Performance Measurement of the Maumee Fire Division;

A Path to Quality Service Delivery

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A proposed research project submitted to the Ohio Fire Executive Program

July 7, 2014

CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

1.   This paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

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ABSTRACT

Performance measurement is critical for any organization to be efficient and effective. The problem encountered was the data collected by the City of Maumee Fire Division (MFD) did not allow the MFD to adequately analyze true service delivery outcomes. The purpose of the research project was determine if a performance based measurement and benchmarking system could be used to provide effective and efficient solutions and answers to community stakeholders.

The research questions were:

1.   What is the purpose of performance measurement?

2.   What are the advantages and disadvantages in performance measurement?

3.   Do comparable departments measure performance, and if so, how is it utilized?

4.   What performance indicators should the MFD measure?

The Literature Review consulted and evaluated numerous resources, including texts, journal articles, private and public sector reports, and NFA EFO and OFCA OFE Applied Research Projects.

The Procedures involved identifying and comparing other fire departments. Comparisons were divided into two parts: local neighboring departments (regardless of population size and square miles served) and other departments in Ohio (with comparable population size).   Direct contact was made with each department and a survey was used through a phone interview.

Current results have shown a lack of awareness of formal performance based measurement systems, but some have created their own measurement system, though specific to their needs.   This would be either process level by measuring specific benchmarks (e.g., patient

contact time, water on the fire, air monitoring) and job/performer level (e.g., individual employee performance, call attendance, and citizen surveys).

Recommendations for the MFD are threefold. First,establish a baseline for MFD performance. Second, establish benchmarks through an informal system, specifically focusing on outcomes, not just outputs. Finally, develop goals and objectives through a strategic plan to ensure quality service now and in the future.

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INTRODUCTION

The Maumee Fire Division (MFD) has been a core organization within the City of Maumee for over 175 years. Through strong support of the community and division members, the MFD has evolved over time into a well-respected organization, and is positively recognized by other area fire departments. It has always been a fundamental mission ofthe MFD to deliver a high standard of care, readiness, and response to the community. In order to maintain high standards, the MFD has focused on keeping track of "outputs"(how many fire calls, EMS calls, fire inspections, training hours, etc.), through annual reports, audits, and data collection. However, the MFD has never examined or measured its "outcomes" (actual results), its "efficiency" (cost measures of outputs), or its "cost-effectiveness" (cost measures per unit of outcome).Oneexample of an "outcome" not being measured has been the availability of paid-on-call personnel to adequately staff the city's medic units (ambulances). Over the last several years, the MFD has experienced a decrease in paid-on-call members signing up for shifts or responding to calls to staff the medic units.This has resulted in unavailable MFD medic units for calls, increased response times, and an increase dependence on mutual aid.

The problem this study will address is the current response data collected by MFD does not allow the MFD to adequately and effectively analyze true service delivery outcomes. In order to find a solution to this problem, the MFD must assess and measure actual performance outcomes. Efficiency and cost effectiveness also can be measured, with the end goal to determine if the MFD is providing a quality service delivery with consistent fiscal responsibility.

As a public service organization, the MFD is accountable and responsible to community stakeholders, such as citizens, the city business community, public and private organizations, elected officials, and MFD employees. Therefore, *the purpose of this study is to determine if a*

performance based measurement and benchmarking system, specific to service delivery, can be used to provide effective and efficient solutions and answers to community stakeholders.

The research questions this study will investigate are:

1. What is the purpose of performance measurement?

2. What are the advantages and disadvantages in performance measurement?

3. Do comparable departments measure performance, and if so, how is it utilized?

4. What performance indicators should the MFD measure?

These questions will be answered through descriptive research methods, utilizing data analysis and a survey tool. This includes literature research on performance measurement, statistical data from MFD incident reporting systems, department reports, city reports, and other applicable resources.

BACKGROUND AND SIGNIFICANCE

Established in 1838, the MFD is a combination department and provides fire, rescue, and EMS service to the City of Maumee, Ohio. Located in Northwest Ohio, Maumee is a suburb of Toledo, and has approximately 14,286 residents (2010 Census), and is roughly 11 square miles.Daytime population in the city exceeds 30,000 due to its diverse commercial and industrial businesses. In 2013, the MFD responded to 1,292 EMS responses and 357 fire related responses. Over the past five years, MFD has averaged 1,287 EMS and 381 fire responses. Full time staff includes the fire chief, three deputy chiefs, two fire inspectors, and 13 full-time paramedics. The six administrative personnel (chiefs and inspectors) work a 40 hour week (Monday thru Friday 0730 – 1600 hrs). There are 31 "paid on call" firefighter/EMT's. These members respond from home, and are paid per call. In addition to the 19 full-time members, the total staffing of the

MFD is 50 members. The authorized strength of the MFD per city ordinance is a maximum of 55 members.

The MFD provides fire suppression, fire prevention, hazardous materials response, limited technical rescue, and EMS (advanced and basic life support, a.k.a. ALS and BLS). There are two fire stations in the city. Fire Station #1 is houses all fire and EMS apparatus, including LS-7. The majority of full time personnel work at Fire Station #1. Fire Station #2 has three full-time staff (fire prevention personnel), and a spare fire engine. As of May 2011, the Insurance Services Office Inc. (ISO) classified Maumee as having a Public Protection Classification (PPC) of "3" (ISO, 2011).

It is important to explain the 13 full-time paramedics work a 24/72 hour shift rotation (three per shift, plus a weekday full-time "station paramedic") and staff the Lucas County ALS Ambulance (Life Squad 7), which can respond anywhere in Lucas County. The minimum manning per 24/72 hour shift is two full-time paramedics. The primary response area of LS-7 is Maumee, Southwest Toledo, and parts of western Lucas County. In 2012, LS-7 responded to a total of 2,031 runs within and outside the City of Maumee. LS-7 is staffed by two full-time paramedics. If the third full-time paramedic is on duty, they will either staff the MFD ALS first responder car (Unit 11), or one of the three city medic units (depending on paid-on-call member availability). Because the full-time paramedics are classified and hired only as "paramedics", they do not staff any firefighting apparatus.

City of Maumee EMS medic units can be staffed by any member, however they are primarily staffed by paid on call members who are firefighter/EMT's. EMS calls in the city and Lucas County are designated as either ALS or BLS. Examples of ALS calls are chest pain, unconscious victims, and uncontrollable bleeding. Examples of BLS calls are non-threatening

emergencies, such as a lift assist, or a minor illness or injury. All ALS/BLS calls are routed through the Lucas County EMS 911 Center, and designation is made by certified Emergency Medical Dispatchers.

Fire calls in the city are designated as either "silent alarms" or "general alarms". The majority of fire calls in the city (roughly 2/3) are classified as "silent alarms". The deployment response to these calls is an "on call officer". This is a single unit response (a FD issued SUV), staffed by one of six "on call officers" (four chief officers and two fire inspectors). These individuals are responsible for one week of "on call" time, and rotate each week, starting Mondays at 0730hrs. until the following Monday at 0730 hrs. These "silent alarms" consist of varying call types. Currently, the Maumee Communications Center (911 dispatch center) answers the call and then decides whether to assign it as a "silent" or "general" alarm. At present, the dispatch center does not have any comprehensive written policies on how to distinguish these call types. Therefore, what one dispatcher may classify as a "general" alarm may be dispatched as a "silent" alarm by another dispatcher. The following are examples of "silent alarm" call types:

- Fire alarms (all occupancies)

- Bomb threats

- Carbon monoxide checks/alarms

- Natural gas leaks

- Smoke investigations

- Wires down

The MFD has consistently collected data for many years. Fire and EMS incident reporting has been maintained through the National Fire Incident Reporting System (NFIRS) and

the State of Ohio EMS Incident Reporting System (EMSIRS). Annual reports are produced

every year, and made publically available. At present, annual reports collect and report on

limited data, specifically outputs (number of calls, training hours, hours worked, etc.).

In March 2012, the State of Ohio, Office of the Auditor of State (2012), performed a

Performance Audit of the City of Maumee. The goal of this audit was to improve operating

efficiency, effectiveness of service delivery, and projected financial condition (p.1). Data was

collected, and comparisons were made against several other Ohio communities, yet the data was

only specific to staffing and expenditures. The only specific recommendation made for the MFD

was to increase the span of control (p.16).

To date, there has been no other system, or study, done on any type of performance

measurement within the MFD. Because MFD performance is not measured, the effects of

situations such as unavailable personnel to respond to EMS calls, and the response of a single

fire officer to the majority of fire calls, is not truly known or understood. Therefore, *the

potential impact this study could have on the MFD is*threefold: 1) Understanding performance

provides an objective and legitimate means of decision making, 2) Help determine current and

future needs, and 3) Establish and maintain "best practices", while focusing on strategic

planning. Furthermore, in order to prove the value of the MFD to the community, the overall

performance must be understood. If service delivery is substandard, it could have adverse effects

on the health and welfare of the public, and fire/EMS personnel. Having a comprehensive

performance measurement system can provide quantifiable evidence of MFD operational

readiness and response, thereby impacting future decision making. Given the constant financial

challenges within the City of Maumee, this is critically important when evaluating cost-

effectiveness and planning future budgets.Through research, the significance and benefits of

performance measurement can be assessed, with the goal of impacting future decision making and planning.

LITERATURE REVIEW

A number of resources were used with the overall goal of providing legitimate, valid, and practical information for decision making. The literature review includestexts, journal articles, private and public sector reports,and National Fire Academy Executive Fire Officer and Ohio Fire Executive Applied Research Projects. The literature review discusses the significance of each of the four research questions: 1) What is the purpose of performance measurement? 2) What are the advantages and disadvantages in performance measurement? 3) Do comparable departments measure performance, and if so, how is it utilized? 4) What performance indicators should the MFD measure?

The purpose of a performance measurement system is simple in theory, for "what gets measured gets done" (ICMA 2002). Yet the process of accurately identifying and capturing data, then analyzing and communicating findings, is complex. For over 30 years, performance measurement has been a key buzzword in the public and private sectors. Robert Behn (2003) points out, "neither the act of measuring performance nor the resulting data accomplishes anything itself; only when someone uses these measures in some way do they accomplish something." As we measure performance against goals and objectives, it legitimizes the process and brings accountability. Performance measurement began to be strongly advocated in the 1990's, especially with the reinventing government movement. The 1992 text *Reinventing Government* by David Osborn and Ted Gaebler, was a catalyst for governments to re-examine their operations. Osborne and Gaebler (1992)stressed governments focusedon inputs, and not on outcomes. They stated because bureaucratic governments don't measure results, "they rarely

achieve them" (p.139). An example would be the amount of money given to systems that fail, such as schools, welfare, and police. When children do poorly in school, or when welfare lists grow, or when the crime rate rises, the systems are funded more (p.139). Governments have to be accountable for their results, and the primary way of accomplishing this is through performance measurement. A system that shows results will be well funded, forcing those who are not well funded to make the necessary changes. Rewarding success instead of failure is the key objective, and "if you don't measure results, you can't tell success from failure" (p.147). Government must know when they are failing, know how and why they failed, and then learn their failures.

The National Performance Review spearheaded by Vice President Al Gore emphasized examining government programs in terms of what they did and did not accomplish. Particular attention to performance measurement was done through the GovernmentPerformance and Results Act of 1993 (GPRA). Designed to improve government project management, the act mandated programs measure accomplishments and be in line with budgets.The purpose of the act was to: (1) improve confidence of government through accountability; (2) measuring program performance against goals, and reporting publicly on their progress; (3) promote focus on results, service quality, and customer satisfaction; (4) help managers improve service delivery; (5) improve decision-making by providing more objective information; and(6) improve internal management of the Federal Government (GPRA 1993). Information from the GPRA can help government deliver economical, efficient, and effective programs.

Kelly and Rivenbark (2010) argue the "why" question of performance measurement has already been covered. Simply stated, the "why" is about accountability (p.90). Since the consensus for the past 15 to 20 years has been to move toward accountability, what matters now

is "how to construct good measures and how to use them to improve efficiency and effectiveness of service delivery" (p.90).

The second research question asks what are the advantages and disadvantages of performance measurement. Overall, the advantages of performance measurement are numerous. One principal advantage is continuous improvement. The concept of continuous improvement is to build from the bottom up. Its goal is to develop relationships with employees rather than focus on the structure or process of the organization (Fessler and Kettle 1996). By focusing on employee relations, cooperation can be achieved. The management concept entitled Total Quality Management (TQM), developed by W. Edwards Deming, was the philosophy in which continuous improvement was based upon. According to the TQM concept, "total commitment to continuous effort to achieve quality in everything the organization does is the keystone to everything that managers must worry about" (p.78). Continuous improvement entails an involvement and a commitment of all employees. Review of the improvement process must be constant as to ensure its effectiveness. Through application of continuous improvement, any organization, public or private, will be able to function better.

Another advantage of performance measurement is data collection. This collection can be analyzed if displayed in a standardized method. In 1999, the Minnesota Office of the Legislative Auditor (1999) issued a report entitled *Fire Services: A Best Practices Review*. This report was a comprehensive best practices review of Minnesota fire departments. The report discussed the importance of data, and measuring performance over time. This enables departments to have information to quantify their achievements as well as identify areas needing improvement (p.152). The report stated:

Performance data shows the actual results of fire departments' actions. They allow fire

departments to demonstrate their real needs with verifiable data on workload, personnel, and other resources, which can be helpful in justifying budget requests, charting a direction for the department's future, and suggesting changes in service.

(p.152)

Flynn (2009) stated the first step in performance measurement was to clearly identify the goals and purpose of the department and fire service functions (p.41). This is done by specifically identifying target rates or percentages for each goal (p.41). Hence, proper data collection is essential. When done correctly, the performance information can be used quite effectively. This includes setting performance targets, learning from other organizations (benchmarking), and communicating results to employees and citizens.

The ICMA text, Managing Fire and Rescue Services (2002), cites several performance measurement "truths". It explains *without* measurement:

- Performance isn't being managed.

- One cannot specifically identify, describe, and set priorities on problems.

- People cannot fully understand what is expected of them.

- People cannot be sure whether their performance is on or off track.

- There are no triggers for performance improvement actions.

- Management is a set of uneducated guesses.

(p.302)

Another advantage is the effect on "results-based budgeting". As stated in the ICMA (2002) text, "the direct application of performance measurement in preparing and justifying budgets for specific programs or activities is called results-based (or outcome-based) budgeting. If performance measurement isn't used, it's very difficult to identify areas needing improvement,

then how to spend the money. Performance measurement can then be used to analyze

performance gap's, and then effects of budget increases or decreases (p.329).

Although the case for performance measurement is strong, there can be disadvantages, or

better stated, drawbacks. First is commitment. There has to be top down commitment from the

organization. Those in director/supervisor roles will make decisions, while those in line

positions may be collecting and reporting data. Therefore, "the usefulness of performance

measurement information is directly related both to the accuracy and completeness of the data

collected and to the analytical skills of those interpreting the data." (p.332)

If management cannot dedicate the time and resources needed, performance measurement

will not be effective. Tyagi and Gupta (2008) list several other disadvantages:

- Multiple interpretations of performance measurement across the organization if goals and
  usage of the system are not clearly defined.

- Lack of common understanding among various stakeholders.

- The performance measurement system is not aligned with organizational strategy and is
  not updated and changed as strategies change.

- The use of a standard cookie-cutter approach but doesn't adapt to the organizational
  context.

- Lack of relationship between measures and organizational performance (missing what is
  measured and what is important).

(p.55)

The third question of this study asks if comparable departments measure performance,

and if so, how is it utilized. In addition to the survey instrument developed, it was important to

review why exactly it's important to look at comparisons, also referred to as benchmarking.

According to Coleman (1997), benchmarking is absolutely critical because the level of service isn't an abstract concept; it's measured by what you actually do for people when they come to you for service (p.31). The term "benchmark"refers to a standard which an organization measures to, but also is a search for the best practices (Flynn 2009, 6). The author C.A. Sharp (1994) pointed out that there are usually five to seven steps in the benchmark process, as shown below in Figure 1:
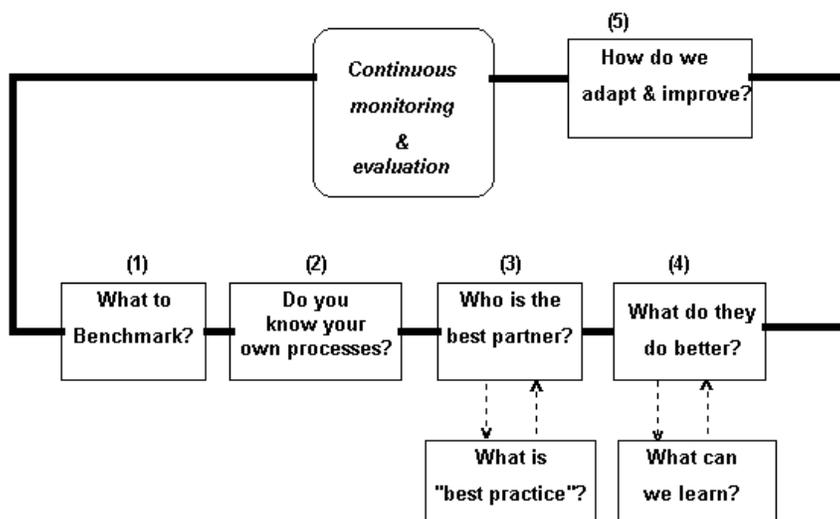

Figure 1 – Five Steps to Benchmarking (Sharp 1994)

Fire departments must be cognizant of how to benchmark correctly. Otherwise, they may be just going through the motions, collecting data that ends up not having much worth. Murray (2006), in his study on Benchmark Analysis and Cost Efficiency of the Deer Park Silverton Joint Fire District, noted many surveys on benchmarking didn't "adequately address both relative effectiveness and cost efficiency" (p.18). Furthermore, many surveys are take time and require a lot of data. Therefore, there is a need for a "system of comparison which is relatively straightforward and which uses readily available data" (p.18).

In order for a comparison to be beneficial, there are some "shoulds" that need to be followed when choosing similar departments. However, since there is no "single characteristic"

that constitutes a "similar" community, we must match some key characteristics (Flynn, p.6).

Flynn (2009) suggests the following to consider:

- Socioeconomic factors, such as population, education level or median household income.

- Climatic conditions, such as measuring the time spent working in temperature extremes.

- Community layout and traffic

- Construction, including age profile of buildings and type of construction.

- Makeup of community (e.g., residential, commercial, and industrial)

To ensure we compare to the right department, Folz (2004) stated "by establishing a target level of service quality and comparing the department's performance to other departments that measure themselves against the same target". If Department A is going to measure against Department B, its critical Department A uses the same measures and means of calculating those measures as Department B when results are compared.

So what performance indicators should the MFD measure? If the comparative information is used, ideally this allows decision-makers to make educated assessments. The objective is to find any gaps or trends, and determine what is acceptable, and what is unacceptable. From there resources should be expanded or restructured to match the needs of the City of Maumee. It is important to define four key terms in performance measurement. Lawson (2006) lists them as:

Inputs- The amount of resources used to produce a program or to provide a service, generally expressed in expenditure or labor units.

Outputs - The amount of a service or program provided, representing completed work activity or effort, as expressed in units of service delivered.

Efficiency Measures – Indicators of how well the organization is using its resources, expressed as a ratio between the amount of input and the amount of output or outcome.

Outcome Measures – Indicators of how well a program or service is accomplishing its mission, including quality, cycle time, and customer satisfaction measures.

Another key term from the ICMA (2002) text is:

Intermediate Outcome – Factors expected to directly result in a change in outcome (e.g., response time and the number of fires that reach flashover) (p.297). If used correctly, these measures can provide a comprehensive picture of MFD operations. The measurements can be quantifiable and legitimate, allowing the MFD to begin to compare itself to other fire departments.

There are several templates fire and EMS departments can use to measure performance. Yet the specific focus is to measure those applicable to the MFD. Once information is gathered, it must be decided what can be done with it. Many departments collect and monitor performance, but many do not analyze the outcomes, and take action to make changes. It is essential past performance and the identified goals be compared. This could be done seasonally, quarterly, or annually. However, there have been cases of departments being very efficient at performing the necessary procedures toachieve the desired outcome, but were not very effective in achieving the desired goal or outcome (Flynn, p.41).The converse is also true, and needs to be remembered when evaluating the effectiveness andefficiency of the department (p.41).This particularly is true when examining budgets.

The ICMA (2002) text discusses the model created by Geary A. Rummler and Alan P. Brache, which directly relates to fire and rescue organizations. Since an organization can be seen as "system", it is easier to understand the relationships among variables and how changes in one part can affect operations of another part (p.301). The three levels they describe are the organization, the process, and the job/performer (p.301). Performance measures of each level would be:

Organizational – strategies and objectives found in strategic plans.

Process – protecting life, property, and environment, and incident stabilization.

Job/Performer – Individual and/or team performance

(p.303-304)

The *Fire Services: A Best Practices Review*(1999), document goes further, and identified five primary goals and seven corresponding actions and best practices. The goals identified were:

1. Prevent the outbreak of fires and achieve fire safety awareness throughout the community.

2. To ensure the enforcement of fire and life safety codes for the prevention and control of structure fires.

3. To investigate the cause, origin, and circumstances of fires in the jurisdiction.

4. To maintain a response capability that is safe and effective.

5. To protect citizens' life safety and property against the dangers of fire and other emergencies that may occur in the response area.

(p.31-32)

The actions and best practices for effective and efficient fire departments were:

1. Assess risks and develop long-range plans.

2. Evaluate fire department performance and use resources cost-effectively.

3. Promote public awareness of fire safety.

4. Ensure fire code enforcement.

5. Develop effective communications systems.

6. Prepare a competent work force and support safe operations.

7. Plan for on-scene responses.

(p.31-32)

Regardless of what is collected and how it's collected, stakeholder acceptance is critical. Administrators and policy makers need to be committed to the time and resources it will take to review results and develop actions. At the same time, stakeholders must be pragmatic and know their limitations, specifically as it pertains to budgets. Otherwise, results just become words and numbers on paper.

PROCEDURES

The objective of this research project was to determine if a performance measurement and benchmarking system can be used to provide effective and efficient answers to community stakeholders. The project used descriptive research methods through data analysisand a survey tool.

First, to discuss the need for performance measurement, and its advantages and disadvantages (Research Question #1 and #2), an extensive literature review was conducted. Resources included literature found in texts, journal articles, private and public sector reports, and National Fire Academy Executive Fire Officer and Ohio Fire Executive Applied Research Projects.

Second, it was critical other fire departments were surveyed to establish comparison (Research Question #3). Comparisons were needed from two groups: 1) Local departments to the City of Maumee (same or neighboring county) and 2) Ohio departments similar in population. Local (neighboring) departments were surveyed to provide city administrators and politicians (policymakers) adequate data to make comparisons. This was critical because locally, policymakers often examine and compare data from neighboring communities in many areas of decision making. Other departments in Ohio were selected based on population size between 13,000 and 18,000 people (similar to the City of Maumee). An email explaining the project, survey, and requesting an interview was sent to 26 departments, 8 of which were local (neighboring) and 18 were in other areas of Ohio. Of the 8 local (neighboring) departments, 8 surveys were completed (100%). Of the 18 statewide departments, 8 surveys were completed (44%). In total, 16 out of 26 surveys were completed (61%).

Completed surveys were done by phone interview to obtain the most accurate data and explanation from respondents. The interview was standardized and asked a mix of closed and open-ended questions. An email was sent to each departments fire chief requesting a phone interview. Interview times were set up via email correspondence. Respondents were individually called, and interviews averaged 15 to 20 minutes.

The first five questions asked population, type of department, number of members, and number of calls (fire and EMS). The survey then asked if a "formal or informal" performance based measurement system was utilized. For each type of system, several follow up questions were asked, specifically why such system was used, and what were the top five indicators to be measured. Attention was given to differentiating between organizational, process, and

job/performer levels. If no system was used, it was asked why. Information from these surveys provided a sampling of how other departments are using performancemeasurement.

Finally, to determine what MFD indicators should beestablished (Research Question #4), data and information obtained was used to assess what indicators should be measured in the MFD, and what recommendations can be made. In addition, careful attention will need to be given to the three levels of performance discussed in the literature review (organizational, process, and job/performer).

Definition of Terms

Commission on Fire Accreditation International (CFAI):A commission of the CPSE which accredits fire and emergency service agencies. This is done through a comprehensive self-assessment and evaluation model that enables organizations to examine past, current, and future service levels and internal performance and compare them to industry best practices (CPSE website, 2014).

Center for Public Safety Excellence (CPSE):An agency made up of individual commissions providing programs including accreditation for fire and emergency service agencies and professional designations for fire and emergency service officers at all levels.

Formal performance based measurement system: A system created by a third party agency (ICMA, CPSE, or other).

International City/County Management Association (ICMA): An association representing professionals in local government management.

Informal performance based measurement system: A system created by a fire department to meet specific needs.

Job/Performer performance measures: Individual and/or team performance

Organizational performance measures: Strategies and objectives found in strategic plans.

Process performance measures: Those operations relating to protecting life, property,

and environment, and incident stabilization.

Limitations

A few limitations to the study were found specific to the survey and interview. A point

was made to directly contact the fire chiefs of each of the 26 cities. Of the 26 chiefs emailed,

only 16 replied and were interviewed. It is understood many fire chiefs have busy schedules and

to participate in a 20 minute survey would be difficult. Another limitation was the limited

amount of cities close in population size to Maumee. In Ohio, there are only 10 other cities with

population between 14,000 and 16,000. In order to survey more departments, the population

threshold was increased to 18,000. It was hoped departments with comparable run volumes

could be evaluated; however no such data base exists to find this information. Therefore, one of

the questions asked was how many runs (fire and EMS) the respective departments responded in

2013.

RESULTS

The results of this applied research project have been compiled through extensive

literature review and survey information. The following are the results to each of the four

research questions.

Research Question 1: What is the purpose of performance measurement?

A number of resources were consulted and researched to examine the purpose of

performance measurement. Throughout the research, the main reason "why" performance

measurement is done is to ensure accountability. Organizations set goals and objectives, and the

only true way to know if those goals and objectives are being met is to measure performance. Specific to the fire service, performance measurement disciplines fire departments to accurately measure what is being done, how it's being done, and why it is being done. Through this process comes not only accountability, but quality decision making and improved service as well.

Examining the survey results, it was evident departments use performance measurement to accurately measure and analyze specific data. This ranged from patient care practices to overtime costs.

Research Question 2: What are the advantages and disadvantages in performance measurement?

The literature review continued to examine the advantages and disadvantages of performance measurement. Various references discussed the advantages and disadvantages of performance measurement. The research showed many more advantages than disadvantages when using performance measurement. These included:

- Continuous improvement

- Data collection

- Improves budgeting

- Assists in identifying issues in service delivery

- Improves decision making

Some disadvantages were also identified in the literature review. Specifically, authorsTyagi and Gupta (2008) listed several, including:

- Multiple interpretations of performance measurement across the organization if goals and usage of the system are not clearly defined.

- Lack of common understanding among various stakeholders.

- The performance measurement system is not aligned with organizational strategy and is not updated and changed as strategies change.

- The use of a standard cookie-cutter approach but doesn't adapt to the organizational context.

- Lack of relationship between measures and organizational performance (missing what is measured and what is important).

From the survey results, it was clear the advantages for fire departments was to assist in policy making by providing the necessary data to justify specific decisions. However, it appeared the primary disadvantage of performance measurement was it time and resource consumption.

Research Question 3: Do comparable departments measure performance, and if so, how is it utilized?

To effectively answer this question, a survey, done by phone interview, was conducted of 16 other fire departments in Ohio. Answers from the survey provided insight into what similar, and neighboring, fire departments are doing when it comes to performance measurement.

The results from the survey instrument suggested very few departments used a "formal" type performance measurement system. Of these "formal" systems, the model used was from the Center for Public Safety Excellence (CPSE) Commission on Fire Accreditation International (CFAI). Research included in the literature review confirms the CPSE model is the preferred system. McGee's (2009) research found of the 14 U.S. fire departments he surveyed using performance measurement, 11 of these used only measures found in the CPSE model (p.36). The CPSE model consists of 244 performance indicators, and departments must enter a plan to ensure improvement. From this projects survey, the two departments using formal systems were

accredited (City of Toledo and Bowling Green). Both departments stated the accreditation

process was pushed by administration, and was very time consuming. However, they stated

through the CPSE model, performance is constantly and consistently measured. Through this

almost all fire department programs and operations are adjusted and updated as needed. Within

the model, there are ten performance evaluation categories:

- Assessment and Planning

- Essential Resources

- External Systems Relations

- Financial Resources

- Goals and Objectives

- Governance and Administration

- Human Resources

- Physical Resources

- Programs

- Training and Competency

(CFAI website, 2014)

It should also be noted in Ohio, there are only 10 CFAI accredited departments, as of

April 2014 (CFAI website, 2014).

Survey results showed the majority of departments (75%) using some form of "informal"

performance measurement. Each of these departments created measures that were applicable

and met the needs of their respective departments or administration. There were two

departments with no system in place. These departments cited lack of knowledge of

performance measurement systems.

The results from the survey instrument are located in Appendix 3 of this paper.

Research Question 4: What performance indicators should the MFD measure?

The literature review and survey instrument identified a number of different methods and models to measure performance. The first question to answer will be whether to utilize a "formal" versus "informal" system. If a formal system is selected, the CPSE model would be a preferred choice. However, for the MFD to undergo the accreditation application and process, it would be extremely time and resource consuming. Although possible, this would not be feasible for the MFD due to lack of resources. Data suggest an informal system, one specific to department needs, can be used.A number of resources could be used as a format to begin the process. These include the ICMA text, Managing Fire and Rescue Services (2002), and the Minnesota Office of the Legislative Auditor (1999) report entitled *Fire Services: A Best Practices Review*. The three levels of performance should be measured indicated in the ICMA (2002) text. These are:

Organizational – strategies and objectives found in strategic plans.

Process – protecting life, property, and environment, and incident stabilization.

Job/Performer – Individual and/or team performance

(p.303-304)

From the survey instrument, data suggests the majority of departments developed their own informal systems to measure what matters to them. However, several key indicators were of priority. These included response times, turn out times, and employee performance. In the departments with formal systems, strategic planning was a top indicator.

DISCUSSION

From the research and survey, several key points came to light: 1) Performance measurement must be understood, 2) performance measurement must be supported, 3) fire departments need to measure what is applicable to their department and service area, 4) fire departments must use a system and/or model that works for their department, and 5) the performance measurement must be continually reviewed and evaluated.

First, it is critical to understand performance measurement.   Research showed many uses and advantages of performance measurement. These included continuous improvement, effective data collection, showing actual results, and assists with budgeting. To reiterate the statement made by Osborne and Gaebler (1992), "if you don't measure results, you can't tell success from failure" (p.147). Administrators need to do their own research and understand the concepts, benefits, and issues with performance measurement before undertaking it. Of the departments who did not do performance measurement, one of the key reasons was because it was not understood, or know what it could do.

Commitment and support from all levels is the next critical point. Much of the literature review recommended administration and employees must have a buy in, and continue to support the process. It cannot be just a onetime thing. In the text Municipal Benchmarks: Assessing Local Performance and Establishing Community Standards (Ammons, 1996), step one of a performance measurement and monitoring system is to "secure managerial commitment" (p.20). Fessler and Kettl (1996) stressed the management concept in the TQM process, stating "total commitment to continuous effort to achieve quality in everything the organization does is the keystone to everything that managers must worry about" (p.78). It's important to note the two

accredited departments surveyed for this project stated they had strong commitment from administrators.

Measuring what is applicable, and what matters, is the next key point. Spitzer (2007) emphasized "in order to thrive – not just survive – and move to a higher level of performance, organizations need to focus on one or more critical measures that matter most, and companies need to focus on everybody's attention on those measures" (p.76). The survey results showed many departments collect data, and many may use that data to measure performance of some type. However, measurement was selective, depending on the needs of the department. These indicators were either driven by administration or community needs. Examples would be a department looking to build a new station. Response times and travel distances would be measured exclusively. Another example is overtime costs. Departments would need to measure run data, crew sizes, and cost per run to determine if more or less staffing would be appropriate.Whatever may be the case, the focus should be on what matters most to the department and community.

Another key point is once a department decides on what to measure, they need to use a system or model that is efficient and effective for their department. There are many models, formats, templates, etc. on how to do performance measurement, and what to measure. One of the key goals of the CPSE accreditation process is to ensure departments are doing what they say they are doing. McGee (2009) in his research stated "it will be necessary to create a model that will be user-friendly while producing accurate results in the areas that really matter to the department" (p.24). Survey research showed the majority of departments (75%) using an "informal" type system. This meant a system that worked for them, and could accomplish their

specific goals and objectives. This system directly relates to the previous point of measuring what matters most.

The final key point is to ensure the performance measurement process is continually reviewed and evaluated. This is part of the overall continuous improvement process. Just collecting data and measuring it will only go so far. For departments to accurately measure what they are doing, the entire process should be reviewed. Are the right questions being asked?   Is the right data collected? Is there continual support and buy in from all involved? From the survey, the two departments using a "formal" system (CFAI accredited) are required to continually review and evaluate the process. Several department using "informal" systems also stated it was critical to review their process. Thorough review and evaluation, regardless of which type, can keep a system and process effective and efficient.

RECOMMENDATIONS

It was the goal of this applied research project to find a path, (through methods or other means) to quality service delivery for the MFD.Furthermore, it was the purpose of this study to determine performance measurement and benchmarking could be used to provide solutions and/or answers. From the literature review and survey instrument, three major recommendations can be made:

1) Establish a baseline for MFD performance.

2) Establish benchmarks through an informal system.

3) Develop goals and objectives through a strategic plan.

First, a current baseline of MFD services needs to be established. Instead of simply collecting data (run volume, training hours, how many inspections, etc.), it's time to start

measuring it. Record management systems have been updated in the past few years, and can

provide administrators with accurate information. This includes a new computer aided dispatch

system (CAD) recently implemented in the city. Annual reports need to reflect what is actually

being delivered. This should include all bureaus of the MFD, including operations, prevention,

and EMS. In essence, the MFD can then determine its service level parameters.

Second, prioritize the indicators that matter, and measure them. The focus needs to be on

the outcomes of these indicators, or benchmarks, with the objective to identify any gaps or

trends. Data suggests an informal system, one specific to MFD needs, can be used. What is

critical is to establish applicable benchmarks. A number of resources could be used as a format

to begin the process. These include the ICMA text, Managing Fire and Rescue Services (2002),

and the Minnesota Office of the Legislative Auditor (1999) report entitled *Fire Services: A Best*

Practices Review. The three levels of performance should be measured indicated in the ICMA

(2002) text. These are:

Organizational – strategies and objectives found in strategic plans.

Process – protecting life, property, and environment, and incident stabilization.

Job/Performer – Individual and/or team performance

(p.303-304)

All three levels (Organizational, Process, and Job/Performer) should be measured to

ensure quality service now and in the future. The benefit will be measures most applicable to the

MFD and its service delivery.

Flynn (2009) emphasized performance measurement relies on the evaluation of achieved

outcomes, not desired outcomes (p. 41). These measures should be compared to past and target

goals. To be a true indicator, it's critical to *measure* what is actually being done. Wodicka

(2013) elaborates even further by stating performance measurement "should not be tied to centrally established measures that fail to consider the environment in which departments are operating" (p.15). Rather, departments should be "assessed based on the merits of the service delivery it accomplishes" (p.15). Survey data suggests response times and staffing are two primary indicators measured by departments, regardless of a formal or informal system.

For the MFD, an example would be to measure the outcomes of the single "on call officer" response. Questions specific to the MFD to ask could be:

1) Are the response times adequate?

2) How many incidents have required more than one responding fire officer?

3) For upgraded alarms, how long were fire suppression crews delayed?

Concerning ambulance staffing, it should be asked:

1) What are the average response times?

2) What are the average patient contact times?

3) What is the patient/customer satisfaction feedback?

Finally, there must be a plan on what to do with the information collected and measured. Goals and objectives need to be established once gaps and trends are distinguished. Only then can it be determined what is acceptable and unacceptable.Of the departments surveyed, there were many responses regarding what is done with the information measured. However, it was noted both formal and informal systems used the information for an overall strategic plan development. The MFD has never had a strategic plan, and could benefit greatly from one. This would impact overall performance in all areas, including operations, prevention, and EMS.

This "path" to service delivery can be found, and then traveled, but only with proper support. Administrators and policy makers need to be committed to the time and resources it will

take to review results and develop actions. At the same time, stakeholders must be pragmatic and know their limitations, specifically as it pertains to budgets. Otherwise, results just become words and numbers on paper.Perhaps the best approach is not to re-invent the wheel, but to see what you have and make it better.

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APPENDIX 1 – Survey Cover Letter

Dear Chief,

I'm currently in the OFCA Ohio Fire Executive Program (OFE) Class 13, and am working on an applied research project on performance measurement.

I'd like to do a brief survey by phone interview with you at your convenience. The questions are based on performance based measurement systems and activities. The call shouldn't take more than 15 to 20 minutes of your time.

If you could do an interview, please let me know a time I could call you. Or if you require further information on the survey, I'd be happy to provide more details.

Thank you,

Brandon Loboschefski

Fire Prevention Chief

Maumee Fire Division

450 W. Dussel

Maumee, OH 43537

APPENDIX 2 - Survey Instrument

1. Please provide the population served by your fire department: _____

2. Please circle your departments type:

      Full-time   Combination*   Volunteer

Note: Combination can be either full-time with part-time and/or volunteer, or can be part-time with volunteer.

3. Please provide how many members are on your department, as applicable to each type:

      Full time: _____   Combination: _____   Volunteer: _____

4. How many FIRE calls did your department respond to last year? _____

5. How many EMS calls did your department respond to last year? _____

6. Does your department utilize a formalized performance based measurement system (created by an outside agency), an informal system (created by your department)?

      _____ FORMAL SYSTEM   (please answer Questions 7 thru 10)

      _____ INFORMAL SYSTEM   (please go to Questions 11 thru 14)

      _____ No system (please go to Question 15)

7. For FORMAL systems used, please provide which agency you are using: (ICMA, CPSE or other)?

   _____

      _____ No, our department uses a system created by an outside agency.

            Please provide the outside agency's name _____

8. Please briefly indicate why a FORMAL system was selected to be used in your

   department.

   _____

   _____

9. For FORMAL systems used, please indicate the top five indicators measured by the

   system.

   *Examples of "indicators": These can be **organizational, process-level, and/or job/performer-level measures.***

   ***Organizational-level**refer to overall strategic planning and goals of your department*

   ***Process-level** refer to: losses incurred, stage or size of the emergency when control occurs, response times, customer complaints and satisfaction surveys (these could be measured benchmarks where data is kept, such as patient contact times, water-on-the-fire times, loss-stopped, etc)*

   ***Job/Performer-level** refer to individual and/or crew performance (employee performance, call attendance, turn-out time, etc.)*

1)_____

2)_____

3)_____

4)_____

5)_____

10. What is done with this data? Please list any specific examples.

   _____

   _____

   _____

11. For INFORMAL systems used, was this system based on another system or created by
    the department?   (Circle one)

    Other system (please indicate if known) _____

    Created by department

12. Please briefly indicate why an INFORMAL system was selected to be used in your

department.

_____

_____

_____

13. For INFORMAL systems used, please indicate the top five indicators measured by the
system.

*Examples of "indicators": These can be **organizational, process-level, and/or
job/performer-level measures.***

Organizational-level*refer to overall strategic planning and goals of your department*

Process-level *refer to: losses incurred, stage or size of the emergency when control
occurs, response times, customer complaints and satisfaction surveys (these could be
measured benchmarks where data is kept, such as patient contact times, water-on-the-fire
times, loss-stopped, etc)*

Job/Performer-level *refer to individual and/or crew performance (employee
performance, call attendance, turn-out time, etc.)*

1)_____

2)_____

3)_____

4)_____

5)_____

14. What is done with this data? Please list any specific examples.

_____

_____

15. If answer to Question 6 was "No", please briefly indicate why a performance

measurement system is not used.

_____

_____

_____

16. Would you like a copy of this final project?

YES   NO

This concludes the survey. Thank you for your time.

APPENDIX 3 - Survey Results

1. Please provide the population served by your fire department:

Q1: Population Served by Fire Department
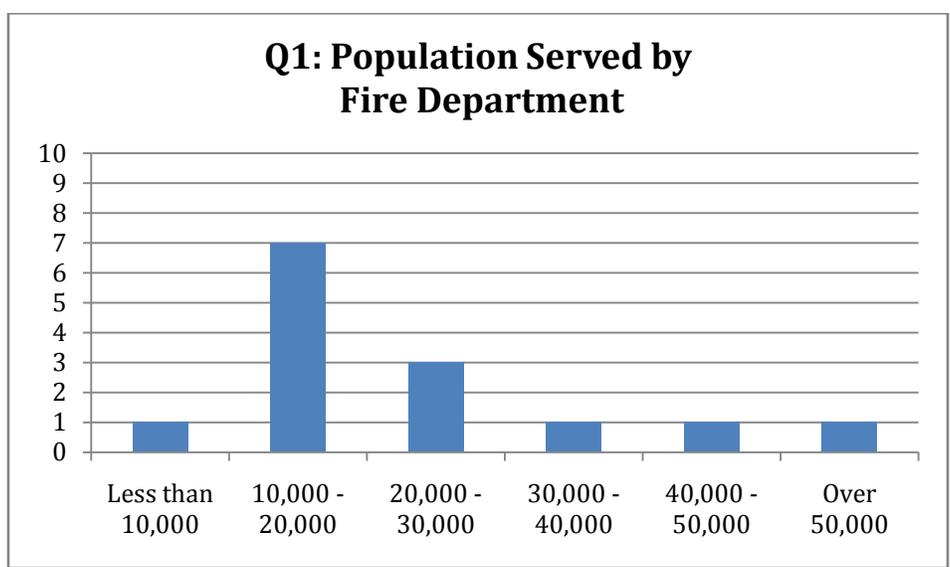
Figure 1

2. Please circle your departments type:

Q2: Fire Department Type
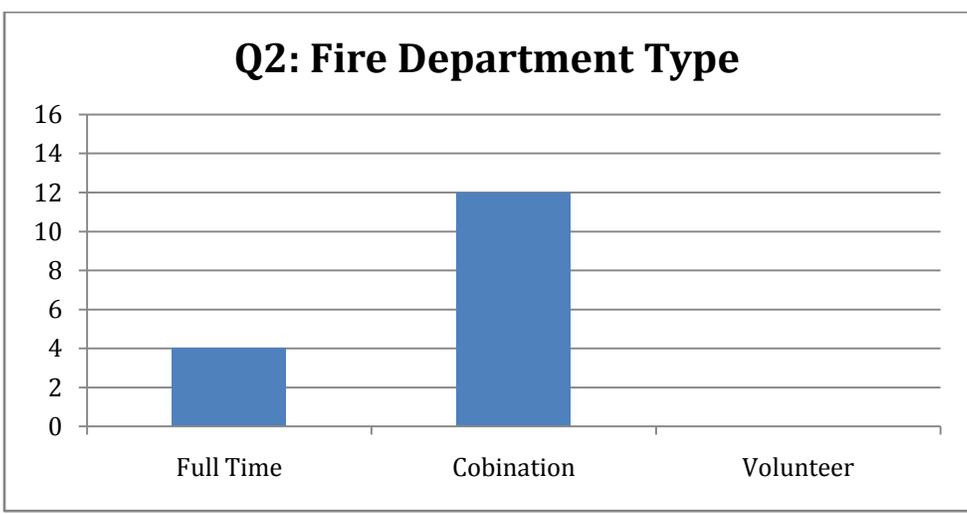
Figure 2

3. Please provide how many members are on your department, as applicable to each type:

Q3: Number of Personnel per Fire Department

0-25	25-50	50-75	75 or more
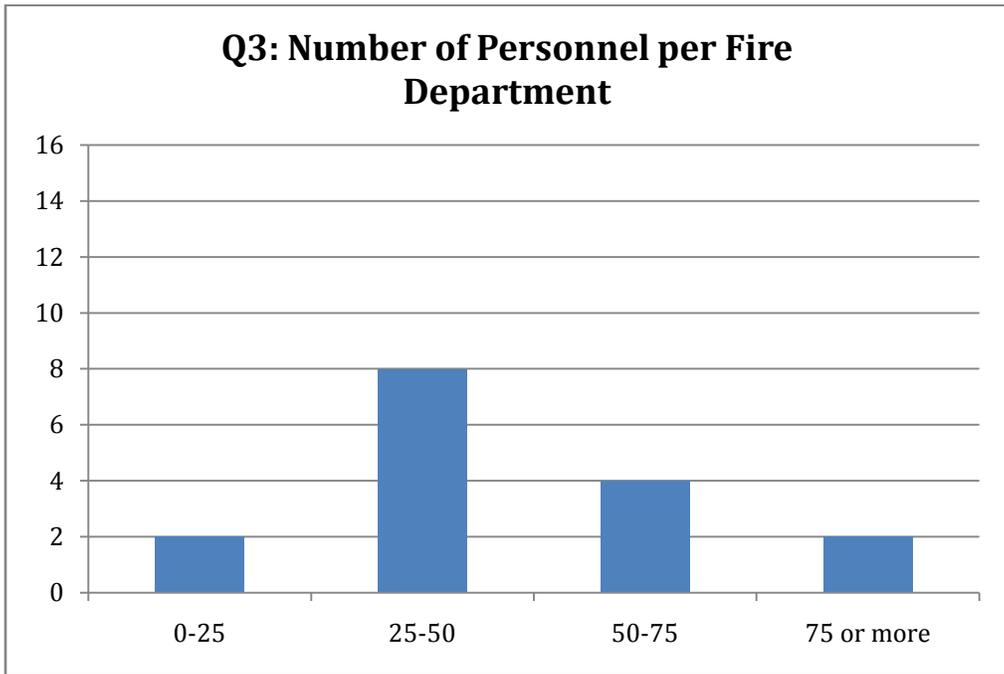
Figure 3

4. How many FIRE calls did your department respond to last year? _____

Q4: Number of Fire Calls per FD

0 to 1,000	1,000 to 2,000	2,000 to 3,000	3,000 or more
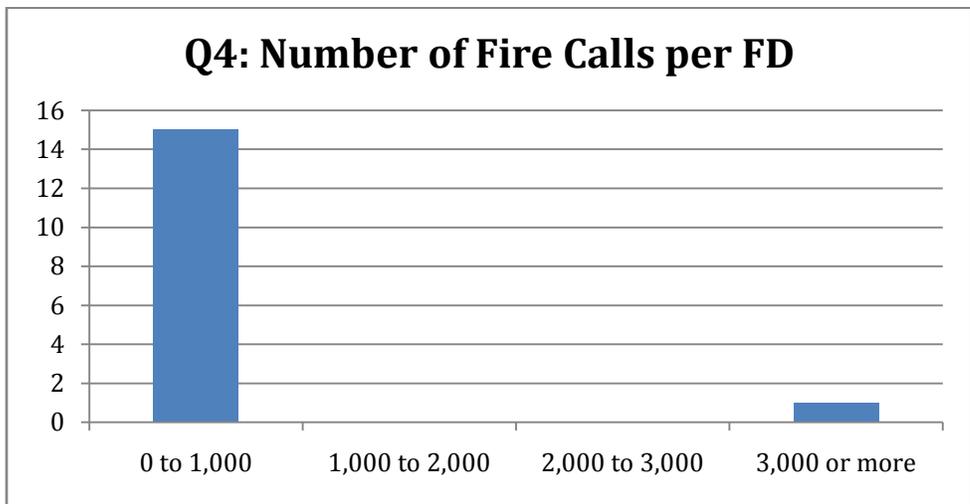
Figure 4

5. How many EMS calls did your department respond to last year? _____

Q5: Number of EMS Calls per FD
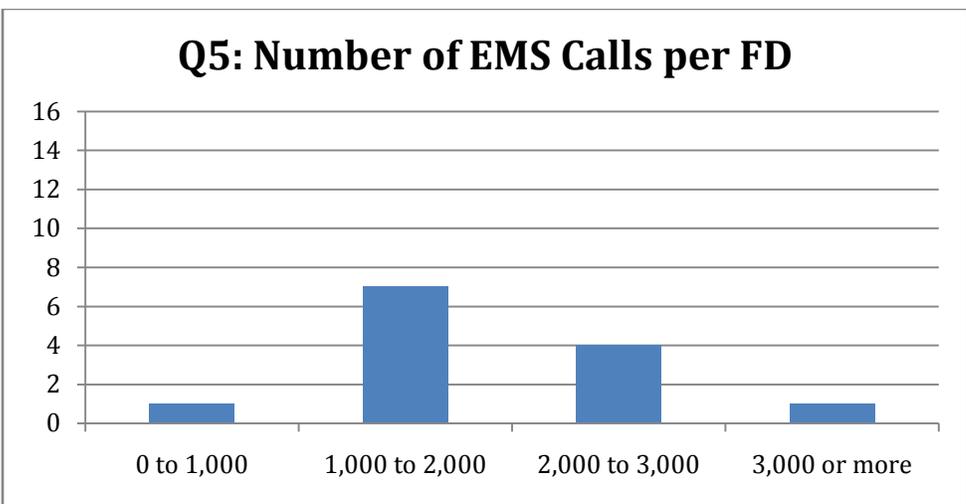
Figure 5

6. Does your department utilize a formalized performance based measurement system (created by an outside agency), an informal system (created by your department)?

Q6: Type of Performance Measurement System Used by FD
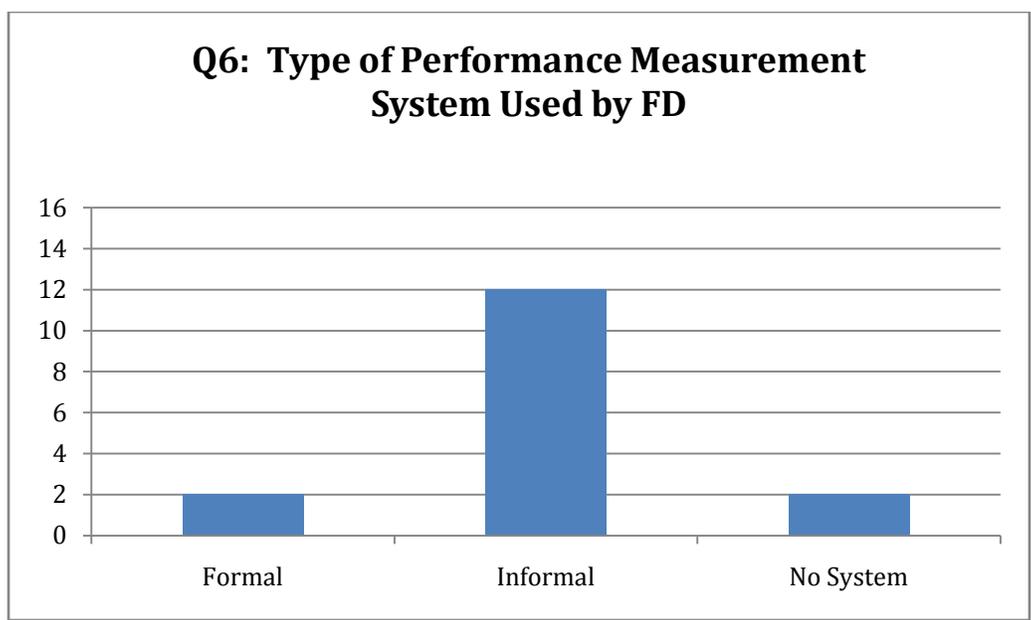
Figure 6

7. For FORMAL systems used, please provide which agency you are using: (ICMA, CPSE or other)?

Q7: Type of Formal Performance Measurement System Used per FD
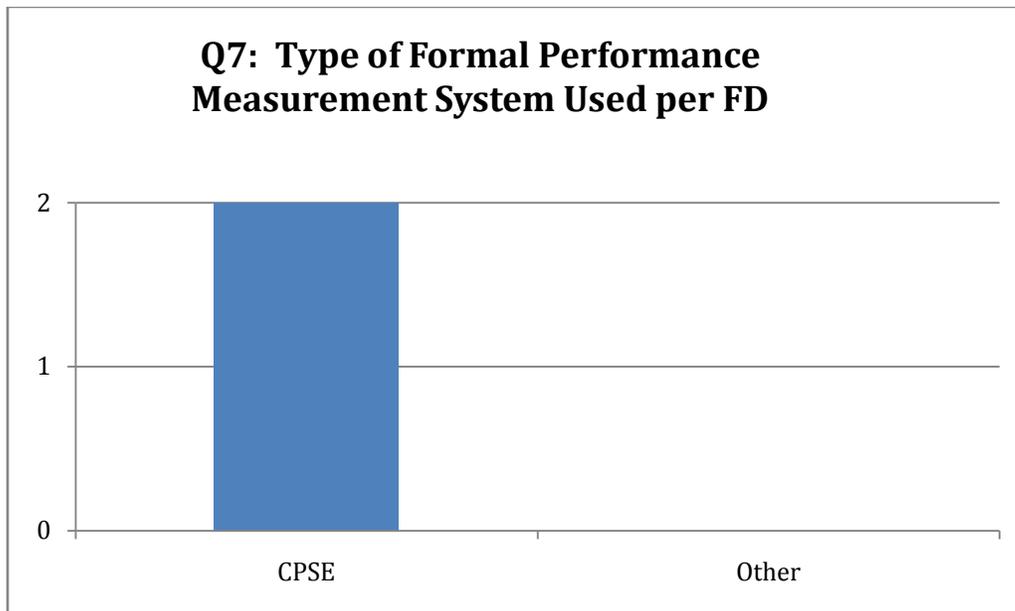
Figure 7

8. Please briefly indicate why a FORMAL system was selected to be used in your

    department.

    - "Desired by city administration"
    - "Improve service"
    - "Become a citizen centered service"

9. What were the top five indicators, or items, measured?

    - Emergency Response Times - 2
    - Strategic Planning - 2
    - Staffing Levels - 2
    - Risk Assessment
    - External Relationships
    - Public Education
    - Water System/Fire Hydrant Capabilities

10. What is done with the data collected and how it is used in the performance measurement

   process.

- Assists with overall Strategic Plan
- Assists with Standards of Cover Plan
- Impacts overall fire department programs
- Reviewed to evaluate current programs

11. For INFORMAL systems used, was this system based on another system or created by
   the department?   (Circle one)
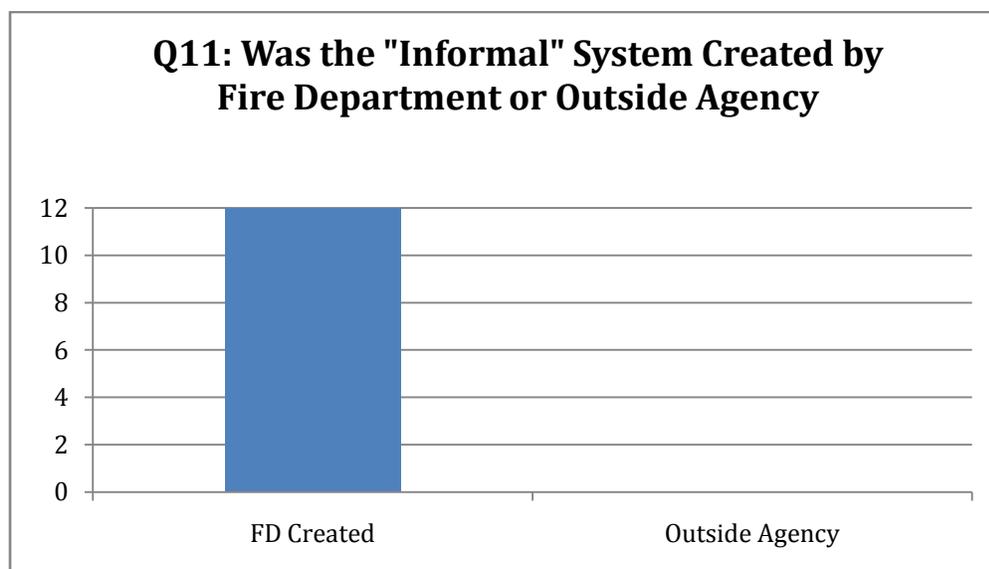
Figure 8

12. Please briefly indicate why an INFORMAL system was selected to be used in your

   department.

- "Driven by mission and vision of department"
- "Keep employees on task"
- "Improved customer service"
- "Collect data for grants"
- "Compensation needs for EMS billing"
- "Meet needs of community"
- "Answer questions from public"
- "Meet standards in EMS and Fire"
- "Justify staffing"
- "Justify positions"

13. For INFORMAL systems used, please indicate the top five indicators measured by the system.

Table 1

Top Indicators as listed by fire departments

Indicator	Number of dept's using
Response Times	7
Turn out Time	3
Employee Performance	3
Crew size	1
Air sampling	1
Employee relations with co-workers	1
Employee relations with public	1
Call Attendance	1
Quality assurance	1
Loss-stopped time	1
Customer surveys	1
Employee injury reporting	1
Training/skill evaluation	1
Run cost per call	1
Overtime costs	1

14. What is done with this data? Please list any specific examples.

- Assists with overall Strategic Plan

- Assists with Standards of Cover Plan

- Impacts overall fire department programs

- Evaluate and compare data to prior years

- Identify new fire station location

- Justify hiring of new firefighters

- Monthly and annual report information to administrators and employees

- Evaluate fire department programs

- Assist with grant applications

- Assist with public relations

- Change/update EMS protocols

- Quality assurance

- Create employee work improvement plans

- Identify reasons for overtime

15. If answer to Question 6 was "No", please briefly indicate why a performance

   measurement system is not used.

  - Lack of time and resources

  - Lack of personnel to collect data

  - Do not understand performance measurement or how to do it