EMS Optimization and Strategic Assessment

August 10, 2020

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Dallas Fire-Rescue Department

EMS Optimization and Strategic Assessment Background

- Requested in 2014 for an EMS Strategic Plan and for Medical Priority Dispatch for Dallas Fire-Rescue.
- In 2018, an amendment was made from EMS Strategic Plan to a Standards of Cover for the entire Fire Department.
- There have been three Fire Chiefs during this time period Fire Chief Louie Bright, Fire Chief David Coatney, and now Fire Chief Dominique Artis.
- Fitch and Associates used data from 2015, 2016, and 2017.

EMS Optimization and Strategic Assessment Data

Although the Data appears dated, we are not asking the consultant to update the data **currently** because completing similar analysis using 2018 and 2019 data would add time and cost to the project;

- While Fitch will make a recommendation at the end of their presentation, DFR will present a Departmental recommendation for moving forward.

EMS Optimization and Strategic Assessment

Fitch and Associates for the City of Dallas, TX

Overall System Assessment

- Overall, the department is performing adequately within the current system.
- However, the department's distribution and concentration delivery models are stressed to cover the EMS program demands.
- Three core issues related to the delivery of EMS:
  - Workload
  - Performance
  - Resource Allocation and Deployment
- These three core issues resonate throughout the report and are essential elements for what is the most important outcome: <u>the clinical experience.</u>

Workload

Community Demand

- EMS accounts for the largest share of community requests for service
- Total calls per year is 248,383 in 2017
- Average of 681 calls per day
- Annual growth in call volume varied from no growth to 6.4%
- National experience is between 3% and 7% growth per year in EMS

Program	Number of Calls		
	2015	2016	2017
EMS	187,017	198,739	198,865
Fire	41,280	44,446	44,597
Rescue	1,636	1,744	1,742
Hazmat	3,065	2,900	2,484
Mutual	308	407	695
Total	233,306	248,236	248,383
Calls per Day	639	680	681
YoY Growth	NA	6.4%	0.1%

[1] The total call count excludes cancelled calls.

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Community Demand

- EMS accounts for 80.1% of the requests for service
- Much higher because canceled calls distorts the value
- Fire related incidents accounts for 18% of the incidents
- Special risks such as hazmat and technical rescue are combined 1.7% of demand
- Outside, Vehicle, and Structure fires combined account for 2.1% of the demand.
- Validates an EMS centric resource allocation

Call Category	Number of Calls	Calls per Day	Call Percentage
Cardiac and stroke	16,064	44.0	6.5%
Seizure and unconsciousness	18,335	50.2	7.4%
Breathing difficulty	18,154	49.7	7.3%
Overdose and psychiatric	11,833	32.4	4.8%
Accident	31,009	85.0	12.5%
Fall and injury	35,268	96.6	14.2%
Illness and other	68,202	186.9	27.5%
EMS Total	198,865	544.8	80.1%
Structure fire	2,346	6.4	0.9%
Outside fire	1,127	3.1	0.5%
Vehicle fire	1,744	4.8	0.7%
Grass fire	1,085	3.0	0.4%
Alarm	15,711	43.0	6.3%
Public service	17,676	48.4	7.1%
Investigation	2,629	7.2	1.1%
Fire other	2,279	6.2	0.9%
Fire Total	44,597	122.2	18.0%
Rescue	1,742	4.8	0.7%
Hazmat	2,484	6.8	1.0%
Mutual aid	695	1.9	0.3%
Total	248,383	681	100.0%

[1] The total call count excludes cancelled calls.

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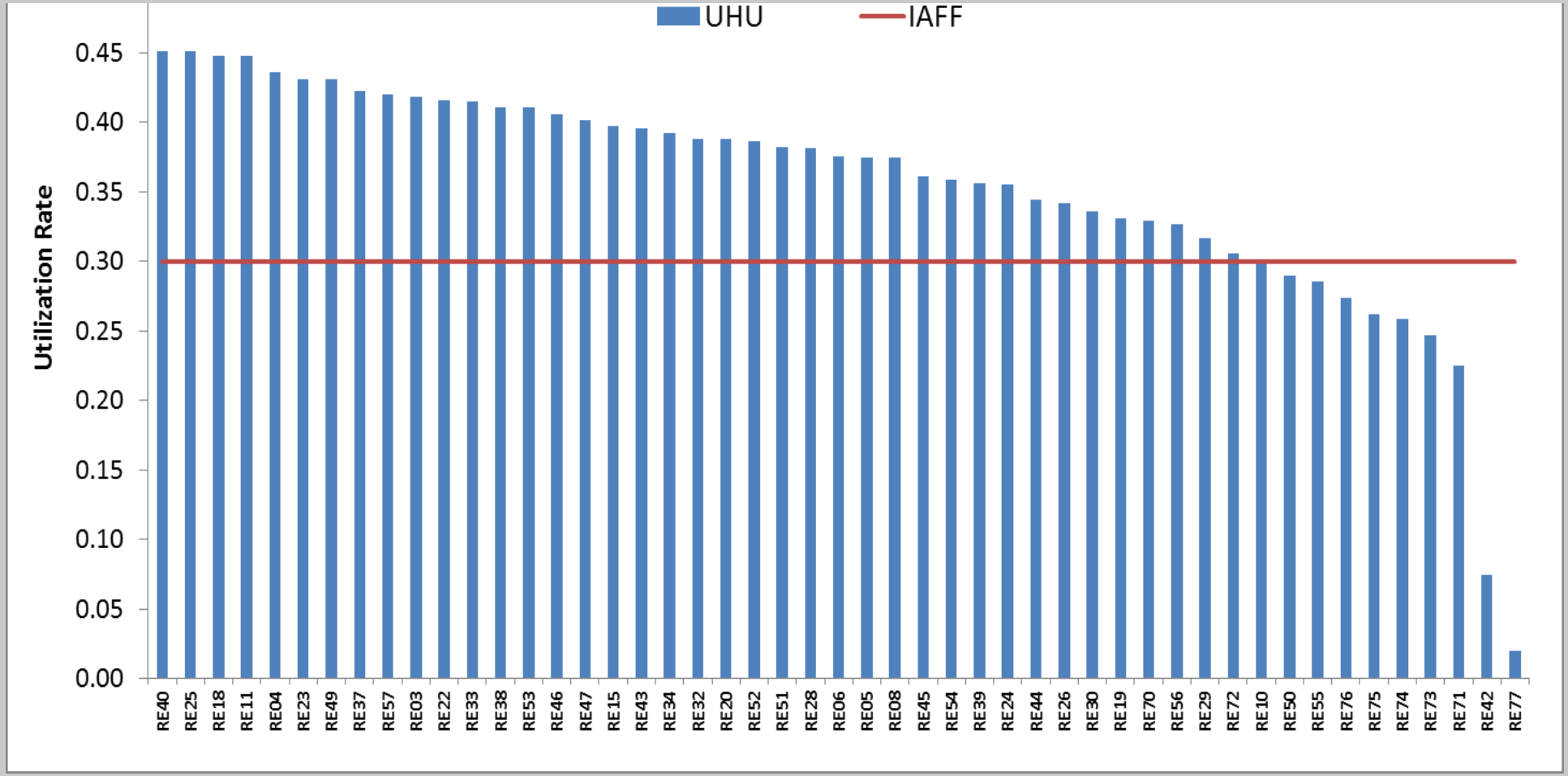

DFR Ambulance Unit Hour Utilization (2015-17) and
International Association of Firefighters upper threshold for UHU

Vast majority of Rescues exceed the recommended upper threshold on workload

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Performance

Program	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
EMS	1.8	1.6	8.1	10.2	173,362
Fire	1.6	1.7	6.4	8.7	36,080
Rescue	1.6	1.7	6.9	9.4	1,818
Hazmat	1.5	1.3	8.1	9.8	818
Total	1.7	1.6	7.8	10.0	212,078

2017 Historical Performance

- Considering “Travel Time”
- EMS is at 8.1 minutes
- Rescue Units are at 8.4 minutes
- Fire is at 6.4 minutes
- System performance is at 7.8 minutes overall
- How is the system designed?

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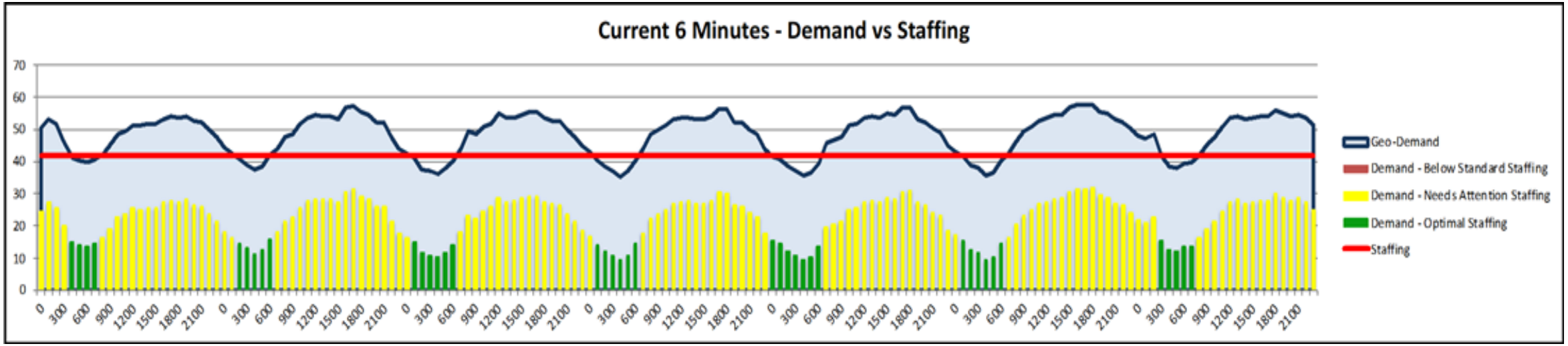

Insufficient Resource Allocation Contributes to Performance Challenges

- Considering “Travel Time”
- EMS is at 8.1 minutes
- Rescues are at 8.4 Minutes
- Fire is at 6.4 minutes
- How is the system designed?

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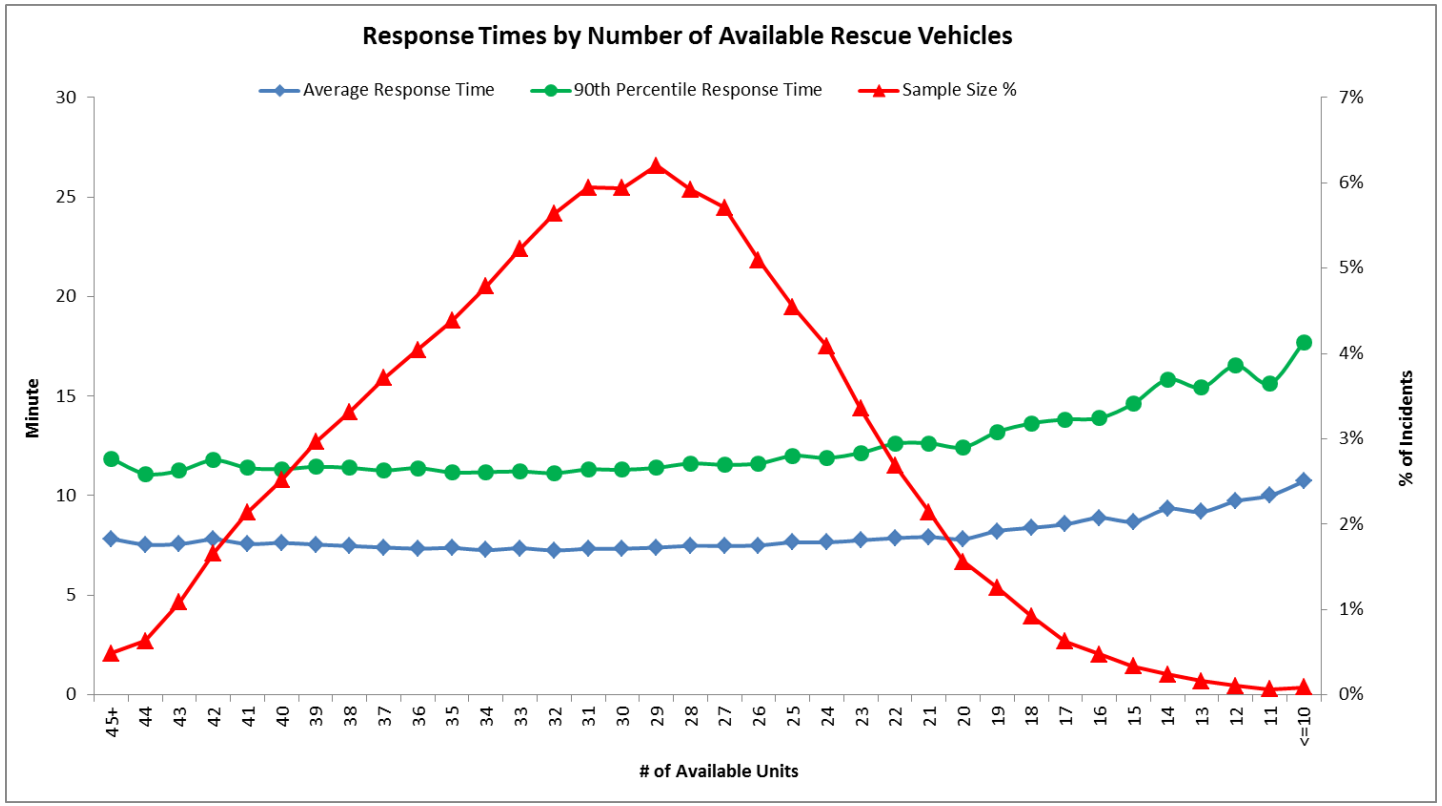
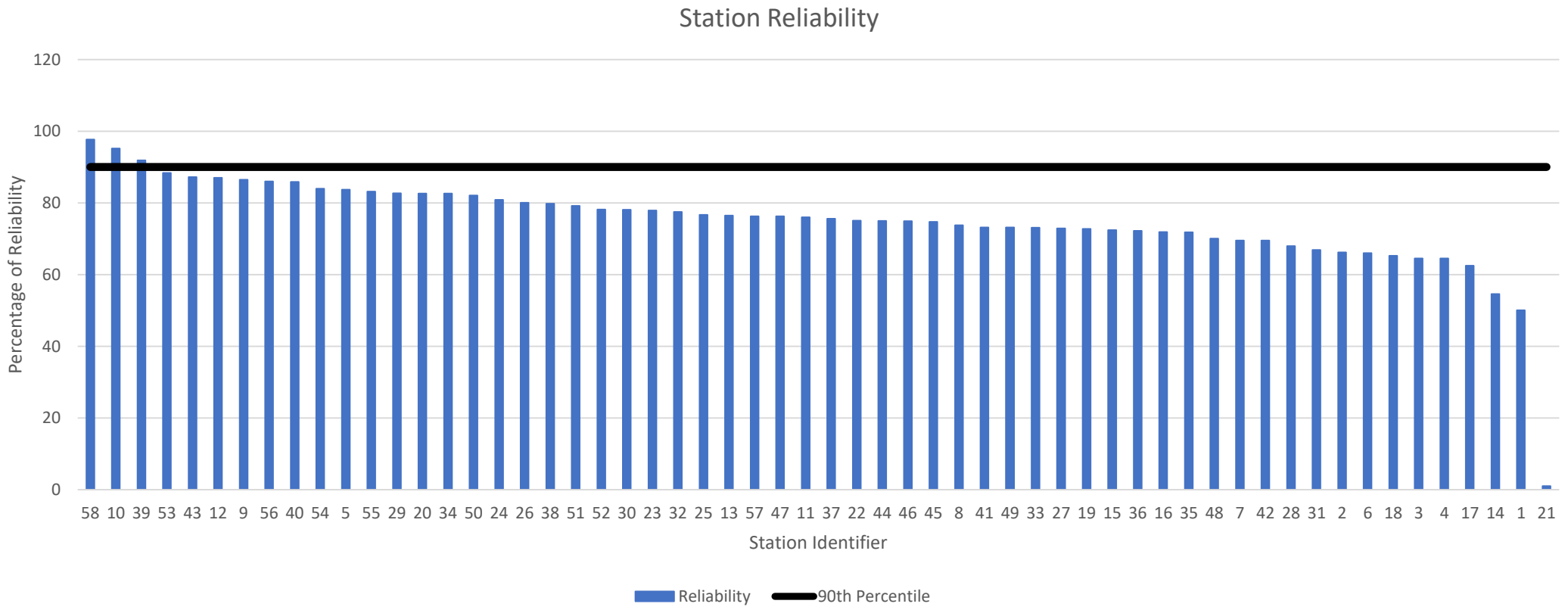
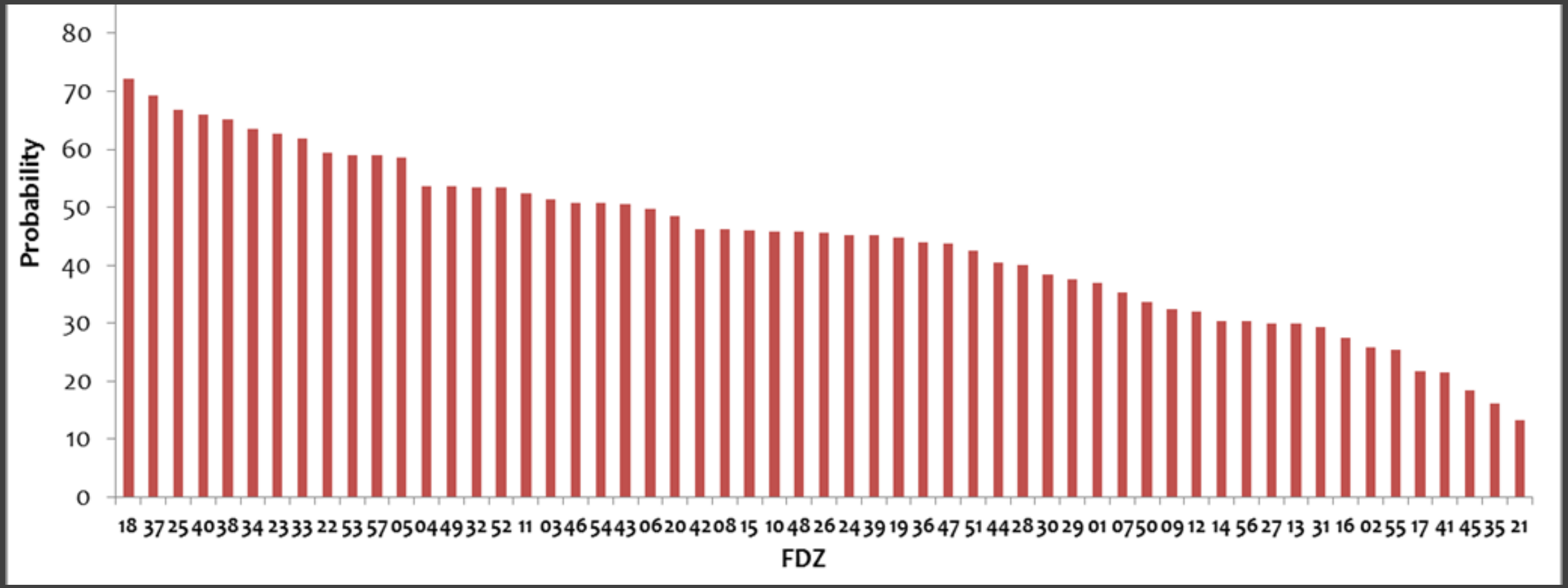
Response Time by Available Rescue Vehicles



- Response time begins to substantively elongate when there are approximately 20 to 26 units available in the system
  - 26 value because 6 PLUs were included
- Response time continues to increase to over 17 minutes when there are 10 or less units available

Station Reliability-is the percentage of time a unit at the station is available to respond to an incident.





EMS Call Concurrency

Call Concurrency- is the probability that a second or greater call for service will happen within the station's response district when the primary unit is assigned to another incident.

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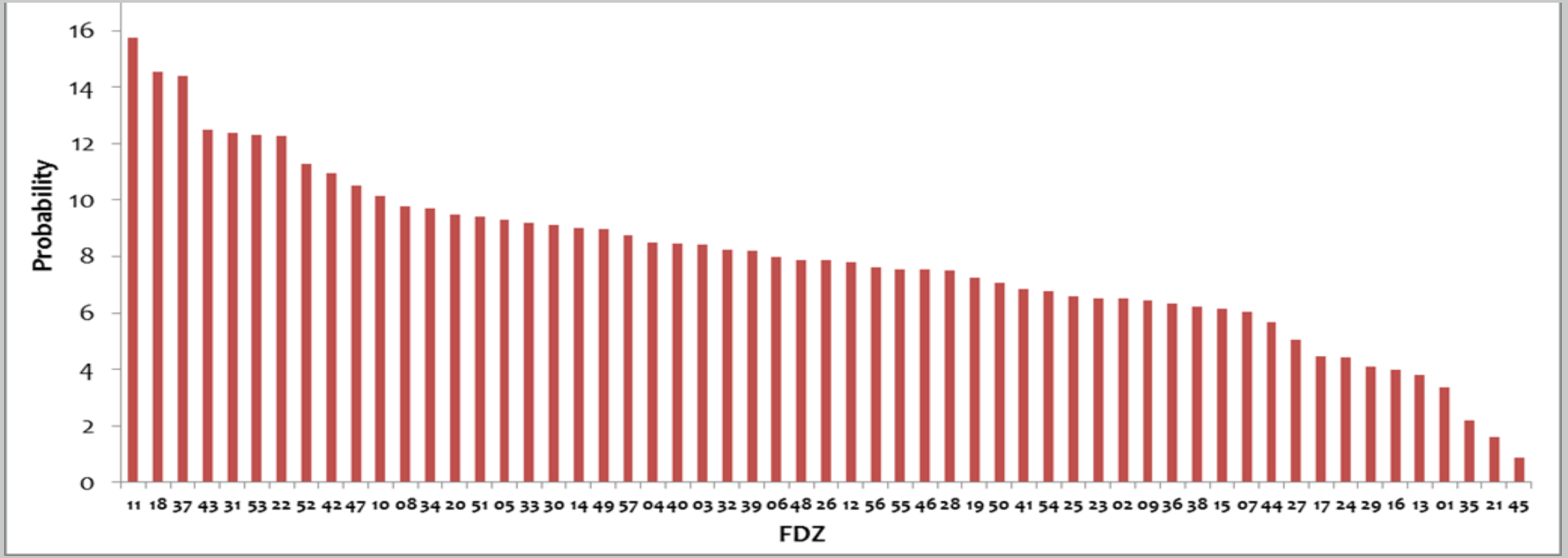
Fire Call Concurrency

Call Concurrency- is the probability that a second or greater call for service will happen within the station's response district when the primary unit is assigned to another incident



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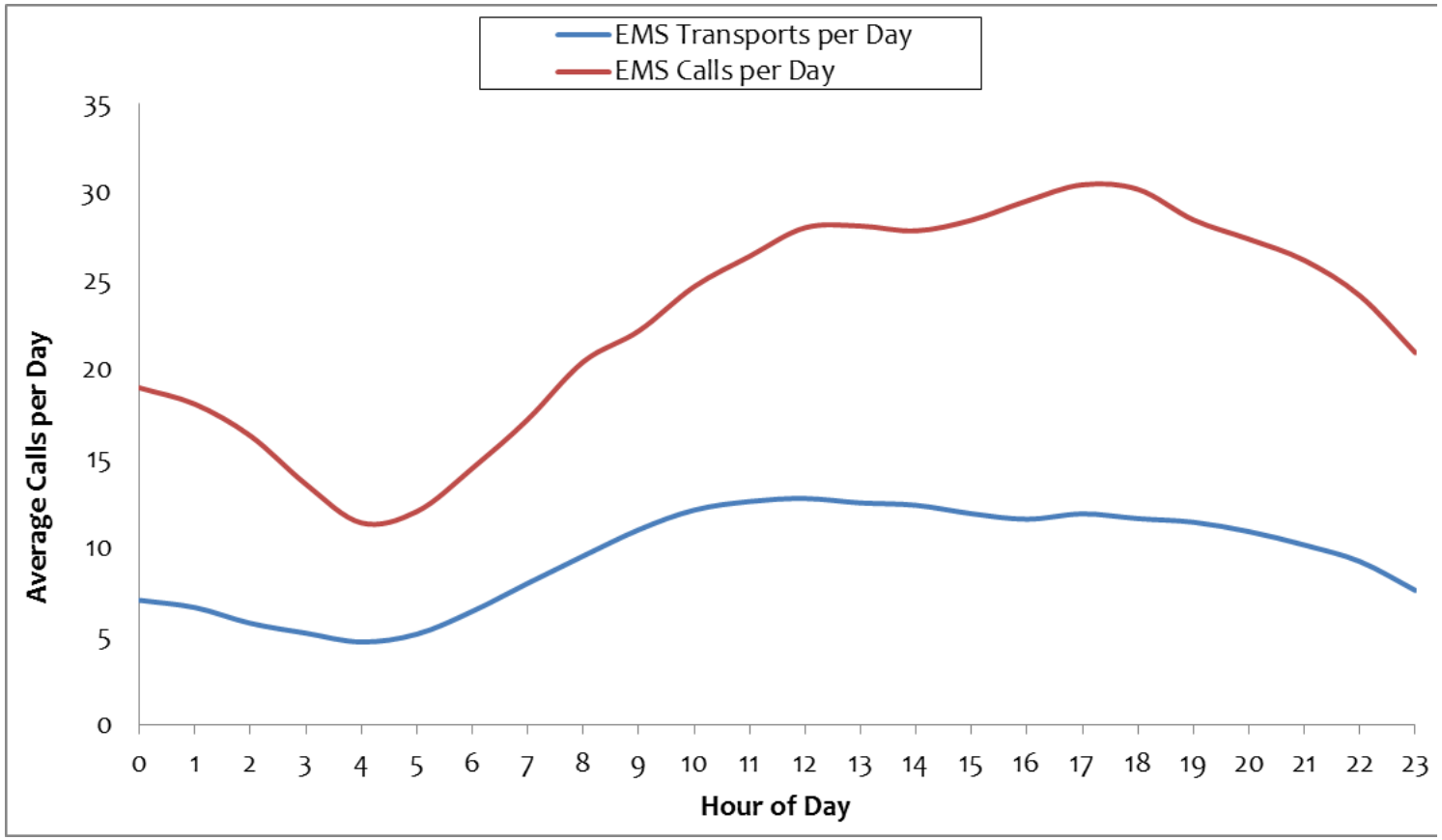

Transport Rates

- During the peak of the day, the transport rate varies
- Overall, the system 911 transport rate is 41.8% (2017)
- Transport rate in 2019 was 41.4%
- Transport rate is not well-aligned with industry experience

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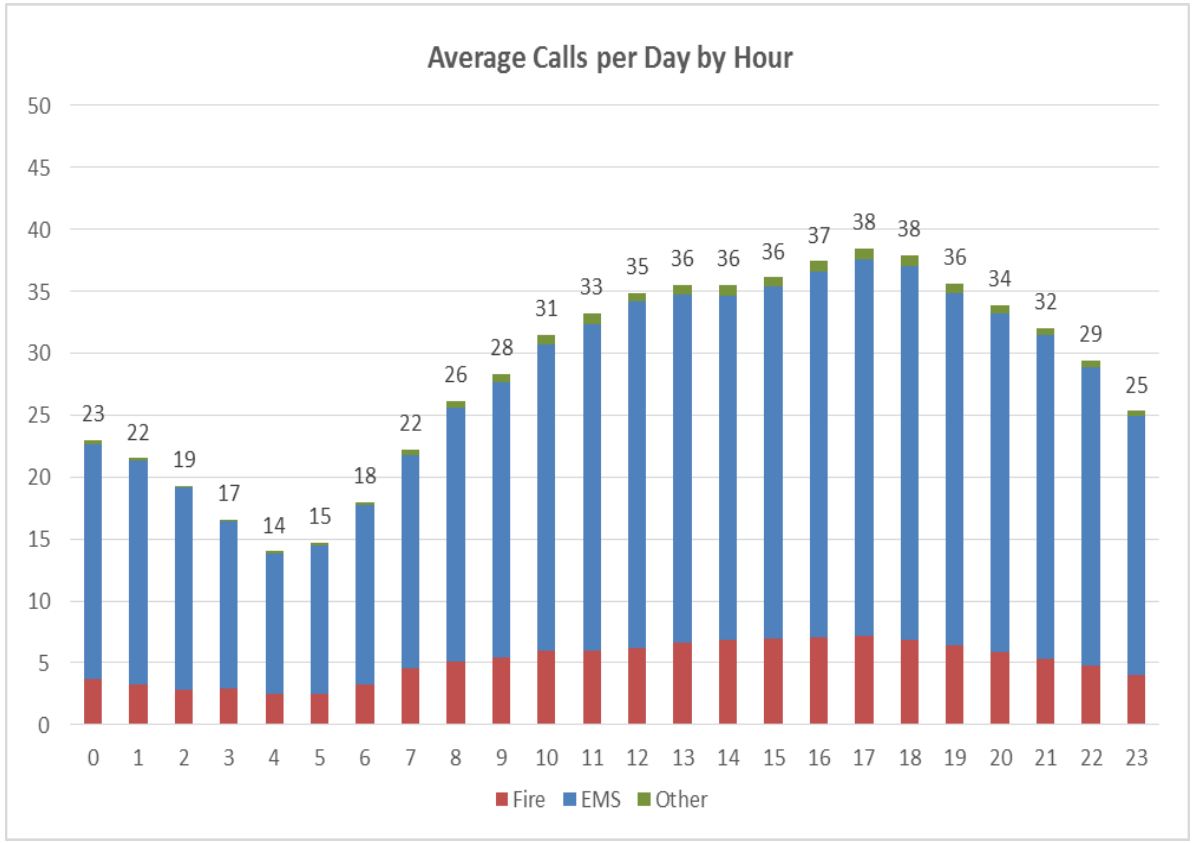
Resource Allocation and Deployment



Temporal Distributions

- No significant impact by month of year or day of week
- However, considerable difference between the peak of the day and non-peak periods
- Average of 38 calls per hour throughout the peak of the day
- Average of 30 EMS calls per hour throughout the peak of the day
- Average of 7 fire related incidents per hour

Optimized Personnel Staffing

Staffing optimization was determined by mathematical formula based upon the required number of seats, the hours to be covered, and the annualized use of scheduled and unscheduled leave.

The resulting “Relief Multiplier” indicates the minimum personnel needed to staff each seat in the deployment model.

24/48 schedule (24/7) on an average 54hr work week requires 3.47 FTEs per seat.

3/4 schedule (peak) on an average 42hr work week requires 2.21 FTEs per seat.

Unit Type	Staffing Multiplier	Total FTEs/Unit	FRO Sworn	Civilian Paramedic
24-hour Rescue Ambulance	3.47	7	$ 612,198.58	N/A
12-hour Peak Load Unit (PLU) Ambulance	2.21	4.4	$ 390,811.12	$ 257,213.16

Summary of Recommendations

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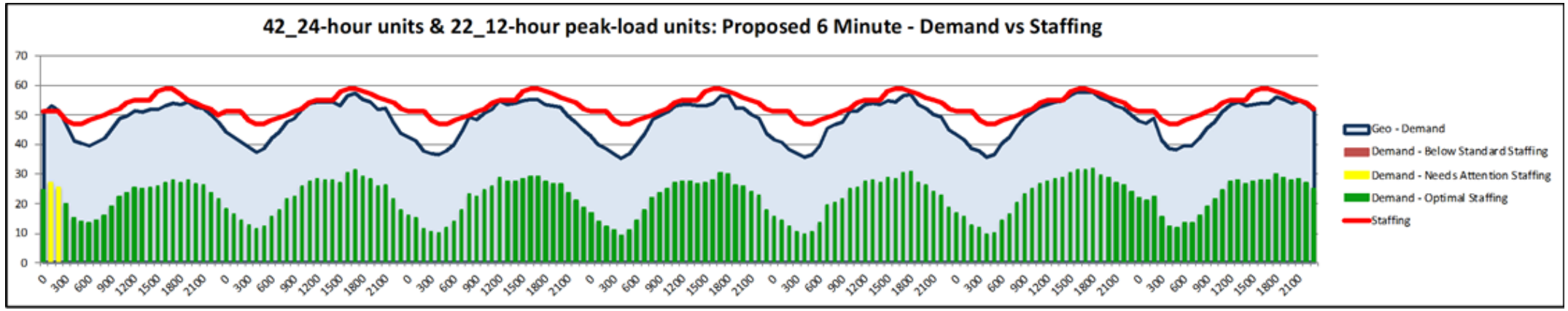
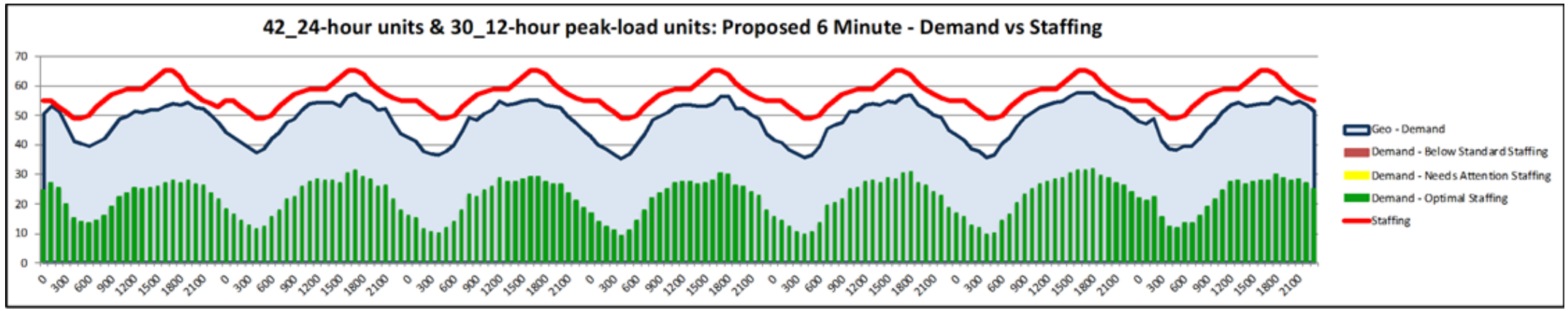
Recommendations

- The current deployment is nearly able to achieve 6-minute travel time performance in the suppression program.
- The EMS program is only able to achieve approximately an 8-minute travel time at the 90th percentile.
  - The agency is reactively performing at 8-minutes as a result of excessive EMS workload.
- Based upon findings, the following alternatives are recommended:
  - Deploy additional resources to improve to a 6-minute system that controls for workload; or
  - Consider a civilian single-certification peak-load deployment strategy that is cost neutral and sustainable at approximately a 55% transport rate; and
  - Adopt a two to three-year implementation of a 30 peak-load unit deployment to supplement the 24-hour Rescue units; and
  - Evaluate patient transport rates to align with clinical expectations
  - Improve patient care report documentation

6-minute Model Controlled Workload





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Examples of Various Civilian EMS Models

Public-Private Partnerships

Very common relationship throughout the country

Outside entity is contracted to provide patient transport services and fire department typically provides first response

MedStar - Fort Worth, TX

Washington, D.C.

San Diego, CA

Las Vegas, NV (FD and Private share responsibility)

Civilian Programs under the Fire Department

Government employees assigned to the Fire Department

City of Philadelphia, PA

City of New York, NY

City of Orlando, FL

Orange County, FL

Marion County, FL

Polk County, FL

Civilian Programs under the Local Government

Often referred to as 3rd Services the EMS Division is an arm under the local government equal to Police and Fire

City of Montreal, Canada

City of Austin-Travis County, TX

Lake County, FL

Volusia County, FL

Pinellas County, FL

Questions?

Chief Artis Comments

DFR agrees with the 3 core issues related to EMS Delivery:

- Workload
- Performance,
- Resource Allocation and Deployment

DFR has already begun work on implementing changes that address these issues for which we have resources. For example:

- We have added 3 full time and 3 peak demand rescues since 2017, which has helped to reduce workload and response times

Regarding the recommendation to add personnel and resources, given the current economic times, DFR is studying ways to make improvements at the best possible value for our stakeholders within our current budget..

Chief Artis Comments (Cont.)

WORKLOAD

- Study ways to expand EMS service with additional Peak Demand and Full time Rescues to improve to a 6-minute response system that controls for workload implementation over a three-year period.

- DFR is also exploring options to redefine the employee entry point and career path for the Department.
  - New recruits would join DFR and operate as single-role Paramedics, staffing Peak Demand Rescue Units on a 40-hour work week
    - Could include Civilian Employees
    - Career Path options
      - Continuation as a Single Role Paramedic
      - Promotion to Firefighter / Paramedic
      - Transfer to Fire Prevention & Inspection Bureau

Chief Artis Comments (Cont.)

WORKLOAD (cont)

- Adjust staffing of existing peak units to ensure 100% staffing
- Research Nurse line and telemedicine integration DFR Dispatch
- Reduce EMS call volume with programs like Right Care, Mobile Community Health Care and individual code response review / adjustments etc.
- Explore options for alternative transportation for patients, such as a partnership with DART

Chief Artis Comments (Cont.)

PERFORMANCE

- The Quality Assurance/Quality Improvement Program related to both the clinical and billing side of electronic patient care reporting (EPCRs) has already begun.

- Statistical analysis of performance specific UHU data (dispatch time, turnout time, at-hospital time) to ensure adherence to performance standards.

- Internal Audit of our EMS Billing system

Chief Artis Comments (Cont.)

RESOURCE ALLOCATION AND DEPLOYMENT

- Deploy existing Peak Demand Ambulance Units from centralized location to create a dynamic response model, adjust peak ambulance in-service time to better match peak call volume times.

- Use statistical analysis to adjust apparatus placement and improve response times utilizing GIS and Dashboard data

DFR continues to work on improvements within our current EMS system.

Questions ?

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