Information Briefing Summary

Kennett Fire and EMS Regional Commission

An Analysis of PoMarLin Fire Company Fire & Rescue Response Performance 2019 and 2020

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Action Forcing Event

In the summer of 2021, the Fire Chief of PoMarLin Fire Company asked Kennett Township to complete an analysis of fire responses for PoMarLin Fire Company ("the company") for calendar year 2020 to determine the response performance of the company.

This Information Briefing Summary is a summary of the analyzed data designed to inform decision-making by PoMarLin Fire Company, the Kennett Fire and EMS Regional Commission, and the Townships they serve. This Briefing Summary is not a policy review, nor does it endorse any recommendations. The call responses analyzed are for 2020 and 2019 which is explained herein.

Background

The analysis was completed with oversight by the Company who provided all the necessary data to be analyzed leading to this report. Additionally, this analysis and written report ("the report") was completed by the Kennett Township staff at no cost to the Commission or the Fire Company. The contents of this report have been reviewed and approved by the Company for accuracy.

The original report only focused on call data for 2020 as provided by the Company. If there are any inaccuracies within the reports provided by the Company, then those inaccuracies would translate to this report. Additionally, the report makes assumptions which are detailed throughout and are necessary to sift through the voluminous data. Importantly, the report only focuses on responses to fire calls based on Incident Type (see page 2 for those Incident Types that were excluded from this study). While some analysis focuses on the Tanker, the majority is focused on the Engine and Rescue.

The purpose of the report is to develop a complete understanding of the quality of fire and rescue responses from the Company in 2020 to inform operational changes that may be necessary moving forward. The reporting system in the Company is not setup to drill down on the quality of fire and rescue responses as it relates to the staffing of apparatus or the time it took an apparatus to respond to an incident. Therefore, an individual analysis of each dispatch was necessary to develop a comprehensive understanding. Of note, there were over 30 dispatches with incomplete data that the Company was unable to source. The author recommends more organized data and record keeping as absent data may skew any findings of an analysis.

Analysis

At the onset of this analysis the Company laid out standards that they hold their company to for fire and rescue responses. It was those standards that were investigated, measured, and reported on in this analysis. The two standards that were analyzed were Turn Out Time and Apparatus Staffing. These two standards were applied only to the first due apparatus per incident.

For the analysis, the provided data was sorted to only focus on incidents that require a fire response. Accordingly, only UNITS/Apparatus ENG36, and RES36 were considered for this analysis. (ATV36, BRU36, COM36, FP36, SQD36, TNK36, and UTL36 were deleted.) Next, the following INCIDENT TYPES were deleted if they were present: 341, 360, 361, 363, 500, 520, 551, 552, 553, 571, 600, 812, 813, 900 and 911. This brought the number of dispatches down from 732 to 275. There were 5 additional dispatches removed so the total number of dispatches used for this analysis is 270. Note that the number "dispatches" is not the same as number "incidents." Rather, this is the number of times ENG36 and RES36 logged a DISPATCH TIME. Those 270 dispatches were sorted by Turn Out Time (ROLL TIME - DISPATCH TIME). Those Apparatuses to arrive under 7 minutes and 59 seconds qualified. Those who took longer did not qualify.

NOTE There were 49 Incident Types/Dispatches that should have had ENG36 or RES36 respond, but instead one of the support units responded. These are counted automatically as failed responses these 49 failed responses will be added into the final Unqualified table as they are not considered for the Turn Out Time or Personnel qualification. 49 will also be added to the total dispatches for the final calculations.

234 dispatches, or 86.67% were qualified based on Turn Out Time Alone (ROLLE TIME- DISPATCH TIME), and 36, or 13.33%, were unqualified based on Turn Out Time and for responding with an incorrect UNIT. The below tables show this breakdown and shows how many of those qualified/unqualified were the ENG36 and RES36.

Turn Out Time Only		# under/over 00:07:59	%
	Qualified	234	86.67%
	Unqualified	36	13.33%
	Total	270	

Qualified Unit by Turn Out Time Only	
ENG36	126
RES36	108
TOTAL	234

Unqualified Unit by Turn Out Time Only	
ENG36	16
RES36	20
TOTAL	36

Then the Apparatus were sorted so that the First Due could be determined. Whichever Apparatus arrived the fastest for each INCIDENT NUMBER was considered First Due. This brought the total number of 1st due dispatches down from 270 to 202. There were 202 1st due and 62 2nd due. Apparatus that had no arrival time (the call was canceled enroute) were labeled “0 due” and not factored into the 1st due analysis (total of 6). In other words, there were 202 incidents that either had ENG36 or RES36 arrive as First Due. We will use this 202 as our "SUM" number for the rest of this study - until the end when we will add back in the 49 responses by the wrong unit. Those 202 First Due had the filter of Turn Out Time applied to it. 180 times, or 89.11% of the time, the First Due Rig was Qualified. 22 times, or 10.89% of the time, the First Due Rig was Unqualified as shown in the table below on the left.

The table below on the right breaks down which Apparatus was the First Due. 110 times ENG36 was the first to respond and was Qualified based on Turn Out Time. 70 times RES36 was the first to respond and was Qualified based on Turn Out Time.

First Due App Turn Out Time		Turn Out Time	Q% of Sum
	Qualified	180	89.11%
	Unqualified	22	10.89%
	Sum	202	

Qualified 1st Due Apparatus Turn Out Time	
ENG36	110
RES36	70
TOTAL	180
% out of 202	89.11%

Once it was determined which First Due Apparatus was Qualified based on Turn Out Time, each dispatch was sorted based on 3 shifts: Weekday, Weeknight, and Weekend. The Weekday shift was Monday through Friday from 7am through 5pm (shown in yellow), The Weeknight shift was Monday through Friday starting at 5:01pm through 6:59am (shown in pink). Note that any calls on a Monday morning before 7am were included as the Weeknight shift. The Weekend shift was Friday starting at 5:01pm through Sunday at 11:59pm (shown in blue).

The table below left breaks down all 202 dispatches (Qualified AND Unqualified First Due by Turn Out Time = FDTOT) regardless of Apparatus. There were 62 Qualified and Unqualified FDTOT for the Weekday shift, 63 for the Weeknight shift, and 77 for the weekend. This table is duplicated throughout the rest of the study for a quick-glance reference (notice the dark grey color fill).

Tables below middle and right show the Shift breakdown based on the Qualified First Due Apparatus based on Turn Out Time. Out of the 110 Qualified FDTOT that were the ENG36, 40 of them occurred during the Weekday, 33 during the Weeknight and 37 during the Weekend. Out of the 70 Qualified FDTOT that were the RES36, 20 of them occurred during the Weekday, 24 during the Weeknight and 26 during the Weekend.

ALL First Due Shift Breakdown Q and UQ		% of total
Weekday	62	30.69%
Weeknight	63	31.19%
Weekend	77	38.12%
TOTAL	202	

ENG36 Qual by Turn Out Time	
Weekday	40
Weeknight	33
Weekend	37
Total	110

RES36 Qual by Turn Out Time	
Weekday	20
Weeknight	24
Weekend	26
Total	70

The table below breaks down the number of the Qualified FDTOT regardless of Apparatus, which is 180.

Out of 180 Qualified FDTOT, 60 of those occurred during the Weekday, 57 during the Weeknight, and 63 during the Weekend. This is displayed as a percentage of the Total (180 shown in green) and the Sum First Due dispatched (202 shown in light gray).

The dark gray columns offer the percentage of times PML turned out a Qualified and Unqualified First Due + Turn Out Time rig by shift out of the ALL SHIFT breakdown (see Table 6 above). 96.77% of the time, PML had a Qualified FDTOT Apparatus arrive on scene during the Weekday. 3.23% of the time, they did not. 90.48% of the time PML had a Qualified FDTOT Apparatus arrive on scene during the Weeknight. 9.52% of the time, they did not. 81.82% of the time PML had a Qualified FDTOT Apparatus arrive on scene during the Weekend. 18.18% of the time, they did not.

Qualified 1st Due Turn Out Time		% of Total	% of Sum	Q% ALL Shift	UQ% ALL Shift
Weekday	60	33.33%	29.70%	96.77%	3.23%
Weeknight	57	31.67%	28.22%	90.48%	9.52%
Weekend	63	35.00%	31.19%	81.82%	18.18%
Total	180				
Sum	202				
ALL Shift Table 6					

The next set of tables considers which first due rigs were qualified based on Turn Out Time and the number of people on them. For PML, any apparatus with 3 or more people is considered qualified (w/ 1 being a trained, active driver). For the purposes of this analysis, only those people with an active status (more than 10% of calls) with the proper level and training are included in the calculations. For Incident Types 322 and 324, there had to be 3 active FF1 with VRT for that rig to qualify.

The total Qualified dispatches only based on an apparatus having 3 qualified people on it was 214 out of the 270 (from Table 1). This is regardless of First Due status and regardless of Turn Out Time. The total Qualified of First Due Apparatuses based only having 3 qualified people on it (NOT Turn Out Time) was 171 out of 202 (from Table 4). 155 (86.11%) Qualified based on Turn Out Time AND 3 qualified people. 25 were Unqualified based on Turn Out Time and 3 people as shown in Table 10 below. Compared to the total 202 first due dispatches (Table 4), 76.73% of the time PML turned out a Qualified FDTOT3 (First Due Apparatus based on Turn Out Time and had 3 qualified people on it). When looking at the Unqualified based on FDTOT3 against the total 202 first due dispatches, it is 12.38%.

Table 11 below breaks down which Apparatus was the First Due that met the qualifiers of Turn Out Time and 3 people. 98 times ENG36 was the first to respond and was Qualified based TOT3. 57 times RES36 was the first to respond and was Qualified based on TOT3.

First Due Turn Out Time 3 or more People		Turn Out Time +3	% of Total	% of Sum
	Qualified	155	86.11%	76.73%
	Unqualified	25	13.89%	12.38%
	Total	180		
	Out of Sum	202		

Qualified 1st Due Turn Out Time 3 or More Peeps	
ENG36	98
RES36	57
TOTAL	155
Q% / 202	76.73%
UQ% / 202	24.75%

As a reminder, Table 6 breaks down all 202 first due dispatches (Qualified AND Unqualified by Turn Out Time = FDTOT) regardless of Apparatus. Tables 12 and 13 show the Shift breakdown based on the Qualified First Due Apparatus based on TOT3. Out of the 98 Qualified FDTOT3 that were the ENG36, 33 of them occurred during the Weekday, 31 during the Weeknight and 34 during the Weekend. Out of the 57 Qualified FDTOT3 that were the RES36, 15 were during the Weekday, 20 Weeknight, and 22 were during the Weekend.

ALL First Due Shift Breakdown Q and UQ		% of total
Weekday	62	30.69%
Weeknight	63	31.19%
Weekend	77	38.12%
TOTAL	202	

ENG36 Q by 1st Due + Turn Out Time + 3 Peeps	
Weekday	33
Weeknight	31
Weekend	34
Total	98

RES36 Q by 1st Due + Turn Out Time + 3 Peeps	
Weekday	15
Weeknight	20
Weekend	22
Total	57

Table 13 breaks down the sum of the Qualified FDTOT3 regardless of Apparatus. Based on Table 10, that sum is 155.

Out of 155 Qualified FDTOT3, 48 of those occurred during the Weekday, 51 during the Weeknight, and 56 during the Weekend. This is displayed as a percentage of the Total (155 shown in green) and the Sum First Due dispatched (202 from Table 4 shown in light gray).

The green column breaks down the percentage of shifts based on the Total of 155. So out of all 155 dispatches that qualified based on first due + turn out time + 3 people, 30.97% of them were during the Weekday, 32.90% were during the Weeknight, and 33.13% were during the Weekend.

The light gray column breaks down the percentage of shifts based on the Sum First Due dispatched, 23.76% occurred during the Weekday, 25.25% occurred during the Weeknight, and 27.72% during the Weekend.

The dark gray columns offer the percentage of times PML turned out a qualified First Due +Turn Out Time + 3 people rig by shift out of the ALL SHIFT breakdown (Table 6). 77.42% of the time, PML had a Qualified FDTOT3 Apparatus arrive on scene during the Weekday. 22.58% of the time, they did not. 80.95% of the time PML had a Qualified FDTOT3 Apparatus arrive on scene during the Weeknight. 19.05% of the time, they did not. 72.73% of the time PML had a Qualified FDTOT3 Apparatus arrive on scene during the Weekend. 27.27% of the time, they did not.

Qualified 1st Due Turn Out Time + 3 Shift Breakdown		% of Total	% of Sum	Q% ALL Shift	UQ% ALL Shift
Weekday	48	30.97%	23.76%	77.42%	22.58%
Weeknight	51	32.90%	25.25%	80.95%	19.05%
Weekend	56	36.13%	27.72%	72.73%	27.27%
Total	155				
Sum	202				
ALL Shift Table 6					

Because PML had 49 dispatches where they did not take either ENG36 or RES36 when they should have, those 49 failed dispatches need to be factored into the total analysis. First though, Table 14 adjusts Table 6 to factor in the shifts in which those 49 were dispatched per Table 15. Table 16 applies the filter of Turn Out Time to the 49 and Table 17 shows the shift break down for the 36 "qualified" of out the 49.

28 times during the Weekday shift, PML failed to send the appropriate apparatus and 8 of those 20 did not turn out on time. 7 times during the Weeknight the wrong apparatus was dispatched with one of them not turning out on time. During the Weekend, PML sent the wrong apparatus 14 times, 4 of which did not turn out on time.

ALL First Due Shift Breakdown Q and UQ Turn Out Time		% of total
Weekday	90	35.86%
Weeknight	70	27.89%
Weekend	91	36.25%
TOTAL	251	

Wrong Apparatus	
Weekday	28
Weeknight	7
Weekend	14
Total	49

Wrong App Turn Out Time		Turn Out Time	Q% of Total
	Qualified	36	73.47%
	Unqualified	13	26.53%
	Total	49	

Wrong Apparatus "Qualified"	
Weekday	20
Weeknight	6
Weekend	10
Total	36

Table 18 below adds the 49 wrong apparatuses into the Unqualified row. This increased the Total and Sum and give more accurate percentages for Qualified and Unqualified responses. PML turned out a qualified rig 67.69% of the time while 32.31% of the time they did not. Out of all dispatches (202 from Table 4 plus the 49), 61.75% of the time PML arrived on scene with a qualified first due rig while 29.48% of the time they did not.

First Due Turn Out Time 3 + Right UNIT		Turn Out Time +3 + UNIT	% of Total	% of Sum
	Qualified	155	67.69%	61.75%
	Unqualified	74	32.31%	29.48%
	Total	229		
	Out of Sum	251		

To break that down per shift, Table 19 shows the sum of all "qualified" shifts (Table 13 plus Table 17).

Qualified 1st Due Turn Out Time + 3 Shift Breakdown		% of sum	% of total	Q% ALL Shift	UQ% ALL Shift
Weekday	68	35.60%	27.09%	75.56%	24.44%
Weeknight	57	29.84%	22.71%	81.43%	18.57%
Weekend	66	34.55%	26.29%	72.53%	27.47%
Sum	191				
TOTAL	251				
ALL Shift Table 14					

Contextualizing Data

Quantitative data can be very helpful when engaging in decision making processes and part of the research process is reviewing results and asking if they make sense with what is being observed. When preforming this analysis this author considered the impact of the COVID-19 pandemic on the results and considered relationships the subject company has with neighboring fire companies.

First, in 2020, many Americans and Pennsylvanians spent much of their time at home, some unemployed, furloughed, or having more free time than previously in their lives. This could mean volunteer first responders were more available to respond to emergencies, or it could mean they were less willing or available to respond.

Second, PoMarLin for the last several years, has had an arrangement with the Longwood Fire Company to run all PoMarLin Fire and Rescue calls in the PML territory of the Regional Commission during Monday-Friday daylight hours. The reason for this arrangement was due to the lack of available PML responders during the weekday business hours to run calls. This author questions why this arrangement exists for Monday-Friday business hours and not on weeknight and weekends when the response rate during those times is worse or the same.

To put the 2020 analysis into context the author preformed the same analysis for PML Fire and Rescue calls for 2019. 2019 was prior to the COVID-19 pandemic and during a time that Longwood Fire Company was running Monday-Friday business hour calls in PML territory to assist with the lack of available responders at PML during those hours.

For 2019 216 calls were analyzed and the findings were that PoMarLin had a successful response 113 times or 52.31% of the year. They had a failed response 47.69% of the year.

1st Due, Turn Out Time, Personnel		Qualified Personnel	%	Total Qualified		% of Qualified	Total Unqualified		% of Unqualified
				Weekday	39	34.51%	Weekday	45	43.69%
	Qualified	113	52.31%	Weeknight	28	24.78%	Weeknight	33	32.04%
	Unqualified	103	47.69%	Weekend	46	40.71%	Weekend	25	24.27%
	Total	216		Total	113		Total	103	

While the author cannot determine the difference between 2019 and 2020 without further research, the data shows that PML had an improved response rate in 2020 compared to the previous year 2019. A review of the volunteer roster does not show a dramatic change in the number of available responders nor does the call data reflect a change in call volume. The author theorizes that response performance could be driven by responder availability.

Conclusion

In conclusion, the data provided by the PoMarLin Fire Company that was analyzed shows significant failed response rates for 2019 and 2020 across all shifts. In 2019 the successful call percentage was 52.31% and 61.75% in 2020. Because the Company turns out their apparatus within the county standard time more than 80% of the time, the challenge appears to be with volunteer performance or availability. PoMarLin frequently responds to incidents with less than the required minimum staffing using volunteers who are either inadequately trained, are minors, or with an apparatus that has less than three responders.

Lastly, the author identified an interesting anomaly in the PoMarLin data not noted in other reports to the Commission. The analysis of calls for both 2019 and 2020 found that the Company self-attached to many medical calls being handled either by Longwood EMS or Kennett Ambulance in addition to low acuity fire calls (i.e., alarms). These calls were not relevant to the analysis and were therefore deleted. However, this is important because routine fire reports generated by PoMarLin reflect a higher call volume as a result. The Kennett Fire and EMS Commission region runs approximately 1,000 first due Fire and Rescue Calls. The author has determined this as a result of analyzing calls and response performance at all three companies in the commission region. The PoMarLin Fire Company is responsible for responding to about 20% of the regional call volume, some of which, is a multiple company response (i.e., including Kennett FC and Longwood FC). A review of monthly or annual reports may not show this call responsibility disbursement as totals would be artificially inflated.

-End of Briefing-