



Fire Station Location and  
Operations Review

# Community Response History

# Community Demand

- ❖ EMS accounts for largest share of community requests for service
- ❖ Fire related events totaled just over 500 incidents
- ❖ Total of 5,394 unique incidents in 2016
- ❖ 14.8 calls per day
- ❖ Demand increases by 5% or more per year

Call Category	Number of Calls		
	2014	2015	2016
Cardiac and stroke	644	640	672
Seizure and unconsciousness	368	384	369
Breathing difficulty	489	500	533
Overdose and psychiatric	179	228	281
Accident	125	158	203
Fall and injury	934	1,042	1,151
Illness and other	1,567	1,397	1,378
<b>EMS Total</b>	<b>4,306</b>	<b>4,349</b>	<b>4,587</b>
Structure fire	22	33	33
Outside fire	36	29	31
Vehicle fire	36	27	26
Alarm	260	282	245
Public service	26	17	39
Fire other	107	116	128
<b>Fire Total</b>	<b>487</b>	<b>504</b>	<b>502</b>
<b>Rescue</b>	<b>2</b>	<b>10</b>	<b>11</b>
<b>Hazmat</b>	<b>44</b>	<b>58</b>	<b>45</b>
<b>Mutual aid</b>		<b>30</b>	<b>69</b>
<b>Canceled</b>	<b>22</b>	<b>186</b>	<b>180</b>
<b>Total</b>	<b>4,861</b>	<b>5,137</b>	<b>5,394</b>
<b>Calls per Day</b>	<b>13.3</b>	<b>14.1</b>	<b>14.8</b>
<b>YoY Growth</b>	<b>NA</b>	<b>5.7%</b>	<b>5.0%</b>

# Community Demand

- ❖ EMS accounts for 85% of the requests for service
- ❖ Fire related incidents accounts for 9.3% of the incidents
- ❖ Special risks such as hazmat and technical rescue are combined 1% of demand
- ❖ Mutual aid accounts for 1.3% of the incidents.
- ❖ Maplewood responds to 98.7% of the incidents

Call Category	Number of Calls	Calls per Day	Call Percentage
Cardiac and stroke	672	1.8	12.5%
Seizure and unconsciousness	369	1.0	6.8%
Breathing difficulty	533	1.5	9.9%
Overdose and psychiatric	281	0.8	5.2%
Accident	203	0.6	3.8%
Fall and injury	1,151	3.2	21.3%
Illness and other	1,378	3.8	25.5%
<b>EMS Total</b>	<b>4,587</b>	<b>12.6</b>	<b>85.0%</b>
Structure fire	33	0.1	0.6%
Outside fire	31	0.1	0.6%
Vehicle fire	26	0.1	0.5%
Alarm	245	0.7	4.5%
Public service	39	0.1	0.7%
Fire other	128	0.4	2.4%
<b>Fire Total</b>	<b>502</b>	<b>1.4</b>	<b>9.3%</b>
<b>Rescue</b>	<b>11</b>	<b>0.0</b>	<b>0.2%</b>
<b>Hazmat</b>	<b>45</b>	<b>0.1</b>	<b>0.8%</b>
<b>Mutual aid</b>	<b>69</b>	<b>0.2</b>	<b>1.3%</b>
<b>Canceled</b>	<b>180</b>	<b>0.5</b>	<b>3.3%</b>
<b>Total</b>	<b>5,394</b>	<b>14.8</b>	<b>100.0%</b>

# 2016 Historical Performance

- ❖ Considering “Travel Time”
- ❖ EMS is at 8.2 minutes
- ❖ Fire is at 9 minutes
- ❖ Maplewood system is at 8.3 minutes overall

Program	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
EMS	3.8	1.0	8.2	11.3	2,320
Fire	5.7	0.0	9.0	11.8	403
Rescue	4.8	2.2	7.8	10.8	11
Hazmat	5.3	0.0	7.8	11.1	40
<b>Total</b>	<b>4.2</b>	<b>0.6</b>	<b>8.3</b>	<b>11.3</b>	<b>2,774</b>

# Public Private Partnerships

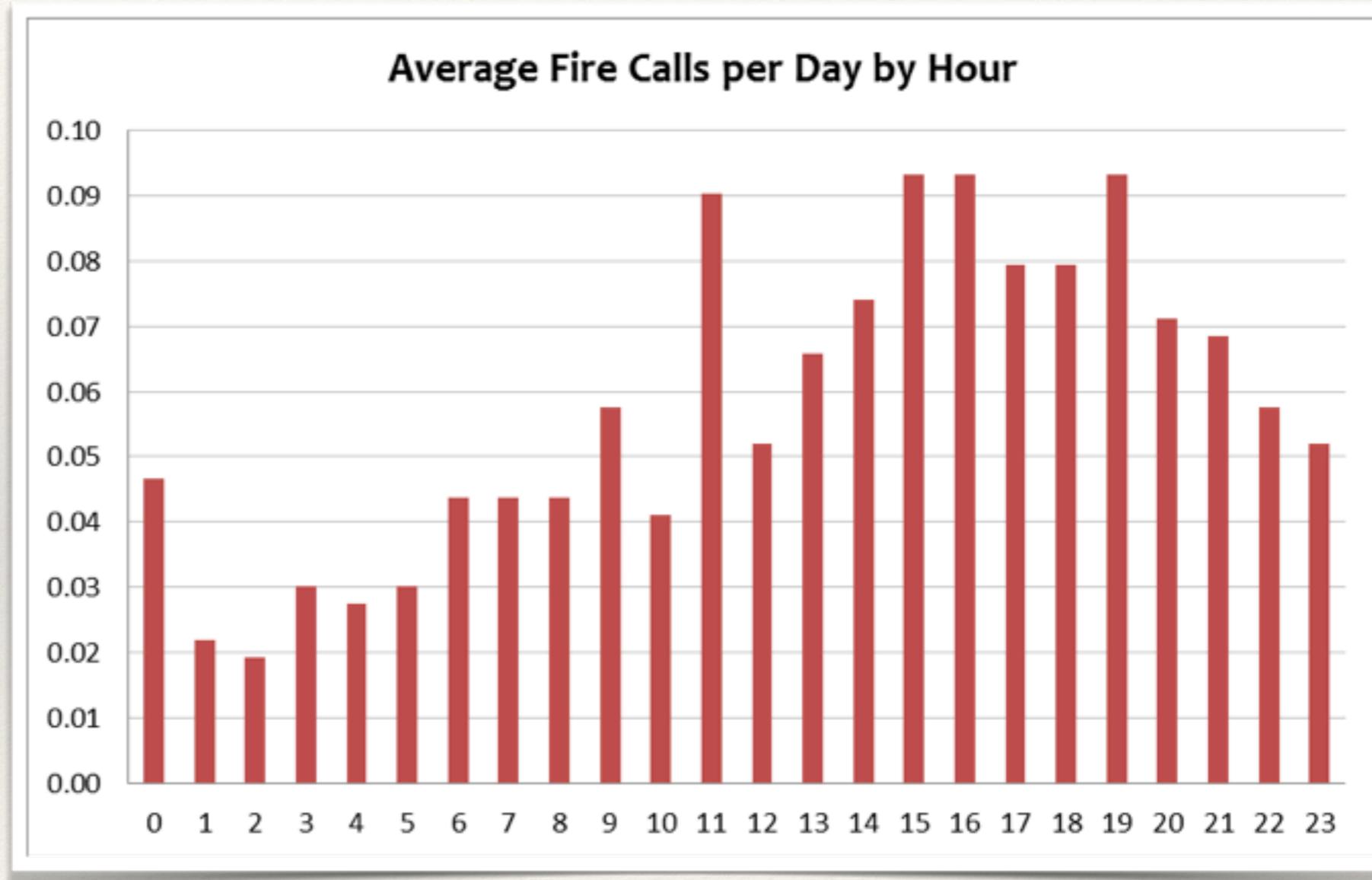
# Public Private Partnerships

- ❖ Policy question begins with what are you trying to fix?
- ❖ Generally, communities look for greater economic and operational efficiencies
- ❖ Accomplished by partnering with a private provider to handle the low acuity or non-emergency events
- ❖ Alpha and Bravo calls account for 43% of the EMS incidents

Program	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
Alpha	4.0	1.2	9.9	13.0	1,004
Bravo	4.1	0.4	9.3	12.2	922
Charlie	3.9	1.1	7.9	11.3	1,090
Delta	3.7	0.4	8.1	11.3	1,024
Echo	3.8	0.0	6.9	10.4	41
Omega	3.2	0.7	10.8	14.0	30
Missing	3.4	1.4	10.1	12.5	414
<b>EMS Total</b>	<b>3.9</b>	<b>0.9</b>	<b>9.1</b>	<b>12.1</b>	<b>4,525</b>

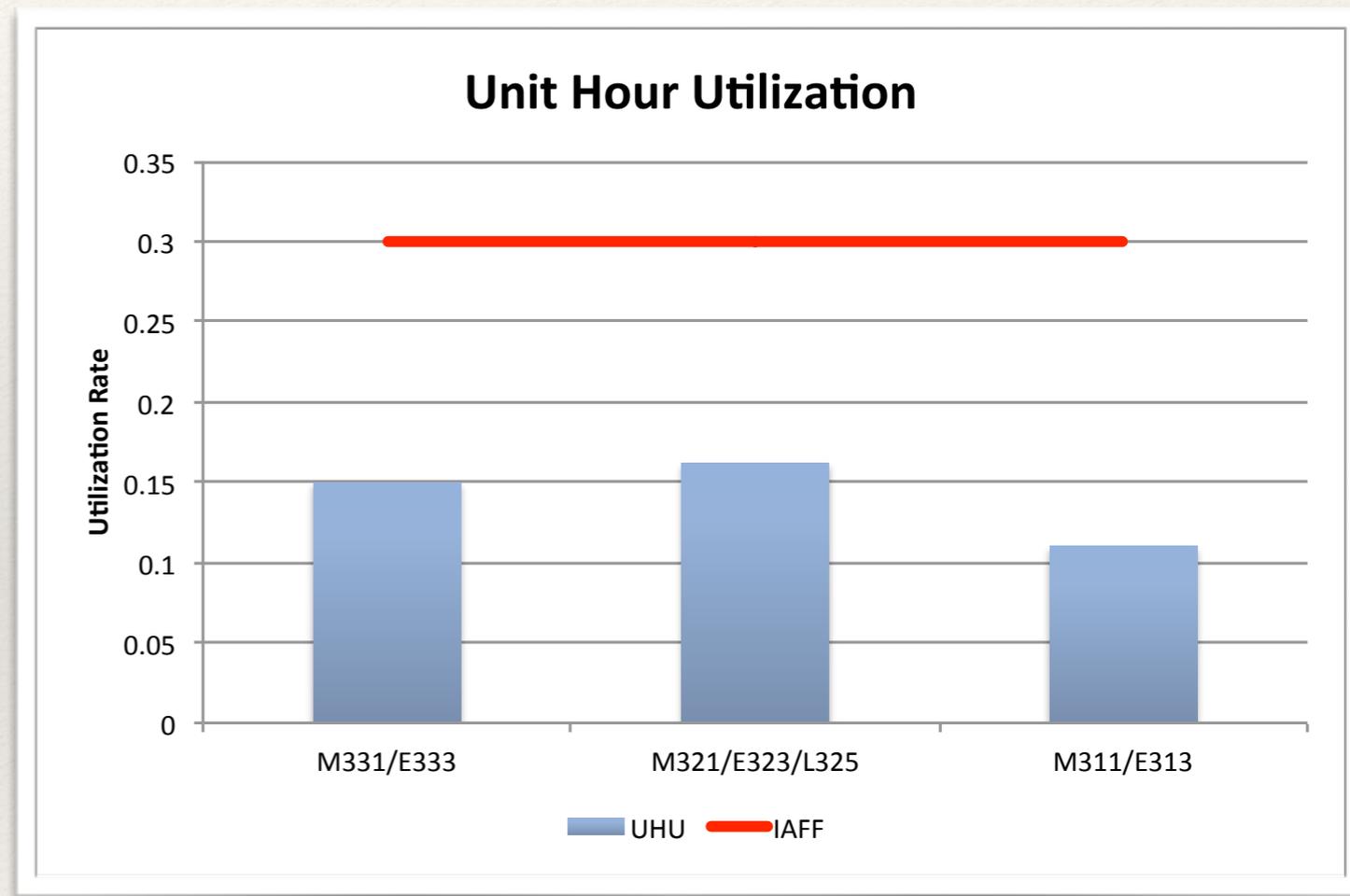
# Public Private Partnerships

- ❖ The rate of fire related incidents would not indicate a strong community demand for fire services
- ❖ In other words, the potential negative impact of providing EMS on the fire suppression program may be minimal and reasonable
- ❖ Average of 1 call every 10 hours



# Unit Hour Utilization

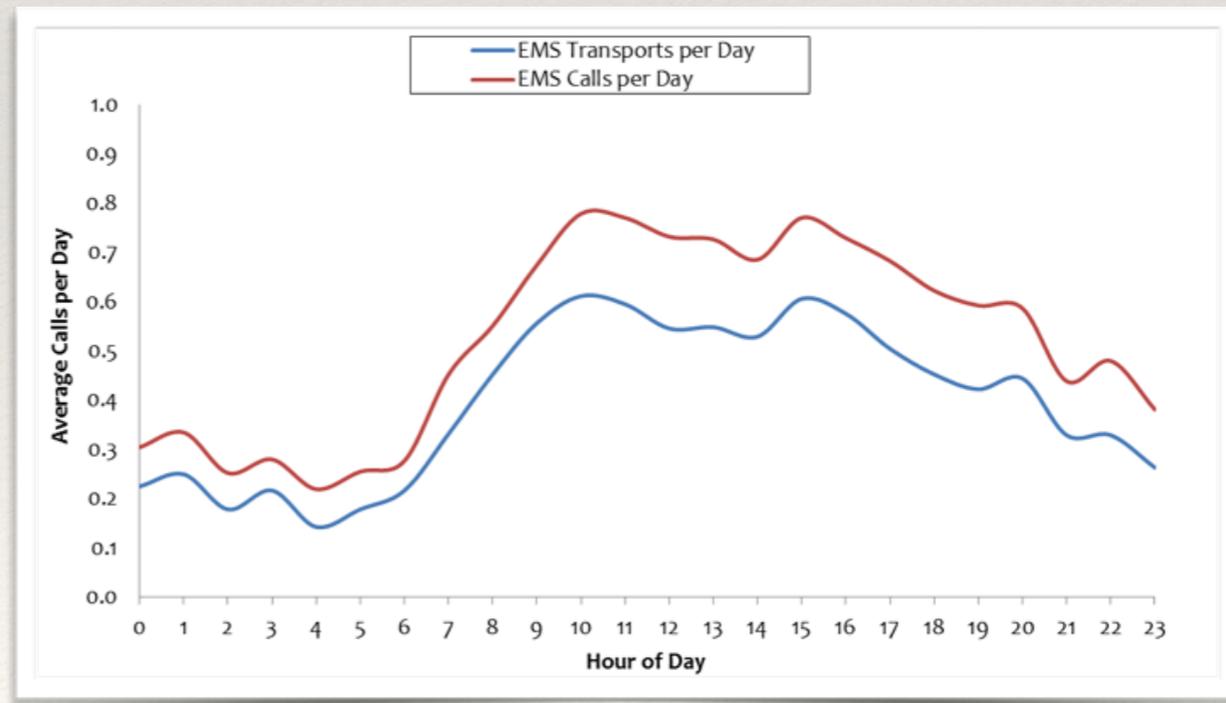
- ❖ Considering how much work is to much work
- ❖ Best practice is not to exceed 0.25 to 0.30 unit hour utilization within a 24 hour shift
- ❖ The current workload indicates that there is excess capacity in the system and therefore can absorb more work
- ❖ In other words, a reduction in workload through a public private partnership may result in a reduction of workload, increased readiness costs, and lost transport revenues



# Staff Schedules

- ❖ Considering a public private partnership, the patient transport rate is high
- ❖ In other words, regardless of whether the fire department responded emergency or non-emergency, the patient received care and transport to the hospital
- ❖ City would incur revenue reductions for patient transportation services if outsourced

Call Category	Non-Transport		Transport		Transport Rate
	Duration	Number of Calls	Duration	Number of Calls	
Cardiac and stroke	30.8	111	49.5	561	83.5%
Seizure and unconsciousness	28.7	79	49.1	290	78.6%
Breathing difficulty	26.2	80	48.0	453	85.0%
Overdose and psychiatric	27.5	44	49.4	237	84.3%
Accident	21.8	98	44.6	105	51.7%
Fall and injury	22.3	440	44.9	711	61.8%
Illness and other	25.0	269	45.9	1,109	80.5%
<b>EMS Total</b>	<b>24.7</b>	<b>1,121</b>	<b>47.0</b>	<b>3,466</b>	<b>75.6%</b>

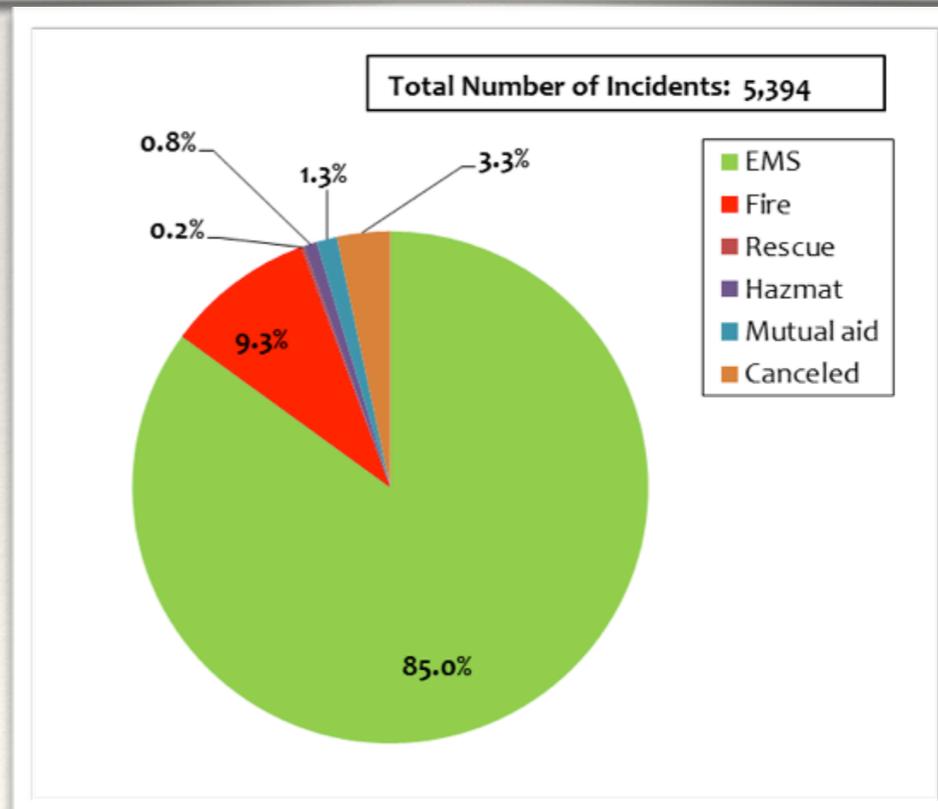


# Staffing Considerations

# Staffing Schedules

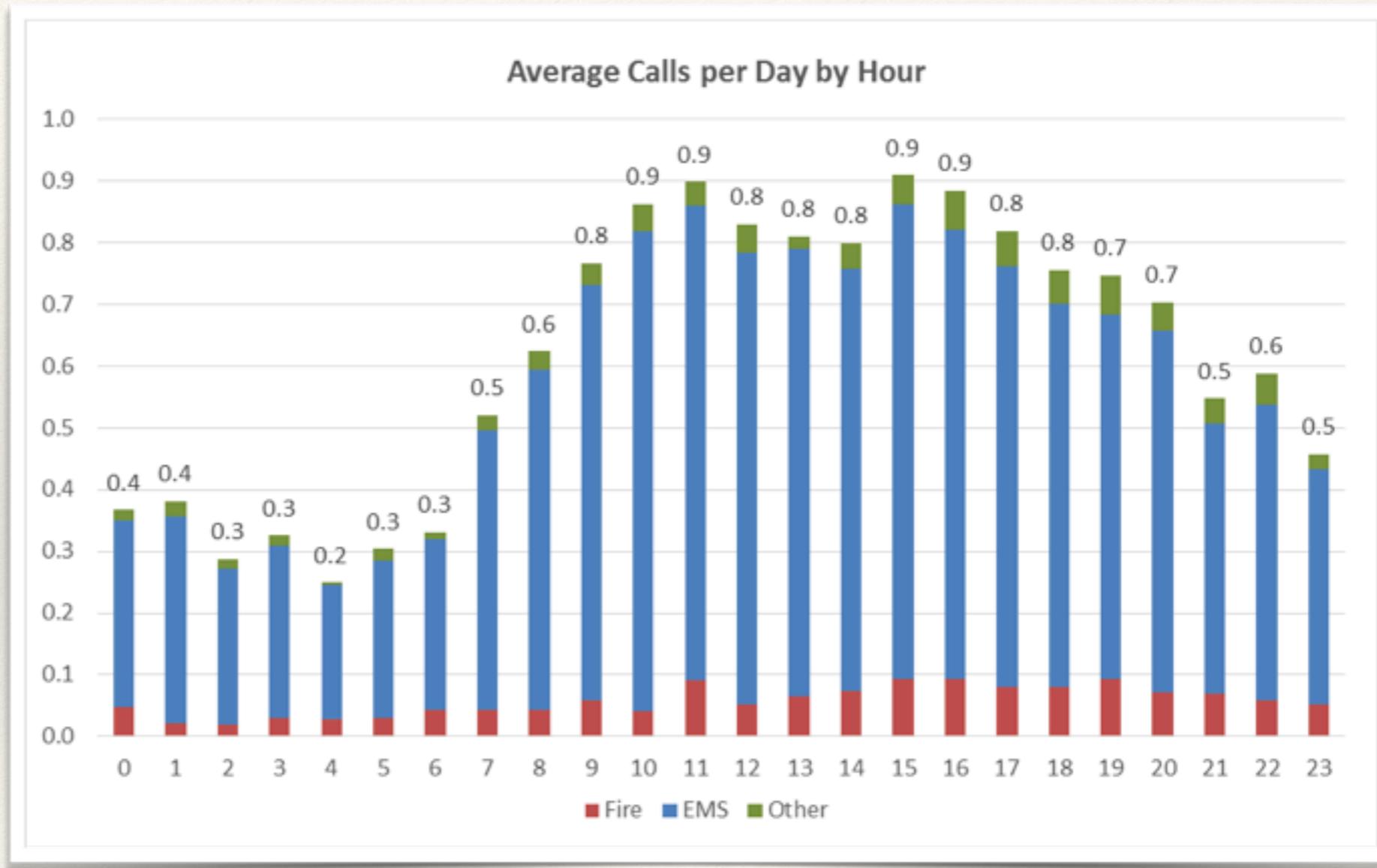
- ❖ While fire related events require more resources to mitigate
- ❖ EMS incidents account for 84.6% of all of the annual time on task
- ❖ Fire related events accounted for 12.7% of the annual time on task

Program	Number of Calls	Number of Responses	Average Responses per Call	Total Busy Hours	Average Busy Minutes per Response	Percentage of Total Busy Hours
EMS	4,587	6,356	1.4	3,571	33.7	84.6%
Fire	502	1,390	2.8	538	23.2	12.7%
Rescue	11	123	11.2	37	18.0	0.9%
Hazmat	45	19	0.4	5	14.9	0.1%
Mutual aid	69	89	1.3	36	24.4	0.9%
Canceled	180	263	1.5	34	7.8	0.8%
<b>Total</b>	<b>5,394</b>	<b>8,240</b>	<b>1.5</b>	<b>4,220</b>	<b>30.7</b>	<b>100.0%</b>



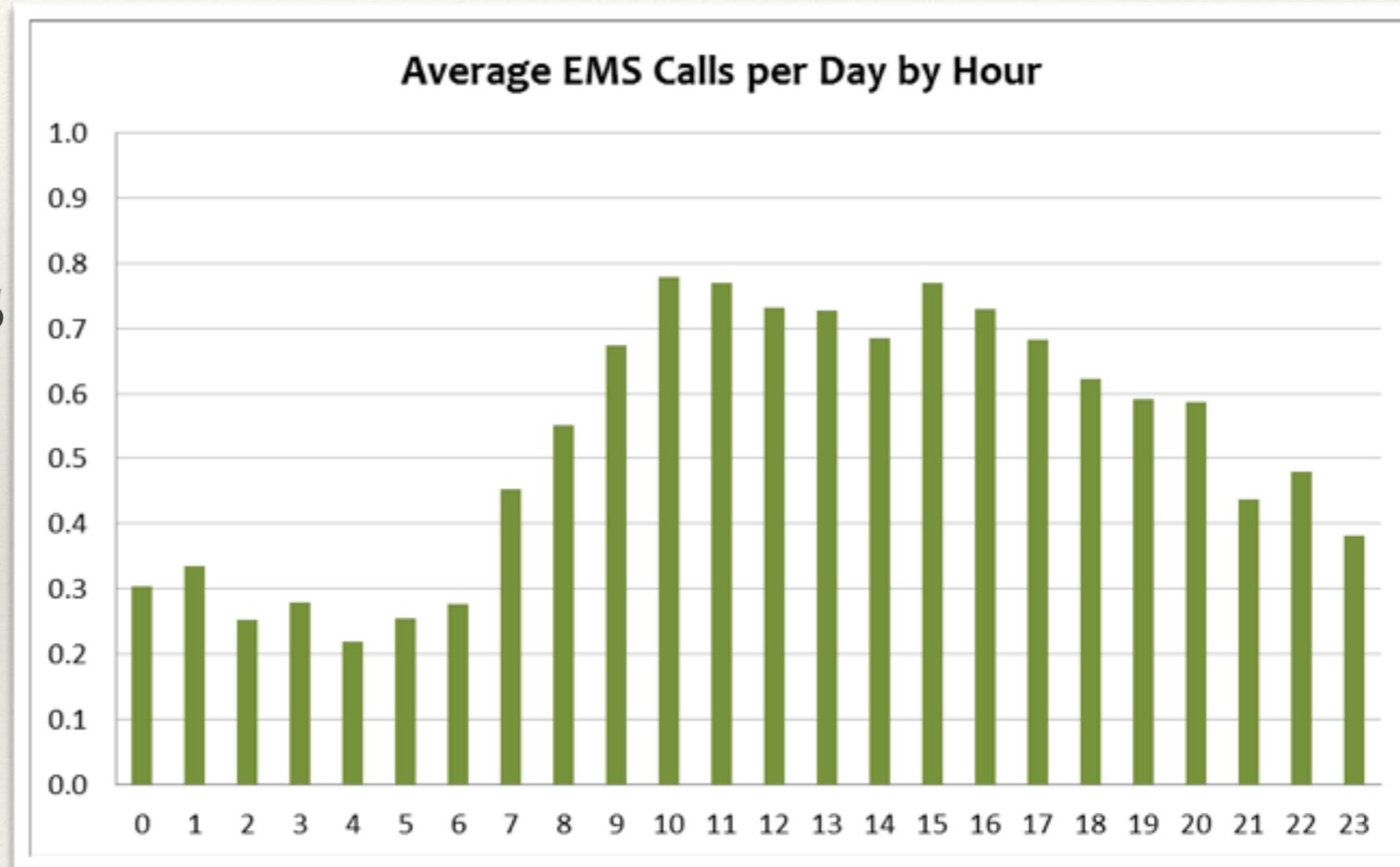
# Staff Schedules

- ❖ The community demand is at its peak between 8 am and 10 pm
- ❖ City should continue peak demand staffing strategies
- ❖ Must ensure base 24/hour services are met



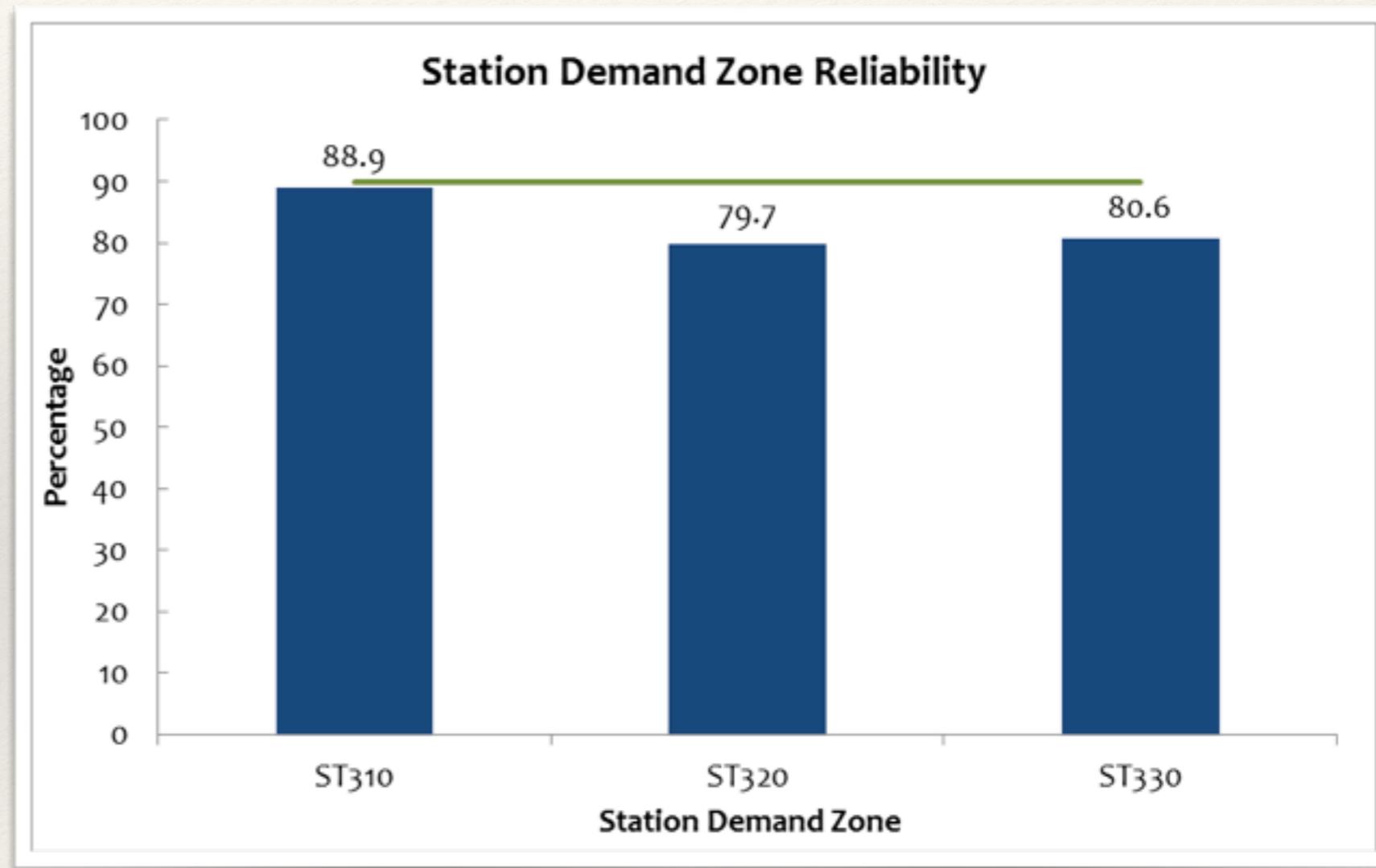
# Staff Schedules

- ❖ The overwhelming demand for services throughout the peak of the day is for EMS related incidents
- ❖ Recommendation is to staff a peak load ambulance for greatest efficiency and return on investment



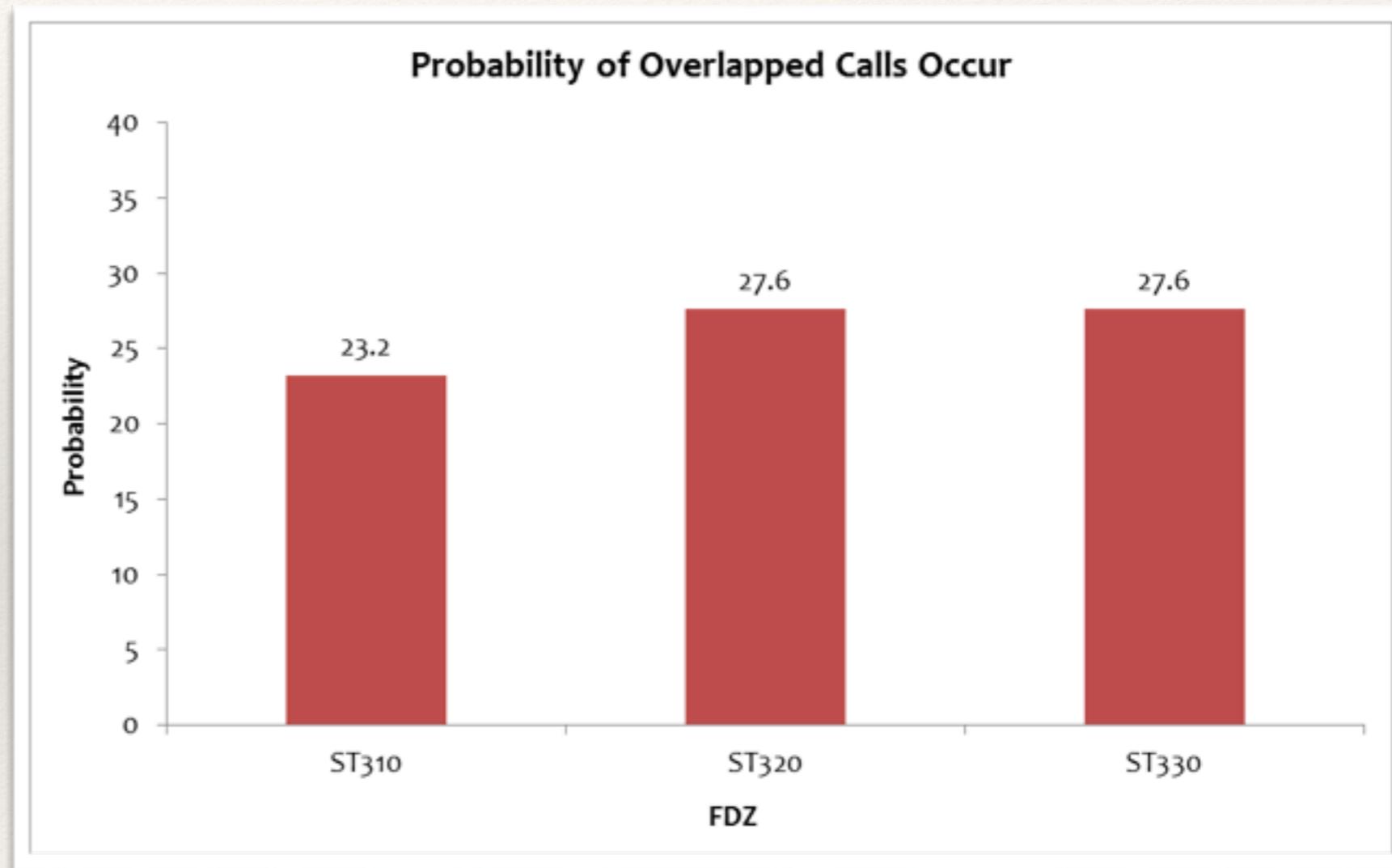
# Station Reliability

- ❖ Each of the stations are approximately greater than 80% reliable
- ❖ Defined by the ability of the resources assigned to a particular station to answer all calls within the assigned area
- ❖ The Department's move-up policy may be contributing to the results as the concentration of resources could be more efficient



# Simultaneous Events

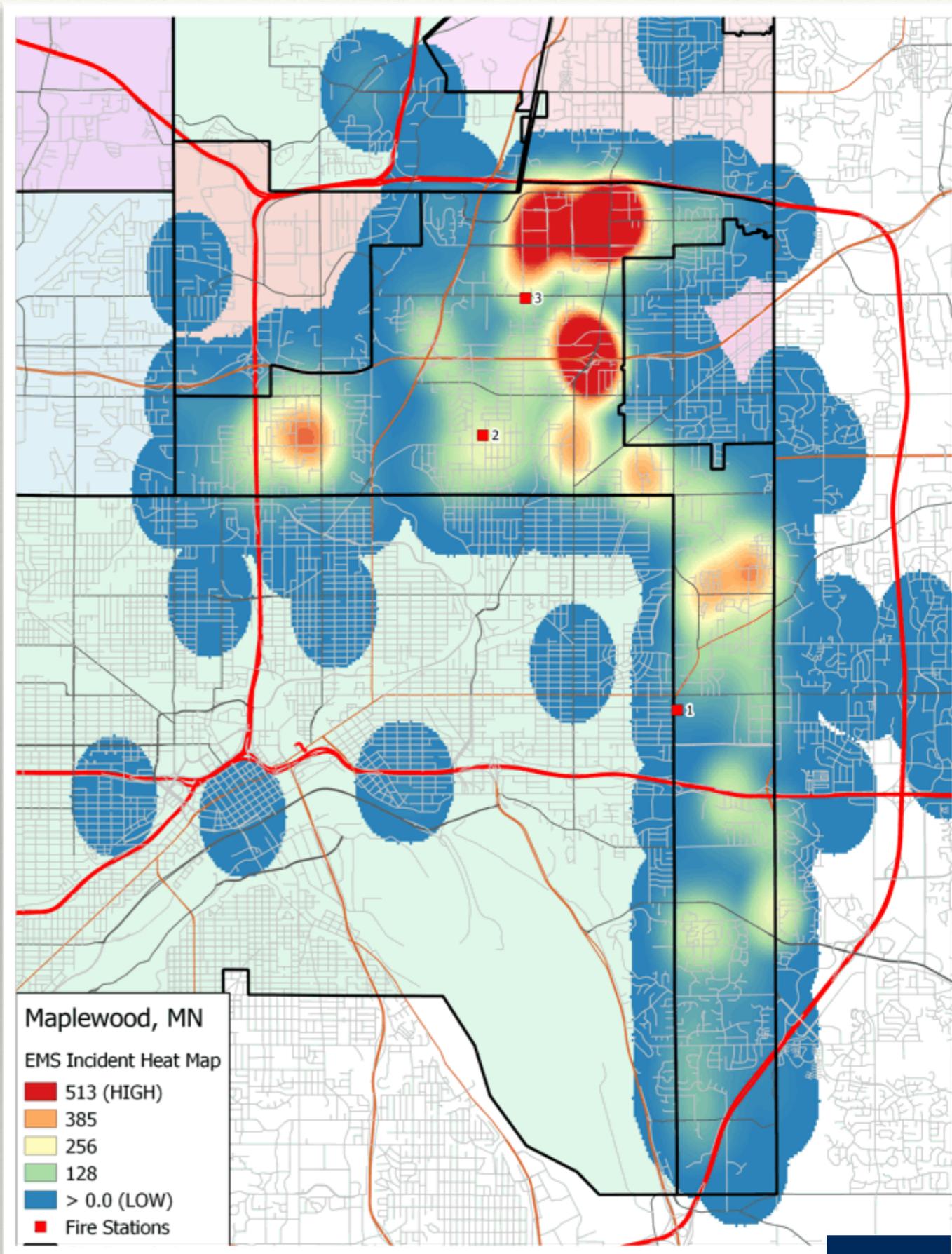
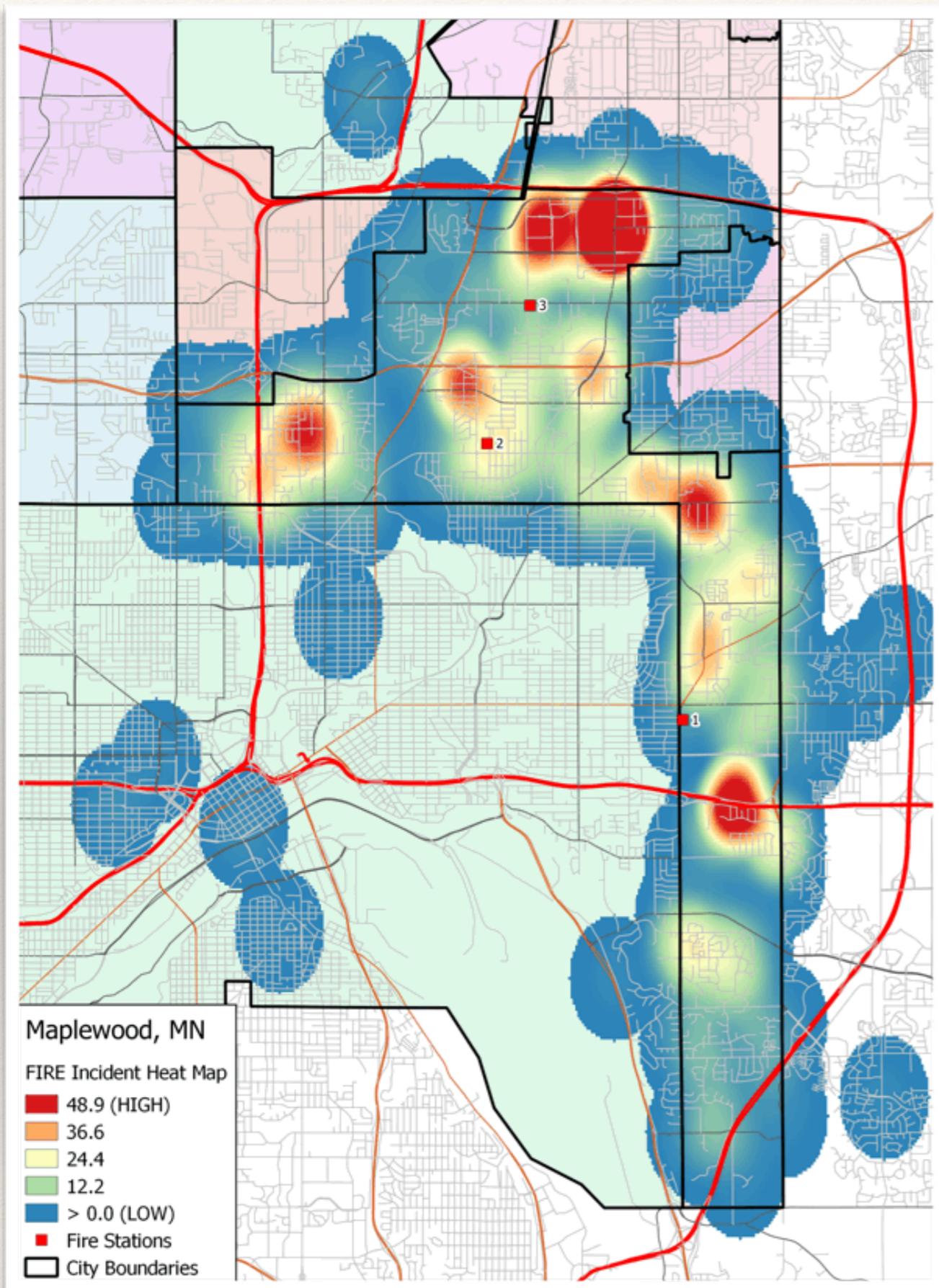
- ❖ All station's simultaneous events are less than 28%
- ❖ In other words, in each of the station areas, the units can respond to a call, mitigate it, and return to available status 72% of the time without a second or greater incident occurring



# Desired Performance and Station Locations

# Fire Incidents

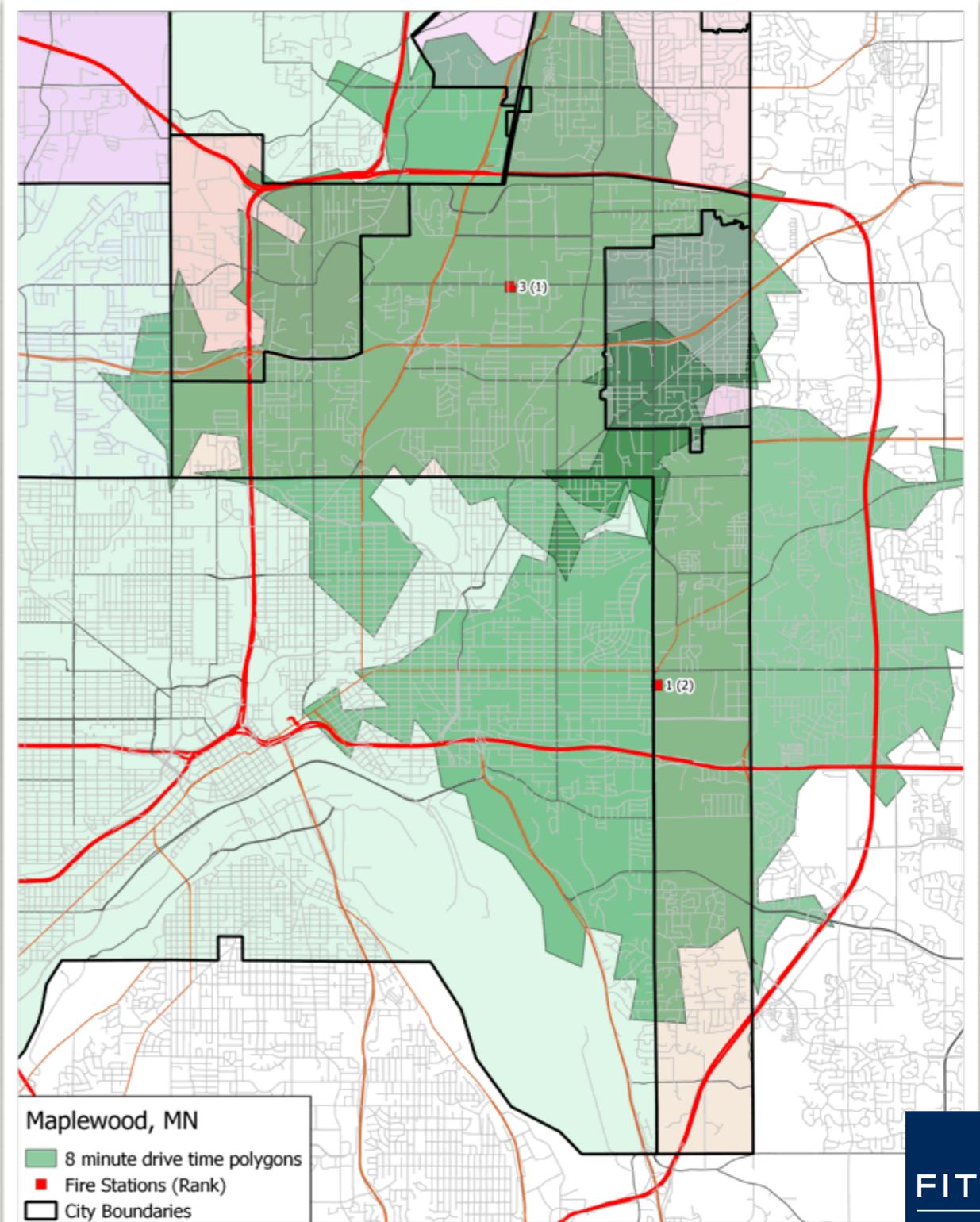
# EMS Incidents



# 8-Minute Travel Time

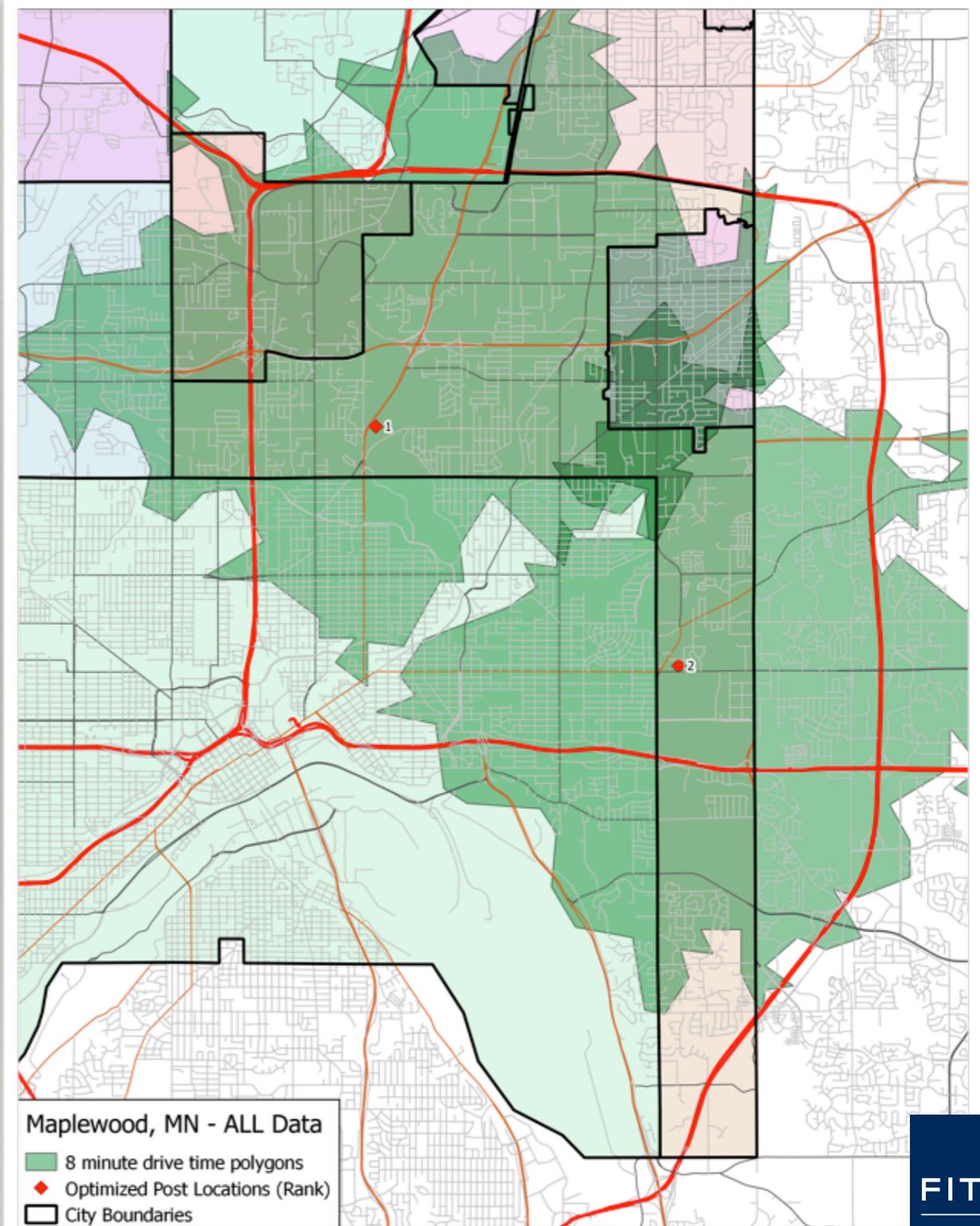
Rank	Station Number	Station Capture	Total Capture	Percent Capture
1	North (3)	9,637	9,637	72.47%
2	South (1)	3,178	12,815	96.38%
3	Central (2)	58	12,873	96.81%

- ❖ The current historical performance is 8.3 minutes with the three station configuration
- ❖ However, can cover 96% of the incidents in 8-minutes or less with only utilizing the North and South stations
- ❖ The Central station would only improve performance by less than 1 percent
- ❖ In other words, the Central station is duplicated for 99% of the territory within 8-minutes



# Optimized 8-Minute Travel Time

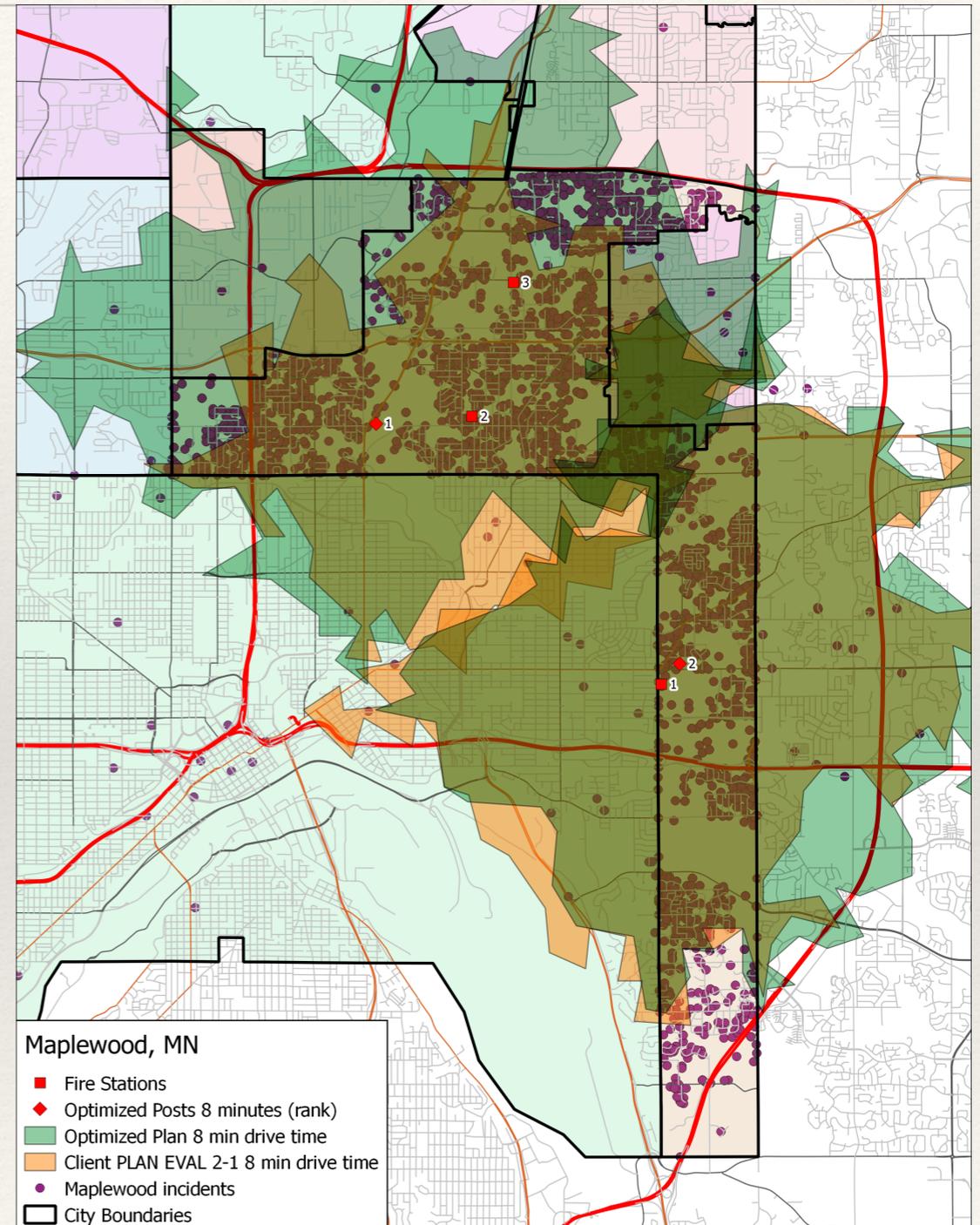
- ❖ The optimized 8-minute travel time still only required two station locations to meet greater than 90% of the incidents within 8-minutes or less
- ❖ No improvement over utilizing the current North and South station locations
- ❖ Station “2” would be nearly identical to current location of the South station
- ❖ Most likely not worth the capital investment for marginal benefit



# 8-Minute Travel Time - Station's 2&1

Rank	Station Number	PostCapture	TotalCapture	PercentCapture
1	2	6918	6918	52.03%
2	1	3160	10078	75.79%

- ❖ Utilizing Station's 2 and Station 1 would decrease the overall performance by approximately 20%
- ❖ 76%
- ❖ Utilizing either the optimized station location or the existing Station 3 location would both provide for 96% coverage paired with the current Station 1 location



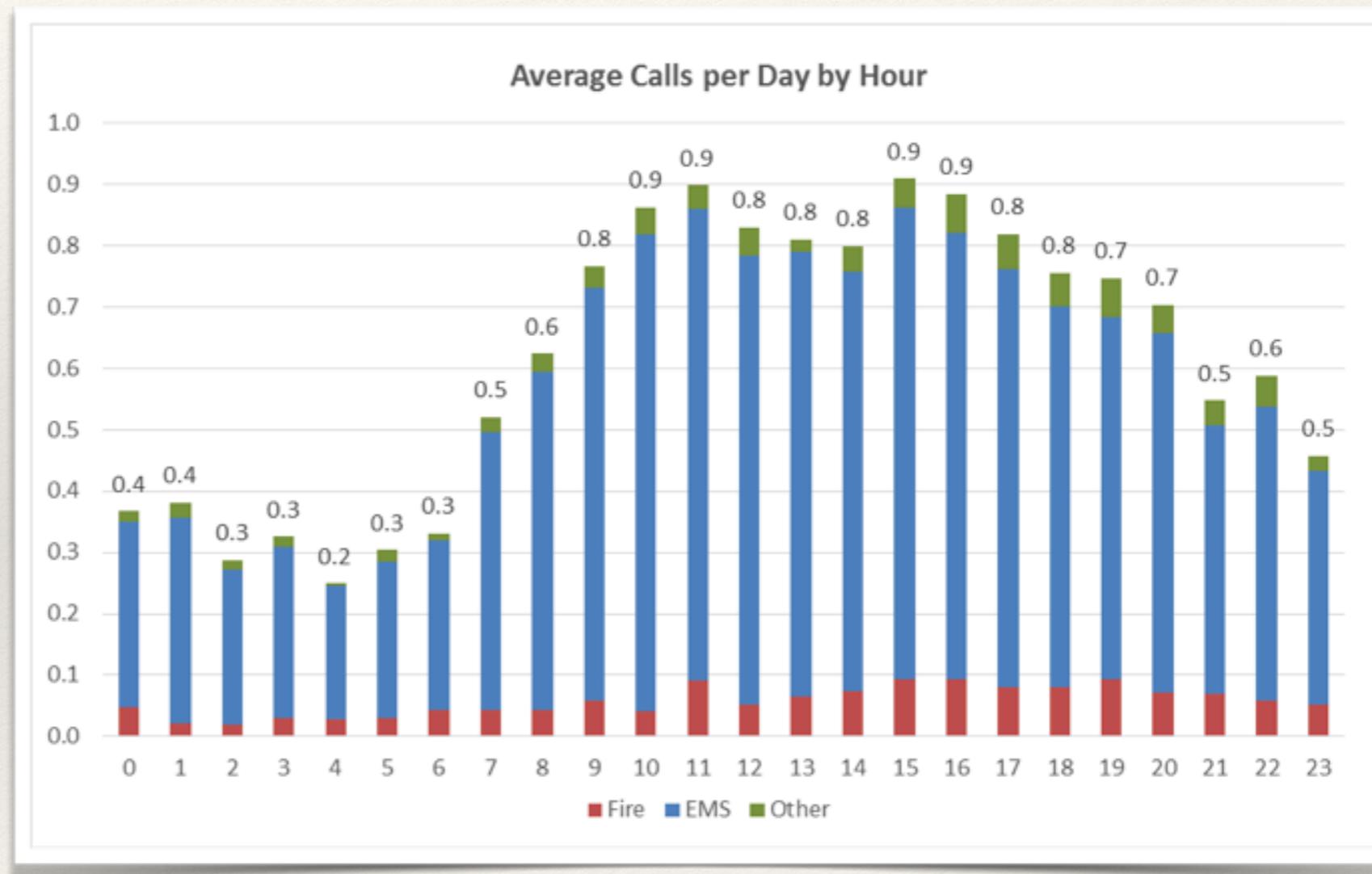
# Alternative Models for Consideration

# Current Deployment

Station	Engine	Medic	Minimum Staffing
South	1	1	2
Central	1	1	2
North	1	1	2
Total 24/Hr	3	3	6

# Staffing Strategies

- ❖ Will require a minimum of 3-units to cover the geographic demands from two-stations and the hourly demand for services
- ❖ Recommend two units at the North station and one unit at South station
- ❖ Recommend a peak-load ambulance during 0800 to 2000
- ❖ Recommend a Battalion Chief on duty
- ❖ Consider 3-person staffing at each station



# Comparison of Staffing Models

	South			North						
Model/ Minimum Staffing	Engine	Ladder	Medic	Engine	Ladder	Medic	BC	Peak Medic	Total 24/HR	Total Peak
1	2	0	0	2	0	2	0	2	6	2
2	2	0	0	2	0	2	PM	2	6	3
3	2	0	0	2	0	2	1	2	7	2
4	3	0	0	2	0	2	1	2	8	2
5	3	0	0	3	0	2	1	2	9	2

# Comparison of Staffing Models

- ❖ Based on average leave history from shift employees it requires 3.31 employees to fill 1 position continuously 24/7
  - ❖ OT should only be for FLSA shift schedule;
  - ❖ Or when leave history is above average
- ❖ Based on average leave history, from the 24-hour shift personnel, it requires 2 employees to fill 1 12-hour position continuously 7 days a week
  - ❖ Better to pay OT for vacancies than hire a full FTE
- ❖ Each of the BC models will have nearly a cost neutral experience as salary savings of the Fire/EMS Chief are reallocated

Model	24-Hour Employees	12-Hour Employees	Estimated Costs
Current	15	3	
1	20	4	\$74,242
2	20	6	\$92,794
3	23	4	\$207,285
4	27	4	\$488,813
5	30	4	\$770,340

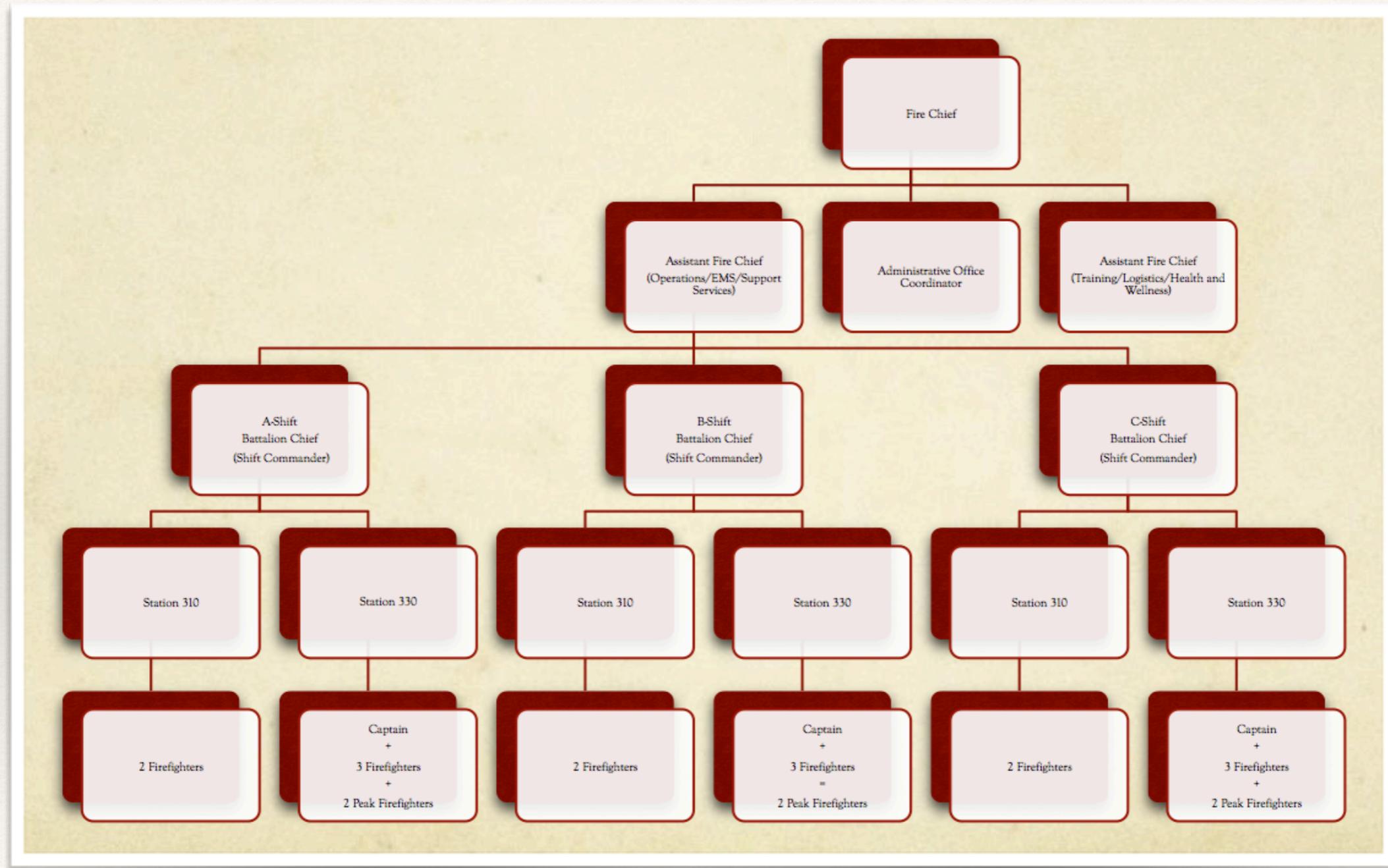
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# Chief Officer Staffing and Command/Control

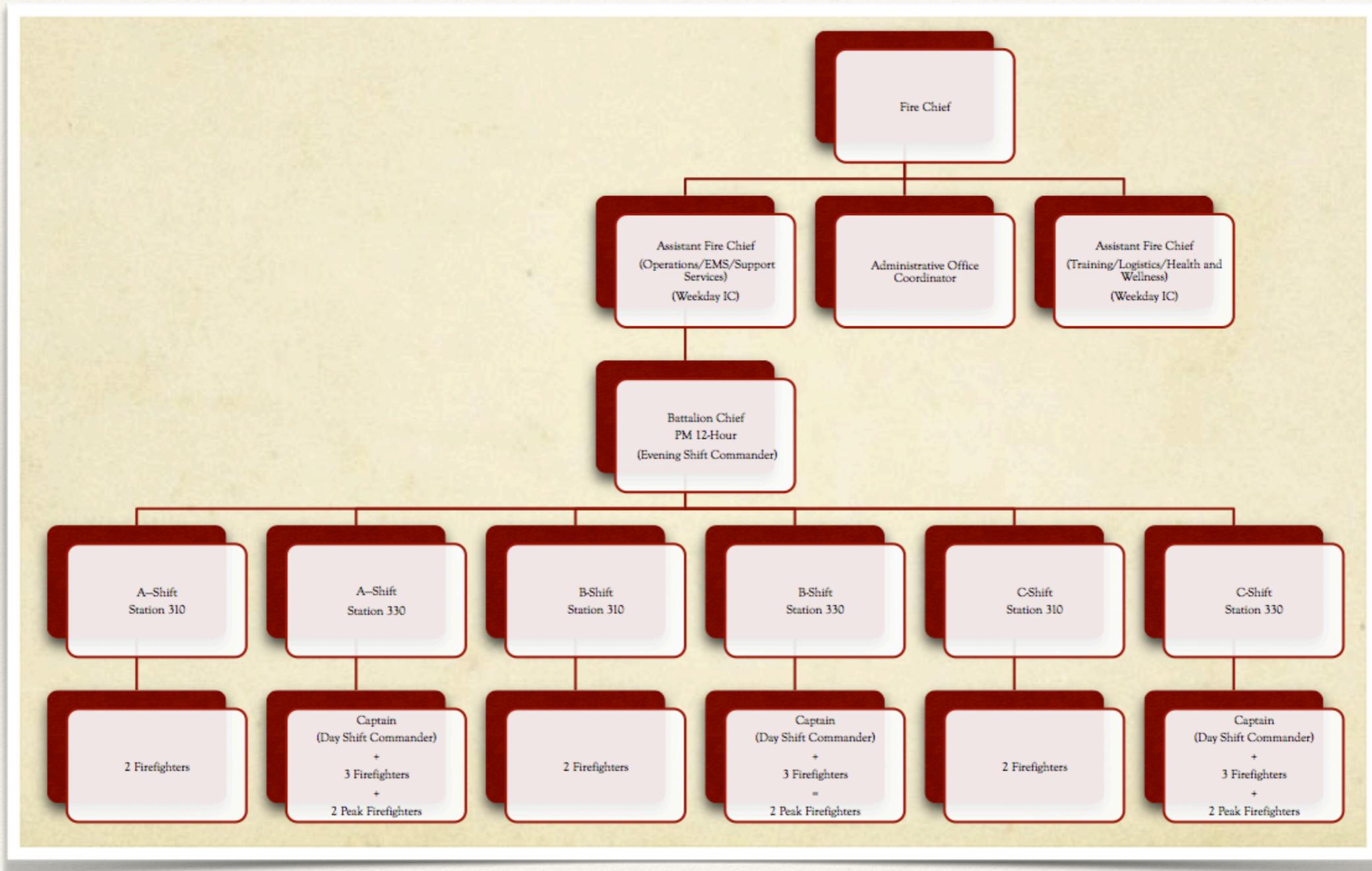
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- ❖ The proposed organizational charts do not intend to eliminate the reporting structure to the Public Safety Director, City Administration, etc.
- ❖ It is suggested that as one of the positions for either Fire Chief or EMS Chief attritions out, that the dual rolled approach is sunset and one administrator retains the combined roles
- ❖ It is suggested that the current 3 chief officers could be restructured from two chief executive and one battalion chief to one chief executive and two assistant chiefs. The reallocation of salary savings and incremental classification adjustments should be nearly cost neutral.
- ❖ The battalion chief field positions are recommended to provide timely command and control for incidents and serves as a more cost effective mitigation strategy than purchasing more readiness
- ❖ Provides for greater opportunities for advancement and succession planning

# Recommended Org Chart Alternative 3



# Recommended Org Chart Alternative 2



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# Summary of Recommendations

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- ❖ Transition from part-time employee group to full time employees
- ❖ Adopt Alternative 3 or 2 to provide for the most efficient performance and coverage
  - ❖ Reallocate resources from the Central station to the North station
  - ❖ Deploy a peak-load ambulance 7-days a week
  - ❖ Deploy a Battalion Chief for command and control on at least nights
- ❖ Reorganize the department's administrative structure as the chief officers attrition
- ❖ Consider upgrading the administrative assistant position to a full time position
- ❖ Delay consideration for public-private partnerships for EMS at this time

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Questions?

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Steven Knight, PhD

**FITCH**

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**& ASSOCIATES**