

**A Review of EMS Systems:**

**County of Maui Department of Fire and Public Safety**

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## Introduction

After careful consideration and review of multiple Emergency Health Services (EMS) Systems, the County of Maui Department of Fire and Public Safety was chosen for review. This system is unique compared to other systems investigated due to the diversity of services that must be provided and the geographical isolation of the divisions and stations. “The Maui Department of Fire and Public Safety provides emergency and non-emergency services for the islands of Maui, Molokai, Lanai, and Kahoolawe and the surrounding waters” (County of Maui, 2016).

This fire-based system provides service to approximately 155,000 citizens plus seasonal visitors to the islands and covers a total of 2,398 sq mi. Of this coverage area, 51.6% is water (Martin, Robson, & McDonald, 2016). Maui County fire is composed of five divisions: Administration and Maintenance, Fire and Rescue Operations, Fire Prevention Bureau, Training, Health and Safety, Ocean Safety. There are 14 fire stations spread across three of the four islands they service (County of Maui, 2016). These stations provide a range of services consisting of fire services, Motor vehicle accident response and rescue, medical emergency services, technical rescue services (mountain and water), hazardous material management, disaster response, as well as non-emergency services. The wide range of capability and self-sufficiency due to limited access to outside agencies makes this system unique in comparison to others.

The unique capability and range of services provided by Maui County Fire also creates a range of challenges that must be overcome. Varying environment and terrain, geographic separation, proximity to a Naval Base with nuclear submarines, and servicing an area with a decommissioned ordinance testing ground means that this department must have greater diversity in their training in order to effectively service their population. With a total tidal shore

line of 343 miles, elevations ranging from sea level to just over 10,000 feet, and many micro climates (DBEDT, 2015), the terrain and environment personnel must operate in varies greatly. This variation requires more diverse training and equipment than many other comparable systems. Given that the Division of Fire and Rescue only consists of 279 personnel, cross training is a necessity. This system covers four of the islands in the State of Hawaii and certain stations and personnel are geographically separated from their higher command structure. This separation has the potential to create major communication difficulties. A 2019 study found “Despite continuous improvements in communication technology, employees’ geographical dispersion remains a challenge to effective workplace interactions and, particularly, to teamwork” (Eisenburg, Post, & DiTomaso, 2019). Although not directly in their service area, the Naval Base at Pearl Harbor has the potential to create major issues as well. As of 2018, there are fifteen Navy nuclear submarines stationed at Pearl Harbor. The Planning Guidance for Response to a Nuclear Detonation developed by the U.S. Department Health and Human Resources states that detectable nuclear fallout from a catastrophic event has the potential to travel several hundred miles (U.S. Department of Health and Human Resources, 2020). This puts the entire county of Maui within a potentially hazardous range should a nuclear disaster occur at the Naval Base. In addition to all other hazards and difficulties mentioned, Maui County Fire also services Kaho’olawe. This area is now a decommissioned testing ground for explosive ordinance and there are still expected to be unexploded ordnance on the island (Deniz, 2018). Although the island is uninhabited, there are still groups of conservationists, researchers, and volunteers that travel there periodically (Baily, 2018). The isolated nature of this island and the dangers involved with responding there would add additional resource and training requirements to facilitate a rescue should an injury be sustained on the island. Although the Maui County Department of Fire and Public Safety faces many challenges associated with operations and training, they are also facing issues due to COVID-19 and budget cuts (Parachini, 2020). Accommodations can be made for the hazards and difficulties associated with

the unique environment this system operates in, the geographic separation of units, proximity to nuclear hazards, and dangerous coverage areas. However, much less can be done to prepare for residual effects of COVID-19 and impending budget cuts. These two issues are the major problems this department is currently facing.

### **Description of System**

The County of Maui Department of Fire and Public Safety is dedicated to protecting and preserving life, environment, and property. To accomplish this mission, they operate 14 fire stations spread across three of the four islands in their service area. The department consists of five divisions: Administration and Maintenance, Fire and Rescue operations, Fire Prevention Bureau, Training, Health, and Safety, and Ocean Safety. They also provide additional resources and programs to educate and engage with the public.

As the name implies, the Administration and Maintenance Division has dual function and consists of two sections. Firstly, The Administration Section is responsible for general oversight of the Department of Fire and Public Safety, including but not limited to the following: Preparing the annual budget, overseeing staffing and promotions, Enforcing Department regulations, overseeing capital improvements, overseeing acquisition of equipment and supplies, and Working with other departments, agencies, and organizations (County of Maui, 2016). The maintenance section takes responsibility for the Department's fleet of 55 vehicles and all of their equipment and tools. This task includes conducting tests, repairs, and preventative maintenance.

The Fire and Rescue Operations Division is the largest of the divisions and consists of 279 personnel. This Division's primary mission is emergency response. The personnel assigned here man the 14 engine companies and are trained in emergency response and mitigation. They also include two ladder companies, one rescue company, and one hazardous materials

company. These companies are supplemented with four tankers, three mini pumpers, three rescue boats, four personal watercraft, 11 utility vehicles, and one helicopter.

The Fire Prevention Bureau consists of four sections that conduct various tasks, but their primary responsibility is to reduce or eliminate fire and safety hazards before they can cause injury, death, or loss of property. The Code Enforcement Section enforces regulations by performing inspections, investigating complaints, answering questions from the general public, and assisting with other tasks as needed (County of Maui, 2016). The Fire Education section develops programs that will help to increase the general public's knowledge and awareness of fire safety and prevention. They also run the Smoke Alarm Maui (SAM) program and outreach programs. The SAM program helps to increase fire safety by providing and installing smoke alarms in the homes of qualifying individuals. For community outreach, they conduct station tours for groups and participate in local events by request. The Fire Investigation Section seeks to determine the cause of fires, prepare investigative reports, and provide testimony in court if required. The Plans Reviewing Section primarily processes and approves building permits and conducts site visits to ensure that safety codes are met prior to the start of any construction. They are also responsible for reviewing and issuing special purpose permits. These permits can include: fireworks, explosive basting, hazardous materials transportation, and a myriad of other unique permits.

The Division for Training, Health, and Safety is divided into two separate sections. The Training Section is responsible for the initial training of new hires and ongoing training for the entire Department. This training covers a wide variety of disciplines including firefighting, emergency medical care, extrication, hazardous materials, and technical rescue. The Training Bureau is responsible for ensuring that personnel are proficient in all necessary skills and that they maintain all required certifications (County of Maui, 2016). The Health and Safety Section ensures that all personnel are healthy, safe, and well.

The Division for Ocean Safety is part of the County's 9-1-1 system and stations lifeguards at public beaches every day from 8:00AM – 4:45PM. All life guards employed by the department are not only certified by the United States Lifesaving Association (USLA), but also maintain certifications as Emergency Medical Responders (EMR), and Cardiopulmonary Resuscitation (CPR). Each lifeguard is highly skilled in rescue techniques using equipment such as rescue boards, tubes and fins, jet skis, four-wheel drive ATV's, and first aid supplies.

The additional outreach programs that this organization maintains includes: a junior lifeguard program, an award and scholarship program, and a fire and public safety commission. The unique breakdown of this department and the additional resources that it employs are critical in its ability to respond to the varying emergencies and disasters it encounters.

### **Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis**

In 2016, the Maui County Department of Fire and Public Safety conducted their own internal review and evaluation of their system. This review and evaluation included a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. "On November 14, 2014, and October 8, 2015, members of the Fire Department and one member of the Fire and Public Safety Commission, were selected to participate in the SWOT analysis" (County of Maui, 2016). Additionally, they presented a plan of strategic initiatives to implement changes within their system. The department also developed a comprehensive list of long- and short-term goals and objectives to track their improvement. This list included public policy changes and existing programs that could be used to meet their goals. Maui County Fire also evaluated their performance and efficiency by sending out "an anonymous public survey requesting feedback on fire department services" from the community (County of Maui, 2016). Although the department's evaluation was comprehensive and thorough, this analysis differs on some points.

**Strengths**

The internal survey of the department identified eighteen strengths that employees valued as significant. Among them, the most notable were “Public education and prevention, Good equipment, vehicles, and Personal Protective Equipment (PPE), Technical rescue, Training program, Utilization of grant opportunities, Leadership development, and Fiscally responsible” (County of Maui, 2016). This analysis agrees with many of these strengths, but disagrees with some. Public education and prevention are arguably some of the most important aspects of any fire service. Not only does it promote trust in the department, it also allows the community to become involved with fire prevention. Several programs that the department runs have a phenomenal impact on public education and prevention. These include: The Smoke Alarm Maui (SAM) program, which provides homes with free smoke and fire alarms in “an effort to reduce the number of deaths related to residential fires” (County of Maui, 2016) and their junior lifeguard program that certifies and trains young individuals in ocean safety. A point of disagreement between the departments SWOT analysis and this review is the maintenance of their equipment and apparatus. Although the service is very well equipped with updated equipment, PPE, and vehicles, proper maintenance can degrade the department’s ability to respond to emergencies. The Maintenance Division of Maui County Fire is uniquely challenged in their mission. With the geographic isolation of the facilities, it is not possible to have a central maintenance facility for upkeep of equipment. Fire trucks cannot be easily shipped between islands and a plan for routine maintenance is essential. One option would be to station mechanics on each island to oversee this process or contract the work out to qualified civilian mechanics in the area. A cost analysis would quickly determine the proper course of action. The department trains and conducts many technical rescue operations and is quite adept at this process. This review also disagrees with training as a strength. The system does offer an adequate firefighter training program for entry into fire service, but they do not appear to have

many opportunities for follow on training to cross-train individuals in many different disciplines. As stated earlier in this review, the geographic isolation of the departments presents a significant challenge in responding to a diverse array of emergencies. It may not be possible for crews to wait for specialists to arrive from another island and having crew members that are diversely trained is essential for efficient response. The utilization of grant opportunities and fiscal responsibility go hand in hand with each other. The information found in this study disagreed with these points as strengths. The Maui County Fire System is currently facing a potential crisis due to budget cuts due to the CoronaVirus. "Maui and Kauai counties could each lose two ambulances and cuts could be scattered across supporting emergency medical services" (Parachini, 2020). Although the system cannot be held responsible for the budget cuts, they can be held accountable for not utilizing the grants that are available to them. "In response to the coronavirus pandemic, HHS is awarding emergency grants and cooperative agreements funded under the Coronavirus Aid, Relief, and Economic Security (CARES) Act, 2020; Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020, Families First Coronavirus Response Act, 2020, and any subsequent COVID-19 related emergency supplemental appropriation" (U.S. Department of Health and Human Services). If they are currently facing a potential crisis due to monetary restraints, they should be applying for any grant they are qualified for. Leadership development is a difficult strength to quantify from the outside of the department. It is important to add to this analysis because the data pulled in the department's study came straight from fire fighters at all levels of the department. If the staff feels that their leaders are being trained and developed well enough for them to mention it in a survey, then it is certainly a strength.

### **Weaknesses**

The most notable weaknesses mentioned in the SWOT analysis were "lack of administrative support, No mobile data terminals, response times, and flow of information within



the department” (County of Maui, 2016). Although lack of administrative support may not seem like a large issue, it can very quickly cause major problems within a department. Although it is not a direct comparison, a survey conducted by the Detroit Foundation of Teachers found “Nearly two-thirds of the teachers who resigned from the Detroit Public Schools over the last two years cited poor administration as one of the three main reasons for leaving” (Brouillette, 1999). If you consider a school of teachers and a department of firefighters at their most basic form, they are a team of individuals helping a community. Both teams have administrative support staff that help them to do their job. Not having enough administrative support can lead to poor administration. Once a handful of firefighters start to leave the department due to this small issue, it can very quickly turn into a flood of personnel leaving. This analysis agrees with the need for updated technology and equipment for personnel in the field. Mobile data terminals “are expected to help streamline first responders’ jobs by arming them with real-time incident and location data when they are on the move” (Mabeus, 2014). Adding mobile data terminals is not only a smart move for this department, it is nearly essential. We are approaching a point in time where emergency services will be unable to function without this technology. Response times were possible the most concerning weaknesses presented in the department's SWOT analysis. A poor response time can have huge implications for a department. It can degrade the communities trust, lead to more property damage than necessary, and even cost lives. This review both agrees and disagrees with response time being a weakness for this fire service. The external survey sent out to the community during the departments own investigation found that civilians were very satisfied with the response times of the department. In fact, over 50 percent of the survey responses gave the highest satisfaction score for response time (County of Maui, 2016). This fact is not the only to consider. The department’s self-analysis also needs to be considered. If the firefighters do not feel they are doing their best, then response times need to be evaluated. Flow of information throughout the department is also a major concern. Again, this is a difficult statistic to analyze as an out-side entity, but it is worth mentioning in this

review because workers that feel neglected are not inclined to put in extra work. Inadequate flow of information can also lead to morale problems that have large negative impacts on the performance of the department.

### **Opportunities**

Significant opportunities identified by the department included: grant funding, youth programs, statewide training facilities, and national fire academy attendance (County of Maui, 2016). Grant funding was also identified by this study as a significant opportunity for improvement within the department. As stated earlier, there are a significant number of federal grants available for departments that are financially struggling due to COVID-19.

Implementation of youth programs is a phenomenal way for a department to conduct community outreach and education. These programs also inspire young individuals to enter public service and expose them to new experiences that they would not have otherwise. Statewide training facilities would also prove to be an asset to the department. Should the County ever require mutual aid assistance, the neighboring islands would be the first entities to respond. Having a statewide training facility would ensure that all firefighters and EMS professionals in the immediate area have standardized training, procedures, and practices. When joint operations are required, this training will ensure that all providers are capable of functioning as a cohesive team. Additionally, sending firefighters to the national fire academy will ensure the department can interface with national response agencies should a large-scale disaster strike. It will also ensure that firefighters and leadership is kept up to date on the most recent training and education in the rest of the country.

### **Threats**

Like all EMS systems similar in size and function, Maui County faces many threats to their department. Like these other agencies, the County of Maui is being threatened by

privatization, lack of funding, the pandemic, and not keeping up with community growth and needs. Privatization is currently a significant threat to many EMS systems nationwide. When private entities begin to operate in an area, they draw call volume away from the system. Call volume translates directly into funding, when call volume is reduced, so is funding. This leads immediately into the next threat facing this particular system. Lack of funding. Funding is what drives EMS systems and allows them to continue operations. Add the next threat of pandemic into the mix and state finances start to struggle. Unfortunately, EMS systems are often the first on the chopping block when it comes to balancing a budget. These factors also feed into the last notable threat to Maui County Fire, community growth. With a projected increase in population size as well as an aging population (Yang-Seon & Bai, 2018), this EMS system is facing significant problems in the time ahead.

### **Strategic Initiatives**

The County of Maui Department of Fire and Public Safety has implemented strategic, department wide initiatives to foster change in their department and to address the concerns brought up in their SWOT analysis. The department identified different components of their SWOT analysis as the most pressing issues requiring attention than this review, but they developed a series of initiatives to solve these issues. The problems they chose to address were peer fitness, morale, fire station maintenance, expanded EMS service, and the potential of charging for rescue operations (County of Maui, 2016). The plan for developing a peer fitness program involves replacing gym equipment in stations, creating non punitive incentives for higher scores on annual fitness tests, providing access to an occupational doctor to reduce on the job injuries, and creating allotted daily times to work out. To increase morale involves improving department communication, planning for regular administration visits of senior leadership to stations, making the promotion process more transparent, and implementing an open-door policy. To fix the issues surrounding station maintenance, department leadership

agreed to examine the possibility of creating a full-time position with the sole responsibility of tracking and coordinating maintenance of fire houses and other facilities. They also agreed to look into expanding the EMS system by coordinating with other departments in the state to coordinate training of EMS personnel. The last issue the department addressed was the option of charging for rescue operations. Senior leadership had no definitive plan to implement this, but conducted research on its feasibility. Although this review agrees with the department's plans to implement changes and processes to improve, it questions the department's priorities. This study does not agree with the topics they chose to address, but the SWOT analysis conducted shows steps in the right direction.

### **Goals and Objectives**

When the Maui County Fire System conducted their own internal review and analysis, they developed a series of short, medium, and long-term goals for the department. In total, they developed ten categories for improvement that they have been implementing across their department. This study found the most significant categories to be governance and administration, financial resources, and physical resources (County of Maui, 2016). The goals for governance and administration included reviewing regulations and standard operating procedures in order to ensure that the department is staying current and periodically evaluating internal workings. Having a system in place to evaluate the efficiency of your own department is critical in operations. To tackle the financial strain on the department, the review developed an ongoing goal to take advantage of all grants, evaluate expenditures, and maintain fiscal responsibility within the department. The goals for physical resources include detailed plans for short term and long-term facility maintenance plans. These three categories were chosen to be highlighted in this paper because they align most closely with the weaknesses, opportunities, and threats that were identified.

### **Recommended Action Plan**

This investigation's primary recommendation to the County of Maui Fire Department would have been to conduct an internal SWOT analysis and review. Since the department conducted their own review in 2016 this recommendation is no longer as significant. However, it is recommended that in 2021, the department consider conducting a five year follow up review in order to track the progress they have made on their goals, objectives, and recommendations. It is imperative to follow up on improvement efforts or they may be forgotten and can even have an opposite effect. In addition to conducting a follow up evaluation, this review recommends that the department consider evaluating the size and effectiveness of their maintenance and administration department and expanding as necessary. Many of the more pressing issues facing this system could be alleviated with more admin and maintenance personnel. Other items that system leadership should consider are improving their use of federal grants, standardizing training with other state departments, evaluating procedures to ensure they follow most recent federal guidelines, and ensuring staff feel confident bringing issues to the attention of leadership.

### **Conclusion**

The County of Maui Department of Fire and Public Safety is a unique emergency medical services system that requires special capabilities and considerations to function. Its isolated nature, range of services, and geographic separation of its units create many challenges that must be overcome for adequate service to be provided. Maui County is also plagued with external threats that could bring down the system if they are not handled

adequately. The internal problems the department faces are: dispersal of units, difficult terrain and environment, proximity to a naval nuclear submarine base, and unexploded ordnance in their service area. The external threats to the department are budget cuts and COVID-19.

Fortunately, the department leadership had the foresight to conduct an internal review to identify potential problems and develop an action plan to correct the issues. The largest problems identified by this review were "lack of administrative support, No mobile data terminals, response times, and flow of information within the department" (County of Maui, 2016).

Leadership developed a comprehensive plan to correct these problems that consisted of long-, medium-, and short-term goals. These goals were designed specifically to provide immediate solutions and long term follow up for the identified problems. If the recommendations listed in this analysis are followed, the County of Maui Department of Fire and Public Safety will rapidly correct their known problems and improve the quality of service they provide to their community.

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