Findings, Analysis and Recommendations for the Pinellas County EMS System (PRELIMINARY)

Revised – Version 2 (27Apr11)

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Acknowledgements

Special thanks are extended to those who served on the Emergency Medical Services Resource Committee. They contributed time, information and expertise towards the analysis and formulation of the recommendations and conclusions made in this report.

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TABLE OF CONTENTS

PREFACE

EARLY PARAMEDIC PROGRAM DEVELOPMENT IN PINELLAS COUNTY

In 1973, St. Petersburg and many other cities began using a dual response Advanced Life Support (ALS) Emergency Medical Service (EMS) system design. Fire department paramedics responded to scenes in a non-transport 'rescue' vehicle while Emergency Medical Technicians (EMTs) simultaneously responded in a private ambulance.

These early fire department paramedic programs were funded by city or fire district tax dollars. The private ambulance transports were funded by user fees that were typically paid by insurance companies, Medicare or Medicaid.

Because there were so many fire stations across the County, the fire department was usually able to arrive on an emergency scene first – hence the name 'first response.' In this report, this fire department service is referred to as medical first response (MFR).

Many municipalities in Pinellas County began their own fire department ALS MFR programs. Each program typically had its own tax millage, physician medical director, medical protocols, and types of equipment. There was very little coordination between these programs and some areas of the County did not have ALS MFR programs, particularly in the unincorporated areas. Most cities made their own arrangements for ambulance service with one of the private ambulance companies. Despite the well-intentioned efforts of all communities involved, these separate resources did not work together as a comprehensive and integrated *system* for emergency care and medical transportation.

In 1980, the inadequacies of EMS in Pinellas County led to action by Pinellas County's State legislative delegation that resulted in legislation for a 'special act' (Ch. 80-585, Laws of Florida). The special act created a *System* that covered all cities and unincorporated areas with ALS MFR services. This *System* was funded by a County-wide *ad valorem* EMS tax, which was capped at 1.5 mills. The Pinellas County Board of County Commissioners was assigned the role of an EMS Authority that would oversee the new County-wide *System*.

PUBLIC UTILITY MODEL

Between 1983 and 1986, the cost of the MFR service increased significantly, rising 42% over a four year period, in contrast to the consumer price index which had only risen 10% in that same period. Consequently, an independent study of the entire EMS System was undertaken in an effort to control costs and improve quality. The results and recommendations of that study led to the adoption of a Public Utility Model (PUM) EMS system design[1] in 1987.

Most PUM system designs encompass a broad range of processes including, but not limited to:

- How the telephone calls requesting service are managed;
- Who provides MFR services;
- Who provides ambulance services;
- How MFR units and ambulances are selected and dispatched for emergency and non-emergency responses;
- How physician medical direction and medical community input is provided;
- How standards and quality management are established and managed;
- How continuing medical education is provided;
- How mutual aid and disaster responses are managed;
- Who provides wheelchair transport services; and
- How all of these different processes, and the entities that provide them, are funded and managed as a cohesive system.

The generic elements of the PUM model were customized to fit the specifics of Pinellas County.

Importantly, one of the most dramatic improvements was to put a single provider of ambulance service into place for the entire County. This was done through a competitive Request for Proposal (RFP) process. The process allowed any appropriately qualified entity to submit a bid, including fire departments. Other significant changes included:

- County-wide ambulance service that delivers care at an ALS level;
- Medical direction provided by a single 'Office of the Medical Director' that works under the guidance of a Medical Control Board consisting of local emergency department physicians and hospital administrators;
- Standardized treatment protocols, medications and equipment across the County; and
- Standardized continuing medical education across the County.

[1] Stout J: Public Utility Model – Parts 1-3. Journal of Emergency Medical Services (JEMS). May, June and July 1980.

FUNDING THE PUBLIC UTILITY MODEL

In Pinellas County's PUM, funding for all emergency and non-emergency ambulance service is paid for by user fees. The County bills for the service and then pays the ambulance contractor using a compensation formula. The formula is established during the RFP process and subsequent contract negotiations.

Historically, after the ambulance contractor is paid for their services, some ambulance user fees and associated revenues are left over. These remaining funds have generally been used to cover all ambulance system program costs as well as offset a portion of MFR program costs. Program costs include medical direction, continuing medical education, billings and collections, the purchase and maintenance of communication and defibrillator equipment, EMS contract administration, transfers to the Property Appraiser and Tax Collector for collections of *ad valorem* taxes, and other services. If there were insufficient funds to pay for these services, the cost difference would have been paid by ad valorem EMS tax funds. If any funds were still remaining after all EMS costs were paid, the excess funds were put into the EMS reserve fund. The reserve fund is designed to pay for continuity of the System in the event of a disaster, such as a hurricane, when ambulance services revenues may be disrupted. MFR service providers have been paid for primarily by *ad valorem* tax revenues.

In the early phases of the System when *ad valorem* tax support became available, most of those funds were spent on the ALS MFR program. This is because unlike ambulance services, MFR services were unable to bill insurance companies for their services. Private ambulance companies operated on the revenues they were able to generate on their own – without *ad valorem* EMS tax support. The principals of *ad valorem* funding for MFR were retained and reinforced through the period when the PUM was designed and implemented.

After 1982, but before the PUM was implemented, an annual budget was submitted by each fire department. They asked for reimbursement of the costs that they chose to allocate to EMS. Fire departments differed in how they allocated their EMS costs. This inadvertently created incentives for fire departments to allocate as much as possible to their EMS budgets. As a result, the costs for MFR rose at a rate which significantly outpaced the Consumer Price Index (CPI) in the early years of the System. It also established disparities in MFR funding levels between departments, and these disparities became magnified over time.

After 1987, under the PUM, a very specific MFR funding formula was put into place to control costs and make the level of MFR funding for similar services fair and consistent across the County. It was based on marginal cost principles, but included funding provisions for entire positions and vehicles, rather than just the salary differentials that a purely marginal cost approach would cover. In an effort to assist cities to adjust to the new MFR funding formula, fire departments receiving more

than their calculated funding level were allowed to continue to receive funding at their 1986 budget levels; however, moving forward, funding increases would only be made if the funding formula qualified them to receive more than their 1986 budget levels. As the CPI and call volume increased over time, all of the fire departments would have become synchronized into the new funding formula – in fairness to all. *In 1988 and 1989, the first two years under this more rational MFR funding formula, the MFR payments actually decreased by 1.9% and 2.8%, respectively.*

In 1989, there were legal actions between the City of St. Petersburg and the County's EMS Authority protesting the new funding formula. The City prevailed, forcing the County to fund MFR for the St. Petersburg Fire Department under the prior funding method. Rather than go through a series of similar lawsuits from other fire departments, the County negotiated a direct cost reimbursement plan for all fire departments similar to the one used for St. Petersburg. This direct cost reimbursement plan has some constraints that draw from the marginal cost principles originally used in 1987; however, it does not provide the same level of MFR cost control as the original PUM MFR funding formula.

This direct cost reimbursement plan remains in place today. *In the period following the legal actions, from FY 1989-90 to FY 2009-10, County-wide MFR payments went from $16.2 MM to $37.7 MM (a 133% increase) compared to an increase in the CPI from 130.7 to 218.056 (a 67% increase).*

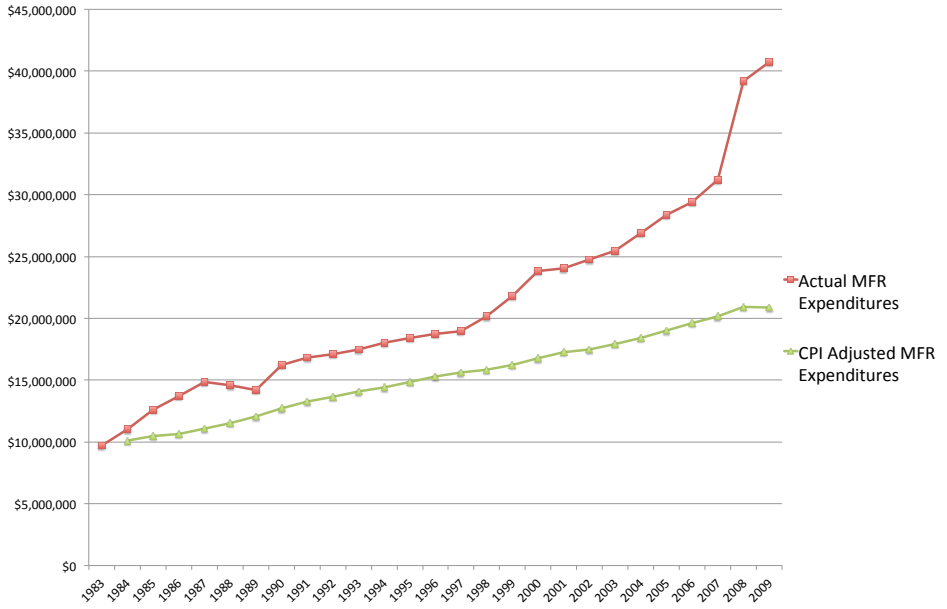
ECONOMIC THREAT

A MFR spending rate that outpaced CPI increases was made possible by strong rises in Pinellas County's property values. The potential windfall of *ad valorem* money into the EMS fund caused by rising property values was appropriately held back by the EMS Authority, thereby decreasing the millage rate. It went from a high of 1.060 in FY 1989-90 down to 0.5832 by FY 2009-10 – a 45% decrease.

Over the past few years, several factors have had a severe and simultaneous negative impact on *ad valorem* funding for MFR. First, the State of Florida passed property tax reforms that curbed all *ad valorem* tax revenues. Shortly after this went into effect, the overall economy began to deteriorate and property values fell significantly. The combined impact of these factors led to a projected $18.5 MM budget shortfall for FY 2009-10.

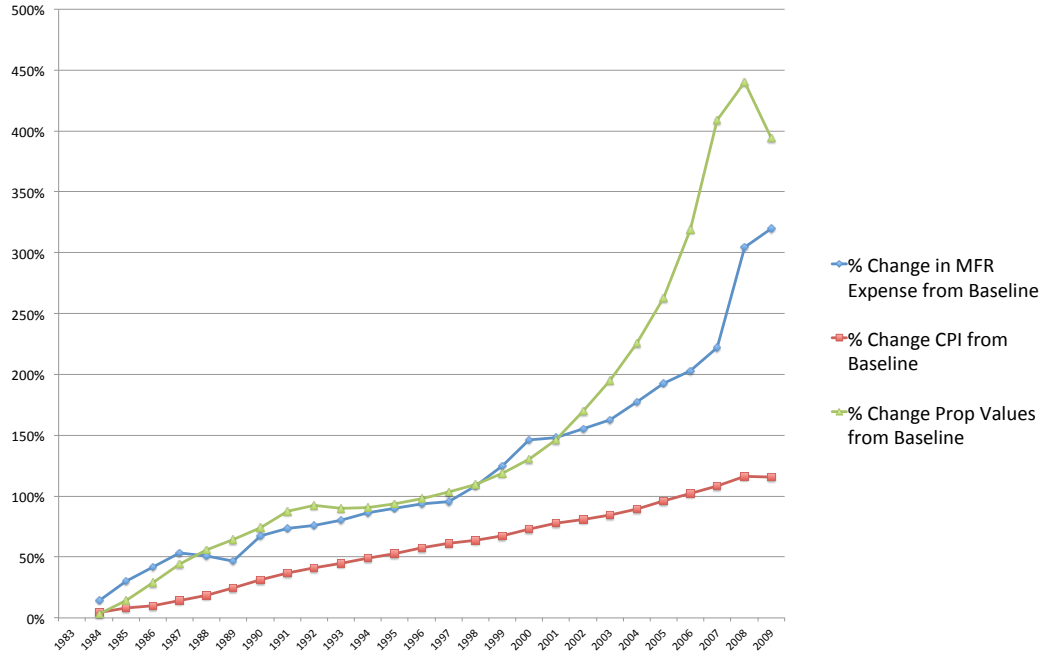
The figure labeled 'Actual MFR and CPI Adjusted MFR Expenditures' shows actual expenditures for the County's MFR program from 1983 to 2009 in red. The amount of what the MFR expenditures would have been had budget increases matched the increases in the CPI are shown in green. Note how spending for MFR has significantly outpaced increases in the CPI.

Actual MFR and CPI Adjusted MFR Expenditures



The figure labeled 'Percentage Changes in MFR, CPI and Property Values' shows the percentage changes from 1983 forward for the CPI (red), MFR costs (blue) and property value (green), respectively. Note how the rate of property value increases outpaced both the CPI and MFR increases.

Percentage Changes in MFR, CPI and Property Values

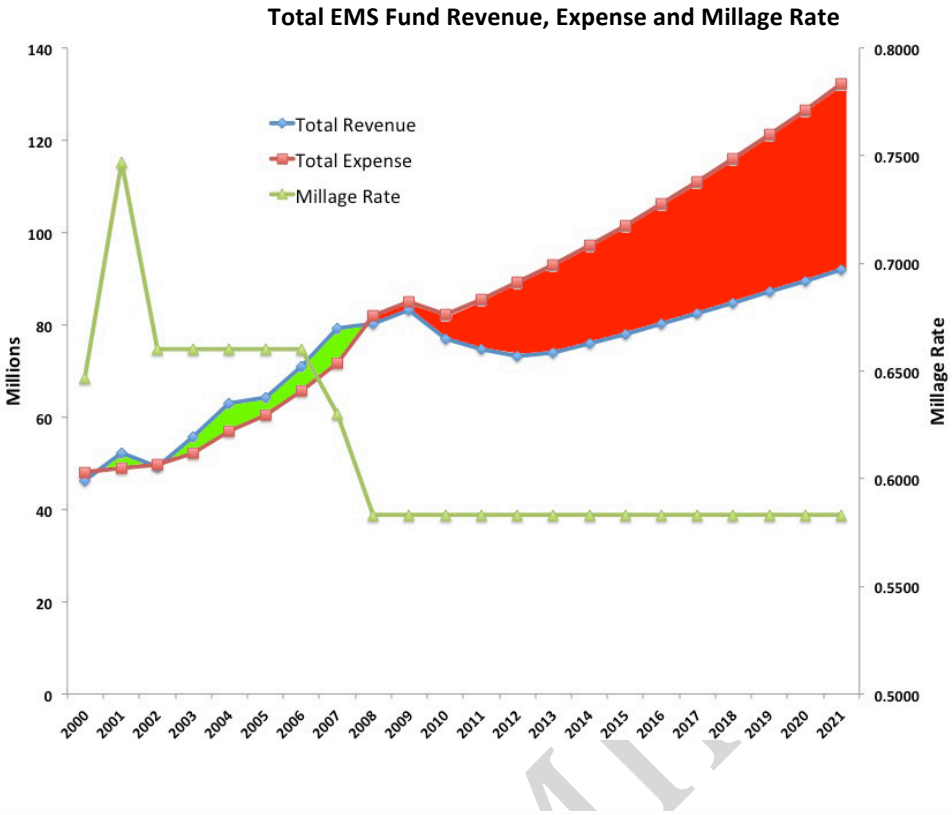


The $18.5 MM deficit projected for FY 2009-10 was an early estimate based upon the adopted FY 2008-09 budget deficit of $14.5 MM plus an additional $4 MM anticipated reduction in EMS *ad valorem* revenues for FY 2009-10 due to declining property values.

In response to this situation, local fire union officials and fire chiefs collaborated to develop a proposal whereby the fire departments would provide transport service for patients seen on 9-1-1 calls. Their intent was to help curb costs at the System level while increasing and diversifying fire department revenue streams. This proposal was presented in late 2009; however, the proposal had several significant flaws in its financial and operational assumptions and was therefore rejected.

The trends in revenues and expenses have changed significantly over the past few years. The actual EMS fund expenditures and revenues going back to 2000 were combined with budget forecast data out to 2021[1] to provide three sets of trend analyses: the Total Revenue, Expenses and Millage Rate; Ambulance Revenue and Expense; and the MFR Revenue and Expense. These projections assume that MFR and ambulance expenses stay at the same general level (with adjustments for inflation over time) and that millage rates and ambulance rates remain unchanged from their current levels. The shading between the trend lines is green with a surplus and red with a deficit.

[1] Based on the 10 year forecast data that was presented by County staff to the EMS Authority (Board of County Commissioners) in January 2011 as well as other historical data provided to IPS by County staff.


Total EMS Fund Revenue, Expense and Millage Rate
Total Revenue
Total Expense
Millage Rate
Millions
Millage Rate
140
120
100
80
60
40
20
0
0.8000
0.7500
0.7000
0.6500
0.6000
0.5500
0.5000
2000
2001
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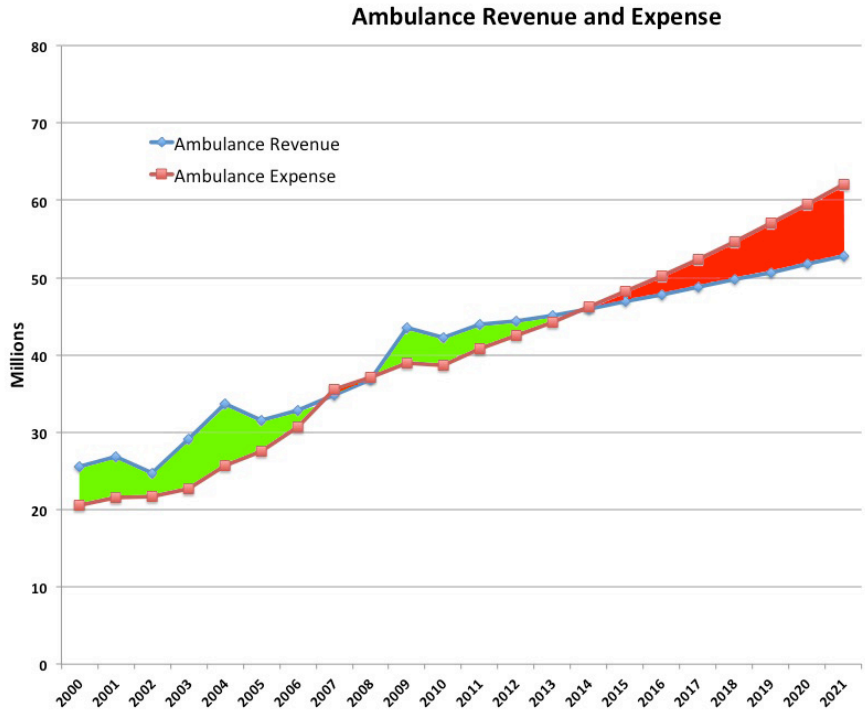
Ambulance Revenue and Expense
Ambulance Revenue
Ambulance Expense
Millions
80
70
60
50
40
30
20
10
0
2000
2001
2002
2003
2004
2005
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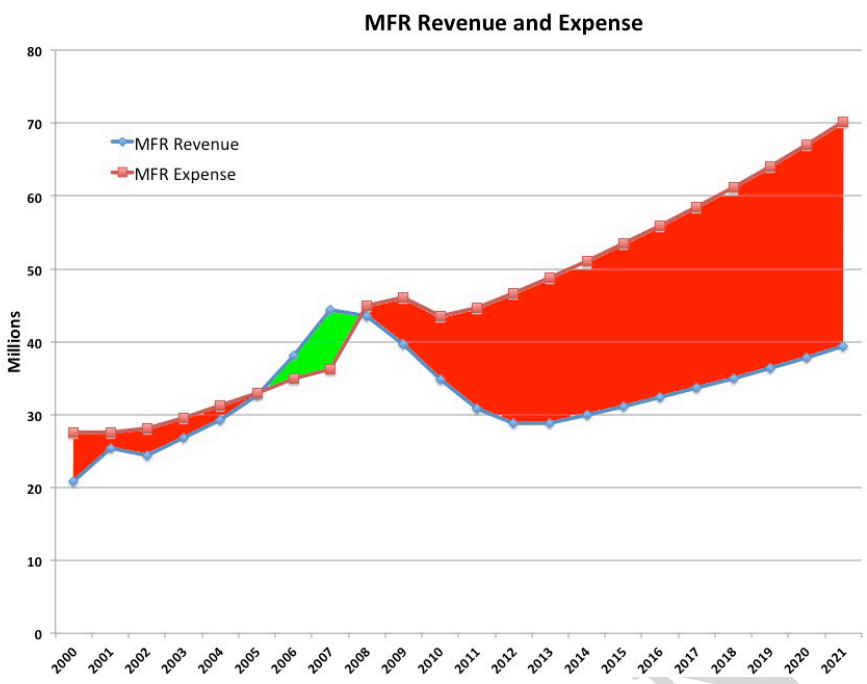


The trend analyses illustrate several key points:

- Total EMS expenses currently exceed revenues and the resulting deficit is projected to dramatically increase
- MFR program expenses exceed revenues and the resulting deficit is projected to continue to increase
- Ambulance program revenues have traditionally exceeded ambulance program expenses, but that may no longer be the case after FY 2013-14
- Historically, the *ad valorem* tax rate has been managed prudently with millage decreases being made when revenues significantly exceeded expenses.

These analyses also suggest that the traditional separation between budgets for the MFR program and ambulance program may not be practical in the future. Some *ad valorem* funds may be needed to cover a larger portion of the support program costs (e.g., medical direction, continuing medical education, and EMS administration) in much the same way that user fee revenues have been used recently to cover some of the MFR program costs. Therefore, the EMS budget should be viewed in a more holistic manner moving forward. However, the ambulance program should always be managed in such a way that tax subsidies are not required to pay the ambulance contractor.

INTERIM COST REDUCTIONS AND REVENUE INCREASES

The County worked with System stakeholders, including the ambulance contractor, County 9-1-1 Communications Center, Office of the Medical Director, and St. Petersburg College to reduce their respective costs in an effort to help offset the growing MFR budget deficits. Although revenues and expenses from these entities normally do not influence the MFR budgets, the circumstances were such that savings in these areas would be applied towards offsetting MFR deficits and thereby reduce the draining of EMS reserves.

Ways to increase revenue were also explored. Following a comparative analysis of ambulance rates in neighboring counties, the EMS Authority found that there was reasonable justification to increase ambulance rates.

The County also negotiated with the fire departments to reduce their costs – or at least try to limit their cost increases.

The table labeled 'Efforts to Reduce Projected $18.5 MM Deficit for FY 2009-10' shows how these various efforts to reduce costs and increase revenues contributed to reductions in the $18.5 MM projected deficit. The table labeled 'Efforts to Reduce Projected Deficit for FY 2010-11' shows the additional actions taken for FY 2010-11.

Efforts to Reduce Projected $18.5 MM Deficit for FY 2009-10

Originally Projected Deficit for FY 2009-10	**$18,500,000**
Cost Reductions	
Reduced MFR Contract Payments	$2,760,843
Reduced Ambulance Contract Payments	$2,400,000
Reduced Office of the Medical Director Payments	$319,934
Reduced CME Contract Payments (St. Petersburg College)	$46,700
Eliminated Ranger Program (5 County positions)	$261,160
Total Cost Reductions	*$5,788,637*
Revenue Increases	
Increased Ambulance User Fees / Collections	$7,564,626
Remaining Projected Deficit (to be covered by drawing from reserves)	**$5,146,737**
Actual Reserve Draw Down (FY 2009-10)	**$5,244,800**

Efforts to Reduce Projected Deficit for FY 2010-11

Cost Reductions	
Elimination of ALS first responder funding for Squad 26 (Redington communities)	$484,750
Elimination of Bayflite funding (half fiscal year)	$312,500
Elimination of ALS first responder equipment reserves for FY 2009-10	$312,385
Elimination of ALS first responder equipment reserve request for FY 2010-11	$266,844
Total Reductions	*$1,376,479*
Revenue Increases	
Increased ambulance user fee retail rate by 10.15% (resulting in an estimated income increase)	*$1,400,000*
Recommendations Not Adopted	
Realignment of ALS first responder funding from Rescue 19 (Lealman) to Engine 16 (Pinellas Park / Kenneth City)	$451,000
Elimination of Bayflight funding (half fiscal year)	$312,500
NOTE: Staff presented, and the EMS Authority discussed, several millage increase options. Ultimately, the EMS Authority elected to not increase the EMS millage rate for FY 2010-11.	
FY 2010-11 Deficit (per adopted FY 2010-11 budget)	**$13,375,580**

These changes helped mitigate the immediate financial deficit; however, projections for FY 2010-11[1] show the *ad valorem* EMS tax yielding approximately $30 MM to cover EMS expenditures. With a FY 2010-11 MFR budget of $38.1 MM (not including the MFR program costs), a gap of $8.1 MM (excluding other system program costs) still remains between the MFR budget and revenue from the *ad valorem* taxes, which is intended to fund the MFR budget. The budgeted fund deficit (entire EMS fund including MFR) for FY 2010-11 is $13.4 MM. The budget gap will be filled by utilization of the EMS fund reserves.

[1] Based on 10 year forecast information presented by County staff to the EMS Authority in January 2011.

EXECUTIVE SUMMARY

Principal Recommendation

After extensive review of the growing funding deficits and the failure of internal discussions with local cities, fire districts and the firefighter unions to resolve these pressing issues, IPS (an experienced firm specializing in EMS and fire rescue system and process design) was engaged to objectively review the Pinellas County EMS system and offer recommendations.

Upon review of several volumes of documents, a series of one-on-one interviews, and various discussions with the EMS Resource Committee, another major issue repeatedly surfaced (in addition to the MFR funding deficit): a lack of fairness in how MFR funds are distributed among the fire departments. This is a contentious issue that must be addressed.

The following pages provide detailed findings and analyses that have led IPS to the principal conclusion and recommendation that:

> ***The Marginal Engine Funding - Paid Position Option should be implemented no later than FY 2012-13 (October 1, 2012).*** *This model provides funding for 72 MFR units at the same level for every fire department, with one County-funded position per unit.*
>
> *The proposed funding level per MFR unit is based upon the County-wide average for annual operating costs allocated to the MFR budget. These annual operating costs include County-wide average salary and benefits paid from the MFR budget. It is not based on call volume or funding level history. Periodically, the number and distribution of MFR responses should be re-evaluated. Adjustments in the number of MFR units needed should be made accordingly.*
>
> *This approach is inherently fair to all fire departments and communities while protecting the existing level of service for the citizens of Pinellas County.*
>
> *Currently, there are 62 County-funded MFR units. Analyses show that 10 more units are needed, for a total of 72, in order to meet the current response time standards on a County-wide basis. There are many additional MFR units already in operation that are now funded by individual cities and fire district budgets. Ten of these units would become County-funded under the Marginal Engine Funding – Paid Position Option.*
>
> *The virtues of the Marginal Engine Funding – Paid Position Option are that it:*
>
> - *provides a rational, factual basis for MFR funding;*
> - *provides a fair way to distribute MFR funding to fire departments on the basis of MFR units operated rather than the number of calls to which they respond;*

- *provides a fair way to address needs of low volume / difficult to serve areas;*
- *converts 10 locally funded MFR units to County-funded MFR units;*
- *introduces a more effective and long-term process to control MFR costs;*
- *allows each community to spend the funds as they choose, so long as they meet their performance requirements and comply with other System policies. Therefore, if a department wants to use a transport-capable rescue unit to provide MFR, it would be allowed to do so; however, they would not receive any more or less in MFR funding on the basis of the type of vehicle they choose to utilize; and*
- *provides an annual cost range between $22.9 MM and $27.1 MM, which represent cost reductions of $15.2 MM to $11.0 MM in the MFR budget.*

The principal disadvantage is a decrease in total MFR funding for the fire departments.

A deployment plan was developed to determine where the 72 MFR units would be placed. IPS recommends that the County perform an additional review to further refine the proposed deployment plan as needed to address local constraints that may arise. Until such adjustments are made to operationalize the proposed plan, the financial impact of the deployment plan on a community by community basis for the different MFR options should be considered tentative.

Current Structure of Medical First Response

The MFR units are operated by 18 separate fire departments, which are operated on 20 MFR budgets, including Tierra Verde (covered by Lealman FD) and Belleair Bluffs (covered by Largo FD). These MFR services are provided under performance contracts.

The general premises behind the MFR program in Pinellas County include:

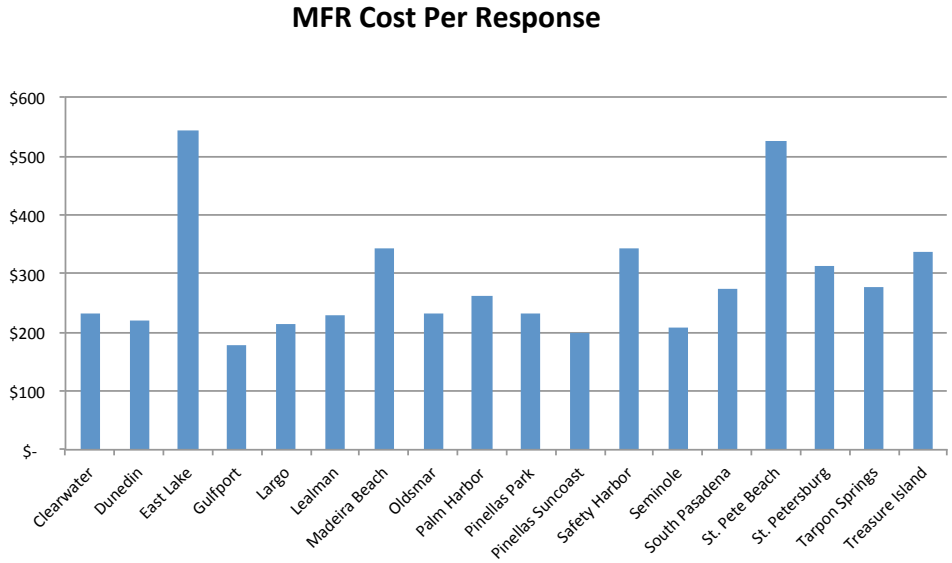
- Net cost is lower for individual homeowners and businesses if they pay more in taxes to have fire stations in reasonable proximity to homes and businesses – versus higher fire insurance premiums if fewer fire stations were built. This typically results in having more fire stations than would otherwise be justified by the fire call volume alone.
- Given the large number of fire stations and their proximity to homes and businesses, fire crews are often closer to the scene of a medical emergency than the closest available ambulance;
- Fires have become relatively infrequent events, leaving time available between calls for fire crews to respond to medical emergencies without significantly compromising their fire suppression role;
- Some medical emergency outcomes are improved by having appropriately trained personnel on-scene sooner rather than later; and

- Fire personnel, vehicles, stations, and other infrastructure have already been paid for by the community to meet their fire protection needs. Adding an EMS mission onto the fire department can be very economical if the existing infrastructure and time between fire calls can be used to respond to EMS calls.

In Pinellas County, the *ad valorem* EMS tax revenues have been used to cover the cost of adding the EMS mission onto the existing fire department infrastructure.

The lack of fairness in how MFR funds are distributed between the fire departments is a major issue. From a system-wide perspective, the amount of money paid by the County to a fire department for MFR services should be equivalent, regardless of which fire department provides the service. Therefore, there needs to be some consideration taken into account on the basis of the number of calls run, number of people served, number of MFR units operated, or some other parameter that is fair to all fire departments.

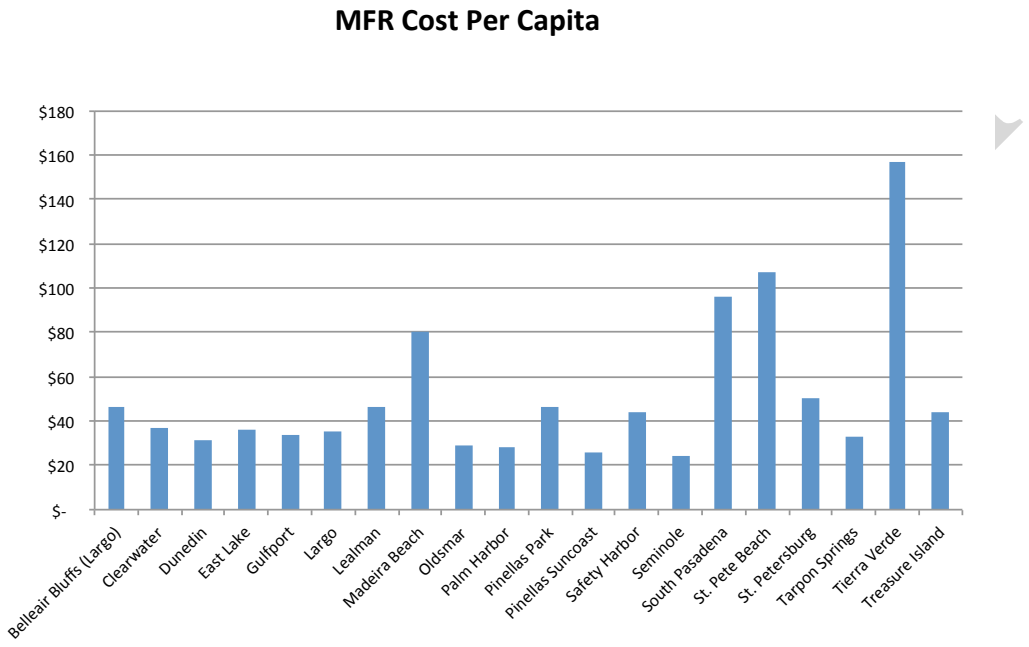
Looking at MFR funding levels per response across all of the fire departments, there is a 203% disparity ranging from a low of $179 to a high of $542 per response (based on FY 2009-10 response data).[1] This is illustrated in the figure labeled 'MFR Cost Per Response.'[2]



[1] Largo data includes Belleair Bluffs; Lealman data includes Tierra Verde

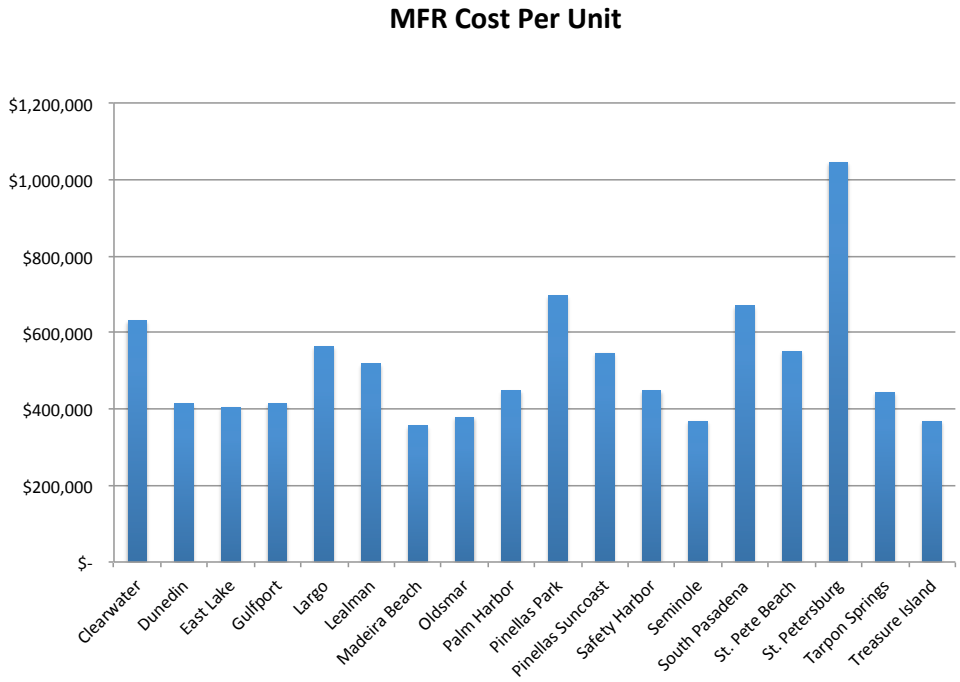
[2] Cost per Response chart utilized FY 2010-11 budget data; It is recognized that Pinellas Suncoast Squad 26 was eliminated in FY 2010-11.

Looking at how much MFR funding is received per resident covered (per capita) by each fire department, there is also a lack of fairness. It shows a 554% disparity from a low of $24 to a high of $157 (based on FY 2010-11 budget data and CY 2010 population data). This is shown in the figure labeled 'MFR Cost Per Capita.'

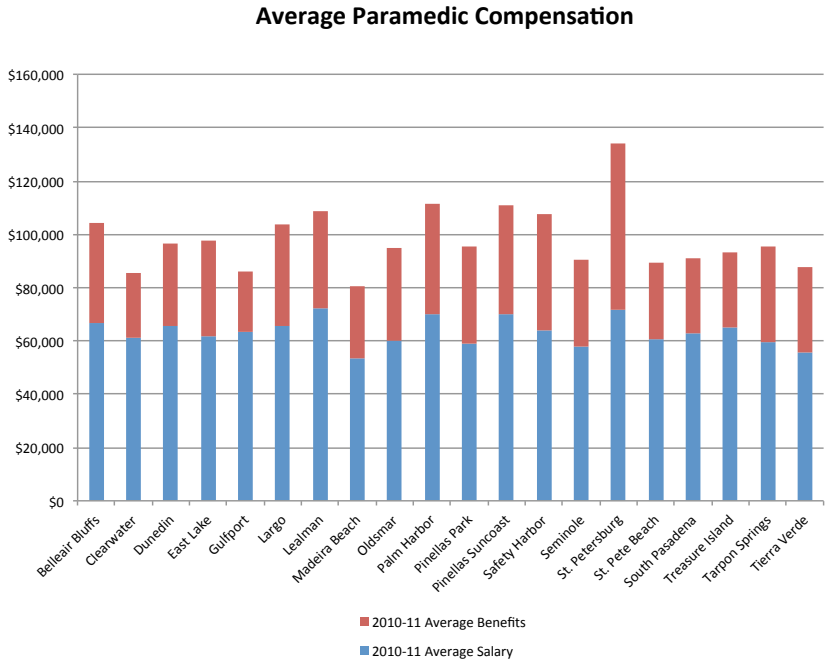


The average cost paid to each department for operating the 62 County-funded MFR units also showed a large disparity from a low of $357,484 to a high of $1,045,395 – a 192% difference.[1] This is shown in the figure labeled 'MFR Cost Per Unit.'

[1] Largo data includes Belleair Bluffs; Lealman data includes Tierra Verde



Another perspective to consider in fairness of funding is the difference in salary levels. Personnel expenses are the largest cost category in an EMS system's budget. These analyses show a high degree of variability between departments in their salary, benefits and total compensation costs. Average salaries by department ranged from a low of $53,722 to a high of $72,205 – a 34% difference. Average benefits ranged from $22,541 to $62,507 – a 177% difference. Total compensation ranged from $80,658 to $134,000 – a 66% difference. The average benefits cost as a percentage of the average salary cost ranged from 36% to 87%. These data are illustrated in the figure labeled 'Average Paramedic Compensation.'



Pinellas County now funds 62 MFR units. Some of the cities and fire districts have chosen to independently fund additional MFR units.

A deployment analysis was made to determine how many MFR units are actually needed to meet the target response interval standard of 7 minutes 30 seconds (7:30) with at least 90% reliability on a County-wide basis. The MFR deployment analysis resulted in a plan that achieves the goal of response intervals at 7:30 or less with 90% reliability or more using 72 MFR units.

Options for Medical First Response

Given these findings, options were considered to close the MFR budget deficit, protect the level of service to the citizens of Pinellas County, and establish fairness over the long term in how MFR is funded between the fire departments. The MFR options considered included:

- Status Quo
- Increasing the *ad valorem* tax rate
- Eliminating MFR
- Privatizing MFR
- Proportional Response Funding
    - Available Funding Option
    - Current Budget Option

- Marginal Engine Funding
  - Paid Position Option
  - Salary Differential Option

Status Quo

Keeping the status quo in place is not financially sustainable. It also fails to address the inequities in funding between departments.

The status quo approach is now dependent upon use of EMS reserve funds to cover the deficit between current MFR costs and the funds generated by the EMS *ad valorem* tax. The reserve funds will be fully depleted during FY 2012-13 at the current rate of reserve fund spending.

Increasing the Ad Valorem Tax Rate

This option alone would not resolve the underlying problems that led to the current situation. The lack of adequate MFR cost controls would persist. The lack of fairness in funding between fire departments would persist. There may also be difficulties in getting public support for a tax increase – particularly if these other problems are unresolved.

Eliminating MFR

Pinellas County is spending approximately $44.7 MM (FY 2010-11) to reduce the EMS response interval by two and a half minutes. Eliminating MFR is very attractive from a cost savings standpoint. However, it could have a severe impact on the small number (<1%) of patients who are the most dependent upon EMS: those who have a witnessed onset cardiac arrest.

The fire departments in Pinellas County have become dependent upon EMS funding to help support their fire mission despite the conflict this presents with the premise of marginal funding for MFR. Therefore, implementing this option would have a severe collateral impact on fire funding.

Privatizing MFR

Using vehicles similar to the 'rescue' units now used by some fire departments and staffing them with two crew members, it would be more expensive to privatize MFR versus having the fire department provide MFR using fire engines. Using a small SUV or sedan staffed by only one person could provide some cost savings, but still would not offer any significant savings compared to using fire engines with a full crew on a marginal cost basis. Privatizing MFR would also have a severe negative collateral impact on fire protection.

Proportional Response Funding – Available Funding Option

This option funds the recommended 72 MFR units across the County in proportion to the number of MFR calls to which a fire department responds. If a particular fire department responds to 5% of all of the MFR calls in the County, that department

would receive 5% of the funds available for MFR. The available funding option divides up the amount of funds available at the then current *ad valorem* millage rate, which is now approx. $30 MM. A formula would then be used to maintain funding equivalence from year to year moving forward. Unfortunately, this method of MFR funding severely and inappropriately impacts low volume / difficult to serve areas of the County.

Proportional Response Funding – Current Budget Option

Instead of dividing up the MFR funds generated at the current *ad valorem* millage rate (approx. $30 MM), this 'current budget option' would increase the *ad valorem* tax millage rate. The new millage rate should be set to yield enough money to match the current MFR payments to fire departments ($38.1 MM) and the additional portion of MFR program costs allocated to MFR ($6.6 MM) for a total of $44.7 MM.[1] It would then be spent rationally using the proportional funding approach moving forward. Even with more total dollars, this method of MFR funding still severely and inappropriately impacts low-volume / difficult to serve areas.

Marginal Engine Funding – Paid Position Option

The Marginal Engine Funding – Paid Position Option offers the best balance of the options presented. It provides one paid position for each of the recommended 72 MFR units. The same funding per MFR unit would be distributed to all fire departments. Low volume / difficult to serve areas are funded fairly. The total cost of this option falls between $22.9 MM and $27.1 MM per year. The principal disadvantage is the reduction in total funding for the fire departments: a 29% to 40% decrease ($11.0 MM to $15.2 MM) from current MFR payments of $38.1 MM.

Marginal Engine Funding – Salary Differential Option

This version differs from the Marginal Engine Funding– Paid Position Option in one fundamental way. Instead of paying for the entire personnel compensation cost of those who will staff the position on a 24/7 basis, this 'salary differential option' only pays for the difference in salary between a firefighter/paramedic and a firefighter/EMT. A 15% salary differential factor was used for this calculation. This option would still pay the County-wide average for the costs of fuel, equipment, vehicle use, etc. This represents a true marginal cost funding approach to MFR. The total cost for this option is very low. However, it represents a dramatic reduction in funding to the fire departments with a severe negative collateral impact on fire protection.

[1] The FY2010-11 budgeted MFR expenditures of an estimated $44.7 MM include all fully-loaded costs for MFR including the administrative costs to the Property Appraiser and Tax Collector for collecting ad valorem taxes; medical direction services; continuing medical education for all EMTs and paramedics; radio, communication, and defibrillator equipment and maintenance; and Bayflite (No longer funded as of April 1, 2011) and Eckerd College provider expenditures.

Other Medical First Response Considerations

Set-Aside Fund

A 'set-aside' fund is envisioned by this proposal. Coming out of *ad valorem* revenues, the set-aside fund is intended to help pay for EMS equipment upgrades, contributions to replenish and maintain the EMS reserve fund, and pay for implementation of new programs. The set-aside fund may also need to be used to cover some of the ambulance share of system program costs in the future, such as medical direction, continuing medical education, and EMS administration. These have historically been paid for with ambulance user fees, but this may not be possible in the future.[1] A $2.5 MM estimate is suggested for the set-aside fund in the budget projections. It would vary from year to year depending on needs.

Funding Equivalence

As the consumer price index, property valuations, and set-aside fund requirements change, a formula should be applied to calculate the changes that are needed in the *ad valorem* tax rate to maintain funding equivalence from year to year. This could remove some of the politics from the millage rate adjustment process as the changes could be automatically applied. This is described in more detail in the appendix called 'Funding Equivalence.'

Adjusting the Number of MFR Units

The County's demographics, population, and EMS call volume will change over time. Therefore, there should be a periodic reassessment of MFR deployment to determine the number of MFR units needed and where they should be located. This would lead to decisions about adding or reducing the number of MFR units in the future.

Appropriate Utilization of MFR

Many have expressed concern and frustration regarding the large number of calls on which MFR units are currently sent. Many of the calls that MFR units respond to are difficult to justify.

It is recommended that the type of calls that MFR units and ambulances respond to, separately or together, be carefully scrutinized to reduce the overall volume of calls that both or either resource respond to. Factors to consider include:

- Sending an engine company for MFR to cases that require ***fire*** first response services (e.g., fire protection at a motor vehicle crash);

[1] Ambulance user fee revenues and other associated revenues will not fully offset estimated ambulance program costs (medical direction, continuing education, EMS administration, etc.), as of FY2013 - 2014, per the January 2011 ten-year forecast provided by County staff. However, the ambulance service agreement could be adjusted, through negotiations or during an RFP process, to contain the ambulance contractor cost and ambulance program costs within the available user fee revenues.

- Sending an engine company for MFR to cases where extrication and/or technical rescue services are needed;
- Sending MFR to cases where additional manpower is likely to be needed (e.g., more complicated medical cases, potentially violent scenes, bariatric patients);
- Sending MFR to extremely time critical cases (e.g., cardiac arrest); and
- Allowing supervisor and administrative vehicles to be counted in meeting MFR time interval requirements, so long as they are appropriately staffed and equipped.

On cases where MFR is not initially deployed, the ambulance crew should always have the option to request MFR as appropriate. The need for MFR cannot always be discerned from the caller.

Ambulance Transport

Who should provide ambulance transport service is another very contentious issue. The fire departments have repeatedly expressed strong interest in becoming transport providers. Several options were explored.

Status Quo

Overall, the current ambulance service arrangement is running very smoothly. The contractor is meeting / exceeding all performance requirements. The County-operated billing and collections operation is running at a high level of performance. Expenses for ambulance contractor fees along with the billing and collection operation costs are well below collected ambulance service revenues. Historically, this has provided funds to pay for support of other ambulance program components including EMS administration, medical direction, and the continuing medical education program. Additional revenues often remain even after these components are funded, allowing the rest of the revenue to be used to offset a portion of MFR program costs and/or be placed into the County's EMS reserve fund. However, recent budget projections suggest that future ambulance fee revenues may not be able to completely fund the ambulance program support costs.[1] Recently, these funds have been used to help offset the deficits in the MFR program.

The transport program configuration is performing well, both operationally and financially. Other options are either more expensive or do not offer any particular advantage over the current arrangement. Therefore, the status quo is the recommended option with regard to ambulance transport.

[1] Ambulance user fee revenues and other associated revenues will not fully offset estimated ambulance system program costs (medical direction, continuing education, EMS administration, etc.) as of FY2013-14, per the January 2011 ten-year forecast provided by County staff.

Fire Department 9-1-1 Transport / Private Non-9-1-1 Transport

A deployment analysis[1] showed that 53 fire department ambulances would be needed if the fire departments transported just the patients from 9-1-1 calls.

To put that plan into place, 28 additional ambulances with equipment would need to be purchased. The estimated cost for that initial purchase is $5.9 MM.

Based on average annual MFR (FY2010-11 budget) personnel compensation costs, fuel, vehicle maintenance, etc., the annual operational cost for a fire department 9-1-1 transport program would be $41.3 MM per year. The current contractor is paid approx. $21 MM for these same 9-1-1 transports. Therefore, the fire department option would increase the annual cost by $20.3 MM (97%).

Presently, the County collects a total of $40.9 MM (FY 2010-11 budget) per year in ambulance revenues. If $41.3 MM is spent on covering costs for fire department transport, there would not be any funds remaining to cover the cost of providing the non-emergency transports and other system program costs (e.g., EMS administration, medical direction, continuing education, etc.).[2]

There would also be significant performance accountability issues in managing System performance through 18 different fire department transport providers in addition to a County-wide private non-9-1-1 transport provider.

Limited Fire Department Transport in High –Volume Areas

IPS was asked to explore the feasibility of fire department transport in high volume locations. A financial break-even analysis was used to determine which high volume MFR units could justify FD transport units. This approach was chosen on the basis of fairness and fiscal prudence. If a given MFR unit did not have sufficient responses to allow a transport unit at that same location to at least cover its own operating costs, it would not qualify for further consideration.

This is a very conservative approach biased in favor of fire department transport. In reality, a transport unit attempting to run in parallel with a MFR unit would actually run fewer calls because transports take more time to complete. Therefore, the break-even threshold should be very clearly met or exceeded to make a responsible selection of potential FD transport unit locations.

The break-even analysis revealed that a FD transport unit must do *at least* 3,481 transports annually. Since only 72.2% of 9-1-1 responses result in a transport (based on CY 2009 data), *at least* 4,821 annual responses are needed to break even. This equates to *at least* 13.2 responses per day to break even. There was only one MFR unit in the entire County that had this level of response volume.

[1] See appendix on 'Deployment Analysis Methods' for details

[2] Ambulance user fee revenues and other associated revenues will not fully offset estimated ambulance system program costs (medical direction, continuing education, EMS administration, etc.) as of FY2013 - 2014, per the January 2011 ten-year forecast presented by County staff.

Government Operated 3rd Service EMS Transport

A government operated '3rd service' ambulance provider model was considered. It did not appear to offer any significant advantages over the current arrangement.

Public-Private Partnership

An option to form a public-private partnership for ambulance transport was considered. In such an arrangement, the fire departments would band together with a private firm to form a new public-private company. This public-private company would be the ambulance service contractor – not the individual fire departments or the private ambulance firm. The combined resources of all parties could then be utilized to meet contractual requirements. The accountabilities could be preserved because the public-private company, not the individual participants, would be held accountable for performance as a whole.

Conceptually, this could work in Pinellas County. The primary barriers are the political complexities of getting all 18 fire departments to agree on terms. In the past, the fire departments have tried to band together to bid on the ambulance service contract under previous competitive RFP processes for the transport contract. The fire departments were never able to hold a substantive coalition together long enough to submit a bid. Therefore, this appears to be an interesting but highly unlikely option.

Virtual Consolidation Between Fire and Ambulance Services

One of the things the fire departments in Pinellas County have done very well together is develop policies and procedures that let their combined resources work well across jurisdictional lines. They have made what could be called a 'virtual consolidation' of their resources. Given that success, an option was considered for a similar virtual consolidation approach that included the ambulance contractor.

A virtual consolidation approach could give the ambulance contractor the latitude to work more collaboratively with the fire departments. While this would be unlikely to have a significant financial or operational impact, it does resolve some ethical issues if such latitudes were not exercised. Therefore, this option is recommended for implementation, however it does not fully address the transport issue on its own.

St. Petersburg's Transport Study

The City of St. Petersburg engaged the services of a fire and EMS consulting firm, TriData, to explore transport feasibility for their City. The projections of revenue and expenses suggested that the City of St. Petersburg could net between $7.4 MM and $10.4 MM annually if it did its own ambulance transportation and billing operations.

The IPS study found that the assumptions behind the TriData revenue projections study did not fully consider payer types, allowable billing amounts and actual

collection rates. On the expense side, the TriData report did not address the costs of medical direction, continuing education program, EMS administration, and other costs that are currently paid from ambulance revenues at $42.62 per transport.[1] It would be inaccurate for the City of St. Petersburg to calculate net revenues without allowing for these costs at the same rate of $42.62 per transport.

Using these more precise and realistic assumptions from actual billing and collection history in Pinellas County, the projected net for the City of St. Petersburg is an annual loss of approx. $4.5 MM. These projections do not include the additional cost of reserve units.

If the City of St. Petersburg separated itself from the rest of the System, it would result in compromises to the rest of the County that includes isolating some areas – creating disruptions in emergency response coverage for 'in-system' mutual aid both in and out of these separated areas. It could also result in loss of economies of scale – to the economic and operational detriment of both the City of St. Petersburg and the County.

Transport Recommendations

Therefore, IPS recommends:

- Keeping the general terms of the current ambulance contract and associated County operated billing and collections processes in place County-wide
- Do not implement a fire-department based 9-1-1 transport service
- Consider modifications to the ambulance contract, first responder contracts and medical protocols as needed to facilitate operations consistent with the virtual consolidation approach

Overall Financial Impact

The overall financial impacts are summarized below.

- Changes to MFR Program Costs: Implementation of the Marginal Engine Funding – Paid Position Option with a 3.6 FTE staffing multiplier (which includes funding for supervision) has an estimated cost of $27.1 MM: a 29% decrease ($11.0 MM) from the FY 2010-11 budget
- Changes to Projected Ambulance Program Costs: None
- Changes to Projected Support Program Costs: None
- Set-Aside Fund Costs: Estimated at $2.5 MM /yr., but is highly dependent upon several factors such as the pace chosen for replenishing the EMS reserve fund, equipment upgrade choices, new program development

[1] The $42.62 figure is based on a total of $5,856,980 in ambulance system program costs (medical direction, continuing medical education, EMS administration, etc.; per the FY 2010-11 adopted budget) allocated on a per-transport basis for 137,428 transports per the FY 2009-10 actual transports.

choices, and any adjustments needed to compensate for increases or decreases in the inflation rate and/or property values.

Together, these recommendations have a projected net decrease in total EMS system costs of $8.5 MM, including the $2.5 MM in set-aside costs.

MEDICAL FIRST RESPONSE REVIEW

The Medical First Response (MFR) program in Pinellas County now consists of 62 County-funded MFR units and multiple locally-funded MFR units. These units are operated by 18 separate fire departments that provide services under performance contracts. These contracts require MFR units to arrive on emergency-mode responses (those using lights and sirens) within 7 minutes 30 seconds (7:30) with at least 90% compliance. In FY 2009-10, the fire departments collectively, including responses made by locally funded MFR units, exceeded those requirements.

There are a few fundamental issues that should be clearly understood to help put the analyses and recommendations about MFR in this report into proper context.

Fire departments provide a variety of services on 9-1-1 calls independent of their EMS role. These services include firefighting, automobile crash extrication and other types of 'technical' rescue operations. These services are referred to as Fire First Response (FFR).

In contrast, Medical First Response (MFR) is a mission that many, but not all, fire departments across the United States have taken on. The general premises behind fire department MFR include:

- Presumption that the net cost is lower for individual homeowners and businesses if enough fire stations are built to put their properties into reasonable proximity of a fire station versus higher fire insurance premiums if those fire stations were not built. This typically results in more fire stations than would otherwise be justified by the fire call volume alone.
- Given the large number of fire stations and their proximity to homes and businesses, fire crews are often closer to the scene of a medical emergency than the closest available ambulance.
- Fires have become relatively infrequent events, leaving time available between fire calls for fire crews to respond to medical emergencies without significantly compromising their fire suppression role.
- Some medical emergency outcomes are improved by having appropriately-trained personnel on scene sooner rather than later
- Fire personnel, vehicles, stations, and other infrastructure have already been paid for by the community to meet their fire protection needs. Adding an EMS mission to the fire department can be very economical if these existing resources can also be used to respond to EMS calls, particularly when the added expense is limited to the following: cost of additional medical training, salary incentives for medical certifications, additional medical equipment, medical supplies, and the added cost of fuel, maintenance, etc. for going on the medical calls.

In Pinellas County, the *ad valorem* EMS tax has been used to cover the costs that fire departments incurred by adding an EMS mission atop their existing fire protection mission.

One way to fund MFR is on a proportional cost basis. If 70% of the calls that the fire department goes to are for EMS, then EMS funding would cover 70% of the costs. This approach is difficult to justify because the reason for adding more fire resources is because of the reductions it brings to fire insurance premiums – not the additional fire call volume.

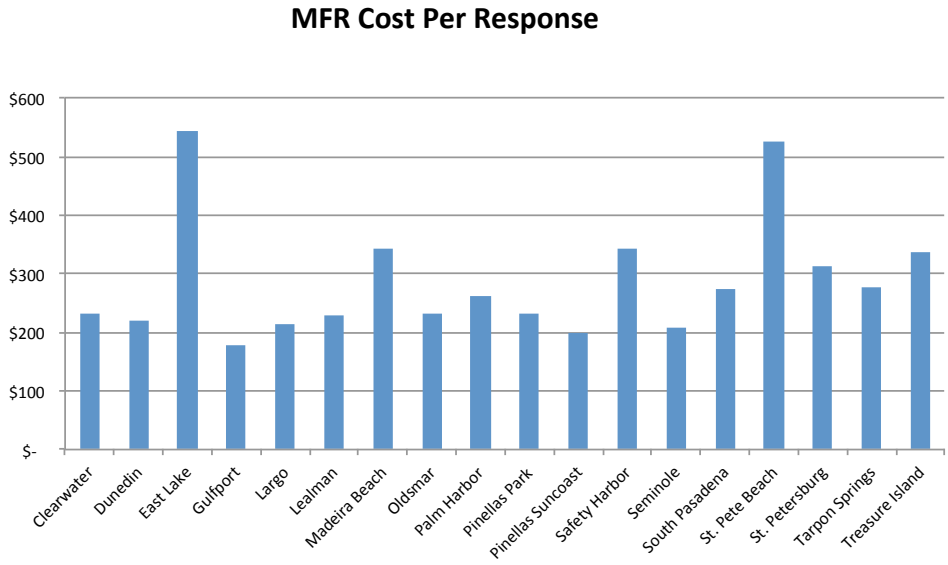
In communities with low to moderate fire call volume adding the EMS mission onto the fire department allows fire resources to be leveraged to serve their community's EMS needs without significant compromise to their fire mission. A key principle is that each community already has sufficient resources in place to meet its fire protection obligations, independent of any EMS funding. EMS funds only pay the cost of adding an EMS mission onto the existing infrastructure. This is called "marginal cost funding." Over the years, the EMS funding in Pinellas County has often paid for entire vehicles and new positions. This is a significant departure from the premise of marginal cost funding for MFR.

Currently, on a County-wide basis, there are two general categories of MFR funding. At the lowest call volume level, MFR funding pays for one 24/7 position with salaries, equipment and associated costs on a MFR fire engine. At higher call volume levels, a separate rescue vehicle with two 24/7 paramedic positions are funded. MFR agencies may elect to separate the two paramedic positions into two MFR units in lieu of operating a rescue unit. However, the funds provided at these levels are not uniform. It depends on the actual costs, which vary from department to department. While this has some elements of the marginal funding approach, the direct cost elements do not allow adequate cost controls to be applied to the funding process. As a result, the rate of cost increases in MFR has significantly exceeded the rate of increases in the Consumer Price Index.

Another very significant issue is the fairness in how the MFR funds are distributed between the fire departments. From a system-wide perspective, the money paid by the County to a fire department for MFR services should be determined fairly and on the same basis regardless of which fire department provides the service. This requires that some sort of equivalence criteria be applied, such as funding based on the number of calls run, number of people served, number of MFR units operated, or some other parameter that is fair and equally applied to all fire departments.

The figure labeled 'MFR Cost Per Response' examines the MFR funding per response for all of the fire departments in Pinellas County. There is a disparity ranging from a

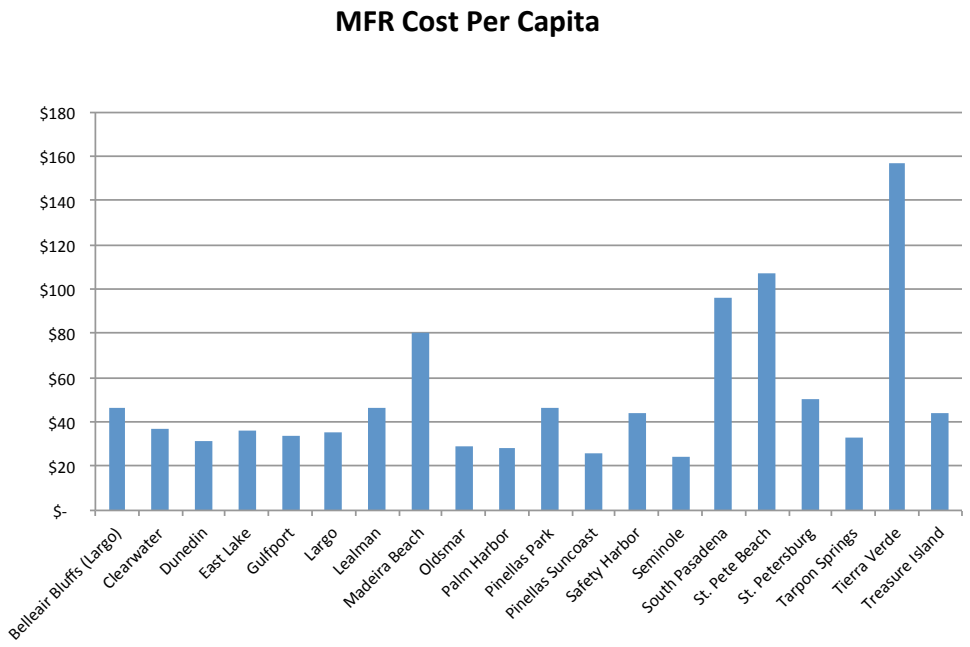
low of $179 to a high of $542 per response – a 203% difference, based on FY 2010-11 budget data and FY 2009-10 response data.[1,2]



[1] The 'MFR Cost Per Response' and 'MFR Cost Per Unit' graphs break down the information for each of the 18 fire departments. Other graphs break down the information for each of the 20 MFR budgets, which include the Tierra Verde budget that is handled by Lealman FD and the Belleair Bluffs budget that is handled by Largo FD. The response volume data used to generate the 'MFR Cost Per Response' graph does not separate Belleair Bluffs data from Largo FD's overall data. The same is true for the Tierra Verde / Lealman FD data.

[2] Cost per Response chart utilized FY 2010-11 budget data; It is recognized that Pinellas Suncoast Squad 26 was eliminated in FY 2010-11.

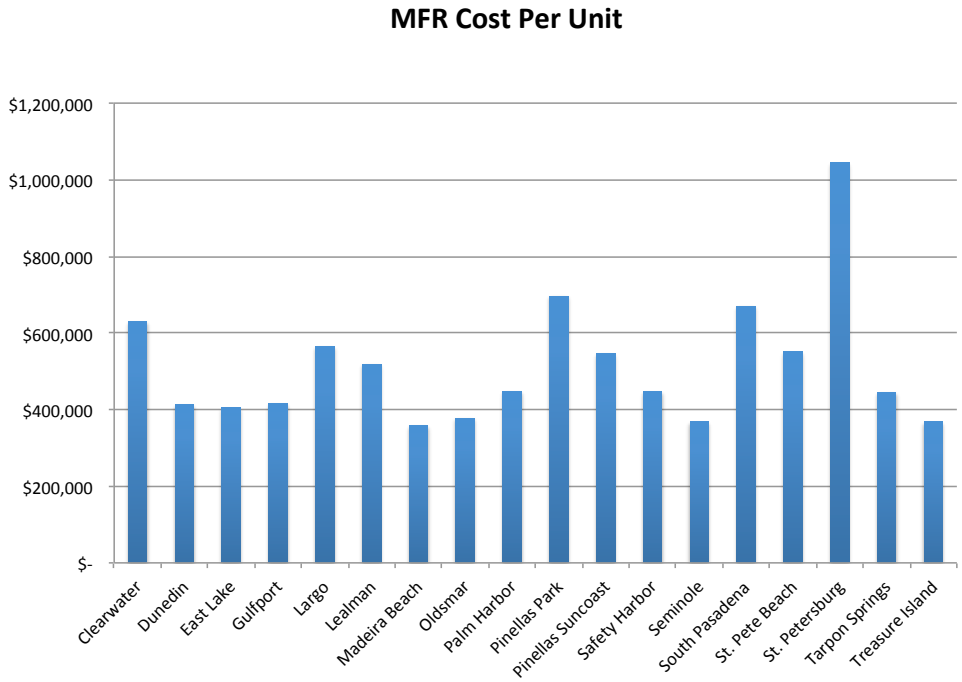
The figure labeled 'MFR Cost Per Capita' examines how much MFR funding is received on the basis of population in each city or fire district. It shows a large disparity ranging from a low of $24 to a high of $157 – a 554% difference (based on FY 2010-11 budget data).



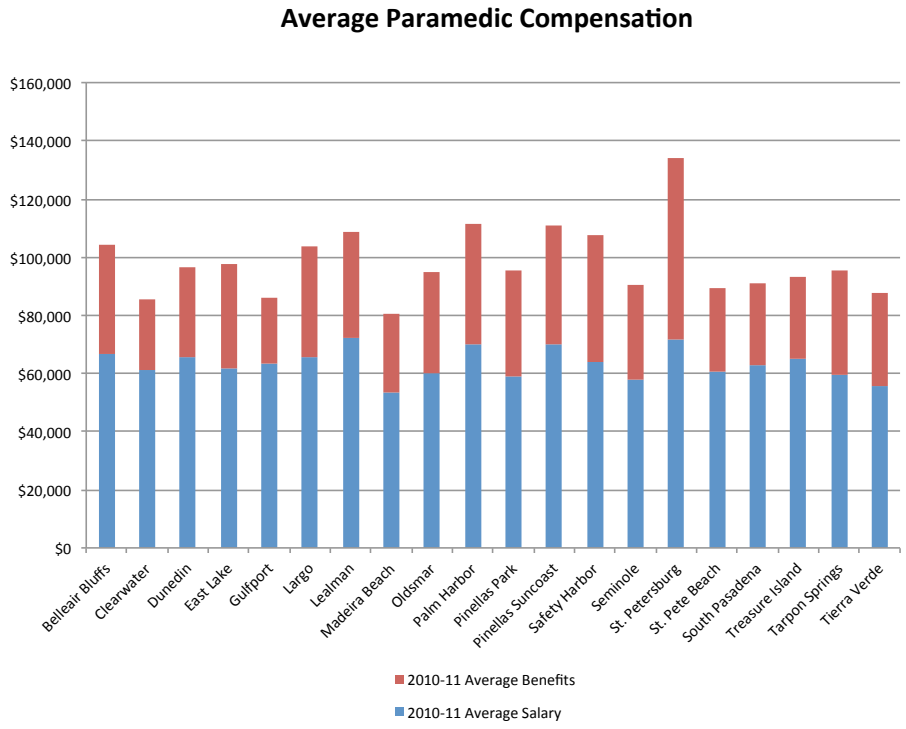
The average cost paid to each department for operating their respective County-funded MFR units was also examined. It also showed a large disparity from a low of $357,484 to a high of $1,045,395 – a 192% difference. This is shown in the graph labeled 'MFR Cost Per Unit.'[1,2]

[1] Largo data includes Belleair Bluffs; Lealman data includes Tierra Verde

[2] The 'MFR Cost Per Response' and 'MFR Cost Per Unit' graphs break down the information for each of the 18 fire departments. Other graphs break down the information for each of the 20 MFR budgets, which include the Tierra Verde budget that is handled by Lealman FD and the Belleair Bluffs budget that is handled by Largo FD. The response volume data used to generate the 'MFR Cost Per Response' graph does not separate Belleair Bluffs data from Largo FD's overall data. The same is true for the Tierra Verde / Lealman FD data.



Another attribute to examine for fairness in MFR funding are the personnel compensation levels. Personnel costs are the largest category in an EMS system's budget. These analyses show a large degree of variability between departments. Average salaries by department ranged from a low of $53,722 to a high of $72,205 – a 34% difference. Average benefits ranged from $22,541 to $62,507 – a 177% difference. Total compensation ranged from $80,658 to $134,000– a 66% difference. The average benefits cost as a percentage of the average salary cost ranged from 36% to 87%. This data is illustrated in the figure and table labeled 'Average Paramedic Compensation'.



Average Paramedic Compensation

Department	2010-11 Average Salary	2010-11 Average Benefits	Benefit %	Average Total Compensation
Belleair Bluffs	$66,600	$37,536	56%	$104,136
Clearwater	$60,943	$24,408	40%	$85,351
Dunedin	$65,391	$31,348	48%	$96,739
East Lake	$61,663	$35,980	58%	$97,643
Gulfport	$63,441	$22,541	36%	$85,982
Largo	$65,400	$38,514	59%	$103,914
Lealman	$72,205	$36,666	51%	$108,871
Madeira Beach	$53,722	$26,936	50%	$80,658
Oldsmar	$60,030	$34,589	58%	$94,619
Palm Harbor	$69,921	$41,526	59%	$111,447
Pinellas Park	$59,109	$36,441	62%	$95,550
Pinellas Suncoast	$69,857	$41,285	59%	$111,142
Safety Harbor	$63,863	$43,529	68%	$107,392
Seminole	$57,865	$32,375	56%	$90,240
St. Petersburg	$71,494	$62,507	87%	$134,000
St. Pete Beach	$60,555	$29,012	48%	$89,567
South Pasadena	$63,029	$27,815	44%	$90,844
Treasure Island	$65,071	$27,935	43%	$93,006
Tarpon Springs	$59,607	$35,603	60%	$95,210
Tierra Verde	$55,836	$32,028	57%	$87,864

The disparities in funding for MFR likely originated from several causes. Many of the disparities seem to trace back to negotiations during the time that the County-wide system was being established. Later, different departments had different ways for allocating EMS costs that were submitted for funding. There were also salary disparities that became exaggerated by cumulative differences in labor contract negotiations over the years.

IPS also examined the interplay between the MFR and non-MFR fire department budget amounts. The objective was to see if there were any discernable trends or patterns between MFR and fire funding. A correlation analysis was performed, but there were too few data points to reach any conclusions.

A comparison of Pinellas County's MFR budget with similar communities was attempted. Unfortunately, MFR was not a separate item in any other fire department line item budgets. This is because MFR is considered to be one of many types of basic services that fire departments provide and is therefore embedded into their overall fire budgets. While it speaks well to the extraordinary financial transparency that Pinellas County has with regard to its MFR funding, it makes valid direct MFR cost comparisons with other communities all but impossible. The results of the attempted comparisons were therefore meaningless.

Another problem noted in the MFR program was lack of a real-time 'closest unit response' protocol. Although GPS technology is commonly used for this purpose in many other EMS systems, fire departments in Pinellas County are not currently using it to guide the assignment of an incoming call to a MFR unit.

Presently, when a 9-1-1 emergency response (i.e., lights and siren) is appropriate, the call is assigned to the 'home' MFR unit that has primary responsibility for serving that location. In the event that the 'home' unit is already on a call or is out of their response area (e.g., training, returning from a distant call), the call is assigned to the unit listed in a database as the 'next in line' to respond to a call in that area. The problem is that the *actual* location of the *closest* MFR unit, which could happen to be passing nearby, is not considered. However, IPS has recently been informed that there are plans already in development to have the dispatch software consider the real-time GPS coordinates for all available units each time a call is in the waiting queue for dispatch. If a unit is closer than that of a 'home' station, the dispatcher will be prompted with an option to change the recommended unit.

The way that MFR response time intervals are tracked is problematic. It does not fully align with the interests of patients. Currently, the target is arrival within 7 minutes 30 seconds (7:30). If a MFR unit arrives just one second before the target, it is counted the same as an arrival 4 minutes before the target. For extremely time sensitive cases, like cardiac arrest, the arrival 4 minutes earlier is incredibly valuable but there is no recognition or incentive for doing so. A related problem is that arrival at 7:29 is acceptable while arrival at 7:31 is not acceptable – even

though there is no significant difference in patient outcome associated with a two second difference in arrival – even on a cardiac arrest.

MFR DEPLOYMENT ANALYSIS

An initial deployment analysis[1] was made to determine how many MFR units would be needed to meet the target response interval standard of 7:30 with at least 90% reliability across the entire County. Data was used from CY 2009, which was the most recent complete calendar year of data available when the deployment analysis was performed. At that time, there were 63 County-funded MFR units and 11 locally funded MFR units already in place (per the '2010 ALS Justification Sheet'). All current fire station locations were used as the set of available locations for MFR units in the deployment analysis.

The initial deployment analysis used a factor of 15% as the portion of time during which MFR units would not be available for EMS responses due to engagement on fire related calls. This is a standard factor used as a starting point in many of IPS' deployment analyses.

The performance goal was a deployment plan which would have a MFR unit arrive on-scene within seven minutes thirty seconds (7:30) with approx. 90% reliability on a County-wide basis.

A preliminary deployment plan required 74 units to reach the performance goal. After its release, IPS received feedback from County staff, who were in communication with stakeholders, offering refinements to address issues such as low geographic coverage in certain areas and placement of more than one MFR unit in locations where additional fire apparatus were not available.

The preliminary deployment plan used a standard 15% factor for MFR unit unavailability due to fire-related calls. Further review based on actual call history in Pinellas County revealed that the average percentage for fire-related call time involvement for MFR units was 6.2%. The highest percentage for a MFR unit was 14.9%. In the interest of using conservative estimates for factors used in the deployment analysis, IPS chose to use a 10% fire-related call commitment time factor in the next deployment analysis, which falls between the average and highest observed values.

The type of feedback and adjustment described above is normal and appropriate in a complex deployment planning process.

Taking all of the feedback into account, IPS re-ran the deployment analysis. The refined plan achieves the desired response interval of 7:30 with 90.11% reliability

[1] See appendix for details on the deployment analysis methodology

using 72 MFR units. This is summarized in the 'MFR Deployment Plan' and 'MFR Units by Community' table.

MFR Deployment Plan

Fire Station ID	Community	# of Units
1/5	St Petersburg	2
3	St Petersburg	2
4	St Petersburg	2
6	St Petersburg	1
7	St Petersburg	1
8	St Petersburg	1
9	St Petersburg	1
10	St Petersburg	1
11	St Petersburg	1
12	St Petersburg	1
13	St Petersburg	1
16	Pinellas Park	1
17	Gulfport	1
18	Lealman	1
19	Lealman	1
20	South Pasadena	1
21	Lealman	1
22	St Pete Beach	1
23	St Pete Beach	1
24	Treasure Island	1
25	Madeira Beach	1
26	Pinellas Suncoast	1
27	Pinellas Suncoast	1
29	Seminole	2
30	Seminole	1
31	Seminole	1
32	Seminole	1
33	Pinellas Park	2
34	Pinellas Park	1
35	Pinellas Park	1

Fire Station ID	Community	# of Units
36	Pinellas Park	1
38	Largo	2
39	Largo	1
40	Largo	1
41	Largo	2
42	Largo	2
43	Largo	1
44	Clearwater	1
45	Clearwater	2
46	Clearwater	1
47	Clearwater	1
48	Clearwater	2
49	Clearwater	2
50	Clearwater	1
51	Clearwater	1
52	Safety Harbor	1
53	Safety Harbor	1
54	Oldsmar	1
56	East Lake	1
57	East Lake	1
58	East Lake	1
60	Dunedin	1
61	Dunedin	1
62	Dunedin	1
65	Palm Harbor	2
66	Palm Harbor	1
67	Palm Harbor	1
68	Palm Harbor	1
69	Tarpon Spings	1
70	Tarpon Spings	1

Total	**72**
Reliability	**90.11%**

The number of MFR units in each community is summarized in the table 'MFR Units by Community.'

MFR Units By Community

Community	# of Units
Clearwater	11
Dunedin	3
East Lake	3
Gulfport	1
Largo	9
Lealman	3
Madeira Beach	1
Oldsmar	1
Palm Harbor	5
Pinellas Park	6
Pinellas Suncoast	2
Safety Harbor	2
Seminole	5
South Pasadena	1
St. Pete Beach	2
St. Petersburg	14
Tarpon Springs	2
Treasure Island	1
Total	**72**

Even with consideration of the additional feedback, this refined deployment plan cannot take every possible constraint, local nuance, and potential concern into consideration. There will almost certainly be some local adjustments needed to operationalize the deployment plan. Fortunately, there is some latitude that can be exercised in making small adjustments to the deployment plan without significantly impacting operational performance.

For example, the deployment plan may call for moving a piece of fire apparatus to provide better coverage for EMS responses. However, if that piece of fire apparatus is a ladder truck, it may be preferable to keep it in its current location to remain in proximity to the high-rise structures that it is intended to cover. This may lead to consideration of moving different types of apparatus between stations and even between communities. It is very likely that such adjustments will be needed to operationalize the proposed deployment plan. Therefore, IPS recommends that the County perform an additional review to further refine the proposed deployment plan as needed. Until such adjustments are made to operationalize the proposed plan, the tables that show the financial impact of the deployment plan on a

community by community basis for the different MFR options should be considered tentative.

When reviewing the MFR deployment recommendations, it is also important to understand the very conservative approach that the deployment model used in its calculations. Because the model is conservative, actual performance is likely to be better than the predicted performance.

While 9-1-1 EMS call volumes have increased since CY 2009 (which was the time period for data used in the deployment analyses), the model assumes that MFR units will continue to respond on most 9-1-1 EMS calls. By the time these recommendations are implemented, the number of calls that MFR units are required to respond to will probably be much less, as discussed in the 'More Appropriate Use of MFR' section of this report. Stakeholders have already been negotiating in earnest to change MFR response criteria in this direction. Such changes would tend to decrease the number of MFR units needed and/or increase reliability to much higher levels than projected in the deployment solution.

Adjustments to the types of calls MFR units are required to respond to should be made on the basis of each individual EMD determinant code and in close consultation with both the EMS Medical Director and fire department operations staff. They should consider each EMD determinant in context of the criteria listed in the section of this report entitled 'More Appropriate Use of MFR.'

MFR OPTIONS

Based on the findings, analyses and conclusions from the assessment of MFR services, a wide range of options were considered to close the budget deficit, protect the level of service to the citizens of Pinellas County, introduce better MFR cost controls, and establish fairness in how MFR is funded between the fire departments. The MFR options considered included:

- Status Quo
- Increasing the *ad valorem* tax rate
- Eliminating MFR
- Privatizing MFR
- Proportional Response Funding
    - Available Funding Option
    - Current Budget Option
- Marginal Engine Funding
    - Paid Position Option
    - Salary Differential Option

STATUS QUO

- Possible for the very short term, but not a viable medium or long term solution.

Based on the 10 year forecast data presented by County staff to the EMS Authority in January 2011, the EMS reserve fund is projected to become totally depleted during FY 2012-13 if things remain unchanged. As discussed earlier in this report, the reserve fund is intended for financially sustaining EMS operations in the aftermath of natural disaster or other emergency situations when ambulance revenues may be disrupted. It is highly unlikely that the economy and property values will recover in time to replenish the EMS fund at the current millage rate before the fund becomes exhausted.

INCREASING THE *AD VALOREM* EMS TAX RATE

- Does not resolve the lack of fairness between fire departments; Does not provide cost controls; Requires tax increase.

This option considers a millage rate increase as the sole remedy. The millage rate for the *ad valorem* EMS tax is currently set at 0.5832. This generates approximately $30 MM in available funds, based on the FY 2010-11 budget data included in the 10 year forecast provided by County staff. The budgeted fund deficit for FY 2010-11 is $13.4 MM. The millage rate cap is 1.5. An increase in the millage rate would be needed to close the budget fund gap. However, the underlying problems of inadequate cost controls and inequities in how MFR funding is distributed would remain unresolved.

ELIMINATING MFR

- Dramatic reduction in cost to the County; Severe adverse collateral impact on fire department budgets; Severe impact would be likely on cardiac arrest survival rates; Lowers the level of service.

Pinellas County is now spending approximately $44.7 MM per year (FY 2010-11 MFR budget) to reduce the EMS response time by two and a half minutes. The ambulance contractor meets the requirement to arrive at the scene of an emergency in 10 minutes or less, with 90% reliability. The fire departments comply with the requirement to arrive at the scene of the same emergencies at least two and a half minutes sooner (7:30), with 90% reliability.

Multiple peer-reviewed EMS research studies have found that EMS arrival several minutes sooner or later has no discernable impact on patient outcomes – except in cases of cardiac arrest.[1,2,3,4,5] However, cardiac arrest cases represent less than 1% of the EMS call volume. Many of these patients will literally live or die as a direct consequence of EMS arriving a few minutes sooner or later. That is why the timeliness of EMS arrival is so closely linked to the level of service issue. Therefore, elimination of MFR is unlikely to have a significant impact on clinical outcomes because of response time issues, with the notable exception of cardiac arrest.

If the entire County MFR budget was eliminated, there would also be a severe adverse impact on fire protection.

PRIVATIZING MFR

- Does not reduce costs using similar vehicles; Some cost reduction if MFR delivered with smaller vehicles and one-person MFR crew – by the fire department or a private contractor; Provides cost controls; Severe adverse impact on fire protection.

IPS performed a deployment analysis to determine if privatizing MFR with a 7:30 minute response interval target with 90% or better reliability would be a reasonable option. Movement of ambulances to match the most likely geographic patterns (dynamic deployment) was permitted with this option. By this method, only 50 MFR units would be required at times of peak demand. This is in contrast with the suggested 72 fire MFR units that are suggested to staff fixed locations.

The costs of fire department and privatized models are best compared by looking at how many total unit hours each requires for a year.

Having one MFR vehicle in service 24 hours a day 365 days per year equals 8,760 unit hours. This is multiplied by 72 for the number of unit hours per year generated by 72 MFR units, which is 630,720. The more unit hours used, the higher the cost of delivering service. The privatized MFR model with dynamic deployment required only 438,000 unit hours - 30.6% fewer than the fire department model. This is

[1] Blackwell T, et al: Lack of Association Between Prehospital Response Times and Patient Outcomes. Prehosp Emerg Care (13)4, 2009

[2] Blackwell T, et al: Response Time Effectiveness: Comparison of Response Time and Survival in an Urban EMS System. Acad Emerg Med (9)4, 2002

[3] Pons P, et al: Paramedic Response Time: Does It Affect Patient Survival? Acad Emerg Med (15)7, 2005

[4] Pons et al: 8 Minutes or Less: Does the Ambulance Response Time Guideline Impact Trauma Patient Outcome? J Emerg Med 23(1), 2002

[5] DeMaio et al: Optimal Defibrillation Response Intervals for Maximum Out-of-Hospital Cardiac Arrest Survival Rates. Ann Emerg Med 42:242-250, 2003

summarized in the table labeled ' Comparison of Fire Department v. Privatized MFR.'

Comparison of Fire Department v. Privatized MFR

Model	Method	Unit hours / year
Fire Department MFR (Existing vehicle types, mostly engines)	Fixed locations; fixed staffing;	630,720
Privatized MFR (Ambulances)	Dynamically adjusted locations; Dynamically adjusted staffing	438,000

The next factor in the privatized MFR analysis was a comparison of costs for putting a unit in service for one hour – the unit hour cost. The unit hour cost was calculated from actual financial data from all fire department MFR budgets and from the County's budget for what is paid to the ambulance contractor for 'base' services.[1]

The unit hour cost for the fire departments, based on the average cost of what all fire departments are paid by the County for MFR (FY 2010-11 MFR budgets), is approximately $70.90. Multiplying this by 630,720 unit hours lines up with the total MFR budget for the fire departments at approximately $44.7 MM.

The unit hour cost for private ambulance service, based on the amount that the ambulance contractor is paid (including any profit), is $127.73. This was determined by taking the amount paid for base services[1] to the contractor ($28.6 MM from the FY 2009-10 payments) and dividing it by the number of unit hours they deploy (223,917, based on the contractor's June 2010 deployment plan).

Since the ambulance contractor does not deploy anything comparable to a fire engine with marginal cost funding, the cost analysis was made with an ambulance staffed by two people (to be as comparable as possible to transport capable fire department MFR rescue units).

Multiplying the number of unit hours needed under the privatized MFR deployment model in a year (438,000) by the unit hour cost ($127.73) gives the projected annual cost for the privatized model – $56.0 MM.

The reason why the privatized MFR model cost is higher, despite dynamic deployment, speaks to the significant advantage of fire departments as MFR

[1] Base services is the amount paid by the County to ambulance contractor for responses and transports to 9-1-1 and non 9-1-1 calls, excluding specialty services such as CCT, long distance transfers, paid stand-by commitments, tactical EMS services, etc.

providers. The local fire departments can provide MFR on a marginal cost basis that effectively leverages the vehicles and other infrastructure that is already paid for under their fire budgets. The further that fire departments stray away from being able to deliver MFR on a marginal cost basis, the more they diminish their biggest competitive advantage in providing MFR.

If the costs to the County were similar between the two models, fire department MFR would be preferable. This is because privatizing MFR would diminish fire protection capabilities by not having as many firefighters on duty at any time to meet County-wide fire suppression responsibilities. This is an important consideration in the event of major incidents or other situations of high demand for firefighting resources. Therefore, privatizing MFR is not a viable option based on these calculations.

However, another option considered for privatized MFR used a small SUV or sedan staffed by only one crew member. This is in contrast to an ALS engine with 3-4 staff members or the commonly used two person 'rescue' truck with transport capability. This smaller vehicle, single paramedic model is common in many areas of the United Kingdom. For that scenario, a general unit hour cost was calculated by taking half of the unit cost from the original privatized model calculations above. This equates to using a vehicle that costs only half as much to purchase and operate. It also equates to half the personnel cost. While this method may not be precise, it has enough accuracy to reveal if the cost is in a range that is greater, similar, or less than the fire department MFR cost. With half the unit hour cost and the same number of unit hours, the total cost of privatized MFR by this method is $28.0 MM.

In fairness to the fire department for comparison, if they used small SUVs or sedans and one crew member for MFR, their total estimated cost would be $29.2 MM (with 3.6 FTEs per position) plus $2.2 MM for the initial purchase of 72 vehicles, estimated for this calculation at $30K each.

This cost is less than the current MFR contract payments at approx. $38.1 MM (FY 2010-11), but similar to the budget projection for use of ALS engines under the Marginal Engine Funding – Paid Position Option as well as the Proportional Response Funding – Available Funding Option. These latter options provide a crew of 3-4 on MFR along with fire first response capabilities, rather than just one crew member.

It is also worth mentioning a single tier EMS system design as an alternative to privatizing MFR. This would involve completely eliminating MFR in favor of simply increasing the size of the private ambulance fleet to get their response interval target from the current 10 minutes down to 7 minutes 30 seconds at 90% reliability. This would match the current performance target for MFR units. This would involve a large increase in the number of ambulances deployed across the County. With this approach, fire department units would only be deployed on EMS calls when they are needed for fire protection, extrication, technical rescue services, and possibly for

additional manpower on specific types of cases. Like the previously discussed option for elimination of MFR, it would be a significant change with a severe adverse impact on fire department funding. Because of this collateral impact on fire funding (and protection), this option was not explored in further detail.

None of these options are recommended over the Marginal Engine Funding – Paid Position Option.

PROPORTIONAL RESPONSE FUNDING – AVAILABLE FUNDING OPTION

- Strong merits in cost reduction for County; Is fair to some fire departments, except those serving low volume / difficult to serve areas; Provides cost controls.

One of the parameters for assessing fairness in MFR funding cited earlier was the amount of funding per response. The proportional response funding (PRF) model takes the total projected amount of available MFR funds for the coming year and divides it by the historical proportion of MFR responses that each fire department responded to. If a given fire department went to 5% of the MFR calls, it would receive 5% of the available MFR funds.

The table labeled 'Department-Level Impact of Proportional Response Funding – Available Funding Option' is based on response data for FY 2009-10 and funding data for FY 2010-11.[1] It shows how MFR funding would look for each of the fire departments and contrasts the proposed funding levels with the current levels. For example, the first row in the table is for Clearwater FD. They ran 21,635 calls in FY 2009-10 and received $5,047,389 in funding. Their call volume represents 15.03% of the total MFR call volume. If they were given 15.03% of the available MFR funds, it would come to $4,132,717. This would be a decrease of $914,672.

[1] Largo data includes Belleair Bluffs; Lealman data includes Tierra Verde

Department-Level Impact of Proportional Response Funding – Available Funding Option

Department	MFR Units	FY 09-10 Responses	Proportional Avail. Funding	FY 10-11 Funding	Difference
Clearwater	11	21,635	$4,132,717.21	$5,047,389.00	-$914,671.79
Dunedin	3	5,634	$1,076,206.55	$1,239,927.00	-$163,720.45
East Lake	3	2,239	$427,693.73	$1,213,943.00	-$786,249.27
Gulfport	1	2,316	$442,402.27	$415,210.00	$27,192.27
Largo	9	18,488	$3,531,577.34	$3,950,724.00	-$419,146.66
Lealman	3	9,036	$1,726,056.51	$2,074,944.00	-$348,887.49
Madeira Beach	1	1,045	$199,615.88	$357,484.00	-$157,868.12
Oldsmar	1	1,634	$312,126.64	$378,218.00	-$66,091.36
Palm Harbor	5	6,819	$1,302,565.22	$1,791,659.00	-$489,093.78
Pinellas Park	6	11,942	$2,281,160.57	$2,786,675.00	-$505,514.43
Pinellas Suncoast	2	2,726	$520,720.46	$545,986.00	-$25,265.54
Safety Harbor	2	2,610	$498,562.14	$894,683.00	-$396,120.86
Seminole	5	8,823	$1,685,369.26	$1,842,936.00	-$157,566.74
South Pasadena	1	2,453	$468,572.00	$670,060.00	-$201,488.00
St. Pete Beach	2	2,102	$401,523.99	$1,101,575.00	-$700,051.01
St. Petersburg	14	40,155	$7,670,407.19	$12,544,738.00	-$4,874,330.81
Tarpon Springs	2	3,209	$612,983.11	$887,739.00	-$274,755.89
Treasure Island	1	1,098	$209,739.93	$368,536.00	-$158,796.07
Total	72	143,964	$27,500,000.00	$38,112,426.00	-$10,612,426.00

Note that the available MFR funds shown totals to $27.5 MM. The total amount of projected *ad valorem* EMS tax revenue is approx. $30 MM, based on the 10 year forecast data presented by County staff to the EMS Authority on January 25, 2011. The difference between these two figures is the amount suggested for use as a 'set-aside' fund. The set-aside fund is intended for equipment upgrades, contributions to the EMS reserve fund, and funds for implementation of new programs. The $2.5 MM funding level for the set-asides are general projections for these purposes.

As the consumer price index, property valuations, and set-aside fund requirements change, a formula should be applied to calculate the changes that are needed in the *ad valorem* tax rate to maintain *funding equivalence* from year to year. This could remove some of the politics from the millage rate adjustment process as the changes could be automatically applied. This formula is described in the appendix on 'Funding Equivalence.'

The advantages of Proportional Response Funding - Available Funding Option are:

- Forces the MFR program to operate within the funding available through the *ad valorem* revenue;
- Provides equity in funding by paying departments the same amount in proportion to the MFR calls they handle;
- Each community can be given the latitude to spend the funds as they choose, so long as they meet their performance requirements and comply with other System policies. For example, if a fire department wants to use a transport

capable rescue unit to provide MFR, it is free to do so. However, they will not receive any more or less in MFR funding on the basis of the type of vehicle they choose to use; and

- Cost reduction for the County – MFR budget matches the current funding yield at the current *ad valorem* millage rate (not including revenue needed for the set-aside fund)

The disadvantages of this funding model are:

- Approximately 28% decrease from current MFR funding to the fire departments;
- Creates a potentially inappropriate incentive for responding to more calls, not less; and
- Severe decreases to low call volume fire departments because the model does not acknowledge that low volume / difficult to serve areas (such as beach communities) are inherently more expensive to serve on a per call basis than the easier to serve areas.

PROPORTIONAL RESPONSE FUNDING – CURRENT FUNDING OPTION

- Offers some elements of fairness, but requires an initial tax increase; Inappropriately severe impact on low volume / difficult to serve communities. These disadvantages outweigh the benefits.

One slight variation to the above described approach was also considered. This method assumes that the current budget of $44.7 MM (which includes MFR program costs) is 'reasonable' for funding MFR. Therefore, the *ad valorem* EMS tax millage would be increased in order to yield $44.7 MM (using FY 2010-11 data).[1] Thereafter, the same formula-based approach would be applied to adjust the tax rate in order to maintain funding equivalence moving forward. This model puts more dollars into MFR than the Available Funding Option, but some departments will still end up with a significant net loss - especially those that serve low volume / difficult to serve areas.

The advantages of Proportional Response Funding - Current Funding Version are:

[1] The FY 2010-11 budget for MFR expenditures is estimated at $44.7MM, which includes all fully-loaded costs for MFR. This includes the administrative costs to the Property Appraiser and Tax Collector for collecting ad valorem taxes, medical direction services, continuing medical education for all paramedics, equipment and maintenance (radios, communications, and defibrillators), and Bayflite (no longer funded as of April 1, 2011) and Eckerd College provider expenditures.

- Forces the System to operate within the funding available through the *ad valorem* revenue – after an initial increase in the millage;
- Provides equity in funding by paying departments the same amount for the MFR calls they handle;
- Each community can be given the latitude to spend the funds as they choose, so long as they meet their performance requirements and comply with other System policies. For example, if a fire department wants to use a transport capable rescue unit to provide MFR, it is free to do so. However, they will not receive any more or less in MFR funding on the basis of the type of vehicle they choose to use.
- Overall, the funding for MFR, collectively, is the same; and
- Some departments will see an increase in MFR funding

The disadvantages of this funding model are:

- Requires a tax increase to initiate;
- Some departments will see a decrease in MFR funding;
- Creates a potentially inappropriate incentive for responding to more calls, not less; and
- Results in severe decreases to low call volume fire departments because the model does not acknowledge that low volume / difficult to serve areas (such as beach communities) are inherently more expensive to serve on a per call basis.

MARGINAL ENGINE FUNDING – PAID POSITION OPTION

- Equally funds 72 MFR units; Protects the level of service; Fair and equitable between all fire departments; Provides cost controls.

The deployment analysis shows that 72 MFR units are needed. This model provides County funding for all 72 MFR units at the same level for every fire department. That funding level per MFR unit is based on the County-wide average for annual operating costs, including average total personnel cost levels on the EMS budget, rather than call volume.

Staffing one 'seat' on a MFR unit on a 24hr basis requires 3 full-time equivalent (FTE) positions. When the firefighter / paramedic scheduled for work on a particular shift is out sick or on vacation, the fire department will need to have another firefighter / paramedic available to fill-in. The number of additional FTEs needed to provide this replacement staffing is referred to as a staffing multiplier. The EMS Resource Committee suggested use of a 0.6 staffing multiplier for these analyses. This means that 3.6 FTEs would be used to staff the one County-funded 'seat' on a MFR unit on a 24/7 basis. The staffing multiplier issue is discussed in more detail in the 'Staffing Multiplier Considerations' section of this report.

The total annual cost of the Marginal Funding – Paid Position Option, with a 3.6 staffing multiplier, is $27.1 MM.

The table labeled 'Department-Level Impact of Marginal Engine Funding – Paid Position Option with 3.6 FTEs Per Position' shows how this option would look financially for each fire department using FY 2010-11 data.[1] For example, the first row shows that the City of Clearwater would receive $4,142,263 under this method, in contrast to its current funding level of $5,047,389. This represents a decrease in annual funding of $905,126.

Department-Level Impact of Marginal Engine Funding – Paid Position Option with 3.6 FTEs Per Position

Department	MFR Units	MEF Funding with 3.6 Multiplier	FY 10-11 Funding	Difference
Clearwater	11	$4,142,263.40	$5,047,389.00	-$905,125.60
Dunedin	3	$1,129,708.20	$1,239,927.00	-$110,218.80
East Lake	3	$1,129,708.20	$1,213,943.00	-$84,234.80
Gulfport	1	$376,569.40	$415,210.00	-$38,640.60
Largo	9	$3,389,124.60	$3,950,724.00	-$561,599.40
Lealman	3	$1,129,708.20	$2,074,944.00	-$945,235.80
Madeira Beach	1	$376,569.40	$357,484.00	$19,085.40
Oldsmar	1	$376,569.40	$378,218.00	-$1,648.60
Palm Harbor	5	$1,882,847.00	$1,791,659.00	$91,188.00
Pinellas Park	6	$2,259,416.40	$2,786,675.00	-$527,258.60
Pinellas Suncoast	2	$753,138.80	$545,986.00	$207,152.80
Safety Harbor	2	$753,138.80	$894,683.00	-$141,544.20
Seminole	5	$1,882,847.00	$1,842,936.00	$39,911.00
South Pasadena	1	$376,569.40	$670,060.00	-$293,490.60
St. Pete Beach	2	$753,138.80	$1,101,575.00	-$348,436.20
St. Petersburg	14	$5,271,971.60	$12,544,738.00	-$7,272,766.40
Tarpon Springs	2	$753,138.80	$887,739.00	-$134,600.20
Treasure Island	1	$376,569.40	$368,536.00	$8,033.40
Total	72	$27,112,996.80	$38,112,426.00	-$10,999,429.20

A slight variation to this model should also be considered. There is a reasonable argument to be made that only 3 FTEs per position are really needed. A staffing multiplier greater than 3.0 FTEs per position often does not represent coverage of actual costs incurred by departments to cover absences, vacations, etc. The total annual cost of this option, with a 3.0 FTE staffing multiplier, is $22.9 MM.

[1] Largo data includes Belleair Bluffs; Lealman data includes Tierra Verde

The table below shows the same model, but with only 3 FTEs per 24 hour 'position' to be funded.[1] For example, the first row shows that the City of Clearwater would receive $3,494,084 under this method, in contrast to its current funding level of $5,047,389. This represents a decrease in annual funding of $1,553,305.

Department-Level Impact of Marginal Engine Funding – Paid Position Option with 3.0 FTEs Per Position

Department	MFR Units	MEF Funding with 3.0 Multipler	FY 10-11 Funding	Difference
Clearwater	11	$3,494,084.00	$5,047,389.00	-$1,553,305.00
Dunedin	3	$952,932.00	$1,239,927.00	-$286,995.00
East Lake	3	$952,932.00	$1,213,943.00	-$261,011.00
Gulfport	1	$317,644.00	$415,210.00	-$97,566.00
Largo	9	$2,858,796.00	$3,950,724.00	-$1,091,928.00
Lealman	3	$952,932.00	$2,074,944.00	-$1,122,012.00
Madeira Beach	1	$317,644.00	$357,484.00	-$39,840.00
Oldsmar	1	$317,644.00	$378,218.00	-$60,574.00
Palm Harbor	5	$1,588,220.00	$1,791,659.00	-$203,439.00
Pinellas Park	6	$1,905,864.00	$2,786,675.00	-$880,811.00
Pinellas Suncoast	2	$635,288.00	$545,986.00	$89,302.00
Safety Harbor	2	$635,288.00	$894,683.00	-$259,395.00
Seminole	5	$1,588,220.00	$1,842,936.00	-$254,716.00
South Pasadena	1	$317,644.00	$670,060.00	-$352,416.00
St. Pete Beach	2	$635,288.00	$1,101,575.00	-$466,287.00
St. Petersburg	14	$4,447,016.00	$12,544,738.00	-$8,097,722.00
Tarpon Springs	2	$635,288.00	$887,739.00	-$252,451.00
Treasure Island	1	$317,644.00	$368,536.00	-$50,892.00
Total	72	$22,870,368.00	$38,112,426.00	-$15,242,058.00

Another factor to consider is funding for EMS supervision. Adding the EMS mission onto a fire department comes with added administrative responsibilities. Presently, the County funds EMS supervision at a level of 0.25 FTEs per each County-funded MFR unit. This is not an unreasonable approach or multiplier in the opinion of the consultants.

The virtues of Marginal Engine Funding – Paid Position Option funding model are:

- Provides a rational, factual basis for MFR funding;
- Provides a level of fairness in MFR funding on the basis of MFR units operated rather than the number of calls that are handled;
- Does not unfairly treat low volume / difficult to serve communities;
- Converts 10 locally funded MFR units to County funded MFR units;

[1] Largo data includes Belleair Bluffs; Lealman data includes Tierra Verde

- Provides a significant cost reduction to the County;
- Each community can spend the funds as they choose, so long as they meet their performance requirements and comply with other System policies, etc. For example, if a department wants to use a transport capable rescue unit to provide MFR, it is free to do so. However, they will not receive any more or less in MFR funding on the basis of the type of vehicle used.

The principal disadvantages are:

- 3.6 FTEs per position version results in an approx. 29% decrease from current MFR funding for the fire departments; and
- 3 FTEs per position version results in an approx. 40% decrease from current MFR funding for the fire departments

Since this is the primary recommendation, a five year cost projection is provided in the table labeled '5 Yr. Cost Projection: Marginal Engine Funding – Paid Position Option with 3.6 FTEs' and '5 Yr. Cost Projection: Marginal Engine Funding – Paid Position Option with 3 FTEs'.[1] These projections use 4% annual cost increases.

5 Yr. Cost Projection: Marginal Engine Funding – Paid Position Option with 3.6 FTEs

Marginal Engine Funding 3.6 - 5 Yr. Forecast					
Department	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15
Clearwater	$4,142,263.40	$4,307,953.94	$4,480,272.09	$4,659,482.98	$4,845,862.30
Dunedin	$1,129,708.20	$1,174,896.53	$1,221,892.39	$1,270,768.08	$1,321,598.81
East Lake	$1,129,708.20	$1,174,896.53	$1,221,892.39	$1,270,768.08	$1,321,598.81
Gulfport	$376,569.40	$391,632.18	$407,297.46	$423,589.36	$440,532.94
Largo	$3,389,124.60	$3,524,689.58	$3,665,677.17	$3,812,304.25	$3,964,796.42
Lealman	$1,129,708.20	$1,174,896.53	$1,221,892.39	$1,270,768.08	$1,321,598.81
Madeira Beach	$376,569.40	$391,632.18	$407,297.46	$423,589.36	$440,532.94
Oldsmar	$376,569.40	$391,632.18	$407,297.46	$423,589.36	$440,532.94
Palm Harbor	$1,882,847.00	$1,958,160.88	$2,036,487.32	$2,117,946.81	$2,202,664.68
Pinellas Park	$2,259,416.40	$2,349,793.06	$2,443,784.78	$2,541,536.17	$2,643,197.62
Pinellas Suncoast	$753,138.80	$783,264.35	$814,594.93	$847,178.72	$881,065.87
Safety Harbor	$753,138.80	$783,264.35	$814,594.93	$847,178.72	$881,065.87
Seminole	$1,882,847.00	$1,958,160.88	$2,036,487.32	$2,117,946.81	$2,202,664.68
South Pasadena	$376,569.40	$391,632.18	$407,297.46	$423,589.36	$440,532.94
St. Pete Beach	$753,138.80	$783,264.35	$814,594.93	$847,178.72	$881,065.87
St. Petersburg	$5,271,971.60	$5,482,850.46	$5,702,164.48	$5,930,251.06	$6,167,461.10
Tarpon Springs	$753,138.80	$783,264.35	$814,594.93	$847,178.72	$881,065.87
Treasure Island	$376,569.40	$391,632.18	$407,297.46	$423,589.36	$440,532.94
Total	$27,112,996.80	$28,197,516.67	$29,325,417.34	$30,498,434.03	$31,718,371.39

[1] Largo data includes Belleair Bluffs; Lealman data includes Tierra Verde

5 Yr. Cost Projection: Marginal Engine Funding – Paid Position Option with 3 FTEs

Marginal Engine Funding 3.0 - 5 Yr. Forecast					
Department	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15
Clearwater	$3,494,084.00	$3,633,847.36	$3,779,201.25	$3,930,369.30	$4,087,584.08
Dunedin	$952,932.00	$991,049.28	$1,030,691.25	$1,071,918.90	$1,114,795.66
East Lake	$952,932.00	$991,049.28	$1,030,691.25	$1,071,918.90	$1,114,795.66
Gulfport	$317,644.00	$330,349.76	$343,563.75	$357,306.30	$371,598.55
Largo	$2,858,796.00	$2,973,147.84	$3,092,073.75	$3,215,756.70	$3,344,386.97
Lealman	$952,932.00	$991,049.28	$1,030,691.25	$1,071,918.90	$1,114,795.66
Madeira Beach	$317,644.00	$330,349.76	$343,563.75	$357,306.30	$371,598.55
Oldsmar	$317,644.00	$330,349.76	$343,563.75	$357,306.30	$371,598.55
Palm Harbor	$1,588,220.00	$1,651,748.80	$1,717,818.75	$1,786,531.50	$1,857,992.76
Pinellas Park	$1,905,864.00	$1,982,098.56	$2,061,382.50	$2,143,837.80	$2,229,591.31
Pinellas Suncoast	$635,288.00	$660,699.52	$687,127.50	$714,612.60	$743,197.10
Safety Harbor	$635,288.00	$660,699.52	$687,127.50	$714,612.60	$743,197.10
Seminole	$1,588,220.00	$1,651,748.80	$1,717,818.75	$1,786,531.50	$1,857,992.76
South Pasadena	$317,644.00	$330,349.76	$343,563.75	$357,306.30	$371,598.55
St. Pete Beach	$635,288.00	$660,699.52	$687,127.50	$714,612.60	$743,197.10
St. Petersburg	$4,447,016.00	$4,624,896.64	$4,809,892.51	$5,002,288.21	$5,202,379.73
Tarpon Springs	$635,288.00	$660,699.52	$687,127.50	$714,612.60	$743,197.10
Treasure Island	$317,644.00	$330,349.76	$343,563.75	$357,306.30	$371,598.55
Total	$22,870,368.00	$23,785,182.72	$24,736,590.03	$25,726,053.63	$26,755,095.78

MARGINAL ENGINE FUNDING – SALARY DIFFERENTIAL OPTION

- Equally funds 72 MFR units, but at dramatically lower levels; Protects the level of service; Fair and equitable between all fire departments; Cost range is far below *ad valorem* yield at current millage rate; Provides cost controls; Severe adverse impact on fire protection.

This model is essentially the same as the Marginal Engine Funding - Paid Position Option just described. The key difference is how much funding is provided per position. Recall that the premise behind marginal cost funding for fire department MFR is that the EMS budget should only pay the difference in cost for adding the EMS mission. With that in mind, all personnel on the MFR unit should already have their base salaries and benefits paid for. This version of the Marginal Engine Funding model limits personnel cost coverage to an estimate for the differential in pay between an EMT and a paramedic. For the purposes of this analysis, an industry- typical 15% salary differential was used. Other County-wide average operational costs (fuel, supplies, etc.) are covered. The total cost for this option is

only $5.0 MM. The table labeled 'Department-Level Impact of Marginal Engine Funding – Salary Differential Option with 3.6 FTEs Per Position'[1] shows the results in funding for this true marginal cost approach. It uses a staffing multiplier of 3.6 FTEs per position.

Department-Level Impact of Marginal Engine Funding – Salary Differential Option with 3.6 FTEs Per Position

Department	MFR Units	Salary Differential 3.6 Multiplier	FY 10-11 Funding	Difference
Clearwater	11	$760,457.83	$5,047,389.00	-$4,286,931.17
Dunedin	3	$207,397.59	$1,239,927.00	-$1,032,529.41
East Lake	3	$207,397.59	$1,213,943.00	-$1,006,545.41
Gulfport	1	$69,132.53	$415,210.00	-$346,077.47
Largo	9	$622,192.77	$3,950,724.00	-$3,328,531.23
Lealman	3	$207,397.59	$2,074,944.00	-$1,867,546.41
Madeira Beach	1	$69,132.53	$357,484.00	-$288,351.47
Oldsmar	1	$69,132.53	$378,218.00	-$309,085.47
Palm Harbor	5	$345,662.65	$1,791,659.00	-$1,445,996.35
Pinellas Park	6	$414,795.18	$2,786,675.00	-$2,371,879.82
Pinellas Suncoast	2	$138,265.06	$545,986.00	-$407,720.94
Safety Harbor	2	$138,265.06	$894,683.00	-$756,417.94
Seminole	5	$345,662.65	$1,842,936.00	-$1,497,273.35
South Pasadena	1	$69,132.53	$670,060.00	-$600,927.47
St. Pete Beach	2	$138,265.06	$1,101,575.00	-$963,309.94
St. Petersburg	14	$967,855.43	$12,544,738.00	-$11,576,882.57
Tarpon Springs	2	$138,265.06	$887,739.00	-$749,473.94
Treasure Island	1	$69,132.53	$368,536.00	-$299,403.47
Total	72	$4,977,542.19	$38,112,426.00	-$33,134,883.81

The virtues of this funding model are:

- Provides a rational, factual basis for MFR funding;
- Provides a level of equity in MFR funding on the basis of MFR units operated rather than the number of calls that are handled;
- Converts 10 locally funded MFR units to County funded MFR units;
- Each community can spend the funds as they choose, so long as they meet their performance requirements and comply with other System policies, etc. Therefore, if a department wants to use a transport capable rescue unit to

[1] Largo data includes Belleair Bluffs; Lealman data includes Tierra Verde

provide MFR, it is free to do so. However, they will not receive any more or less in MFR funding based on the type of vehicle used for MFR.

- Provides a *dramatic* reduction in cost to the County.

The principal disadvantage is a severe funding reduction to all fire departments – by 87% overall.

STAFFING MULTIPLIER CONSIDERATIONS

When the firefighter / paramedic scheduled for work on a particular shift is out sick or on vacation, the fire department will need to have another firefighter / paramedic available to fill-in. The number of additional FTEs needed to provide this replacement staffing is referred to as a staffing multiplier.

The EMS Resource Committee suggested use of a 0.6 FTE staffing multiplier for these analyses. Three FTEs are needed for routine 24/7 staffing. Adding the staffing multiplier of 0.6 means that 3.6 FTEs should be used in staffing calculations for each County-funded 'seat' on a MFR unit on a 24/7 basis. However, review of FY 2010-11 MFR budget data[1] shows that the un-weighted staffing multiplier (simple average of all fire department MFR staffing multipliers, regardless of department size) is actually 0.66. The weighted staffing multiplier (which factors in department size) is 0.76.

Another consideration related to the staffing multiplier is provision of EMS supervision. Currently, the County uses an EMS supervision factor, much like the staffing multiplier, of 0.25 supervisory staff FTEs for each MFR unit. This would provide funding equivalent to one paramedic FTE for every 4 MFR units. While the 0.25 EMS supervision factor is arbitrary, IPS feels this is a reasonable figure to use.

This information raises the question: What staffing multiplier should be applied to MFR unit cost calculations based on both replacement staffing and EMS supervision considerations?

IPS feels that a multiplier of at least 0.25 is justifiable for EMS supervision purposes. For the recommended Marginal Engine Funding – Paid Position Option, this has an annual cost impact of $1.8 MM.

The relief staffing multiplier issue is more complicated. Based on conversations with stakeholders and County EMS staff, it is not unusual for a fire department not to call someone in on overtime to fill-in a position when a paramedic is absent using their sick or vacation time. This is possible because there are far more firefighter / paramedics than there are County-funded firefighter / paramedic positions. This makes it very likely that there will be other firefighter / paramedics already on-duty

[1] Based on final budget submissions from cities and fire districts for FY 10-11 as reflected in a County file named 'ALSFR Cost Analysis FY 10-11.xls'

in any department at any given time to fill-in without having to call someone in to serve as the paramedic on a MFR unit.

MORE APPROPRIATE USE OF MFR

Many voices in the general public, elected and senior appointed County and municipal officials, and many EMS personnel have expressed frustration with the large number of calls that MFR units are now sent on. A very large portion of the calls to which MFR currently responds are difficult to justify.

If an option for MFR funding is chosen that is not based on the number of responses that are made, there is probably a better chance for more earnest dialog with fire department officials on the topic of which calls MFR should, and should not, be sent on.

Reducing the number of calls that receive an initial deployment of MFR should be approached with careful consideration. MFR should be sent, at a minimum, on calls that meet any of these criteria:

- Cases which require ***fire*** first response services (e.g., fire protection at a motor vehicle crash); Send MFR fire engine
- Cases where extrication and/or technical rescue services are needed; Send MFR fire engine
- Cases where additional manpower is likely to be needed (e.g., more complicated medical cases; potentially violent scenes; bariatric patients)
- Extremely time critical cases (e.g., cardiac arrest)

On cases where MFR is not initially deployed, the ambulance crew should always have the option to request MFR as appropriate. The need for MFR cannot always be discerned from the caller. There may also be cases where MFR is sent alone – without a simultaneously dispatched ambulance. These may be cases that have a very low probability for transport, but where MFR could be useful for patient evaluation or other services. An ambulance can be requested later by the on-scene MFR crew as appropriate.

Current contracts for MFR do not recognize the arrival of a fire department supervisor or administrative staff vehicle on the scene of an MFR call. Their arrival time does not count towards meeting their department's response interval requirements – even if those vehicles are staffed and equipped, at a minimum, with an EMT, appropriate 'jump gear' and an AED. In many cases, a single person arriving as a MFR will be sufficient. Clinically, the arrival of a professional rescuer with appropriate equipment is what matters.

The occasional use of a single rescuer unit, like a fire officer in an appropriately equipped vehicle as described above, may be a recognized way to stop the MFR

response interval clock for statistical / accountability purposes. However, using single rescuer response vehicles as the routine means by which MFR services are delivered is a more complicated issue.

Clinically, all critical interventions that make a difference if implemented a few minutes sooner rather than later can be provided by a single rescuer (e.g., CPR, defibrillation, stopping severe external bleeding, opening an airway, giving epinephrine for anaphylaxis).

The main limitation to use of a single person for routine MFR responses is rescuer safety. The degree to which rescuer safety is an issue on a given call is related to the type of call and the specifics of the situation, which may be discerned by the emergency medical dispatcher.

RECOMMENDATIONS

- Use the Marginal Engine Response – Paid Position Option
    - Apply a staffing multiplier of 3.6 FTEs per position based on:
        - 3.0 FTEs for normal coverage on a 24 hrs. / 7 days a week basis
        - 0.25 FTEs to cover the costs of EMS supervision
        - 0.33 FTEs to cover replacement staffing costs. This is based on an assumption that costs are incurred to fill the opening only half of the time. The 0.33 FTEs figure is half of the County-wide un-weighted average staffing multiplier 0.66)
        - 3.58 is rounded up to 3.6
- Even if the MFR is significantly reduced by applying the Marginal Engine Response – Paid Position Option with a 3.6 staffing multiplier, some level of millage increase may be needed to accommodate:
    - Increasing support program costs (i.e., medical direction, continuing medical education, EMS administration)
    - Restoring the EMS reserve fund back up to 33⅓% of the annual operating budget. It is recommended the reserves be re-paid over 3 to 5 years by adding the appropriate amount needed into the set-aside fund calculations.
    - Funding any equipment upgrades, such as electronic patient care report tablets and software for MFR units
    - Funding pilot and/or operational programs for more appropriate care of the lower acuity calls (e.g., urgencies and chronic care support) and/or any of the Community or Witness Life Support initiatives – as described in the 'Scope of System' section of this report
    - Adjustments for further declines in property values

- Limit initial deployment of MFR to cases where it can be justified on the basis of fire protection, scene safety, manpower needs, or extreme time sensitivity
    - If economic conditions further deteriorate in the years after implementation of these recommendations, consider conducting an updated deployment analysis to re-calculate the number of MFR units needed, based on most recent MFR call volumes. Reduce the number of MFR units and reposition them as appropriate.
    - Identify cases where MFR alone is initially deployed and an ambulance is only dispatched if requested by the MFR crew.
    - Give each city and fire district the option to respond to calls above the minimums as determined by triage in dispatch, however do so without changing the level of funding they receive from the County
- Give each city and fire district the option to use transport capable units, but without changing the level of funding they receive from the County.
- Allow fire department supervisor and administrative staff units to have their responses to MFR calls count towards meeting their department's response interval requirements, providing those vehicles are staffed and equipped at a minimum with an EMT, appropriate 'jump gear' and an AED. A fire engine or other type of MFR unit, as appropriate, should continue to respond if needed for fire response needs, additional manpower, etc. In many cases, a single person arriving as an MFR will be sufficient. The initially arriving single rescuer should communicate the need for other units to either respond, downgrade or cancel as soon as possible and appropriate after they have assessed the situation on-scene.
- It may be possible to safely deploy single rescuer MFR units as the routine response configuration, providing appropriate policies can be developed that identify situations where a single rescuer MFR unit should stand-by until other units are available to safely approach and enter the scene. This option could provide additional flexibility to fire departments in their efforts to meet their MFR contract obligations while reducing their operating costs – particularly if a small and efficient vehicle (e.g., a small sedan) with a single rescuer MFR unit can be operated for less than the marginal cost of a traditional fire engine MFR unit or when a fire engine MFR unit is not available at a given station to provide MFR services.
- GPS should be used on all FD apparatus, including field supervisor units.
    - The pending project at the County's 9-1-1 Communications Center to begin using real-time GPS data to facilitate real-time closest unit selection should be supported and implemented as soon as possible.
    - Unit locations should be integrated into any unit selection decision support systems, particularly on *extremely* time sensitive cases, such as cardiac arrest and other medical dispatch category 'echo' cases.

- Response interval performance should be reported and regulated in a more detailed manner which recognizes that arrival sooner rather than later on extremely time sensitive cases, like cardiac arrest, is valuable.
    - Rather than using a single time metric for reporting purposes, the EMS Authority and the fire departments should consider using reports that look at the percentage of responses within four minute time segments as well as the 7:30 target:
        - % of responses within 7:30 (at least 90% required)
        - % of responses within 0:00 to 3:59
        - % of responses within 4:00 to 7:59
        - % of responses within 8:00 to 11:59
        - % of responses within 12:00 to 15:59
        - % of responses greater than or equal to 16:00

TRANSPORT

Overall, the ambulance service component of the EMS system is running very smoothly. The County-operated billing and collections operation is running at a high level of performance. Expenses for ambulance contractor fees along with the billing and collection operations costs are well below collected ambulance service revenues. Historically, ambulance user fees and associated revenues have generally paid for all ambulance system program costs and a portion of MFR system program costs. As of FY 2013-14, per the 10 year forecast , this may not be possible. Other revenue sources may be needed in the future to replenish the EMS reserve fund.

The projected costs associated with having a fire department operated 9-1-1 ambulance service dramatically exceed the current costs. A FD-operated ambulance program would also create a wide range of accountability and other operational problems.

No major changes are recommended in the ambulance transportation or billing and collections components of the Pinellas County EMS System.

Ambulance transport is currently provided by a private contractor, who was selected through a competitive procurement process. The selected bidder was awarded exclusive County-wide market rights to provide emergency and non-emergency ambulance service.

The ambulance contract comes with many stipulations to meet a variety of performance requirements. The contractor must also post performance bonds, which protect the County's interests and provide for continuity of service in the event of failure to adequately perform on key requirements.

The procurement and contract management processes operated by the County are well-designed and provide a robust set of quality controls that dramatically improve the probability of compliant performance throughout the duration of the contract.

The ambulance service operates under a County trade name of Sunstar. The purpose of the trade name is to maintain continuity of branding regardless of the entity that the County contracts with to provide the service.

No significant issues or deficiencies were identified in contractor performance. The contractor has exceeded expectations in many respects. Their high level of performance has been externally validated through their receipt of the highest level

of recognition in the Florida Sterling program.[1] This is a very significant achievement.

Similar to the problem noted in MFR response time tracking and reporting, the way that ambulance response interval performance is tracked by the County does not fully align with the interests of patients. Currently, the target is arrival within 10 minutes (10:00). If an ambulance unit arrives just before the target, at 9:58, it is considered the same way as arrival four minutes earlier at 5:58. For the extremely time sensitive cases, like cardiac arrest, arrival four minutes earlier is incredibly valuable but there is no recognition or incentive for doing so. A related problem is the arrival at 9:58 is acceptable while arrival at 10:01 is not acceptable – even though there is no significant difference in patient outcome associated with a few seconds difference in arrival – even with cardiac arrest.

The ambulance contract currently requires that the ambulance meet the 10 minute response interval target with 90% reliability for the County overall and within 12 minutes in each of the cities and fire districts. The rationale for this policy is that all residents pay the same rate in taxes to support EMS; therefore they should be assured EMS responses in each community will meet the same standards for response interval performance.

Generally, this makes sense in a densely populated area such as Pinellas County; however, this may inadvertently have a negative impact on the outcomes for extremely time sensitive emergency cases. There is peer-reviewed science suggesting that there may be significant differences in how ambulances are optimally deployed, depending on which of the following two objectives are being sought: political equity or survival from extremely time sensitive emergencies such as cardiac arrest.[2] The current system design and ambulance contracts recognizes the political equity factor but does not recognize the potential conflicts this may cause when trying to optimize deployment to improve survival rates from cardiac arrest.

The system design in Pinellas County places responsibility for billing and collections of ambulance user fees on the County, rather than the ambulance contractor. The ambulance contractor is paid a guaranteed rate for each transport provided. Through this arrangement, the County is incentivized to manage the billing and collections process efficiently so that more funds in user fees are collected than paid out to the ambulance contractor.

In Pinellas, this has worked out well. The collections in ambulance user fees have been in excess of the payout to the ambulance contractor and billing and collections

[1] http://www.floridasterling.com/performanceimprovement_awardrecipients.html. RE: 2009 recipient listing for Sunstar Paramedics.

[2] Erkut E, Ingolfsson A, Erdogan G: Ambulance Location for Maximum Survival. Naval Research Logistics. 2007.

operation costs for many years. This has been helpful to offset the recent deficits in MFR costs. These revenues are generally used to pay for ambulance program costs and offset MFR program costs, which include EMS administration, medical direction, and continuing medical education. The January 2011 ten-year forecast provided by County staff reveals that ambulance user fee revenues and other associated revenues may no longer offset all ambulance program support costs as of FY 2013 – 2014.

OPTIONS

Given the economic challenges facing the System, IPS examined the potential benefits that other options for ambulance transport services might provide.

FIRE DEPARTMENT AMBULANCE SERVICE

- Operating a fire department 9-1-1 transport program has significantly higher costs and only provides part of the overall service. There would also be significant performance accountability issues with this option.
- Fire department transport units, if operated on traditional 24 hour shift schedules, would need to be limited to a 30% maximum workload level for rest and safety considerations per the Pinellas County Fire and EMS Reconfiguration Committee. In contrast, the ambulances now operated by the current ambulance contractor routinely, and safely, operate at much higher workload levels due to their shorter shifts, dynamic deployment and peak load staffing strategies that maximize their productivity.

Fire department managers and firefighter union representatives expressed interest in providing transport on 9-1-1 calls. They did not have interest in providing transport for routine, non-emergency calls. They would prefer to have a private contractor provide those services.

A deployment analysis[1] was performed to determine how many fire department ambulances would be required for only the 9-1-1 transports. The fire department ambulances would be based out of existing fire stations, not strategically selected locations that could vary by time of day as often used by the current contractor.

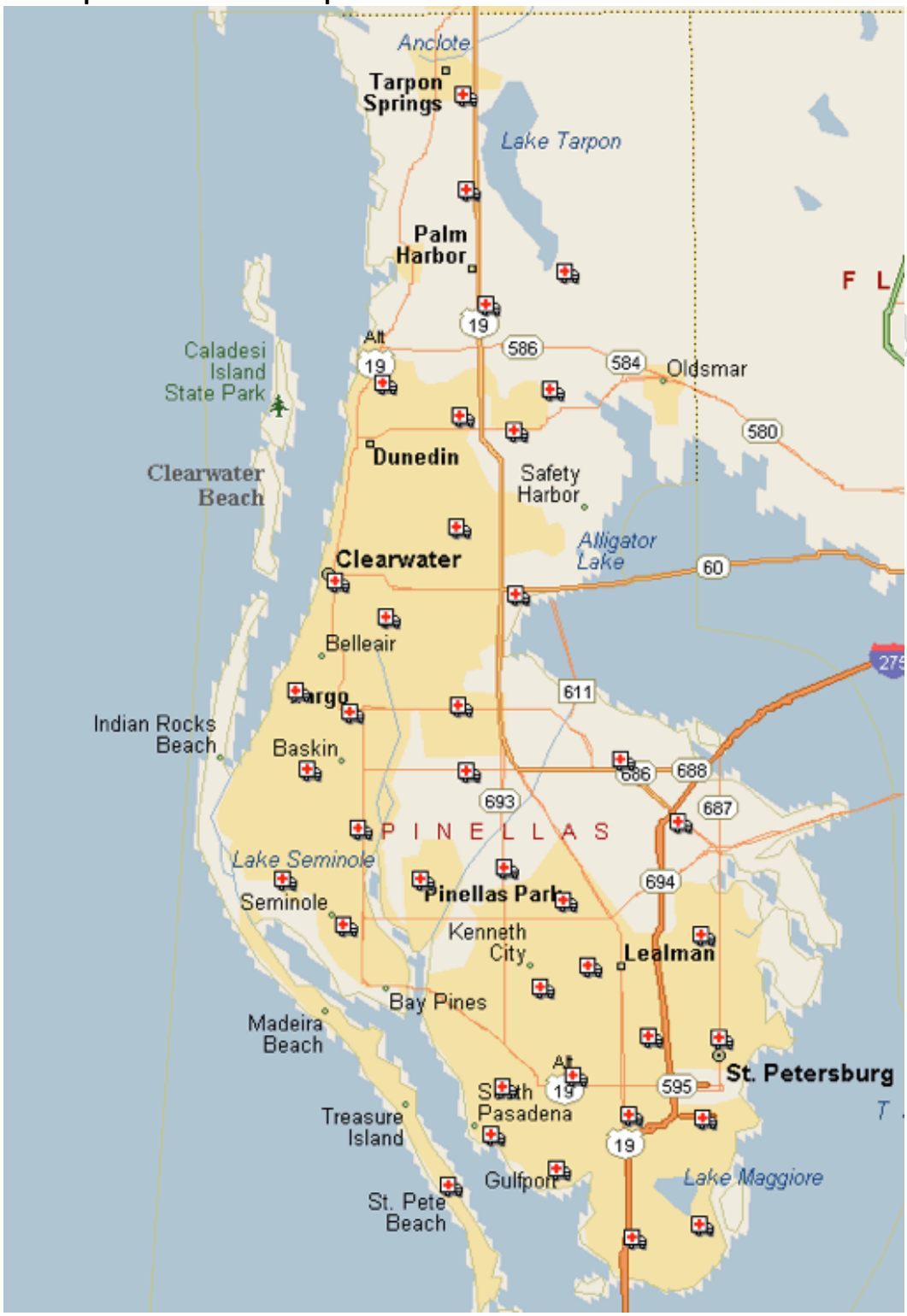
The deployment modeling used for fire department transport assumes that upon completion of a transport to the receiving hospital, the fire department ambulance is immediately available for another call – even if that hospital is far outside of their

[1] See appendix for section on 'Deployment Analysis Methods'

'home' response area. This is in contrast with the fire department's preferred scenario of returning to the response area / community where the ambulance is based before accepting additional calls. The deployment analysis determined that 53 fire department transport units would be required to meet a 10 minute standard with at least 90% reliability on 9-1-1 calls.

The locations selected for the 53 fire-based ambulances are shown on the map labeled 'Fire Department Transport Unit Locations.' There is some flexibility in the modeling. Other combinations of fire station locations could potentially yield similar performance levels with slight changes in the selection of the fire station locations. The deployment analysis selected 39 locations for the 53 fire department transport units, thus, some locations would have more than one transport unit. The addresses of the 39 locations are shown in the appendix on 'Locations For Fire Department 9-1-1 Transport Units.'

Fire Department 9-1-1 Transport Unit Locations



To put the 53 ambulance plan into place, 28 additional ambulances with equipment would need to be purchased. The most current pricing data provided by the County is $210K per ambulance, which comes to total of $5.9 MM. The table labeled 'Ambulance Cost Breakdown' shows specific vehicle and equipment cost estimates.

Ambulance Cost Breakdown

Transport-Capable Rescue Unit	$160,000
EKG Monitor	$20,000
Hydraulic Cot	$15,000
Radios (800/UHF)	$10,000
Small Equipment	$5,000
Total	**$210,000**

Based on average MFR budget figures (FY 2010-11), the annual operating cost per fire department ambulance would be $779.7K. For a total of 53 ambulances, this comes to $41.3 MM per year for just the 9-1-1 transports.

Based on information for FY 2010-11 from the 10 year forecast presented to the EMS Authority in January 2011, the County now collects a total of $40.9 MM per year in ambulance revenues for both 9-1-1 and non-9-1-1 transports. The County's current accounting processes do not separate billing and collections for 9-1-1 from non-9-1-1 calls. Therefore, a separation of revenues for these two categories of service cannot be made directly. However, it is a generally accepted principle in the EMS industry that non-9-1-1 calls tend to have a higher net collection percentage than 9-1-1 calls. This is a major reason why it is in the best interests of an EMS system to include non-9-1-1 calls in the revenue stream for the overall system so that those revenues can help offset the potential losses on the 9-1-1 transports – and/or improve the overall revenue.

The County could potentially shed the non-9-1-1 transports from its billing and collections process. Those processes could be handled directly by the private contractor. However, these presumably more lucrative net revenues would be lost. The County could charge the non-9-1-1 contractor a fee for regulatory oversight, medical direction and CME to offset some of those expenses in proportion to the non-9-1-1 call volume, but the County would still lose the non-9-1-1 revenues that currently contribute to the EMS reserve fund and would still have to fund the 9-1-1 transport portion of the administration, medical direction, and CME costs by other

means. Overall, making a County-operated 9-1-1 billing and collections process separate from a contractor-operated non-9-1-1 billing and collections process is not in the County's best financial interests.

Under the present arrangement, the ambulance contractor was paid $28.6 MM for both 9-1-1 and the non-emergency transports in FY 2009-10. Of that amount, approx. $21.0 MM was for the 9-1-1 transports.

Looking at the 9-1-1 program on its own, the projected fire department 9-1-1 transport expense of $41.3 MM is $20.3 MM (97% higher) than the current arrangement with the private contractor for 9-1-1 transports.

Fire department transport units, if operated on traditional 24 hour shift schedules, would need to be limited to 30% maximum workload levels for rest and safety considerations – per the Pinellas County Fire and EMS Reconfiguration Committee. This would render FD ambulances less productive when compared to the ambulances now operated by the current ambulance contractor. Paramedics Plus routinely operates at approximately 60% workload levels (transports and responses), which is double the fire department limits for workload levels. This is possible due to their shorter shifts, dynamic deployment, and peak load staffing strategies, which are designed to maximize productivity.

Beyond the financial disadvantages of a fire department 9-1-1 transport program, there would also be significant accountability issues. From an efficiency standpoint, the County is best served by an ambulance fleet that has complete flexibility to send the closest ambulance to emergency scenes. This desired flexibility would dramatically complicate accountability if the ambulances are operated by 18 different departments – plus the private ambulance contract for non-emergency calls. It is far better from an operational standpoint to have all ambulances available to respond when and where needed, regardless of the organization or call type. This flexibility is severely compromised with any separation between 9-1-1 and non-9-1-1 transport resources.

Accountability for ambulance performance should only come with control of the resources that impact performance. That is why the incumbent ambulance contractor controls the scheduling, placement, selection and dispatching of its own ambulances. If similar accountability was put onto the fire departments, it should have similar operational control of its resources – including dispatch. However, it is impractical to have 18 different MFR dispatch operations. A single County-wide fire department would make this more feasible, but that is a very different issue outside the scope of this study. The complexities and politics of creating a County-wide fire department makes that an unlikely event in the near-term.

Therefore, given the dramatically higher costs, lower maximum workload levels and the accountability complications, implementing fire department ambulance service operations in Pinellas County would have a negative impact on system finances and operating efficiencies.

LIMITING FIRE DEPARTMENT TRANSPORT TO HIGH CALL VOLUME LOCATIONS

- There is only one MFR unit location where a fire department ambulance is likely to run enough calls to break even financially. Breaking contracts with the current ambulance contractor and disrupting the current system design to accommodate fire department transport does not offer any particular benefit to the System – apart from political accommodation to the interests of fire departments wanting to provide transport. The benefits do not outweigh the disadvantages.

IPS was asked to explore the feasibility of limiting fire department transport to high volume locations. IPS applied a financial break-even analysis to see which MFR units were associated with enough call volume that they could potentially generate sufficient revenue to cover the operating expenses if a fire department-based transport unit responded to those same calls. This approach was chosen on the basis of fairness and fiscal prudence. If a given fire department MFR unit could not be expected to respond to enough calls to at least cover its own operating expenses, a transport unit would not be justified.

This is a very conservative approach that is biased in favor of fire department transport. In reality, a transport unit running in parallel to a MFR unit would actually run fewer calls because transports take more time to complete. The expense calculations are based on County-wide average personnel and operating costs, although the departments with higher volume MFR units tend to come from departments with higher personnel costs.

The private contractor is currently paid $224 per transport (the 'base services' cost per transport). To be fair, this same amount should be applied per transport to offset the operating costs of the fire department ambulance. The break-even point was determined by dividing the County-wide average estimated fire department ambulance operating cost of $779.7K by $224.

This calculation shows the fire department transport unit must have *at least* 3,481 transports annually to break even. Since only 72.2% (CY 2009) of 9-1-1 responses result in a transport, *at least* 4,821 annual responses are needed to break even. This equates to *at least* 13.2 responses per day to break even. There was only one MFR unit in the entire County that met this requirement – Rescue 3 in St. Petersburg. It runs an average of 13.57 responses per day (4,952 per year).

Some fire stations have a combined response volume with two MFR units near or above the break-even point, but the criteria are based on MFR call volume for an individual unit, not a pair.

Since only one MFR unit met the criteria, it is difficult to justify breaking the contract with the incumbent contractor. Having a fire department transport unit does not offer any particular advantage to the System over the current arrangement. Therefore, this does not appear to be a reasonable option.

GOVERNMENT OPERATED AMBULANCE SERVICE

- A government-operated '3rd service' ambulance provider does not offer any significant advantages over the current arrangement. It potentially takes away the incentives now in place with a private provider to meet / exceed performance requirements.

Many counties in Florida, and across the nation, have government-operated ambulance services that are not associated with fire or police departments. Hence, these are commonly referred to as 3rd service ambulance providers (with police and fire as the other two public safety services).

A 3rd service ambulance operation could potentially operate with greater flexibility in scheduling and deployment than the fire department; however, 3rd service operators typically do not use dynamic deployment methods to the degree that private entities do. Third service operators are not typically under the beneficial dynamics that demands high performance to comply with a well-designed performance contract. They do not have the same pressure to perform with a risk of losing performance bonds and being 'fired' if they fail to meet requirements. They also do not have the same financial incentives to be efficient in their business operations in order to maximize profits and shareholder value.

A 3rd service provider would not have a profit margin that goes to private owners, so that revenue could stay within County budget. Given the lack of incentives cited above, any potential profit retention by the County would probably be more than offset by higher costs of government operation due to the lack of performance incentives.

The implementation of a 3rd service ambulance operation does not seem to offer enough advantages to merit further consideration.

PUBLIC-PRIVATE PARTNERSHIPS

Another option considered was a public-private partnership. In such an arrangement, all of the fire departments would band together with a private company to form a new public-private company. This public-private company would be the ambulance service contractor, not the individual fire departments or the private ambulance firm. The combined resources of all parties would be utilized to meet contractual requirements. The accountabilities could be preserved because

the public-private company, not the individual participants, would be held accountable for performance as a whole.

This approach has been used for over 10 years in the City of San Diego with the San Diego Medical Service Enterprise as the public-private company. The company is a joint venture between the City of San Diego's Department of Fire & Life Safety Services and Rural/Metro Corporation.

In that arrangement, the fire department provides geographic coverage across the entire service area from its fixed locations. The private entity provides the flexibilities needed to make dynamic changes in when and where resources are needed depending on actual demands by location, time of day, day of week, and season / special events considerations.

Conceptually, this could work in Pinellas County. The primary barriers are the political complexities of getting all of the cities and fire districts to agree on terms. In the past, the fire departments have tried to band together to bid on the ambulance service contract under the competitive RFP process. The fire departments were never able to build a coalition with a critical mass long enough to collectively submit a bid.

Therefore, this is an interesting but unlikely option. It would have very strong merit if the fire departments could effectively come together. A County-wide fire department would also make this more feasible.

VIRTUAL CONSOLIDATION

One of the things the fire departments in Pinellas County have done very well together is develop policies and procedures that let their combined resources work smoothly across jurisdictional lines. This arrangement is called a 'virtual consolidation.'

Given the success and experience of the fire departments in Pinellas County with virtual consolidation, an option was considered for virtual consolidation that included the ambulance contractor.

This virtual consolidation approach could give the ambulance contractor additional operational latitudes. The ambulance contractor could ask the fire departments with transport capabilities to provide transport on cases when it is experiencing response delays. The ambulance contractor could also be given the option to purchase ambulance unit hours from fire departments on a pre-scheduled basis. This may be mutually beneficial in difficult to serve low call volume areas – such as the beach communities or the smaller departments that cover the peripheral areas along the north and northeastern edges of the County.

This arrangement is unlikely to involve a large number of calls being transported by the fire department. It would be unlikely to have a substantive financial impact on

the fire departments or the ambulance contractor. However, it does provide a simple and sensible solution that offers direct benefit to patients. It would also resolve potential ethical conflicts that may arise if such latitudes are not exercised.

CITY OF ST. PETERSBURG'S TRANSPORTATION FEASIBILITY STUDY

The City of St. Petersburg engaged the services of a fire and EMS consulting firm, the TriData Division of System Planning Corporation[1], separate from the County's EMS study.

TriData's projections of revenue and expenses suggested that the City of St. Petersburg could net between $7.4 MM and $10.4 MM annually if it did its own ambulance transportation and billing operations. The net revenue projections were based on billing $600 per transport with a 70% collection rate. These assumptions did not consider payer types, allowable billing amounts and actual collection rates.

IPS examined the actual billing and collections data from the Pinellas County EMS billing and collections office. The objective was to get a more accurate basis for projecting the amount of money that St. Petersburg could realistically expect in gross revenues. IPS' review considered payer types, allowable billing amounts, historical collection rates, and payer profiles on a County-wide basis.

The IPS review showed that the County has a net collection rate of 70.4%, based on the most recently completed billing year (FY 2008-09). The County has a payer case mix and average cash collected per trip as follows:

Payer	Average Cash Per Trip	Percentage of Trips Billed
Medicare	350.04	39.90%
Medicaid	163.25	6.10%
Insurance	394.97	26.50%
Facilities	437.27	5.40%
Private Pay	59.39	22.00%
Overall	**288.64**	**100%**

[1] http://www.sysplan.com/capabilities/fire_ems/index.html

The system program costs (consisting of medical direction, continuing medical education program, EMS administration, and other costs) are paid from transport revenues. These expenses equate to $42.62 per transport.[1] It would be incorrect for the City of St. Petersburg to calculate net revenues without allowing for coverage of these costs at the same rate of $42.62 per transport.

The table labeled 'St. Petersburg Transport Program Financial Projections' compares the cost of operations against the projected revenue by two methods as outlined in the TriData report. In one method, the City manages a self-collection process using a billing and collections contractor. The other method uses the County to manage billing and collections while the City takes the same rate of payment as the ambulance contractor receives, which is $224 per transport (the 'base services' cost per transport). IPS' deployment analysis calls for 15 ambulances versus the 13 ambulances in the TriData report to provide 9-1-1 transport services.

Using these more precise and realistic assumptions from actual billing and collection history in Pinellas County, the projected net for the City of St. Petersburg is an annual loss of $4.5 MM based on St. Petersburg adjusting its personnel costs to be in line with the County-wide average. When St. Petersburg's first year operating costs are calculated to include the new units costs, the first year loss is $5.5 MM.

These loss projections do not include the additional expense of the initial purchase and periodic replacement of reserve ambulances.

St. Petersburg Transport Program Financial Projections

New Unit Costs	$1,050,000.00
Annual Cost	$11,695,767
FY 09-10 Responses	40,155
'Base Services' Revenue	$6,494,188
Self Collect Revenue	$7,200,130
Self Collect Net	-$4,495,637
Self 1st Year Net	-$5,545,637

There are other issues to consider beyond the net revenue impacts on both the City of St. Petersburg and the County. If the City of St. Petersburg separated itself from the rest of the System, it would likely result in compromises to the rest of the County:

[1] The $42.62 figure is based on a total of $5,856,980 in ambulance system program costs (medical direction, continuing medical education, EMS administration, etc.; per the FY 2010-11 adopted budget) allocated on a per transport basis for 137,428 transports per the FY 2009-10 actual transports.

- Some areas would be totally or partially separated from the rest of the County, particularly to the south and along the southern beaches. This would create disruptions in emergency response coverage for 'in-system' mutual aid.
- Loss of economies of scale to the economic and operational detriment of both the City of St. Petersburg and the County.

RECOMMENDATIONS

- Keep the general terms of the current ambulance contract and associated County operated billing and collections processes in place County-wide
- Consider modifications to the ambulance contract, first responder contracts, and medical protocols as needed to facilitate operations consistent with the virtual consolidation approach
- Do not apply political equity standards to Echo cases (which include cardiac arrests) if data are found that supports deployment changes that may optimize for improved cardiac arrest survival rates
- Report and regulate response interval performance in a more detailed manner which recognizes that arrival sooner rather than later on extremely time sensitive cases, like cardiac arrest, is valuable.
- Rather than using a single time metric for reporting purposes, the EMS Authority and the ambulance contractor should consider using reports that look at the percentage of responses within four minute time segments as well as the 10:00 target:
    - % of responses within 10:00 (at least 90% required)
    - % of responses within 0:00 to 3:59
    - % of responses within 4:00 to 7:59
    - % of responses within 8:00 to 11:59
    - % of responses within 12:00 to 15:59
    - % of responses within 16:00 to 19:59
    - % of response greater than or equal to 20:00

OTHER FINDINGS AND RECOMMENDATIONS

SCOPE OF SYSTEM

There are two primary routes of access to services provided by Pinellas County EMS. Requests for service can come in via the 9-1-1 telephone number, which is answered by the County 9-1-1 Communications Center. Additionally, the ambulance contractor manages calls coming in via a 7 digit telephone number, which is used for inter-facility and other types of scheduled medical transportation services.

The problem is that a large portion of the calls that come into the EMS System via the 9-1-1 telephone lines have low severity. Many of these might be characterized as urgencies and chronic care support calls. The field care components of the EMS system were primarily designed to meet the needs of patients having a medical emergency. EMTs and paramedics are not appropriately trained nor are there appropriate processes in place to provide care and referrals for many of these lower severity cases. This frequently leads to 9-1-1 calls where neither care nor transport are provided. Quite often, these patients are taken to the hospital just to see if they need to go to the hospital. This is a clear example of a misalignment between community needs and the EMS system design.

This problem is not unique to Pinellas County. Other EMS systems across the United States, and internationally, have recognized this need and are working to develop better processes. Pinellas County EMS was actually at the forefront of recognizing this need back in the early 1990's when it sponsored a ground-breaking conference that directly addressed this issue. In 1998, a fire chief from Pinellas County also studied the problem and explored how fire departments could potentially help address it.[1] Unfortunately, there were several political, legislative and financial barriers to using EMS resources to address this problem – and insufficient political will to push past those barriers.

On the other end of the severity spectrum, less than 1% of EMS responses are due to cases of witnessed cardiac arrest. This is an extremely time sensitive problem. Despite best efforts by fire departments and the ambulance service, EMS does not arrive fast enough to save the lives of many cardiac arrest victims that could

[1] McGuff S: Pinellas County Fire Service Paramedics in Community Based Health Care Services. An applied research project submitted to the National Fire Academy as part of the Executive Fire Officer Program. March 1998. http://www.usfa.dhs.gov/pdf/efop/efo28237.pdf

potentially survive with shorter onset to treatment time intervals. This points to another deficiency in the scope of the current system.

Bystander CPR and public access defibrillators can potentially save more of the lives now being lost to cardiac arrest. However, there isn't anyone being held accountable for bystander CPR rates or the rates in which public access defibrillators are applied to cardiac arrest victims. Fortunately, technology is now available, and is still rapidly evolving, to utilize resources in ways never thought possible just a few years ago.

The location of almost any cell phone can be identified with moderate precision and an increasing number of cell phones are coming equipped with more precise GPS technology. Smart phones are able to run increasingly sophisticated computer software with live external data connections. Together, these technologies offer interesting new possibilities for improving survival from cardiac arrest.

RECOMMENDATIONS

- Urgencies (minor illnesses and injuries such as ear aches; minor cuts; minor abrasions) and chronic care support cases (e.g., lower acuity problems from diabetes and chronic respiratory problems; frequent falls due to inadequate home care resources)
    - Bring together local stakeholders from EMS, public health, hospitals, and payers to begin to discuss:
        - Nature and scope of 9-1-1 and emergency department resource utilization for urgencies and chronic care support cases using the 9-1-1 system;
        - Clinical consequences of inadequate care for those cases;
        - Costs to payers (governmental and private) for those cases; and
        - Ways to eliminate, reduce or mitigate the problem.
    - In parallel, begin to explore existing research, program development efforts, and best practices in other EMS systems for these cases. Examples to consider include:
        - Frequent 9-1-1 caller intervention programs
            - Houston Fire Department's CareHouston program[1]
            - Alameda County EMS' (CA) Project Respect[2]

[1] http://www.jems.com/article/operations-protcols/carehouston-provides-new-appro-0/

[2] http://documents.csh.org/documents/ResourceCenter/HotTopicsSH/2010-FrequentUsers/ProjectRESPECTSummary.doc

        - Community Paramedicine programs, such as those described at the International Roundtables on Community Paramedicine[1]
        - Wake County (NC) Advanced Practice Paramedic program[2]
        - Asthma Assessment and Education Program from AMR in Alameda County (CA)[3]
    - Fund development of pilot programs, and then implement them County-wide if successful. Funding should come from the set-aside component of the EMS fund, grant funds or other sources of revenue.
- Cardiac Arrest
    - The Pinellas County EMS System should take responsibility for the performance metrics associated with bystander CPR and public access defibrillator utilization.
    - Take a more aggressive approach to promoting bystander CPR, and include very strong efforts to encourage, facilitate and sponsor CPR training programs (Witness Life Support)
    - Take a more creative approach to leveraging current technology to improve response intervals to witnessed onset cardiac arrest cases (Community Life Support)
        - Engage community partners with fleet operations to collaborate in development of programs that would allow their vehicle locations to be displayed on a layer of the electronic maps in the 9-1-1 CAD system in the event of a witnessed onset cardiac arrest. If a participating fleet vehicle is available and in proximity, it could be asked to respond to the scene to begin CPR and/or utilize a public access defibrillator.
        - Potential community partners that may be suited for such roles might include:
            - Wheelchair medical transportation units
            - Package delivery services (e.g., FedEx, UPS, USPS)
            - Hospital lab specimen and supply couriers
            - Police units
        - Create a program that allows appropriately screened and trained individuals to opt-in to respond to witnessed cardiac arrest cases to which they are in close proximity. Their locations would be determined using their GPS enabled cellular smart phones. Individuals appropriate for participation might include:
            - Off-duty EMS and other medical personnel

[1] http://www.ircp.info

[2] http://www.wakegov.com/ems/staff/app.htm

[3] http://itunes.apple.com/us/podcast/asthma-assessment-education/id350488765?i=80479244

- CERT team members
- The smart phones used by individuals could be equipped with apps that show the location of nearby public access defibrillators so they may be summoned to the scene.
- The EMS system would take responsibility for building and updating the Pinellas County portion of the defibrillator location database used by the smart phone apps. Defibrillator location app examples currently include:
    - http://www.firstaidcorps.org/locate-aeds-near-you/
    - http://itunes.apple.com/us/app/aed-nearby/id350066826?mt=8
    - http://www.iphoneappsplus.com/medical/aed-locator/index.htm
    - http://www.androidfreeware.net/download-shownearby-aed.html

GOVERNANCE

The governance structure of the EMS System consists of the EMS Authority, County Administrator, Assistant County Administrator, Director of Public Safety Services, and the County EMS staff. The clinical governance rests with the Office of the Medical Director and the Medical Control Board.

The EMS Advisory Council (EMSAC) is established by the Pinellas County EMS Special Act, Chapter 80-585, Laws of Florida. Section 5 of the 2001 amended version of this legislation[1] makes reference to the EMSAC as follows:

> *"It shall be the responsibility of this Council to evaluate the County's emergency medical services system from a qualitative point of view, to review the operation of EMS on a countywide basis, to recommend requirements and programs for the contract management firm and monitor performance of same, to review and evaluate studies commissioned by the authority upon the authority's request, and to make such recommendations as may be necessary to the authority on needs, problems and opportunities relating to emergency medical services, including the financing and establishment of a trauma center*

[1] http://laws.flrules.org/2001/305

> *or centers, and to carry out such other duties as may be required to ensure the delivery of good, countywide EMS at reasonable costs."*

Based on conversations with EMSAC members and other stakeholders, along with a review of the minutes from prior EMSAC meetings, the following assessments were made.

Despite the existence of the EMSAC, it does not seem to be utilized or have the level of influence envisioned by the legislation. The current EMS assessment and recommendations project that led to this report would seem to be the sort of activity that the EMSAC should have been deeply involved in. However, it was not involved in developing the RFP, selecting a consulting firm, or overseeing the project.

Other clauses of the Special Act state:

> *"…evaluate the County's emergency medical services system from a qualitative point of view, to review the operation of EMS on a countywide basis…"*

There does not appear to be a process in place that prompts the EMSAC to perform a system evaluation.

> *"…to recommend requirements and programs for the contract management firm and monitor performance of same, to review and evaluate studies commissioned by the authority upon the authority's request…"*

The EMSAC does not seem to play a meaningful role in setting requirements, recommending programs, monitoring the performance, or reviewing studies of the overall system or the contracted providers – to include the ambulance firm, medical first responders, CME contractor, or the medical direction contractor.

> *"…to make such recommendations as may be necessary to the authority on needs, problems and opportunities relating to emergency medical services, including the financing and establishment of a trauma center or centers"*

The EMSAC seems to receive a lot of information about the happenings within the System but does not appear to engage in developing consensus between stakeholders on contentious issues or making recommendations of any sort.

> *"…to carry out such other duties as may be required to ensure the delivery of good, countywide EMS at reasonable costs."*

The EMSAC does not appear to be asked to perform, nor does it initiate, activities to ensure quality EMS at a reasonable cost.

Discussions with various stakeholders revealed several potential reasons why the EMSAC is not a stronger influence. The most significant reason seems to be that

many of the members of the EMSAC who serve in an operational capacity (e.g., for the ambulance service, Office of the Medical Director, fire departments, and St. Petersburg College) are on other committees that meet more often and therefore have already provided their input on issues. This seems to inadvertently bypass the broader input of the full range of technical and consumer input designed into the EMSAC's structure.

Some of the consumer-representative positions on the EMSAC are filled by persons who are not 'consumers' in the sense of being individuals without other interests / biases regarding EMS. Indeed, some of these positions are filled by physicians, elected officials, or others with specific stakeholder interests that are clearly not those of the typical citizen / consumer.

Another stakeholder group codified into the System design is the Medical Control Board. The Medical Control Board provides an important check and balance mechanism for the EMS Medical Director. It formalizes medical community input on EMS. It seems to be working reasonably well in review and approval of protocols and clinical policies.

In Pinellas EMS, there is little evidence of any visioning activities regarding where the EMS system should be at some point in the future. Hence, there does not seem to be a strategy in mind for how to move the System forward. Management of the 'System' is far more reactive than proactive. In this context, IPS is referring to 'visioning' as efforts to describe what the EMS System should be like at some point in the future. The 'strategic planning' would outline the steps, resources, and associated accountabilities needed to fulfill the vision.

In the absence of visioning and strategic planning efforts (or some version thereof), the Pinellas EMS System seems to drift from year to year in efforts that seek more to preserve the status quo. This is a leadership issue. Pinellas County EMS has a strong infrastructure and excellent operational capabilities. It is capable of performing, and innovating, at a much higher level.

The County EMS and Fire Administration appears to be operating well on a day-to-day basis. The billing and collections operation seems to be operating at exemplary levels. Contract management functions seem to be working well.

A notable void is a lack of 'system' performance analysis by County EMS staff. The contract management processes provide scrutiny of operational performance at an individual contractor level from a contract compliance standpoint. There is a stark absence of analysis in how the overall system performs. For example, there are two sources of dispatch data: from the 9-1-1 communications center for fire department MFR, and the ambulance communications center for all ambulance responses. Processes have not been developed that allow analysis of the combined impact of ambulance and first response performance in aggregate. IPS attempted to do its own aggregate response performance analysis to report on overall system performance.

It found that the data structures do not accommodate this in a reasonable manner, particularly for a high-volume EMS system.

Another shortcoming was found in financial oversight. Until the current economic challenges described earlier in this report came to light, there did not seem to be much detail in the scrutiny of the medical first responder budgets. Fortunately, the economic challenges seem to have forced a correction of this shortcoming.

RECOMMENDATIONS

- Utilize the EMS Advisory Council in a manner that better meets the intent of the legislation
- Reconsider the structure of the EMS Advisory Council to include four distinct groups:
    - Community Advisory Group
        - To consist of citizens or consumer group representatives without specific ties or biases to any particular EMS provider group
    - Medical Control Board
        - As is; consisting of physicians, medical society representatives, hospital representatives, and a County health department representative
    - City and Fire District Group
        - To consist of elected or senior appointed officials (e.g. mayors, city council members, fire district board members, city managers; should *not* include fire department staff). The members in this group should include designated liaisons from groups of elected and senior appointed officials (e.g., mayor's council; city manager's group). The Chair of the EMS Advisory Council should come from this group.
    - Provider Group
        - To consist of representatives from the ambulance contractor, fire department MFR contractors, medical direction contractor, and CME contractor
    - Non-voting members should include the Director of Public Safety Services and a designated representative from the County Attorney's office.
- Reconsider the purpose of the EMS Advisory Council as a body which:
    - Establishes a formalized source of input and counsel to the governance structure (EMS Authority, County Administrator, Assistant County Administrator, Director of Public Safety Services, County EMS staff, Medical Control Board and the Office of Medical Director)

- Utilizes the various EMS constituency groups as ancillary sources of input and support (e.g., Pinellas Advanced Life Support (PALS) group, city managers association, fire chief's association, CME steering committee, emergency department nurse manager's association, nursing home association, etc.)
  - EMS-related activities from these recognized constituency groups report 'up' through the EMSAC
  - Promotes dialog and seeks consensus on issues among the constituency groups
  - Advises the EMS Authority and County EMS staff accordingly
  - A similar structure exists with the Florida EMS Advisory Council and its various EMS constituency groups[1]. This may serve as a useful model for the interrelationship between the Pinellas EMSAC and its own EMS constituency groups.
- Facilitates a visioning process every 2 years that re-visits and re-articulates what the EMS System needs to strive to accomplish in the future to better serve the community
  - Consider an initial focus in visioning efforts to address gaps between the current status of the System versus the goals articulated in the EMS Agenda for the Future[2]; Institute of Medicine's EMS at the Crossroads report[3] and the Baldrige Criteria for Healthcare Performance Excellence[4] (or the Florida Sterling program criteria[5])
  - Consider recommendations for vision statement milestones on 1, 3, 5 and 10 year timeframes
    - Work with County staff to translate the vision statement milestones into strategic plan recommendations coupled with budget recommendations to fund actions to achieve those milestones
  - EMS Advisory Council Chair or designee should present an oral and written report of these findings to the EMS Authority
- Leads a process that evaluates the overall *System* and conducts a performance audit of County EMS administration (during opposite years from the visioning process)

[1] http://www.doh.state.fl.us/demo/ems/EMSAC/EMSAChome.html#EMSACgroups

[2] http://www.nhtsa.gov/people/injury/ems/agenda/emsman.html

[3] Institute of Medicine: Emergency Medical Services at the Crossroads. 2006. National Academy Press, Washington, DC

[4] http://www.nist.gov/baldrige/enter/health_care.cfm

[5] http://www.floridasterling.com/p&s_assessement_tools.html

- Evaluation process should be led by the Council (not the County), but performed by consultants or other outside experts
- Appropriate funding for this function should be provided by the EMS Authority
- Criteria for the system evaluation should be derived from:
  - EMS Agenda for the Future[1];
  - IOM EMS at the Crossroads report[2]
  - Baldrige Criteria for Healthcare Performance Excellence[3] (or the Florida Sterling program criteria[4]).
- EMS Advisory Council Chair or designee to present an oral and written report of findings to the EMS Authority.

○ County EMS Administration, to include the billing and collections operation, should have its performance continuously measured using appropriate performance indicators (e.g., monthly or annually depending on the nature of the indicator)

SYSTEM EVALUATION AND IMPROVEMENT

Pinellas County EMS has reached a level of sophistication that begs for better tools and processes for evaluating *System* performance. Objective evaluation of data for overall System performance is essential to sound decision-making at a System level. The Pinellas County EMS System has severe limitations in this area which are hampering high-level decision-making.

More specifically, the lack of this type of data compromises the ability of System leaders to objectively assess the impact that substantive changes have, or may have, on System performance. Further, in the absence of objective evaluation data, the System is highly susceptible to continuations of ineffective and costly policies, programs and procedures.

For example, the current data infrastructure prevents an objective assessment of clinical impact from changes made in the ambulance contractor's response interval reliability from 92% to 90% compliance at the 10 minute level. On cardiac arrest and other extremely time-sensitive case types, what correlations were there, if any, between that change and the survival rates?

[1] http://www.nhtsa.gov/people/injury/ems/agenda/emsman.html

[2] Institute of Medicine: Emergency Medical Services at the Crossroads. 2006. National Academy Press, Washington, DC

[3] http://www.nist.gov/baldrige/enter/health_care.cfm

[4] http://www.floridasterling.com/p&s_assessement_tools.html

Currently, Pinellas County EMS does have *some* metrics in place to help evaluate System performance. The Office of the Medical Director has been diligent in development and implementation of various clinical case registries and associated process performance metrics; however, clinical outcome data is still very scarce. Certainly, this is a challenge that goes beyond the span of control of EMS. It also speaks to the very limited level of engagement that EMS has with the receiving hospitals, which unfortunately impedes progress at a community healthcare level.

For example, what is the impact of the trauma system? The impact may be known for an individual patient and maybe for an individual hospital but not for the entire County trauma *system* in aggregate. Additionally, it is not known if there are differences in stratified risk-adjusted outcomes between cases delivered by ground ambulance versus helicopter versus private vehicles. Similar problems exist for evaluating care of heart attacks, stroke and other time-sensitive high-risk cases.

Operational metrics for response interval performance are in place for each of the fire department MFR programs and the ambulance contractor. These metrics have been important for County EMS staff to use in determining contractual compliance to response interval requirements. The metrics are very well evolved for each individual contractor. However, the necessary infrastructure and processes are *not* in place to integrate information from disparate data systems on the same incident:

- emergency medical dispatch data from the 9-1-1 CAD
- fire department MFR operational and response data from the 9-1-1 CAD
- ambulance operational and response data from the ambulance CAD
- emergency medical dispatch data from the ambulance contractor's CAD
- medical records from the MFR crew
- medical records from the ambulance crew
- billing and collections data from the County EMS administration office
- patient disposition / outcome data from the receiving emergency department and/or hospital record systems

Presently, there is no real accountability for the performance of the overall System. This is probably why the necessary infrastructure and processes are not in place to integrate data so System performance can be measured and monitored. In the absence of objectively and regularly monitored System performance data, the System is forced to identify improvement opportunities that come up as problems to be 'solved' in a reactive manner. Typically, the outcome in 'reactive' improvement initiatives restores the relevant process to its pre-problem performance level. In contrast, proactive improvement initiatives seek to raise the level of performance above the current level.

There are plans for Pinellas County Government, as a whole, to implement an 'enterprise performance management' solution - Oracle Hyperion[1]. This is a step in

[1] http://www.oracle.com/us/solutions/ent-performance-bi/index.html

the right direction. This type of solution is suited to addressing data collection and reporting needs of multiple entities with tiers of reports that can 'roll-up' from a very granular 'micro' level (e.g., performance metrics on an individual EMS call) up to a 'macro' level for enterprise-level (System) views (e.g., performance metrics for all EMS calls).

RECOMMENDATIONS

- The EMS Advisory Council should facilitate System assessment by:
  - Identifying key stakeholders and then determining their respective needs from and expectations of EMS;
    - Develop 'quality' performance indicators that reflect on how well those needs and expectations are being met.
    - Develop 'cost' performance indicators that reflect on the cost of processes used to address those needs and expectations.
    - Combine quality and cost metrics to quantify value[1].
    - Work with the EMS Authority to develop the resources needed to implement and report on these metrics at a provider organization and System level via a business intelligence system accessible to the County EMS staff, OMD, provider organizations, CME contractor, and others as appropriate.
  - Oversee a regularly scheduled System self-assessment process. This would gather and organize information in preparation for an external assessment process.
    - Assess the System in context of:
      - Accreditation criteria from CAAS[2] and CFAI[3]
      - The Baldrige Criteria for Healthcare Performance Excellence[4]
      - EMS Agenda for the Future (and applicable Agenda documents for system components [e.g., education, research])[5]
      - IOM's EMS at the Crossroads report[6]

[1] Gunderson M: The EMS Value Quotient: Looking at the Combined Effects of Costs and Quality. Journal of Emergency Medical Services (JEMS). 34(3):36-7 (March 2009)

[2] Commission on Accreditation of Ambulance Services. http://www.caas.org

[3] Commission on Fire Accreditation International http://www.publicsafetyexcellence.org

[4] http://www.nist.gov/baldrige/enter/health_care.cfm

[5] http://www.nhtsa.gov/people/injury/ems/agenda/emsman.html

[6] Institute of Medicine: Emergency Medical Services at the Crossroads. 2006. National Academy Press, Washington, DC

- Oversee a regularly scheduled external assessment of System performance, particularly in context of how well the System is meeting community needs and at what cost
    - Consider participating in the Florida Sterling[1] or the national level Baldrige programs for the self-assessment and to qualify for a site-review team to perform the external validation assessment
    - Have summaries of System and provider agency performance reports presented to the Office of the Medical Director, Medical Control Board, EMS Advisory Council, and the EMS Authority
        - To enhance external accountability and transparency, send copies of the performance report summaries to local media
    - Develop a data warehouse that can integrate data from disparate sources pertaining to a specific incident
    - Develop and implement a universal incident and patient identifier system
        - Orange County (FL) EMS has had an excellent system for this purpose in place for several years
    - Leverage the universal incident and patient identifier system to help facilitate capture of patient outcome and disposition data from local hospitals.
    - Develop and implement, incrementally, a comprehensive set of clinical, operational, and financial performance metrics at System, provider agency, and work unit (i.e. crew or individual) levels
    - Couple the performance metric data with a robust business intelligence system that facilitates automated calculation, display and dissemination of performance reports.
        - Explore how the County's Oracle Hyperion system could be used by Fire, EMS and 9-1-1 for key performance indicators, dashboards, scorecards, and other business intelligence functions with access by dispatch, ambulance contractor, FDs, OMD, CME and EMS administration
        - Discussions should take place regarding the integration of EMS data into the Oracle Hyperion system.
        - FirstWatch may also be a viable platform for this functionality within EMS
    - Include robust on and off-site data storage for routine back-up and disaster recovery.
- The EMS Advisory Council and Office of the Medical Director should facilitate System performance improvement efforts.

[1] http://www.floridasterling.com/p&s_assessement_tools.html

- Focus most efforts on projects that align with the System's strategic and operational priorities
- Adopt a performance improvement methodology (e.g., Six Sigma, Lean) and use it consistently

MEDICAL DIRECTION

Medical direction in Pinellas County is a responsibility shared by the Medical Control Board (MCB) and the EMS Medical Director. The MCB is an 11-member board, appointed by the EMS Authority. The MCB is responsible for[1]:

- Recommending to the EMS authority a medical director for the County EMS system.
- Promulgating rules and regulations on:
  - Minimum personnel standards for ambulance crew members, first responder personnel, control center personnel, and wheelchair service drivers;
  - Certification provisions for ambulance drivers, paramedics, dispatchers, and wheelchair service drivers;
  - In-service training;
  - On-board equipment and supplies;
  - Medical protocols for first responders and ambulance service providers;
  - Radio protocols;
  - Mass-casualty protocols;
  - Transport protocols;
  - Helicopter services and protocols;
  - Protocols for interaction by first responder services and ambulance personnel;
  - Requirements for uniformity of equipment and supplies;
  - Standards governing the training and conduct of on-line medical control physicians;
  - Standards for control center operations (i.e., telephone protocols, pre-arrival instructions and protocols for requesting first responder services);
  - Standards for recordkeeping and reporting;
  - Standards for wheelchair vehicle services; and
  - Procedures for issuance, renewal, suspension, and revocation of certifications of ambulance drivers, paramedics, and dispatchers or of wheelchair vehicle service drivers, which procedures shall contain

[1] Pinellas County Code - Article II, Section 54-60

due process provisions; all such provisions shall be approved, in advance, by the County Attorney.

The responsibilities of the EMS Medical Director are described in two sections of legislation. The first pertains to all EMS medical directors throughout the State.[1] The second is in language that governs EMS in Pinellas County.[2]

Responsibilities for medical direction are carried out primarily by a medical direction contractor. The contracted firm is required to employ a physician, subject to County approval, that serves as the designated medical director for the Pinellas County EMS System. The company is required to provide a range of administrative services needed to carry out the fiduciary responsibilities as expressed in State and County statutes pertaining to EMS medical direction and other responsibilities described in its contract with the County. The activities of the medical direction contractor are not performed under the business name of the contractor, but as the Office of the Medical Director (OMD). This is a useful approach, as a change in medical direction contractors would not require changes in all of the various documents in the County that refer to the entity that provides medical direction. A similar approach and rationale is used in referring to the ambulance contractor as Sunstar rather than by the business name of the company that provides ambulance service.

Generally, feedback from field personnel and managers at all levels on medical direction was quite positive. However, Online Medical Control (OLMC) was one of the areas that was repeatedly cited as an area of concern by both EMS managers and field personnel. OMD reporting on quality management initiatives and results was also cited as a concern.

OLMC is a process in which field crews make radio contact with a member of the OLMC staff for clinical consultation, authorization to perform some types of treatment, or after-the-fact notification of specific types of interventions under specific circumstances. There were two general criticisms: the use of paramedics in an OLMC role and the limited latitude given to field crews in carrying out care without the requirement of contacting OLMC.

OMD plays an unusually dominant role in clinical supervision compared to other EMS systems. In most EMS systems, front-line operational supervisors play a strong role in *clinical supervision*. Clinical supervision is commonly used for many types of administrative and clinical policy challenges, such as managing hospital destination and bypass issues. In most other systems, emergency department physicians that are on-duty in receiving hospitals or designated 'base' hospitals provide the *online medical control (OLMC).* OLMC is typically required in many systems to obtain

[1] Florida Statutes Ch. 401 and Florida Administrative Code 64J-1.004

[2] Pinellas County Code - Article II, Section 54-60

authorization to perform higher risk treatments. It is also where field crews turn for consultation with a physician on difficult cases.

In Pinellas County, there are 19 different sets of EMS provider agency supervisors (18 fire departments plus Sunstar) who manage over 700 EMTs and nearly 900 paramedics. The system transports patients to hospitals with 15 different sets of emergency department physicians. In this situation, there is ample potential for inconsistencies in how care is actually delivered. Further complicating the issue, there is a huge range in the level of skills, knowledge, and experience among identically credentialed field personnel.

Therefore, Pinellas County uses its OLMC process to help ensure consistency in clinical quality across all provider organizations for clinical, policy, and treatment authorization issues, and clinical consultations.

Using appropriately qualified paramedics for the policy issues is not that different from the way that clinical supervisors are utilized in other systems. The use of appropriately qualified paramedics to provide clinical consultation and treatment authorization is less common.

In Pinellas County, the paramedic staff members used to provide OLMC are referred to as Medical Officers of the Day (MODs). In the event of truly complex clinical situations, the MODs always have access to one of the OLMC physicians to step in as needed.

The knowledge and skills needed to provide high quality OLMC are not a part of what paramedics or paramedic supervisors are normally taught. However, formal processes are missing, which would initially train, mentor and improve the skills of the MODs. The lack of such processes undermines the credibility of the MODs in the eyes of many of their EMT and paramedic colleagues. Similarly, the initial training and on-going professional development processes specific to EMS for the OLMC physicians also appears to be very unstructured.

The latitude given to field crews to carry out treatment before making OLMC contact is another point of contention. The protocols specify when field crews are required to contact OLMC for care on a particular type of case. If they are required to make OLMC contact, the issue is deciding at what point in the process of care does contact have to be made. This is referred to as the OLMC trigger point.

There are several factors that typically come into play when medical directors decide where to set the OLMC trigger point for their EMS systems. Those factors include the size of the system, the level of detail at which the quality assurance system operates, the quality of the initial training and continuing education, the ease and practicality of real-time field to OLMC communications, and the general risk tolerance of the medical director, Medical Control Board, and EMS system managers.

Factors working toward a more conservative trigger point include the fact that Pinellas County is a large EMS system, the quality assurance system does not work

at a very detailed level, there is easy access to real-time communications between field and OLMC staff, and risk tolerance is relatively low. Factors in favor of a more liberal trigger point are the reasonable quality of initial training for most EMTs and paramedics, and the good quality of the continuing medical education program. Currently, all EMTs and paramedics have the same trigger points, regardless of their experience, knowledge or skill levels.

A significant portion of OMD's responsibilities relate to quality management. There are three dimensions to a well-designed quality management program: quality planning (process design), quality assurance, and quality improvement[1].

The quality planning (process design) component, as it relates to OMD, is to write and update clinical protocols and policies. The process for this seems to be working well.

Quality assurance, as it relates to OMD, is a review of compliance to the clinical protocols and policies. OMDs efforts in this regard have been limited to detailed reviews of selected cases with a high risk profile, such as cardiac arrests and all cases with endotracheal intubation. Processes for data collection, validation and analysis of those cases have been developed and improved over many years. These processes generally operate very well, within their limited scope.

Quality assurance reviews of cases are also done by each of the fire departments and the ambulance service contractor in varying degrees and with varying methods. The fire departments and ambulance contractor also provide front line supervision for a level of real-time quality assurance as well as retrospective documentation reviews for a level of retrospective quality assurance.

There is no minimum standard or template for how the fire departments and ambulance contractor perform their respective quality assurance activities. There does not appear to be a training program for those front line and middle managers that actually provide front line supervision and retrospective documentation reviews.

The ambulance contractor has been utilizing an electronic medical record for approximately four years. Two of the fire departments are now preparing to implement the electronic medical records system.

Electronic medical records can have an enormous impact on quality assurance. The data from the paper patient care reports has limited conversion into electronic data. Therefore, quality assurance reviews have to be performed manually and are very time-consuming to do well. Conducting detailed manual patient care report reviews with high levels of consistency is incredibly difficult. Sustaining it over time is almost impossible. That all changes with a well designed and well managed electronic patient care report and review process. The reason is that the software

[1] Juran JJ: Juran on Leadership for Quality. Free Press, New York, NY. 1989.

can perform a significant portion of the reviews, doing so in great detail, with great consistency, and can sustain that level of performance over time. These processes are very well evolved in the ambulance contractor's operations and will hopefully transfer well into the two fire departments that are still early in their implementation learning curve. Plans are in place to bring all of the fire departments online with electronic patient care reports within the next few years.

OMD leads a process for managing complaints. It is referred to as the Quality Assurance Review (QAR) process. This is a very well designed and well managed process.

Quality improvement is the deliberate changing of a process design in hopes of improving its performance. There are many examples of successful clinical quality improvement efforts by OMD, but they are relatively infrequent. A specific formalized process for conducting quality improvement projects is not in place. This makes developing and managing projects all the more difficult, and also makes it less likely for projects to produce demonstrable and sustainable results. Additionally, it appears that much of OMDs efforts are spent on managing the QAR process, which leaves very little time or resources available to conduct quality improvement projects.

In Pinellas County, the EMS medical director is currently provided by a contracted firm that is chosen through an RFP process. This is not particularly unusual, but is certainly a less common approach. Many other government-operated EMS systems directly employ the medical director. One of the principal advantages of directly employing the medical director is having their service provided under municipal liability protection. This saves on the cost of obtaining commercial liability insurance coverage. One of the principal disadvantages is the degree of separation and independence that not being a County employee provides.

In the event that the System decides to implement a community paramedicine program, there are very limited relationships established between EMS, public health, third party payers, and other relevant stakeholders.

RECOMMENDATIONS

- OMD should consider implementing a more formal training, continuing education and professional development program for its MODs. It should be focused on higher level clinical and operational decision-making, knowledge and skills associated with OLMC issues and advanced level clinical EMS issues. It should also provide continuing education and professional development oriented towards OLMC issues for the physicians who provide OLMC.
- Consideration should be given to development of a program in which field paramedics are differentiated on the basis of their objectively demonstrated knowledge, skills, and experience. That differentiation would then be used to

grant use of a more liberal set of trigger points in clinical policies and protocols. This would:
    - create incentives to encourage professional development and clinical excellence beyond the minimum requirements of all field staff;
    - reduce frustration among the best of Pinellas County's field staff members; and
    - unfortunately, add to administrative complexities by having to track and manage more than one level of field paramedic, but the benefits would seem to be worth the investment.
- Adopt electronic patient care reporting systems as soon as possible. This should be coupled with the aggressive development of robust tools that automate as much of the quality assurance review process as possible for all patient care reports.
- OMD should place a greater emphasis on conducting formal quality improvement / research projects.
    - Emphasize projects that align with the System's strategic and operational priorities – particularly from a clinical perspective.
    - Use established process improvement methods to manage projects in an effort to improve the likelihood of success and simplify training and analysis (e.g., Six Sigma, Lean, Institute for Healthcare Improvement process improvement programs).
- Improve the detail and frequency of routine clinical performance reporting and clinical quality improvement projects, at both system and provider agency levels.
    - Provide access to source data on case registries (e.g., cardiac arrest and intubation) to provider agencies involved in those cases.
        - Make accommodations to recognize internal provider agency quality management programs and thereby come within the realm of 'protected' activities of the EMS system's quality management program.
        - Provide training and support to provider agencies in order to facilitate their internal quality management efforts.
- Maintain the separation of OMD from County government.
- If a community paramedicine program is to be developed, OMD and the MCB should start working towards establishing deeper and more collaborative relationships with relevant stakeholders.
    - This may lead to a need for changes in how OLMC is provided and how stakeholders are represented on the EMS Advisory Council and Medical Control Board. This should be anticipated and planned for accordingly.

CONTINUING MEDICAL EDUCATION

The continuing medical education (CME) program, at minimum, is intended to maintain core knowledge and skills. It is also intended to update providers as the state of the art and science in EMS evolves over time. The State of Florida mandates CME through its requirements for recertification. Some EMTs and paramedics also decide to meet CME requirements in order to maintain national certification through the National Registry of Emergency Medical Technicians (NREMT).

The CME program in Pinellas County satisfies the State of Florida recertification requirements. Additional, but optional, classes are also offered to satisfy CME requirements for those who maintain NREMT certification. These education services are made available to fire department personnel while they are on-duty. Ambulance staff, due to the nature of their shift schedules, attend while they are off-duty; however, they are compensated for their time. Pinellas County also offers remedial education services. These are used to address specific education issues with individuals or small groups.

Since the early 1990's, the County has had an exclusive non-competitive contract with St. Petersburg College (SPC) to manage and deliver CME services to all field EMS personnel. A CME Steering Committee, composed of ambulance and fire department representatives, provides input on curriculum topics to be addressed. OMD works with SPC to provide editorial oversight of the CME curriculum development process. SPC, working in collaboration with the CME Steering Committee and OMD, develops and delivers an original CME class specifically for Pinellas County personnel each month. Classes that do not have a hands-on skills component are delivered online. For hands-on class sessions, they are scheduled at various stations and at EMS headquarters throughout the month. If anyone misses the class for which they were scheduled, several make-up class sessions are offered.

The CME program in Pinellas County is excellent in many respects. Most of the field personnel and managers interviewed were generally satisfied with the CME program. Many expressed very strong satisfaction with the hands-on skills sessions that have been taken 'on-the-road' to fire stations.

A number of issues came out of the conversations that point to areas where there may be opportunities for significant improvement:

- Text and static images are the formats used for most all of the online class materials. They are not very engaging.
- CME, in general, has a 'one size fits all' approach that does not recognize different levels of knowledge and experience. New medics, ones with different learning styles, or ones with interests limited to 'just meeting the minimums' receive the same CME as long time veterans and those who are intrinsically motivated to catalyze their professional growth.

Conversations with OMD revealed that there seems to be a trend developing whereby more and more of the CME content development is taking place at OMD rather than by the CME contractor (SPC). OMD's role in the CME program design is supposed to be focused on editorial oversight. This would involve provision of some guidance on topics and areas to emphasize in classes to be developed. It would then be followed up with review and comment on class curriculum drafts, leading to final approval by OMD.

Measurement of CME program performance seems to be limited to quizzes that are taken upon completion of individual classes. Longer term knowledge and skills retention is not assessed. The impact of CME on actual clinical performance is not measured. Operational performance or student satisfaction is also not measured.

RECOMMENDATIONS

- Use more engaging online content delivery methods, such as videos, narrated slides, etc.
- The CME contractor should be doing all of the content development, allowing OMD to focus on providing CME content ideas and editorial review.
- Expand the scope of the CME program to cover the minimum requirements, but consider offering a more advanced version as an elective program.
- Put the CME contract out to competitive RFP in order to get higher levels of value for the funds being spent. Even if the incumbent contractor wins the RFP, they will have improved the value of their offerings to win the contract in a competitive process.
- Develop more robust indicators of CME program performance, to include long term retention, impact on clinical performance, operational performance of the program itself; and student / stakeholder satisfaction levels.
- Apply quality improvement methods to CME processes.

OTHER CONSIDERATIONS

COUNTY EMS ADMINISTRATION

A time/activity/workload analysis was requested in the RFP. In conversations with County administration staff above the Public Safety Services Department level, this level of review was anticipated to be helpful in the event that the consultant needed to get very specific regarding where cuts or adjustments were to be recommended towards resolving the budget deficits. Ultimately, that level of detail was not

necessary, as the consultants found that much larger issues dominated and resolved the budget deficit issue.

However, throughout the course of this study, attention was given to issues, comments or other references that might shed light on the structure and utilization of County EMS Administrative staff. The topic was specifically brought up in many conversations with system stakeholders.

Comments on this topic were mixed. Many stakeholders expressed frustrations with the level of involvement that County EMS Administration attempted to have in what they perceived as the internal affairs of managing their respective operations. Fortunately, most of these comments were made in reference to prior County EMS management staff. There now seems to be more acceptance of County EMS administration in what was perceived as a focus on contract administration issues.

Apart from these types of comments, there were no 'red flags' or notable issues that came to the attention of the consultants.

In sections of this report that deal with issues on measuring and reporting on overall System performance, there are clearly unmet needs that County EMS administrative staff should be addressing.

This report proposes that the EMS Advisory Council engage in System-level visioning, strategic planning and performance improvement. County administrative staff should be supporting, not directing, efforts of the EMSAC in this regard. The EMSAC should also be the entity responsible for facilitating reviews of the performance of County EMS administrative staff.

With these considerations in mind, it is recommended that the incumbent contract managers work with the EMSAC as well as ambulance, MFR, medical direction and CME contractors. They should develop performance metrics and reporting formats that may be used to measure and report on individual contractor performance. The incumbent EMS administration staff should also work with EMSAC to develop System performance metrics and reporting formats.

While the introduction of business intelligence system software (i.e. Oracle Hyperion) is planned for County-wide implementation, there may still be a need for an appropriately qualified performance / business intelligence analyst to provide such services in the interim while waiting for Hyperion to be deployed and to assist in configuring the performance metrics that would be incorporated into Hyperion.

FIRE DEPARTMENT ADMINISTRATIVE STAFF AND EMS COORDINATORS

The combined level of fire department administrative staff needed to be involved in EMS was considered primarily in context of performance issues and funding. In conversations with County administration staff above the Public Safety Services

Department level, that level of review was anticipated to be helpful in the event that the consultant needed to get very specific as to where cuts or adjustments were to be recommended in the fire department's administrative ranks in order to resolve the budget deficits. Ultimately, that level of detail was not necessary as the consultants found that much larger issues dominated and resolved the budget deficit issue.

However, particular attention was given to the issue of fire department EMS coordinators. The consultants acknowledge that additional supervisory staff is needed within each fire department from a marginal cost perspective to support the MFR mission. This was addressed in the sections dealing with staffing multipliers to be used if the Marginal Engine Funding – Paid Position Option was implemented. The consultants feel that providing for EMS coordination / supervision with funding equivalent to 0.25 paramedic FTEs per County-funded MFR unit is reasonable.

The unique structure of EMS in Pinellas County includes an extremely active Office of the Medical Director (OMD), which provides 24/7/365 clinical and related operational supervision. County EMS administration also provides system level support for management of disasters and other larger scale incidents. The unique features of EMS supervision in Pinellas County EMS limits the utility of benchmarking comparisons of supervisory personnel in other EMS systems and fire departments – and therefore was not pursued.

A significant deficit was noted with regard to fire department EMS Coordinators. Overall, their roles did not place an adequate emphasis on quality assurance. The fire departments seem to be very content to let the Office of the Medical Director address quality assurance issues. This is inappropriate in the opinions of the consultants. EMS Coordinators should see this as their primary duty.

Unfortunately, the County and the Office of the Medical Director have not done a very good job in providing support and professional development resources for the ranks of its EMS Coordinators. Therefore, most of them are poorly prepared to provide more than cursory review of patient care documentation for completeness.

However, much of the quality assurance burden will be relieved when the electronic medical records and administrative analysis tools now being deployed become fully implemented. This will allow many of the basic quality assurance reviews of patient care reports to become automated. The ambulance contractor has made significant strides in this regard and should help the fire departments develop similar capabilities.

As the electronic medical records system and back-end support systems become fully implemented, the focus should be simultaneously shifting from quality assurance to quality improvement. The latter is focused on using the high quality electronic data to make data-driven decisions about where improvement efforts should be focused. The County and the Office of the Medical Director should provide

leadership and facilitate this type of training for fire department and ambulance contractor staff.

The County's performance contract with the ambulance contractor is specifically designed not to intrude on the contractors methods of operation. The cost to the County is linked to call volumes and compliance to minimum performance specifications. It is entirely up to the contractor to determine how many and what types of supervision and administrative support staff they want to use to meet their requirements. Therefore, the consultants do not recommend that supervisory staffing within the ambulance contractor's operations become an issue of concern for the County. However, the ambulance contractor's staff should be invited, and encouraged, to participate in the professional development activities that are recommended for the fire department EMS coordinators.

SYSTEM BRANDING

The *System* does not have any specific branding beyond a 'default' of Pinellas County EMS. Culturally, the fire departments, ambulance contractor, medical director's office have their separate identities – but are not unified by a clear *System* brand/identity. It is suggested that a clear and distinct branding of the overall system be developed and utilized as appropriate to promote the overall *System*.

OVERALL FINANCIAL IMPACT

Based on the recommendations within this report, the overall financial impacts are summarized below.

- Changes to MFR Providers Costs - Implementation of the Marginal Engine Funding – Paid Position Option with a 3.6 FTE staffing and supervision multiplier would have an estimated cost of $27.1 MM. This represents a 29% decrease from the MFR provider cost from the FY 2010-11 budget.
- Changes to Projected Ambulance (Transport) Costs: None
- Changes to Projected Support Program Costs: None
- Set-Aside Fund Costs – Estimated at $2.5 MM /yr., but this is highly dependent upon:
    - Size of shortfall at the time a financial action decision is made and the pace chosen for replenishing the EMS reserve fund.
    - Equipment upgrade choices.
    - New program development choices (e.g., community paramedicine initiatives for lower acuity cases, and community and witness life support program initiatives for cardiac arrest cases).

- Any adjustments needed to compensate for increases or decreases in the inflation rate and/or property values.

Together, these recommendations have a projected net decrease in total EMS system costs of $8.5 MM, including the $2.5 MM in set-aside costs.

GLOSSARY

Ambulance Contractor – Private contractor that provides emergency and non-emergency transport services

Advanced Life Support (ALS) – Care level above the basic life support level, including advanced skills in the management of airway problems and use of medications to treat various medical conditions

Basic Life Support (BLS) – Basic skills and protocols used to support basic physical functions (e.g., breathing and circulation)

Emergency Medical Technician (EMT) – Emergency care giver trained in basic life support

EMS Authority – Board of County Commissioners acting in its EMS oversight capacity

Fire First Response – First response calls that require services such as extrication or fire protection

Full Time Equivalent (FTE) – Equivalent of one person employed on a full-time basis. One FTE could consist of two half-time staff members.

Marginal Cost Funding – Approach to funding MFR that assumes fire personnel, vehicles, stations, and other infrastructure have already been paid for by the community to meet their fire protection needs. Marginal cost funding covers the additional incremental cost of adding the EMS mission onto the existing fire department infrastructure.

Marginal Engine Funding (MEF) – Funding method based on the marginal cost of providing first response

Medical Direction – Oversight of EMS activities by a designated physician

Medical Control Board (MCB) – 11-member board appointed by the EMS Authority that provides higher level input on medical policies and procedures

Medical First Response (MFR) – Fire department response to EMS calls without the intent to transport; Typically arrives first on-scene

Medical Officer of the Day (MOD) – Paramedic staff members used to provide online medical control

Office of the Medical Director (OMD) – Consists of the EMS Medical Director and support staff. This is a contracted service.

Online Medical Control (OLMC) – Medical control and consultation services provided by physicians and Medical Officers of the Day via radio to field paramedics

Paramedic – Emergency care giver trained in advanced life support

Peer-Reviewed Research – Highest caliber of scientific research; research that is carefully scrutinized by other researchers and subject matter experts before being approved for publication in an academic journal

Proportional Response Funding – Funding method that proportions available funding based on call demand.

Public Utility Model (PUM) – EMS design model that provides accountability for the provision of all components of the emergency medical care system.

Request for Proposals (RFP) – Document that invites qualified bidders to submit proposals / bids to perform work for the County

Target Response Interval – Time target for arrival at the scene of a call

Unit Hour – An hour that a unit is staffed and ready to respond to a request for service

Unit Hour Utilization (UHU) – Productivity measure; Ratio between total unit hours and number of transports that have occurred

APPENDICES

RFP PROCESS

After review and consideration of both policy and financial implications of the EMS system, a decision was made to seek an objective assessment of the *System* with recommendations. The County Administrator and County EMS staff worked in collaboration with stakeholders to develop an RFP for the System review study. The RFP was widely circulated throughout the EMS industry and bids were received from several firms throughout the United States. A committee was used to review proposals and consisted of:

- a local city manager and an assistant city manager;
- two local fire chiefs;
- a representative from Sunstar Paramedics;
- two staff members from the Public Safety Services Department;
- a representative from the Purchasing Department (acting as a facilitator)

The committee reviewed and scored the proposals in accordance with pre-established criteria. The highest score was given to the proposal from Integral Performance Solutions, LLC (IPS) based in Lakeland, FL. The scoring results were presented to the Board of County Commissioners / Pinellas County EMS Authority with a subsequent decision to award the contract to IPS.

STUDY PROCESS

The process of conducting the study began with an extensive initial document review that encompassed:

- Prior consulting studies of EMS in Pinellas County, as far back as 1980.
- Documents pertaining to the 1989 legal actions between the City of St. Petersburg and the County's EMS Authority
- Consulting studies that were being performed for the City of St. Petersburg and the City of Clearwater regarding their fire and EMS services
- Contracts between the County and the EMS providers, including: each of the fire departments, the ambulance contractor, the medical direction contractor, and the continuing medical education contractor.
- Any other recent EMS related studies or proposals, including those from the Reconfiguration Committee, the Charter Review Commission, Pinellas Legislative Assembly, Pinellas County Fire Chief's Association, and Pinellas County Firefighters Council
- Copies of all current laws, ordinances, and EMS Authority resolutions regarding EMS.
- Any strategic plans pertaining to EMS and Fire Administration from Pinellas County Government.
- Current and prior EMS budgets.
- CAD data for all EMS and fire responses.

During the course of the study, many additional documents were also requested.

IPS also conducted many meetings over the course of several months with various stakeholders to get their perspectives on the EMS System. These meetings included city officials, fire chiefs, ambulance service managers, and representatives of the Office of the Medical Director, members of the EMS Advisory Council and Medical Control Board, and members of County staff. IPS also met with various union officials and front line personnel from the fire departments and ambulance service.

IPS collected data on 9-1-1 EMS responses from the County's computer-aided dispatch (CAD) system. That data was used for the deployment analysis, which showed when and where (geo-temporal) resources are needed to meet response interval and reliability requirements. Several aspects of the deployment analyses were conducted by IPS working in collaboration with faculty from the Department of Industrial and Systems Engineering at the University of Arizona.

Analyses of EMS billing data were made working in collaboration with billing process experts from EMS Management & Consultants, Inc.

Through the course of the study, IPS met with the EMS Resource Committee to present preliminary findings and discuss potential recommendations. This exchange was vital to the study process as it provided a mechanism to draw upon the enormous collective experience and expertise of the stakeholders represented on the committee. The EMS Resource Committee served as a sounding board that provided invaluable feedback and suggestions for other issues and ideas to consider as a part of the study.

In development of options to be considered, IPS took a 'blank page' approach that began with consideration of what communities like Pinellas County need in terms of emergency medical response and transportation. The assessment of needs was based on:

- Review of CAD records for the nature of actual EMS requests that were made in Pinellas County.
- Review of applicable major studies that have been made of community EMS needs:
    - Institute of Medicine: Emergency Medical Services at the Crossroads[1]
    - Office of Emergency Medical Services (NHTSA): EMS Agenda for the Future[2]

IPS also considered:

- new ideas;
- available and emerging research and technology;
- best practices in other communities;
- collateral impact that an option may have outside of EMS (particularly to fire protection); and
- specific ideas already being debated in the System that needed to be objectively reviewed (i.e., fire department operated ambulance service).

In development of options to consider in meeting those needs, IPS placed a very strong emphasis on how existing resources could be leveraged to the community's advantage.

The clinical perspective was kept primary in these considerations. However, it has to be recognized that decisions need to be made that also address financial, operational and political considerations.

[1] Institute of Medicine: Emergency Medical Services at the Crossroads. 2006. National Academy Press, Washington, DC

[2] http://www.nhtsa.gov/people/injury/ems/agenda/emsman.html

Inevitably, these perspectives conflicted. Ideally, one would have physicians on all ambulances that are prepared to make immediate surgical or medical interventions that are beyond the scope of a paramedic. From a financial and operational perspective, one must consider how often such needs actually occur and how much additional benefit comes from making such interventions a few minutes earlier in the field before they could be done at the hospital.

The argument is often made in debates on EMS system design that "lives will be lost" if the highest possible level of capability are not on all ambulances and first response units. Such arguments fail to consider that community resources are not infinite. Elected and appointed officials have to consider all of the community's needs and do their best to choose options that offer the most value at the most reasonable cost. This involves finding options that meet most needs in most circumstances.

Consequently, elected and appointed officials have to make difficult choices that attempt to balance clinical, financial, operational, and political perspectives. What may be best clinically may not fit in a budget that the community is willing to pay for (e.g., emergency response intervals of four minutes or less with 90% reliability would save more lives than the current system, but would add many millions to the annual operating cost). What may be best operationally may not have enough political support to be a reasonable option (e.g., consolidating all 18 fire departments into a single County fire department would be simpler to manage on an operational basis but would require the cities and fire districts to relinquish control of fire protection services to the County). In developing its recommendations, IPS did its best to provide intellectually honest recommendations that provide a reasonable balance from a clinical, financial, operational, and political perspective.

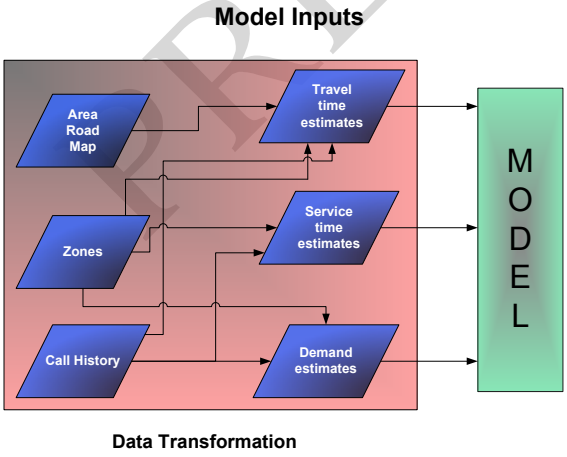
DEPLOYMENT ANALYSIS METHODS

A deployment analysis was performed for Pinellas County using CY 2009 data from the County's 9-1-1 CAD system. The deployment analysis was used to determine how many, where and when units of different types should be located across the County.

IPS used a highly sophisticated series of processes for emergency resource deployment assessment and planning. These processes can be used in a variety of ways to find:

- a combination of locations that provides the most effective use of resources at the lowest potential cost;
- the optimal placement of stations from a set of available locations (e.g., where fire stations already exist); and
- the optimal set of a desired number of stations from a larger set of available stations (e.g., what 53 stations would provide the best coverage from a set of 62 available stations).

The IPS approach to deployment analysis involved detailed computer modeling to provide insights into critical system design issues such as the number and location of stations/posts, the number of crews to deploy, and the scheduling of crews. The IPS approach used methods from operations research that are backed by decades of peer-reviewed operations research analysis. This approach, coupled with IPS' close ties with the Department of Systems and Industrial Engineering at the University of Arizona, have enabled us to go far beyond traditional system status (dynamic) and static deployment methods of analysis used by other consulting firms in the EMS and fire industries.



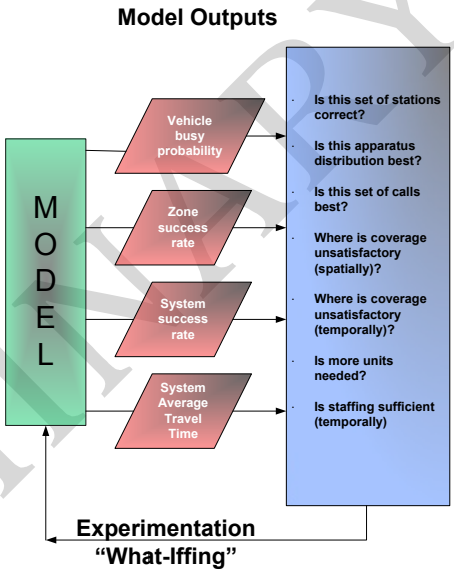
At a general level, IPS' deployment modeling involved three major steps:

- Develop a clear understanding of the current system's performance;
- Develop a model of the operations of the system based on the client's business rules; and
- Make iterative adjustments to the model to enhance its effectiveness at predicting performance accurately and then using the model to give insight on the impact of different decisions.

IPS reviewed the current station and posting placements. We then applied desired response interval, along with the 90% compliance criteria for comparing the outcomes of potential changes.

IPS then took data from the current system (see diagram labeled 'Model Inputs'), including the zone structure, ambulance and ALS first response demand, travel times, service times, and transport times, and then built the computer model used to predict system performance as measured by vehicle utilization, inter-zone pickups, average travel time, and percentage of calls that do not meet the response interval performance criteria.

In a final step, IPS carried out iterative experimentation with the model. IPS was able to rapidly investigate the wide range of scenarios and various strategies in an effort to optimize performance; something that would be impractical with the actual system. This iterative process is depicted in the figure labeled 'Model Outputs.' Once IPS established the reliability of the model, it was used to consider alternative strategies.



In the traditional systems status management approach, one estimates the number of crews required (by hour of the day), in order to meet demand 90% of the time. The computational method underlying this approach typically uses 20 weeks worth of data and is largely ad hoc.

IPS' approach used queuing theory to set crew levels. In the demand analysis, it was easier to validate assumptions that calls come to the system based on a Poisson process distribution, rather than a 'normal' distribution. With the correct parameters and values given any number of crews and any service time mean (and distribution), IPS was able to compute the probability distribution on the number of busy crews. IPS was able to see the tradeoffs in performance for adding additional crews. This approach was interactive in that it is a simple matter to experiment with different numbers of crews, see performance, and then make a decision. This is a far stronger approach than the 'single value' output seen with traditional system status management methods of analysis.

Once the number of crews is set, then one must deploy vehicles over the geographical area. Here again, IPS used a computer model to help make decisions. At a detailed level, the model employed simulated the operation of a spatially distributed queuing system. These systems have multiple servers (ambulance units in this case) and customers/demands (patients) that have a preference for particular servers based on some criteria such as proximity or appropriateness.

These systems have been used to model the performance of emergency vehicle systems, mobile repair systems, distributed database systems, and weapon fire control systems. The models have been shown to be valid when applied to specific systems and there are many instances of successful application in the operations research literature.

To implement the model, Pinellas County was partitioned into zones and the zone location of each vehicle station was known. For each zone, past data was used to estimate demand, call service time including possible hospital and transport times, and turnout times. Also, for each station-zone pair, the travel time and the probability that a call is answered within a set time standard (eight minutes for example) was estimated. The model then estimated performance of the system by estimating the following statistics:

- Fraction of time that each vehicle is busy;
- Number of calls that each vehicle answers;
- Fraction of answered calls that meet the time standard (by vehicle);
- Fraction of calls that meet the time standard (by zone and system wide);
- Fraction of calls that go to a system operating parallel (e.g., mutual aid) due to all vehicles being busy for example; and
- Average travel time for each vehicle (based on the calls it answers).

The model used by IPS / University of Arizona is based on the Hypercube Approximation Model. This was developed by Dr. Richard Larson at M.I.T. in 1975 and extended by Dr. James Jarvis at Clemson in 1985 and extended further by Dr. Jeff Goldberg at the University of Arizona in 1990. Each call is assumed to require one vehicle and it is assumed that each zone has a unique preference ordering of the available vehicles/stations. This unique preference order simply implies that for any call, there is a dispatch preference order. The dispatcher then goes down the order and dispatches the first idle vehicle on the list. The model simulates this process by computing the probability that each vehicle/station on the dispatch list actually gets the call.

This analysis can be used to generate several types of reports including detailed call analyses that include:

- 90th (or any other) percentile of reaction and response time thresholds;
- 90th (or any other) percentile of call volumes;
- Unit Hour Activity and Utilization levels; and
- Spatial (geographic) and temporal (time) mapping of response performance patterns stratified by time of day, day of week, etc.

IPS' approach was used to identify appropriate deployment of resources for:

- Placement of MFR unit locations;

- Placement of fire department ambulances for 9-1-1 only transport services;
- Units needed for privatized MFR services;
- Comparing alternate plans; and
- Preparation of maps and diagrams.

MFR UNIT PLACEMENT AND RE-EVALUATION

The simulation model used for the deployment analysis is designed to optimize the placement of units (vehicles) to achieve desired level of performance across the entire County. In the case of MFR units, that performance level is 7:30 with at least 90% reliability.

The simulation model is given a set of locations where a unit could be placed. As the model factors in the historical location and timing of calls, it decides where to place the units in a way that balances deployment based on workload. If an area has more calls than other areas around it, units in that area will become busier and the area is given higher priority for additional units as the model evolves. Different combinations of unit locations are attempted until the desired level of performance is achieved across the entire system. If adjustment of locations is not enough to reach the desired performance levels, more units are added.

For the simulation and analysis in Pinellas County, all existing fire stations were used as potential locations for a MFR unit. The desired level of performance was not approached until 72 units were placed into the model. At that point, the performance was 7:30 at 90.1% reliability.

Conservative Bias

The model is conservative in its consideration of travel times to and from calls. Therefore, IPS' expectation is that performance will actually exceed the predicted 90.1% reliability level. Since the model makes global assumptions about travel time, areas of the County with faster than typical driving times will have better performance. Areas with faster than typical travel times also tend to be the areas with lower population densities. This will help improve actual performance in these same areas, even though there may not be as many units available. Most all areas will see better performance at night, when drive times overall are better than typical.

Call Volume Reductions

Another factor that is expected to significantly improve actual performance over the model's predictions is the anticipated reduction in the number of calls that MFR will be required to respond to. This is discussed in the section of this document called 'More Appropriate Use of MFR.' IPS is recommending that 72 MFR units be deployed in spite of these reductions, since it is not known at this point exactly how many calls will be removed from the MFR response requirements.

Target Response Interval and Reliability

The 7:30 target response interval with at least 90% reliability is an arbitrary standard. While standards at or below 8:00 with 90% reliability may be cited as a standard by some national organizations, they are not supported by contemporary research linking response intervals to clinical outcomes. Changes of a few minutes in response intervals sooner or later have not demonstrated any significant difference in clinical outcome, with the notable exception of cardiac arrest cases.[1][2][3][4][5]

For cases of cardiac arrest, MFR arrival in 7:30 with 90% reliability is not fast enough. Deploying enough MFR units to get response intervals down to four minutes with 90% reliability would add tens of millions to the cost of MFR. It makes more sense to put serious emphasis on compressions-only bystander CPR training and the strategic placement of public access defibrillators. This is why IPS is recommending that these efforts receive more emphasis along with development of a Community Life Support program, as described in the section of this document called 'Scope of System.'

Operationalization and Testing Adjustments

All deployment models make imperfect assumptions and generalizations. When the time comes to operationalize the deployment plan, IPS recommends that an operational review be initiated and local managers be consulted. IPS recommends that an independent firm with specialized EMS and fire deployment expertise be engaged to assist in this process. Local managers will have direct local knowledge about roads, traffic patterns, construction / expansion projects, and other idiosyncrasies that may impact expected demand and/or travel times. These insights can be invaluable in fine tuning the deployment plan. For example, local managers may know about upcoming major road construction projects, a soon to open nursing home, or other factors that may impact demand or travel times which would not have appeared in the historical data used for building the deployment model.

After the fine tuning is applied, the deployment plan should go live. Response interval performance should be closely monitored. If areas are identified with performance issues, small changes should be made on a pilot basis to see if they

[1] Blackwell T, et al: Lack of Association Between Prehospital Response Times and Patient Outcomes. Prehosp Emerg Care (13)4, 2009

[2] Blackwell T, et al: Response Time Effectiveness: Comparison of Response Time and Survival in an Urban EMS System. Acad Emerg Med (9)4, 2002

[3] Pons P, et al: Paramedic Response Time: Does It Affect Patient Survival? Acad Emerg Med (15)7, 2005

[4] Pons et al: 8 Minutes or Less: Does the Ambulance Response Time Guideline Impact Trauma Patient Outcome? J Emerg Med 23(1), 2002

[5] DeMaio et al: Optimal Defibrillation Response Intervals for Maximum Out-of-Hospital Cardiac Arrest Survival Rates. Ann Emerg Med 42:242-250, 2003

improve performance. Discontinue the pilot and revert to the prior plan if performance declines.

Unfortunately, a barrier to pilot testing of adjustments is the fact that there are 18 separate fire departments to be dealt with. Moving a MFR unit from one station to another for pilot testing will often cross jurisdictional lines. Adding and removing staff and vehicles between departments is a complicated issue that would be much easier under a County-wide fire department.

This issue provides an opportunity for the fire departments in Pinellas County to take their virtual consolidation to the next level. The barriers to pilot testing changes in deployment across jurisdictional lines are political, not technical. An engine and crew can be moved to another station for a pilot test, providing there is sufficient political will to work in earnest to improve *System* performance despite the challenges. If the pilot yields results that should make the change permanent, plans for re-allocations of resources at the appropriate time in the budget cycles should be made accordingly.

Re-Evaluation

IPS recommends that the MFR deployment be re-evaluated after a year of performance data can be reviewed under the new MFR deployment plan and after the reductions in MFR call volume have been made. Thereafter, given the conservative nature of the model, IPS recommends that MFR deployment be re-evaluated whenever performance on a statistical process control chart repeatedly shows sustained unfavorable 'special cause' variation[1] or when process capability metrics show that performance has fallen below specification limits that have been set to coincide with 7:30 with 90% reliability. These are strong indications that factors in the System have changed enough to warrant a new deployment analysis.

[1] Performance should be monitored using statistical process control charts to detect signs of special cause variation. Eight or more consecutive data points trending in the same direction is one of many statistical signals of special cause variation, any one of which should prompt re-evaluation of the deployment plan. Information on statistical process control is widely available. One resource is the Sandia National Laboratory's Center for System Reliability – see http://reliability.sandia.gov/Manuf_Statistics/Statistical_Process_Control/statistical_process_control.html

FUNDING EQUIVALENCE

As the consumer price index, property valuations, and set-aside fund requirements change from year to year, a formula should be applied to calculate the changes that are needed in the *ad valorem* tax rate to maintain funding equivalence.

Funding equivalence would be maintained from year to year based on the following principles:

- Increases in property values would push the millage rate lower, because the *ad valorem* revenue would go up.
- Increases in the Consumer Price Index would push the millage rate higher, because the system will be more expensive to operate.
- Increases in equipment upgrade costs would push the millage rate higher to generate enough revenue to cover the upgrade expense.
- Increases in the amount of system program costs that are not completely covered by the ambulance fees would increase the millage to cover those 'overflow' costs.
- Increases in the rate of contribution to the EMS reserve fund will push the millage rate higher.

To calculate the change needed from year to year in the *ad valorem* tax millage rate, follow the following steps:

- Calculate the expected yield from the *ad valorem* revenues based on the new property values at current millage rate. Deduct fees taken off the top by the Property Appraiser and Tax Collector. This is the projected net yield at the current millage rate.
- Calculate the difference between the projected net yield at the current millage rate and the prior net yield. Add or subtract to compensate for any differences between projected and actual revenue collections from the prior year. This is the net projected *ad valorem* yield change.
- Calculate the change in costs based on the change in the Consumer Price Index.
- Calculate the amount of funding needed for the set-aside fund:
    - Amount to be placed into the EMS reserve fund for the coming year
    - Amount needed for EMS equipment upgrades
    - Amount needed for designated projects (Community Paramedicine Program, Community Life Support and Witness Life Support Programs).
    - Amount needed to meet system program costs not covered by user fees.

- Add the projected net *ad valorem* yield change, projected cost change due to the Consumer Price Index change, and the total cost for the set-aside fund. This is the Total Funding Change.
- Calculate the change needed in the millage, up or down, to meet the Total Funding Change.

LOCATIONS FOR FIRE DEPARTMENT 9-1-1 TRANSPORT UNITS

Number	Location	Vehicles
1	400 DR MLK JR ST S (SP)	2
3	3101 5TH AVE S (SP)	2
4	2501 4TH ST N (SP)	2
5	400 DR MLK JR ST S (SP)	1
6	901 49TH ST N (SP)	2
7	6635 DR MLK JR ST N (SP)	1
8	4701 DR MLK JR ST S (SP)	1
9	475 66TH ST N (SP)	1
10	2800 30TH AVE N (SP)	1
11	5100 31ST ST S (SP)	1
13	11600 ROOSEVELT BLVD (SP)	1
16	4600 58TH ST N (PP)	1
17	5314 23RD AVE S (GP)	1
18	4017 56TH AVE N (LE)	1
20	911 OLEANDER WAY S (S. PAS)	1
23	7301 GULF BLVD (SPB)	1
29	11195 70TH AVE N (SE)	1
30	8971 STARKEY RD (SE)	1
31	13091 88TH AVE N (SE)	1
32	10780 110TH AVE N (SE)	1
33	5000 82ND AVE N (PP)	2
34	6565 94TH AVE N (PP)	2
36	13801 MOOG PL N (PP)	1
38	7630 ULMERTON RD (LA)	1
39	12398 134TH AVE N (LA)	1
41	180 4TH ST SW (LA)	3
42	151 BELCHER RD (LA)	2
43	682 INDIAN ROCKS RD (LA)	1
45	610 FRANKLIN ST (CL)	2
47	1460 LAKEVIEW AVE (CL)	2
48	1700 N BELCHER RD (CL)	2
49	520 SKY HARBOR DR (CL)	1
50	2681 COUNTRYSIDE BLVD (CL)	1
53	3095 McMULLEN BOOTH RD (SH)	1
56	1933 EAST LAKE RD (EL)	1
61	1940 ED ECKERT DR (DU)	1
62	2833 BELCHER RD (DU)	1
65	250 WEST LAKE RD (PH)	2
67	2300 GLENEAGLE PKWY (PH)	1
69	444 S HUEY AVE (TS)	1
Total		**53**

There are 40 stations listed in the table above. Note that Station and 1 and 5 are at the same address. This gives 39 different locations, which correspond to the 39 location icons on the map of fire department transport unit stations.