the most comprehensive in measuring outcomes within the community it serves.

LNKStat Strategic Plan

Challenge: "*Improve Emergency Response Times*"

Reduce the response time of LFR's first arriving units at the scene of life threatening calls.

Analysis: Reducing response times will often result in better outcomes to emergent events such as structure fires and medical incidents. This issue, however, has several various factors to consider.

A significant impact on current response time performance is due to the limited number of resources in comparison to the existing workload. Over the last 5 years LF&R has experienced a 18.21% increase in call volume. This rate of increase is markedly greater than that of the population growth of the City of Lincoln which, on average, is approximately 1.3% annually. The increase in workload is more accurately measured by establishing each units individual Commitment Factor. The Commitment Factor measures each unit's commitment time to incidents in seconds compared to the amount of time each unit is available for emergency calls. The level of efficiency when discussing this measure is .25, or, the unit is committed to calls 25% of the time. All of LFR front line medic units have commitment factors over .30 or 30%. At these levels, we see a degradation in response time performance due to the fact that the unit is not in service and available for calls in their primary jurisdictions because they are already on other calls. The increased response times are due to the fact that other units are having to travel longer distances to cover the area served by the primary unit which is already on another call for service.

Some improvement in response times will be realized with the relocation of stations 10, 11, and 12 along with the addition of stations 15 and 16 as currently planned. These locations optimize existing stations ability to meet response time goals while the new stations will cover previously undeserved areas.

The City of Lincoln has acquired and just recently installed a CAD (Dispatch Center) Geo Server. This technology enables LF&R to do several things to increase efficiency. As it pertains to response time improvement, the greatest impact will be achieved through dispatching the closest geographically located unit. Other fire service organizations which have implemented this technology have enjoyed up to 12% improvements in response times. This technology also enables LF&R to deploy units based upon

the established risk. This enables the department to deploy the most efficient number of resources to an incident as opposed to the current system which breaks most calls for service into only three deployment packages. The new GeoCAD should result in increased reliability of units through a decrease unnecessary unit commitment.

While workload and infrastructure needs are contributing factors to longer response times, LF&R, in conjunction with the emergency communications center, installed an automated dispatching/station alerting system acquired through a FEMA Assistance to Firefighters grant in 2017. This system automatically dispatches firefighters to emergencies via a computerized voice, LED message boards, and HDTV's. The system also provides real time feedback on response time performance via an electronic timer strategically placed directly in front of each apparatus and ambulance. Thus far the 911 center has realized a decrease in call processing times and LF&R has experienced a decrease in the amount of time to respond from the station once an alarm is received. These decreases in time result in shorter response times overall.

Finally, LF&R measures individual unit Turn Out Times (ToT's). In November 2017, LF&R purchased an updated deployment analysis software program which helps us to more rapidly and accurately track ToT's. Reports are now distributed internally which reflect each units ToT performance every 90 days. This encourages accountability as well as performance measurement for continued improvement. ToT is one aspect of emergency response times that LF&R has the most control. Call processing times and travel times are subject to many variables, such as language barriers, traffic and weather, but ToT is the one aspect that LF&R staff continue to seek opportunities to improve.

Recommendations for Action:

1. Continue to move the station(s) project(s) forward. Immediate benefit in terms of response times through the optimized location of existing stations as well as the addition of 2 new stations will be experienced. However, LF&R as well as the City of Lincoln needs to ensure growth of fire protection infrastructure at a rate equal to city growth moving forward.

2. Continued implementation of the Geo server within the 911 center. LF&R will begin testing this new technology this year and our current goal is to implement both a risk based response and closest unit dispatching within the next 12 to 18 months.

3. Explore options for reducing the amount of time units are out of service for non-response activities such as training or maintenance, or replacing out of service units with temporary peak demand units.

4. Continue analysis on the addition of medic units (ambulances). Early analysis suggests a greater impact through the deployment of multiple peaking units as opposed to a single full-time unit. Analysis has shown a difference in organizational workload by day of week and by hour of day. The deployment of units which are placed in service during these peak times will assist in reducing the workload of full time units and will have a positive impact on response time.

Reduce turn-out-time by LFR personnel during lifesaving events.

Analysis: Currently, LF&R references NFPA Standard 1710 which identifies the Turn Out Time (ToT) measurement for emergent incidents. As an organization that actively assesses other fire service organizations for best practices, we have yet to observe one department which can consistently meet this performance standard. For this reason, LF&R completed an in-depth analysis of turnout times and has identified new, more realistic, goals for emergent call types. This standard includes both a day and night time standard which is achievable and promotes improvement and accountability.

Additionally, we believe that turnout time is in fact improving since the implementation of the new automated dispatching/station alerting system. This system gives real time feedback to responders as they leave the station via an electronic turn out timer mounted directly in front of each apparatus and ambulance. Finally, LFR has made available 90 day reports of ToT performance to the department.

Recommendations for Actions:

1 Continue the analysis and implementation of a new ToT standard.

2 Continue to produce to the department ToT performance reports for review.

3. Design future stations with ToT efficiency in the layout.

4. Implement Closest Unit dispatching when new GeoCAD is installed.

Review demand for service at the Lincoln Police Department and Lincoln Fire & Rescue to aid personnel decisions.

Analysis: A significant driver of when and where to add personnel is based on workload. Over the last 5 years LF&R has experienced a 18.21% increase in call volume. This rate of increase is markedly greater than that of the population growth of the City of Lincoln which, on average, is approximately 1.3% annually. The increase in workload is more accurately measured by establishing each units individual Commitment Factor. The Commitment Factor measures each unit's commitment time to incidents in seconds compared to the amount of time each unit is available for emergency calls. The level of efficiency when discussing this measure is .25, or, the unit is committed to calls 25% of the time. All LFR front line medic units have commitment factors over .30 or 30%. At these levels, we see a degradation in response time performance because the unit is not in service and available for calls in their primary jurisdictions because they are already on other calls. The increased response times are because other units are having to travel longer distances to cover the area served by the primary unit which is already on another call for service. The addition of future fire stations 15 and 16, and possibly expanding the use of peaking medic units will provide improved performance but will require additional staffing. LF&R has also developed criteria for when future fire stations (beyond stations 15 &16) are opened. The criteria include a measurement of workload, response time performance and percentage of urban development to make sure stations not opened too soon or too late to ensure efficiency.

Other measures that help determine optimum staffing levels include: percentage of fires LF&R can keep within room/area of origin, cardiac survival rate, CPR effectiveness, insurance rating, and cost per capita.

Recommendations for Action:

1. Continue with plan to open fire stations 15 & 16

2. Continue with plan to expand use of peaking medic units

3. Continue with plan to identify future fire station locations and secure property in advance of development

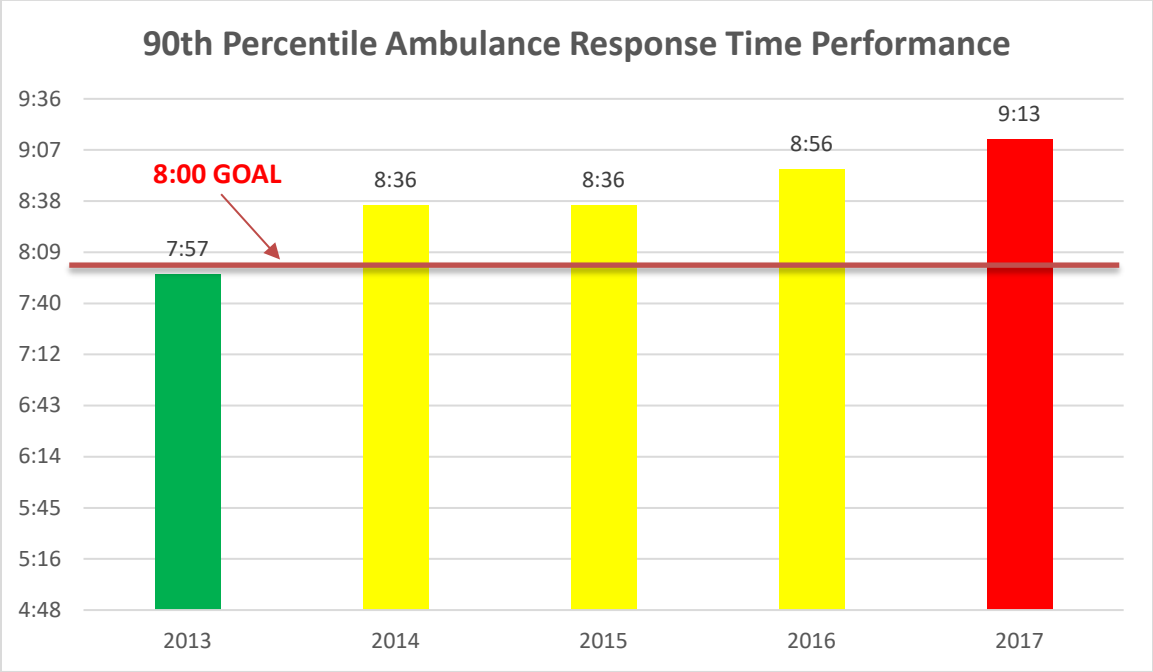
4. Continue to explore staffing patterns that better match minimum staffing with risk/demand for service

Performance Indicator 1:

LF&R ambulances will have a total response time of 8 minutes or less 90% of the time to emergent medical incidents.

Methodology: Data is utilized from the Computer Aided Dispatch (CAD) system to measure the time from en-route to arrival to emergent medical incidents. This includes the call types of; Delta, and Echo. The measure of time is from dispatch to on location and is congruent with City Ordinance.

Result:



Rationale: Quick response times contributes to improved patient outcomes. In cases of cardiac arrest seconds can make the difference between a survival as well as quality of life after the incident. This performance indicator is also codified in the Lincoln Municipal Code.

Analysis: LF&R has noted a gradual decline in performance in this indicator. In 2013, LF&R was able to have an ambulance on scene at emergency medical incident within 7:57 90% of the time. In 2017, performance has dropped to 9:13 90% of the time. This has a negative impact on not only indicator performance, but on patient outcomes due to a delay in receiving definitive care from an advanced life support provider and any subsequent downstream EMS care. The decrease in performance is due to a number of factors:

1. Increase in call volume. In 2013, LF&R responded to 21,357 incidents. In 2017, LF&R will have responded to almost 26,000 incidents. In 5 years this as an increase in call volume of almost 18.21%. That is an average increase in annual call volume of 4.34% or 3 times the rate of population growth.

2. Decrease in unit reliability. Increases in call volumes mean that units will not be in service and less able to respond to calls within their primary jurisdiction . LF&R measures each units individual commitment factor which is an evaluation of the amount of time in seconds that a unit is committed to calls for service. All front-line medic units are showing commitment factors well over 30% which is an indicator of decreased reliability and increasing response times. Industry best practices promote a 20% to 25% as the most efficient range for paramedic units. Anything over 30% is inefficient and, over time, adversely impacts patient care and employee performance.

3. City geographic growth. The City of Lincoln continues to grow at a rate greater than that of emergency response infrastructure. In the last 5 years alone the City of Lincoln has annexed an additional 3.53 square miles of which LF&R needs to respond. As a rule of thumb, a new station/unit should be added for every 1.5 square miles added to a jurisdiction to maintain service levels. In fact, the City of Lincoln has grown by more than 5.72 square miles since the 6th medic unit was added in 2009 and 26.49 square miles since the last station was added in 1997.

Recommendations for Actions:

1. Continue to deploy the 7th medic unit as a peak demand unit (12 hour shifts). This unit is currently deployed three days a week and should be increased to 7th days a week as soon as LF&R has sufficient paramedics to handle the additional shifts.

2. Deploy an 8th medic unit as a peak demand unit (12 hour shifts), to replace absent frontline medic units that are out of service due to in service training, as soon as LF&R has sufficient paramedics to handle the additional shifts.

3. As the relocated and new stations are placed in service, LF&R will have more deployment options. Re-evaluate where the medic units are currently located and realize potential improvements in a revised deployment model.

4. The City of Lincoln acquired a "Geo Server" for installation into the 911 CAD system. The server gives LFR the ability to always send the geographically closest unit to emergent calls. Units are often closer to calls in which another unit is dispatched. Many department have seen as much as a 12% decrease in

response times when implementing this technology. LFR is striving to have these two functions up and running in the next 12 to 18 months.

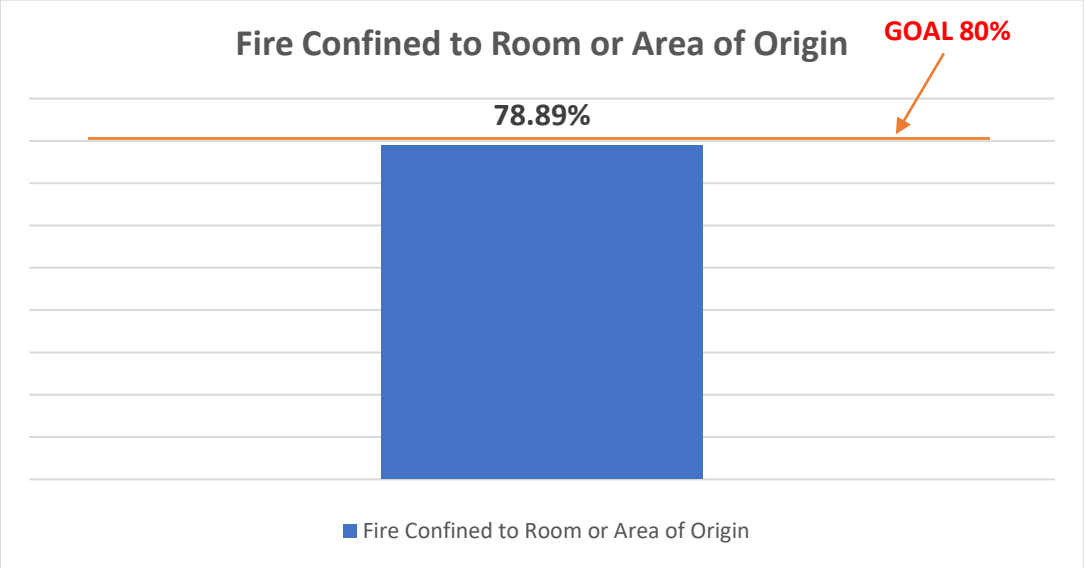
Performance Indicator 2:

LF&R will stop fires at the room or area of origin for at least 80% of structure fires.

Methodology: For this analysis data was utilized from the PRIME Fire RMS system. Evaluation of incidents dispatched as a FIREA, FIREB, FIREC, FIRED, or FIREI were evaluated. Each individual call narrative was reviewed to determine if;

- Incident was a structure fire
- Fire (thermal damage) was confined to the room/area of origin
- Extinguishment was performed by LF&R personnel through the application of an extinguishing agent or through an intervention
- Excluded were fires in unattached garages, utility vaults
- Included were incidents that were in a structure but were confined to the original products ignited. (cooking fires where an extinguishing agent was used, waste basket fires, etc.

Result:



Note: Data through 12/16/2017

Note: This was a total of **109** Structural Fire Incidents

Rational: There is a direct correlation between stopping the fire at the room/area of origin and fire victim outcome. Data shows that if the fire can be stopped at the room/area of origin the chance of injury or death is only 3%. If allowed to extend past the room/area of origin, the chances of injury or death rise to 83%. Source: National Fire Protection Association

Analysis: LFR is performing very well in achieving this indicator, however, has fallen short of this at 78.89% in 2017 and estimates this number will continue to drop over time due to increasing fires in the areas of the city not yet covered by new fire stations. Fortunately, new stations 15 and 16 should be in place and staffed before any significant reduction in performance is realized.

The City of Lincoln enjoys a fire loss rate and fire casualty rate lower than that of most of the country and our goal remains to perform at the 80th percentile or better because this is one of the best measurements of overall fire suppression performance and provides one of best return investments to the community.

Recommendations for Actions: One of most important factors in stopping the growth of fire before it grows beyond the room/area of origin is response time.

1. Continue moving forward with the station relocation plan. The relocation of stations 10, 11, and 12 will reduce response times to a greater number of structure fire calls in those areas. In addition, the deployment of new stations 15 and 16 will also reduce the response time in the south and east.

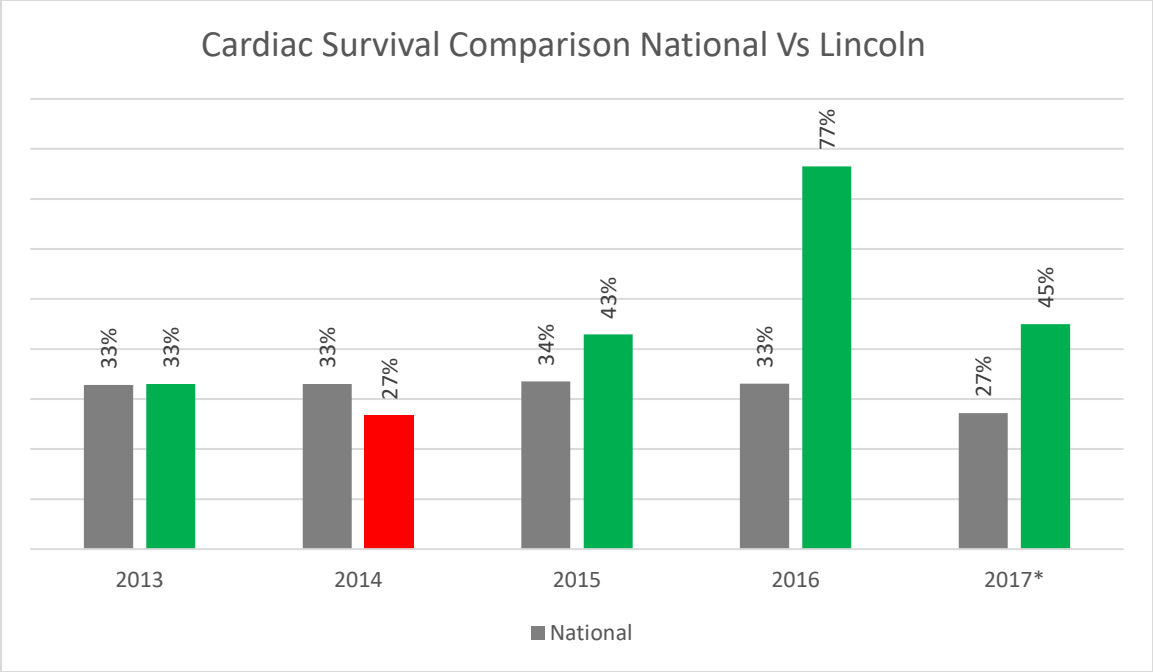
2. The City of Lincoln acquired a "Geo Server" for installation into the 911 CAD system. This server enables LFR to do 2 unique response time saving things it has been unable to do in the past. First it enables the department the ability to dispatch a compliment the correct number of apparatus to an incident based upon the "risk profile" of the given structure. This reduces unnecessary responses to incidents keeping units in service to respond to calls. Next, the server gives LFR the ability to always send the geographically closest unit to emergent calls. Units are often closer to calls in which another unit is dispatched. Many department have seen as much as a 12% decrease in response times when implementing this technology. LFR is striving to have these two functions up and running in the next 12 to 18 months.

Performance Indicator 3:

LF&R will maintain a cardiac survival rate equal to or higher than the national average.

Methodology: LF&R utilizes a nationally excepted and identified method for cardiac survival determination. The model utilized is the National Utstein Survival model. To qualify as “survived”, the patient must be discharged from definitive healthcare back into the general population with a high, or, near normal neurologic function. Data is collected through the patient care reporting system as well as collaboration with area hospitals to determine patient outcome.

Result:



*Note: Data through 11/2017

Note: 135 Resuscitation Attempts/82 With Cardiac Etiology/20 w VF or VT as Initial Rhythm

Rational: The citizens of Lincoln desire the very best cardiac care possible which measures success not just on survivability, but on the quality of life after a significant cardiac event. LF&R continues to provide one of the best performing emergency medical programs in the country. LF&R utilizes a nationally accepted model called the CARES Registry for the determination of performance which allows LF&R the ability to measure and display data comparable to the rest of the country. Source: C.A.R.E.S. - Cardiac Arrest Registry to Enhance Survival

Analysis: LFR applied for and was accepted into the CARES registry in 2013. CARES registry participation ensures that the quality and accuracy of an organizations reporting meets a specified standard so that the agency can accurately compare cardiac event outcome performance with other participating agencies throughout the nation. The currently accepted model for cardiac survival is the industry recognized Utstein Model which not only focuses on survival of a cardiac event but the quality of life after the event as well.

LFR has increased its cardiac survival performance to arguably one of the best in the country and well above the national performance in the last 3 years. In 2016 the City of Lincoln enjoyed a cardiac survival rate 133% greater than the national average. This increase in performance has been attributed to the following actions:

1. Instituting a community outreach education program on hands only CPR encouraging bystander CPR.

2. Establishing technology such as the Pulsepoint App for smartphones which utilizes CAD generated data to direct CPR trained citizens to assist persons in need until emergency responders arrive.

3. Deployment of AED's to Lincoln Police Department who are often closer than emergency medical units to persons needing CPR and early defibrillation.

4. Working closely with the LFR Medical Director in establishing protocols focusing on quality CPR.

5. Streamlining processes within the 911 center to more quickly recognize cardiac events and dispatching emergency responders more quickly.

6. Training for dispatchers on instructing bystander CPR more quickly.

7. Deployment of automated CPR equipment which reduces interruptions in CPR and delivers consistent high-quality CPR.

8. Continual training and performance evaluation of responders on an individual and departmental basis.

Recommendations for Actions:

1. Continue moving forward with the station relocation and implementation plan. The relocation of stations 10, 11, and 12 will reduce response times to a greater number of structures. In addition, the deployment of new stations 15 and 16 will also reduce the response time to a greater number of structures.

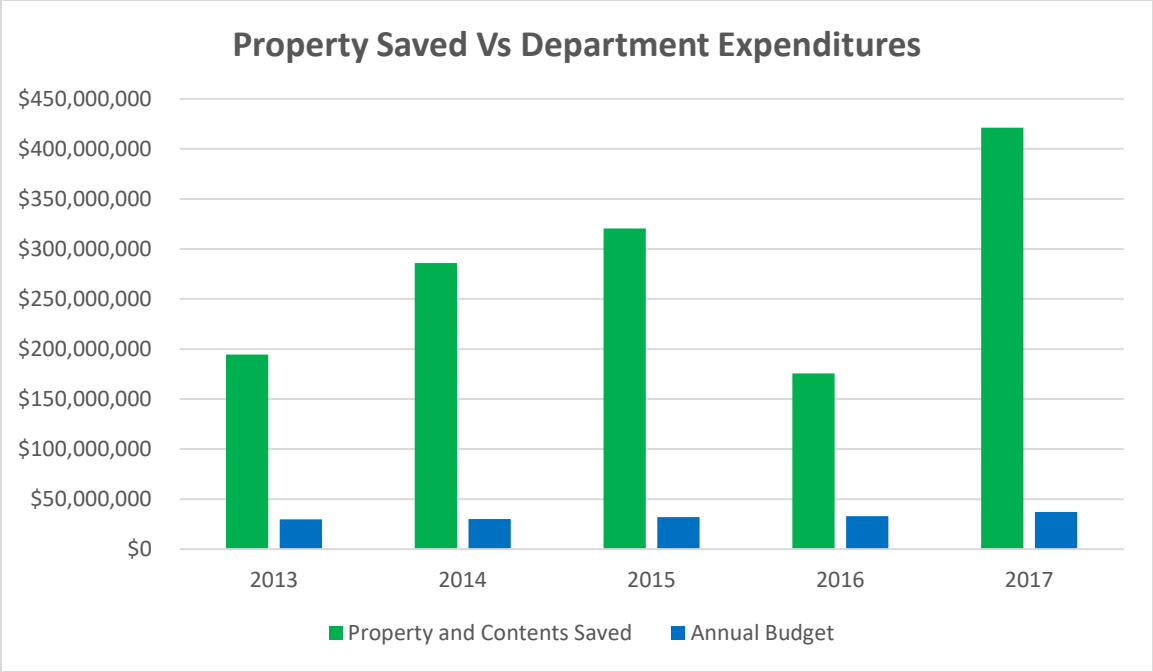
2. The City of Lincoln acquired a "Geo Server" for installation into the 911 CAD system. This server enables LFR to do two unique response time saving actions it has been unable to do in the past. First, it enables the department the ability to dispatch a compliment the correct number of apparatus to an incident based upon the "risk profile" of the given structure. This reduces unnecessary responses to incidents keeping units in service to respond to calls. Next, the server gives LFR the ability to always send the geographically closest unit to emergent calls. Units are often closer to calls in which another unit is dispatched. Many department have seen as much as a 12% decrease in response times when implementing this technology. LFR is striving to have these two functions up and running in the next 12 to 18 months.

Performance Indicator 4:

LF&R will save/salvage property and contents which are lost to fire at a rate higher than the cost of annual operation.

Methodology: LF&R utilizes LFRMIS data and compares Bureau of Fire Investigations property and contents loss estimates against actual assessed value.

Result:



Note: Data through 11/30/2017

Rationale: The original purpose of a community forming a fire department was to protect the lives and property from the ravages of fire. Damage to structures was detrimental to the economic viability of a community, especially when it would impact commercial areas. The original formation of fire brigades were contracted and paid for by the insurance industry to help mitigate loss for their customers. Therefore, in a sense, the cost of operating LF&R is similar to insurance. The annual operating cost can be equated to the premium and the property/contents saved is the return on the investment. This indicator demonstrates that ratio of operational cost of LF&R in relation to economic benefit to the community.

Analysis: Reviewing the data LFR continues to provide exceptional value to the community. In 2017 LFR saved $420 Million in property and contents through its fire suppression efforts alone. Essentially, for every dollar spent on fire suppression, eleven dollars were saved just in property. This does not count the economic benefits of keeping adjacent businesses and occupancies operational, keeping employees employed, property owners able to pay applicable taxes, etc.

Recommendations for Actions: A significant factor in reducing property and contents lost to fire is reducing response times. Therefore, the following action steps have been developed;

1. Continue moving forward with the station relocation and implementation plan. The relocation of stations 10, 11, and 12 will reduce response times to a greater number of structures. In addition, the deployment of new stations 15 and 16 will also reduce the response time to a greater number of structures.

2. The City of Lincoln acquired a "Geo Server" for installation into the 911 CAD system. This server enables LFR to do 2 unique response time saving things it has been unable to do in the past. First it enables the department the ability to dispatch a compliment the correct number of apparatus to an incident based upon the "risk profile" of the given structure. This reduces unnecessary responses to incidents keeping units in service to respond to calls. Next, the server gives LFR the ability to always send the geographically closest unit to emergent calls. Units are often closer to calls in which another unit is dispatched. Many department have seen as much as a 12% decrease in response times when implementing this technology. LFR is striving to have these two functions up and running in the next 12 to 18 months.

Performance Indicator 5:

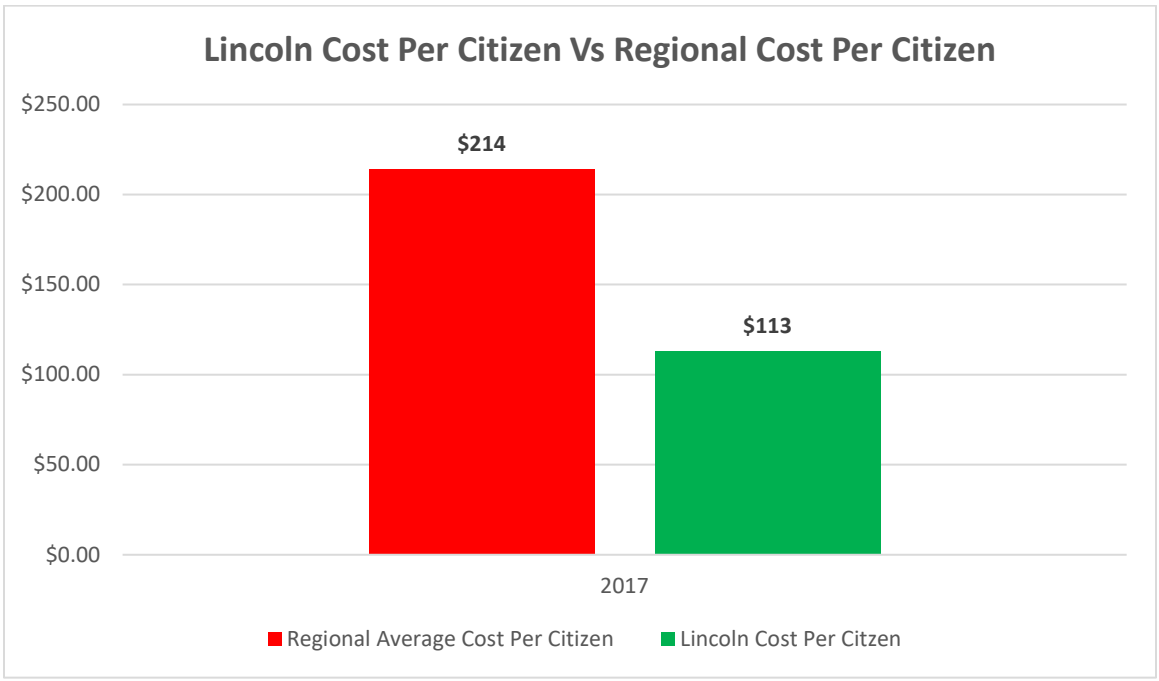
LF&R will maintain a per capita cost of operation equal or lower than the regional average.

Methodology: Dividing the actual operating cost of LF&R into the current population establishes a "per-capita cost of operation." Applying this formula to other fire service organization regionally we can establish a comparison of fire department cost and provide a measure of overall efficiency

Regional Cities meet the following criteria:

- Like services
- Positive growth rate
- Populations within 200,000 below/above
- Proximity of 600 miles or less (Midwest)

Result:



Rationale: Cost per person is one of the best barometers of a fire agency's efficiency. As an example, inefficient agencies might be spending valuable funding on excessive leave allowances, lawsuits, discipline, poor equipment, etc. This is money that is no longer going toward service to the community, thus inefficient. LF&R strives to keep costs as low as possible through overall efficiencies so the maximum amount of funding is directed toward measurable service to the customer.

Analysis: Dividing the actual operating cost of LF&R into the current population establishes a "per capita cost of operation." Applying this formula to other fire service organization regionally we can establish a comparison of fire department cost and provide a measure of overall efficiency

Regional Cities meet the following criteria:

1. Like Services such as EMS transport and hazardous materials response in addition to municipal firefighting capabilities.

2. Positive Growth Rate: Population shows steady and consistent growth similar the City of Lincoln.

3. Populations 200,000 above or below the City of Lincoln.

4. Proximity of 600 miles or less (Midwest)

Cost per person is one of the best barometers of a fire agency's efficiency. As an example, inefficient agencies might be spending valuable funding on excessive leave allowances, lawsuits, discipline, poor equipment, etc. This is money that is no longer going toward service to the community, thus inefficient. LF&R strives to keep costs as low as possible through overall efficiencies so the maximum amount of funding is directed toward measurable service to the customer.

Upon analysis LF&R is doing a good job providing value to the community at a cost much mower than like organizations. The average regional cost per citizen in 2017 was $214 per year, whereas the City of Lincoln citizens enjoyed a cost of only $113 per citizen.

LF&R continues to maximize efficiencies as we plan, deploy and make purchases. Examples of practices that keep costs low include: pursing grants, refining our deployment of resources, preventing injuries, seeking cost recovery on certain incident types, seeking additional non general fund sources of revenue, etc.

Recommendations for Actions:

1. Invest in Capital Improvement projects that provide cost savings over time, such as; energy efficiency upgrades, apparatus and equipment with better front line lifespans, purchasing land for new fire stations in areas where land is still cheap, etc.

2. Dynamic deployment. Staffing additional resources and personnel during times of higher demand and lower staffing levels when demand is lower.

3. Prevent/Mitigate Injuries; lower workers compensation costs

4. Prevent/Mitigate personnel issues that create unnecessary costs; investigations, discipline, grievances, lawsuits, etc.

5. Hire, train and promote quality people

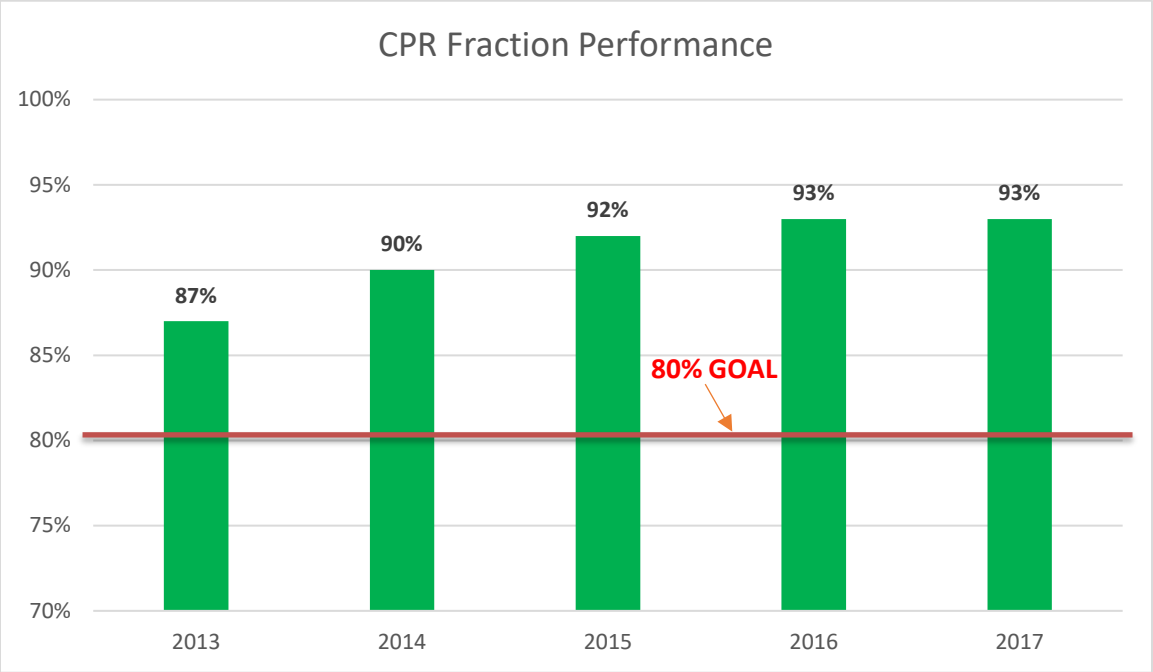
6. Seek additional sources of non general fund revenue: cost recovery, GEMT/Medicaid support, public/private partnerships

Performance Indicator 6:

LF&R will achieve a CPR fraction of at least 80%.

Methodology: Technology advancement allows LF&R to measure the quality of CPR we provide to our customers. LF&R equipment measures chest compression performed by paramedics. After care is delivered, data is downloaded from the field provider's medical equipment and compiled.

Result:



Rationale: Cardiopulmonary Resuscitation (CPR) is the method of providing oxygen and blood circulation through the delivery of rescue breathing and chest compressions to victims of sudden cardiac arrest. This procedure ensures that a critical flow of oxygenated blood gets to the heart and brain until cardiac function can be restored. This is one of the most important measures in determining patient outcomes for cardiac arrest.

Analysis: LFR utilizes CPR fraction as an indicator of quality CPR in support of definitive patient care. LFR has found that quality CPR is one of the most important factors in surviving a cardiac event with no/limited post neurological deficit. This is an important factor in quality of life after the incident. The CPR fraction is quantified using software which analyzes post incident data from the defibrillator. The CPR fraction is an evaluation of the quality of CPR delivered to the patient as well as any interruptions in

CPR. Interruptions are sometimes necessary to safely move a patient, evaluate a patient, or to administer a specific treatment or procedure. Thus, a 100% CPR fraction performance is unlikely. However, providers strive to achieve a performance as close to 100% as possible. As LFR is currently one of the top performers in the country in terms of cardiac arrest saves, LFR will continue to utilize and study this indicator.

It is noted that LFR has successfully increased performance in terms of CPR fraction. in 2013 LFR had a performance of 87% and has increased or maintained performance every year. In 2016 and in 2017 LFR achieved a CPR fraction of 93% both consecutive years. This has been due to the following actions;

1. Immediate evaluation of performance post incident to providers.

2. Continual training designed around quality and effectiveness of CPR.

3. The acquisition and deployment of automated CPR devices such as the LUCASII.

Recommendations for Actions:

1. Continue to evaluate this indicator.

2. Explore additional funding mechanisms for the acquisition and deployment of automated CPR devices, such as the LUCAS II, to more front-line units.

3. Continue to integrate the fundamentals of high quality CPR into the training schedule.

4. While CPR fraction is a ground-breaking measurement tool for the evaluation of CPR performance, evaluate other measurement tools that quantify CPR performance.

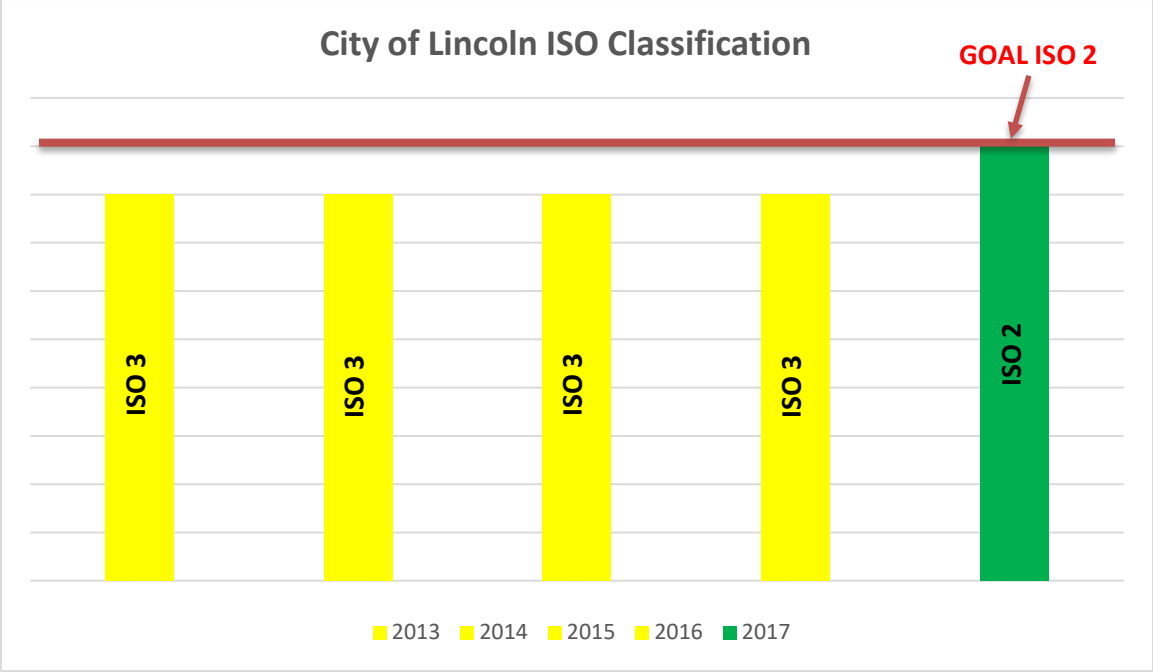
DISCARDED PERFORMANCE INDICATORS

Performance Indicator X:

LF&R will maintain an ISO classification of 2 or better.

Methodology: Data is provided directly to the Insurance Service Organization from; the LFRMIS Fire Reporting System, ArcGIS analysis, Water Supply System Infrastructure Design and Capability, Emergency Communications, Fire Department Infrastructure, and the Community Risk Reduction Plan.

Result:



Rationale: ISO utilizes a Fire Suppression Rating Schedule which is criteria utilized in determining the fire prevention and suppression capabilities of communities or fire protection areas. The schedule develops a numerical grading called a Public Protection Classification. The grading system is from a minimum level of “not rated” to the highest level of “1”. This system not only quantifies a fire departments abilities, but, directly impacts insurance costs passed on to our customers.

Performance Indicator X:

LF&R will maintain its status as an accredited agency through the Center for Public Safety Excellence

Methodology: Accreditation is a comprehensive self-assessment and quality improvement model that enables organizations to examine past, current, and future service levels and internal performance and compare them to current research and industry best practices. This process leads to a more efficient and effective emergency service organization.

CPSE's Accreditation Program, administered by the Commission on Fire Accreditation International (CFAI) allows fire and emergency service agencies to compare their performance to:

Determine community risk and safety needs and develop community-specific Standards of Cover.

Evaluate the performance of the department.

Establish a method for achieving continuous organizational improvement.

Result:

LF&R Accredited Status

	YES/NO
2013	YES
2014	YES
2015	YES
2016	YES
2017	YES

Rationale:

LF&R has maintained accredited status through 2017.

Errata

Addendum to the 2018 – 2023 Standards of Cover, All Hazard Risk Assessment.

Tornado: Low frequency, varying consequence. Although tornados are common in Nebraska, no recorded tornado of any magnitude has ever impacted the City of Lincoln. Response to this incident type includes normal operations consistent with fire, rescue, medical response, etc. Normal operations are likely unaffected by these events. NETF1 is available in case of an extreme incident. Likely consequences range from wind damage to trees, to catastrophic structural decimation. Each fire suppression apparatus is equipped with chainsaws, to be used as conditions dictate.

Earthquake: Low frequency, low consequence. Although earthquakes are uncommon in Nebraska, the effect from distant epicenters has been felt within the City of Lincoln. Response to this incident type includes normal operations consistent with fire, rescue, medical response, etc. Normal operations are likely unaffected by these events. NETF1 is available in case of an extreme incident. Likely consequences include minimal structural foundation damage.

Extreme winter weather: Low frequency, varying consequence. Extreme winter weather is somewhat common in Nebraska and has hindered the City of Lincoln's emergency response capabilities. Response during these conditions include normal operations consistent with fire, rescue, medical response, etc. Operations are likely hindered by these events and supplemented through deployment of extra personnel. This can include the Nebraska Army National Guard, who has supplied all-terrain vehicles to assist LF&R during these conditions, by deploying in concert with our medic units. NETF1 is available in case of an extreme incident. Likely consequences range from slowed traffic to impassible roads and widespread power outages.

Flooding: Low frequency, low consequence. Flooding in the City of Lincoln, NE has been a somewhat uncommon occurrence in easily predictable areas and has hindered LF&R's emergency response capabilities. Response during these conditions include normal operations consistent with fire, EMS, HAZMAT, etc. Normal operations can be hindered by these events and are supplemented through deployment of extra personnel available through call-back. This includes deployment of LF&R's water rescue team, made up of both on-duty personnel and those available by callback. All LF&R suppression apparatus are equipped with a compliment of water rescue equipment. This includes but is not limited to swift water throw bags, life jackets, and rescue helmets. NETF1 is available in case of an extreme incident. The most likely consequence is impassible roads.

Air accident: Low frequency, high consequence. Air accidents are an extremely uncommon occurrence in Lincoln, NE with the last incident transpiring in 1987, in a residential neighborhood. Response to this incident type, on airport property, includes automatic aid to supplement the Nebraska Air National Guard. Normal operations are likely hindered by these events if a large response is required at the incident. Depending on the size of the incident, response ranges from the normal air accident response to multiple alarms, as resource needs are determined by the incident commander. Off airport property, this incident type could severely hinder LF&R's normal operating capacity. Extended operations can be supplemented through

deployment of extra personnel available through call-back. NETF1 is available in case of an extreme incident. The most likely consequence is damage to an airplane's fuselage.

Hazardous materials incident: High frequency, varying consequence. HAZMAT incidents are a daily occurrence in the City of Lincoln, NE. However, Lincoln has yet to suffer a high consequence from a HAZMAT incident. Response to this incident type includes normal operations consistent with this incident type. Normal operations are likely hindered by these events if a large response is required at the incident. Depending on the size of the incident, response ranges from the normal HAZMAT response to multiple alarms, as resource needs are determined by the incident commander. Extended operations can be supplemented through deployment of extra personnel available through call-back. This would include but not be limited to all personnel trained to the HAZMAT technician level. NETF1 is available in case of an extreme incident. The most likely consequence is loss of commerce from isolation of transportation routes and entry denial to structures with an IDLH environment.

Terrorism/social disturbances: Low frequency, varying consequence. Terroristic threats and social disturbances are a somewhat uncommon occurrence in Lincoln, NE. Response to this incident type includes normal operations consistent with the underlying call type (fire, EMS, HAZMAT, etc.). Emergency response includes a likely downgraded response code, to ensure an adequate law enforcement presence is available on-scene. Extended operations can be supplemented through deployment of extra personnel available through call-back. The most likely consequence is loss of commerce from isolation of transportation routes and entry denial to structures with an IDLH environment. As identified in the individual FPZs (beginning on P. 31), LF&R has identified and accounted for critical infrastructure within the City of Lincoln, in case of an incident of this type.

Transportation incident: High frequency, varying consequence. Incidents involving routes of transportation are a daily occurrence in the City of Lincoln, NE. However, Lincoln has yet to suffer a high consequence from an incident of this type. Response to this incident type includes normal operations consistent with the underlying call type (fire, EMS, HAZMAT, MVC, etc.). Normal operations are likely hindered by these events if a large response is required at the incident. Depending on the size of the incident, response ranges from a normal MVC, to multiple alarms, as resource needs are determined by the incident commander. Extended operations, like those that could be encountered with an overturned train, can be supplemented through deployment of extra personnel available through call-back. This would include but not be limited to all personnel trained to the HAZMAT technician and technical rescue level. NETF1 is available in case of an extreme incident, like what could transpire in one of Lincoln's two large rail yards. The most likely consequences vary, depending on the type of transportation, and the location in which the incident transpires. The most likely consequence for these incidents is loss of commerce from isolation of transportation routes and entry denial to structures with an IDLH environment. In the case of a large railyard, there is potential for a large-scale HAZMAT incident, and a large-scale disruption in a national commerce route.