Pembroke Pines Call Processing Times

Under

Broward County's Consolidated Regional 911 System

Briefing Paper

July 13, 2016

FITCH
& ASSOCIATES

Overview

During evaluation of the Broward Regional E911 System, FITCH became aware of City of Pembroke Pines officials' concerns with issues related to call processing standards. Call processing intervals relate to the time from when a 911 call is received in the 911 center until an emergency responder (law enforcement and/or fire-rescue unit) is dispatched. Generally, this is referred to as 'call processing time', and is evaluated in the current regional system by several specific performance measures. Within the Broward System, the nomenclature of P2/P3 refers to the time interval from when a 911 call in answered by a 911 operator until the time when emergency responders are notified/dispatched to the incident. The term P1, not examined here, examines the time interval from when the phone rings in the 911 center until the emergency call is answered. The analysis of P1 will be reported within the full FITCH report, but is generally quite strong. Attachment A provides the relevant performance measurement language from the Broward County & Broward Sheriff's Office agreement related to operation of the Broward Regional 911 System.

Historically, Pembroke Pines was an independent primary public safety answering point (PSAP) prior to consolidation under Broward County's Regional E911 System. Serving only Pembroke Pines Police and Fire Rescue Departments, the Pembroke Pines PSAP operated under a process that focused on call processing time performance – utilizing a process referred to by various monikers, but herein referred to as "Quick In / Quick Out". Across the nation, this process is sometimes referred to as "pre-alert" – a process where field units are notified of an incident as quickly as possible. Generally, this rapid pre-alert requires two essential pieces of information – ***where*** an incident is located, and ***what*** type of emergency exists (law, fire or EMS). Further information is then gathered and transmitted by 911 operators, but after emergency responders are notified of the incident.

While not a component of the formal assessment on the regional 911 system, Broward County asked FITCH to assess this specific issue as it relates to Pembroke Pines, determine any variance from prior performance to current performance, and offer relevant observations on how best to address and/or frame this issue. A significant limitation of this specific analysis is that FITCH does not have access to raw data for Pembroke Pines performance prior to consolidation. Therefore, for purposes of this discussion only, FITCH relied upon summary data analysis provided by Broward County. Current performance did utilize raw data that FITCH obtained as part of the overall Regional E911 System review.

Past Performance (as reported by ORCAT)

During implementation of the regional E911 system, Pembroke Pines was selected to host one of three regional E911 centers. As part of that process, the City migrated from its' then current computer-aided dispatch (CAD) system to Broward County's Motorola CAD. During the period from approximately July 2013 through March of 2014, Pembroke Pines operated their center in the same historical fashion as they had previously, but while utilizing the County's CAD. Therefore, the County does have some summary data which they had analyzed that assesses performance of Pembroke Pines PSAP prior to consolidation.

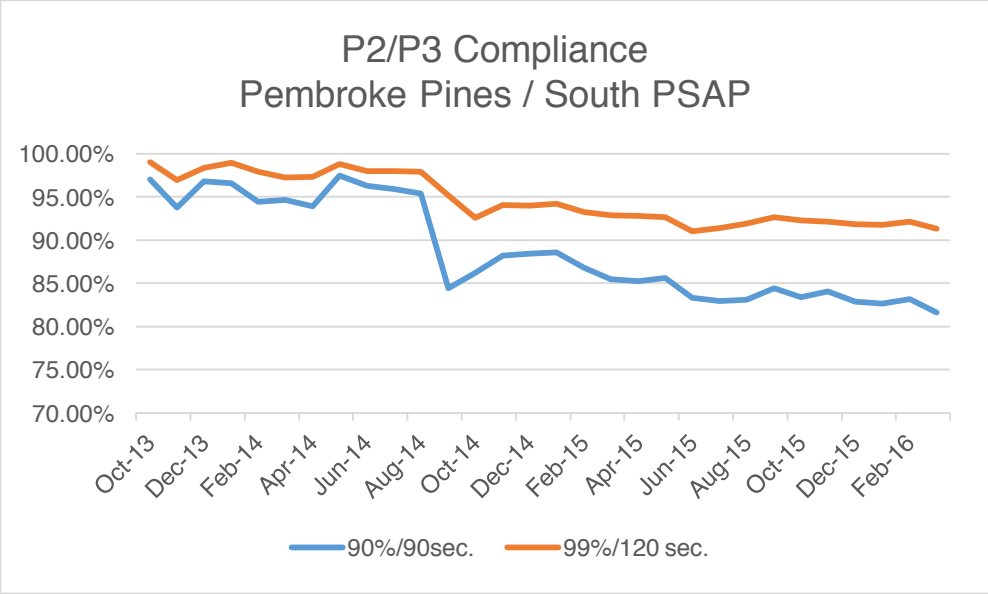
From November 2013 through January 2014 the workload as demonstrated by 911 activity was approximately 2,726 calls per month - 1,275 calls for fire rescue, and 1,451 calls for police. Since Pembroke Pines did not provide emergency medical dispatch (EMD) services in their communications center, a small number of EMS related calls were transferred to Broward Sheriff's office 911 center. During the months in question, those calls from Pembroke Pines to BSO for EMD services averaged 226 per month.

Further, as a standalone primary PSAP, a number of cell phone callers trying to reach Pembroke Pines 911 had to be forwarded from other 911 centers when their initial call was answered elsewhere based on cell tower locations. Of these calls, records from Broward County indicate that a monthly average of 387 emergency calls were transferred to Pembroke Pines 911. This represents approximately 14.2% of all emergency incidents and is assumed to represent Pembroke Pines' historical record of 911 transfers into their PSAP. Today, transfers from a primary PSAP to a secondary PSAP have been essentially eliminated.

Figure 1 illustrates the performance of P2/P3 from October 2013 through March 2016. The data for this graphic was assembled and analyzed by Broward County's staff. It is important to note that for the first six months of this graph, Pembroke Pines was operating the system and providing services only to its personnel as they had historically. After March 2014, various steps toward full integration into the regional system were underway. The tabular data is reflected in Attachment B.

At a high level of analysis, and based on data compiled and summarized by Broward County, Pembroke Pines has experienced a level of degradation since it's transition to the Regional 911 System. For the timeframe of November & December 2013 the performance for EMS calls averaged 95.82% compared to November & December of 2015 where it had fallen to an average of 83.47%. With the exception of October 2013, neither agency met the 120 seconds target at the 99% compliance.

Figure 1: P2/P3 Compliance



Current Performance (Fitch Analysis)

As part of FITCH's overall project, the call counts of FIRE and LAW incident records containing both phone and CAD records are limited to the time period of November 2015 and December 2015. This constraint is imposed by the availability of data. FIRE and LAW computer-aided dispatch (CAD) records are available for all of 2015. However, phone records are available for only from November 01, 2015 through January 31, 2016. Therefore, it is only that two-month overlap between the two sets of data that allows for the analysis of current performance. Therefore, for purposes of comparison we have used the timeframe encompassing November 2015 and December 2015.

Figure 2 summarizes the analysis of fire-rescue incidents – distinguishing those that have been characterized as EMS related, and those labeled "n-EMS" generally representing fire and other non-EMS incident types. Of the total 3,391 records available, only 1,822 are considered valid for use in this analysis. The details of data challenges in this project and the validation process employed by FITCH will be explained more fully in our Phase 1 report.

Consistent with ORCAT's analysis, P2/P3 call processing times did not meet the stated benchmark of 90% within 90 seconds. However readers may note a variance between ORCAT's calculated and previously reported compliance, and that FITCH calculated as shown in Figure 2. For purposes of analyzing current performance, we will utilize FITCH's analysis as summarized.

Figure 2: Size of Data Sets Available for Calculations of Compliances for 11/01/2015 Through 12/31/2015

Month	Call Type	Count	Received Timestamp				Raw Compliance			
			Absent	Present	Validated	% Validated	90% @ 90 sec	99% @ 120 sec	80% @ 60 sec	95% @ 106 sec
Nov-Dec 2015	EMS	3,033	857	2,176	1,742[1]	59%	87%	96%		
	n-EMS	358	124	104	80[2]	24%			41%	90%

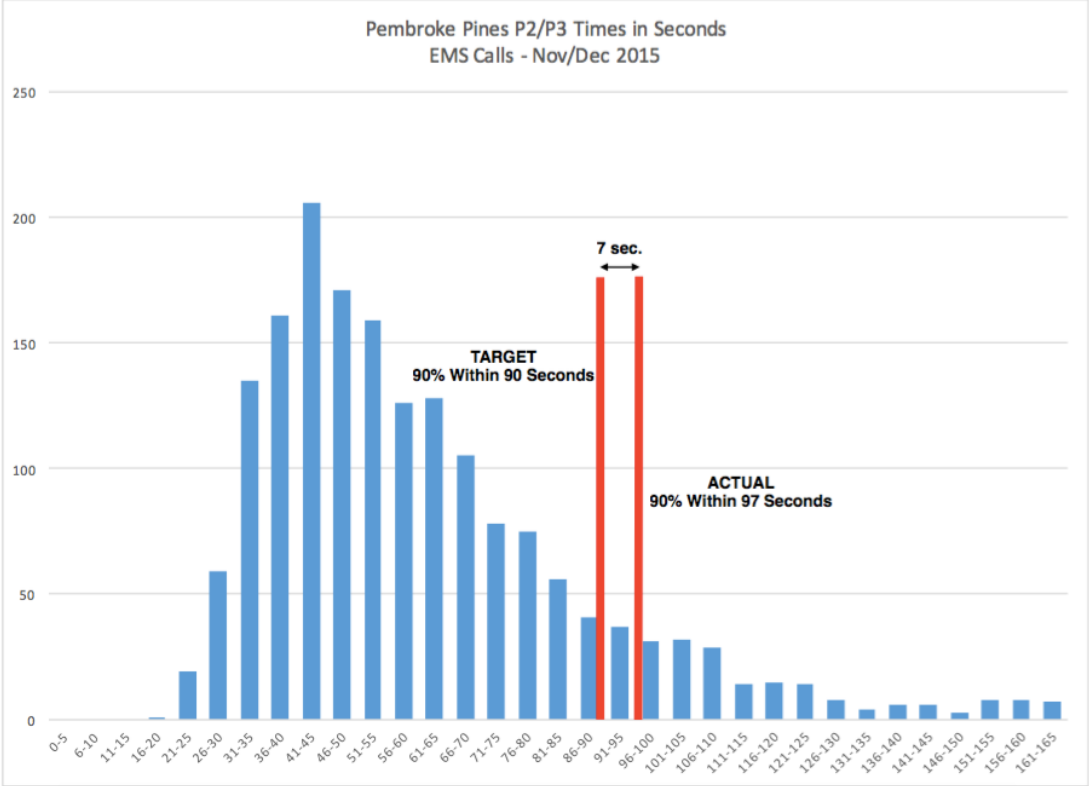
[1] The P2/P3 intervals for EMD Call Types greater than 165 seconds were assumed to be "purposefully pending" and excluded from analysis.

[2] The P2/P3 intervals for non-EMD Call Types greater than 180 seconds were assumed to be "purposefully pending" and excluded from analysis.

Data issues confounding this analysis are described elsewhere. Briefly, the percentage of non-EMS related incidents being validated only reaches 24% and a sample size of just 80 calls. For these reasons, we limited our discussion here to larger set of EMS call types. Broward County with agreement from police chiefs does not report on law enforcement call processing times, therefore the same is done here.

As noted in Figure 2, actual performance for EMS related incidents fell short of the stated benchmark by 3% at both the 90th and 99th percentile compliance targets. The important question for policy makers is what does that shortcoming represent from a practical perspective. Figure 3 answers the question by noting the actual performance would require a goal of 97 seconds in order to reach a 90th percentile compliance. Therefore, at the 90th percentile the variance between actual performance compared to the target is 7 seconds.

Figure 3: P2/P3 Performance – Target versus Actual



Discussion

There was a limited ability to assess Pembroke Pines' historical "Quick In / Quick Out" performance. Discussions with the City's police and fire departments generated an understanding of the "Quick In / Quick Out" call processing system as previously applied in the City. However, neither agency was able to identify or provide a written policy, procedure or performance standard based on this "Quick In / Quick Out" model. When questioned on how best to assess the current System's performance against the City's historical approach, an expectation for performance levels as stated in Exhibit D of the existing Operator Agreement was highlighted.

The Regional E911 System was launched with high expectations, and a concurrent set of highly aggressive performance measures. Where Broward based their performance metrics on national recommendations, recent research has now raised questions on the veracity of certain metrics adopted in this System.

Considering fire rescue incidents, a study[1] by the NFPA's Fire Protection Research Foundation from 2010 found a surprising lack of compliance with some recommendations embodied in NFPA 1221 – the basis for elements of Broward's of P2/P3 performance measures. Examining data from 14 large metropolitan fire departments, EMS calls were able to be processed 90% of the time within 84 seconds. However,

[1] Upson, R. and K. Notarianni (2010). Quantitative Evaluation of Fire and EMS Mobilization Times. Quincy, MA, The Fire Protection Research Foundation.

that same study reported that EMS incidents required 182 seconds (just over three minutes) to process 99% of those EMS incidents – far exceeding the current Broward County and NFPA 1221 standard of 120 seconds. For fire related incidents, the study found 79% of incidents were able to be processed within 60 seconds, just meeting the current NFPA 1221 standard. The second criteria for processing fire calls in the study was 99% handled within 90 seconds. This criterion also failed significantly among the 14 studied agencies.

Recent research that examined the call processing times within high-performing 911 systems found that actual performance, when utilizing EMD, does not support current call processing standards. The authors concluded:

> The results of our study do not support either of the NFPA 1221 percentile time requirements—90% within 90 seconds, and 99% within 120 seconds. In fact, given that the elapsed time to achieve address and phone number verification is not included in our data, it would be unrealistic to expect the vast majority of Emergency Medical Dispatch agencies to meet such requirements, particularly for agencies that complete the EMD call prioritization process before notifying EMS response crews.[2]

FITCH considers the use of EMD to be a best practice for 911 centers handling fire rescue emergency calls. The use of EMD has been supported by the Fire Chiefs Association of Broward County within the Regional 911 System. In fact, the Fire Chiefs Association had recently requested further integration of EMD codes into the dispatch process as the County undertakes the current deployment of a new CAD system.

Policy makers should remain aware that the current Broward Regional E911 System should not be compared to the former Pembroke Pines primary PSAP (911 center) under an 'apples-to-apples' scenario – two significant differences exist. First, a certain number of callers (approximately 14%) were required historically to be transferred from another 911 center to Pembroke Pines 911. The transfer is assumed to add 30 seconds to the call processing times. This delay for those callers has been essentially eliminated. The second difference, which impact P2/P3 times, is that previously Pembroke Pines did not provide emergency medical dispatch to all their EMS incidents – clearly a best practice for EMS systems across the nation.

However, performance under the Regional E911 System has declined from that previously enjoyed by Pembroke Pines. The County, and BSO as its Operator, have the ability to improved existing performance of the System back to that similarly enjoyed by Pembroke Pines previously. Specific recommendations from FITCH will be forthcoming in our Phase 2 report.

[2] Scott, G., et al. (2016). "Characterization of Call Prioritization Time in a Medical Priority Dispatch System." Annals of Emergency Dispatch & Response 4(1): 27-33.

Conclusions

Broward County's Regional E911 System has not yet reached its second year of operation. Stakeholders seem in agreement that a number of issues have challenged the System's implementation. And while improvements have been documented, there remains additional opportunities for greater performance. FITCH will identify specific recommendations in their future reports. However, with regard to Pembroke Pines performance under the existing System, the following conclusions can be made.

- Current performance, as measured under fire rescue metrics, can be improved. BSO should emphasize to intake operators the need to prioritize gathering 1) incident location, and then 2) incident type. Thereafter, a rapid transmit of the incident (F12) to the dispatcher for assignment to emergency responders will improve the P2/P3 metric.

- At the 90th percentile of performance for EMS related calls, actual P2/P3 times exceeded the target by 7 seconds. Focusing on this metric from an operational perspective, and concurrent improvements in the System's technology, should allow future performance to meet and then exceed the target.

- Policy makers should remain cognizant that 911 transfers, should their use be reintroduced back into the System at higher levels, will increases total call processing times for those calls by approximately 30 seconds.

Attachment A:

Call Answering (P1) and Call Processing (P2/P3) Performance Standards from Exhibit D of the Agreement Between Broward County and Broward Sheriff's Office for Operations of Regional E911 System.

Time to Answer Emergency (911) Lines Standard:

- Ninety percent (90%) of all 9-1-1 calls arriving at the Public Safety Answering Point (PSAP) during the busy hour shall be answered within ten (10) seconds (P1)
  The busy hour is defined as the hour each day with the greatest call volume.

- Ninety-five (95%) of all 9-1-1 calls should be answered within twenty (20) seconds (P1)

Alarms (audible, silent, panic, fire, smoke, medical, etc.) Received on Alarm Lines Standard:

- **N**inety-five percent (95%) of alarms received on alarm lines shall be answered within 15 seconds (P1)

- Ninety-nine percent (99%) of alarms shall be answered within 40 seconds (P1)

First Call Process Time Standard:

- Emergency alarm processing for the following call types shall be completed within 90 seconds 90% of the time and within 120 seconds 99% of the time (P2 and P3)

    - Calls requiring emergency medical dispatch questioning and pre-arrival instructions

    - Calls requiring language translation

    - Calls requiring the use of a TTY/TDD device or audio/video relay services

    - Calls of criminal activity that require information vital to emergency responder safety prior to dispatching units

    - Hazardous material incidents

    - Technical rescue

- With the exception of the above six call types, 80% of emergency alarm call processing

shall be completed within 60 seconds, and 95% of alarm processing shall be completed within 106 seconds (P2 and P3)

- Where alarms are transferred from the primary public safety answering point (PSAP) to a primary and secondary answering point, the transfer procedure shall not exceed 30 seconds for 95% of all alarms processed* (P2)
  *Only applicable if non-participating municipalities operate their own primary and secondary PSAP

Law Enforcement Call Process Time Standard:

- Priority one and priority two law enforcement calls shall be processed within 45 seconds, 90% of the time ** (P2 and P3)

- Priority three law enforcement calls shall be processed within 90 seconds, 90% of the time ** (P2 and P3)

Note:

Availability of police units shall be considered when reviewing performance. Agencies must adopt standard signal codes to evaluate performance and the authority having jurisdiction shall determine time frames allowed to the completion of dispatch.

***Priority assignments based on current proposed standard*

Attachment B
P2/P3 Performance for Pembroke Pines / South PSAP
October 2013 thru March 2016

Data analyzed and reported by Broward County

	90%/90sec.	99%/120 sec.
Oct-13	97.00%	99.00%
Nov-13	93.81%	96.99%
Dec-13	96.82%	98.33%
Jan-14	96.60%	98.99%
Feb-14	94.43%	97.90%
Mar-14	94.66%	97.29%
Apr-14	93.89%	97.33%
May-14	97.51%	98.80%
Jun-14	96.32%	98.03%
Jul-14	95.94%	97.97%
Aug-14	95.41%	97.91%
Sep-14	84.47%	95.20%
Oct-14	86.22%	92.56%
Nov-14	88.23%	94.09%
Dec-14	88.44%	93.97%
Jan-15	88.60%	94.24%
Feb-15	86.79%	93.25%
Mar-15	85.51%	92.91%
Apr-15	85.28%	92.81%
May-15	85.64%	92.67%
Jun-15	83.32%	91.01%
Jul-15	82.94%	91.44%
Aug-15	83.11%	91.91%
Sep-15	84.47%	92.66%
Oct-15	83.39%	92.31%
Nov-15	84.06%	92.14%
Dec-15	82.88%	91.85%
Jan-16	82.69%	91.78%
Feb-16	83.16%	92.11%
Mar-16	81.63%	91.32%