**EMS Case Study**

You are the budget director of Anytown County, NC. In the last 5 years, the County’s population has increased by 30% as has the EMS call volume. During that period, you have not added any ambulances to your EMS system. Your EMS director is requesting a 30% increase in ambulances from 10 to 13. Below is some important information to help your decision.

The fire department in your jurisdiction has firefighters on each apparatus that can provide basic life support care and dispatches an apparatus to every top priority medical call to support your EMS department. Your department has one response time standards for EMS service. The standard for is just for high priority calls which states that a medical first responder (fire apparatus count under this definition) should be on scene within 4 minutes 90% of the time and an ambulance should be on scene within 8 minutes 90% of the time. The response time for high priority calls is based on medical evidence for getting optimal outcomes for cardiac arrest patients. You also have the unit efficiency ratio for ambulances, this ratio tells you what percentage of a shift, ambulances are on calls. A ratio of 50% means that half of the shift, an ambulance is responding to calls and the rest of the shift, they are waiting for calls. The industry standard calls for a ratio of between 30 and 50 percent.

A 24/7 ambulance requires 4 shifts (each shift is 12 hours) which each shift needing 2 employees. A peak ambulance works 12 hours a day during peak call times which requires 2 shifts (each shift is 12 hours). Each employee is entitled to 192 hours of paid time off and must be out of service for 40 hours a year for training. Prior to their time off and training, a EMS employee is supposed to work 2184 hours a year. Due to revenue constraints, you cannot hire more than 12 additional employees. Currently all ambulances are staffed 24/7.

Questions:

1. Do you add additional ambulances?
2. Should the department shift to a mixture of 24/7 and peak ambulances?
3. What should the ideal mix of ambulances?

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| **Year** | **Population** | **# of ambulances** | **Total Calls for Services** | **% of Calls During Peak Shift** | **Average Response time for all calls** | **Average Response Time for Highest Priority Calls** | **% of top priority calls w/ EMS response time under 8 minutes** | **% of top priority calls w/ fire dept response under 4 minutes** | **Unit Efficiency Ratio** |
| 2013 | 100,000 | 10 | 10,000 | 65% | 12.55 | 6:12 | 84% | 95% | 0.28 |
| 2014 | 110,000 | 10 | 10,700 | 70% | 13.45 | 6:15 | 85% | 93% | 0.32 |
| 2015 | 115,000 | 10 | 11,000 | 70% | 13.58 | 6:58 | 82% | 95% | 0.38 |
| 2016 | 125,000 | 10 | 12,000 | 67% | 14.12 | 7:16 | 81% | 97% | 0.43 |
| 2017 | 130,000 | 10 | 13,000 | 70% | 14.54 | 7:23 | 75% | 91% | 0.47 |