

**CUSTOMER EXPECTATIONS FOR MANAGEMENT INFORMATION IN FIRE AND
EMERGENCY SERVICE ORGANIZATIONS: DEVELOPING A STANDARDIZED
PRODUCT LINE FOR THE INFOMATICS AND QUALITY IMPROVEMENT UNIT
AT TUALATIN VALLEY FIRE & RESCUE**

EXECUTIVE DEVELOPMENT

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Appendices E and F Not Included. Please visit the learning Resource Center on the Web at <http://www.lrc.fema.gov/> to learn how to obtain this report in its entirety through Interlibrary Loan.

ABSTRACT

This research paper examined the needs and desires of line fire service supervisors for management information to assist them in carrying out their supervisory duties. The problem was a lack of a standardized and consistent approach to developing and reporting operational performance data within the department, resulting in diminished efficiency and effectiveness of the Infomatics and Quality Improvement Unit. The purpose of the project was to produce a menu of standardized reports which could be programmed, produced and distributed efficiently, and which would be useful to managers and supervisors.

The development of this paper involved both historical and action research to identify the needs and wants of fire service supervisors for reports of operational performance parameters, to identify those reports commonly used by supervisors in other fire departments, and to develop a menu of standard reports which could be readily produced from the department's records management and reporting system.

The major procedures were (a) a review of the literature concerning fire service information systems planning and development, (b) a survey of internal customers, and (c) a survey of selected fire services conducted to determine their information reporting and utilization practices.

The major findings of this paper were that there is consensus among internal customers concerning their needs and desires for standardized reports and on the desired frequency of reporting, that few fire departments regularly distribute performance data to line managers and supervisors, and that the development of a useful menu of standard reports is possible.

Recommendations included a proposed menu of standardized reports to be developed, that fire service education programs increase the emphasis on managing operational performance using quantitative data, and that the fire service begin an effort to develop a standard for operational performance analysis and reporting.

INTRODUCTION

Tualatin Valley Fire & Rescue (hereafter TVF&R, or “the district”) is a regional provider of fire suppression and prevention services, emergency medical services, and emergency management services, which serves ten cities in three counties outside Portland, Oregon. It prides itself on providing a high level of customer service, and in delivering its services “better, faster and cheaper” than similar organizations (Johnson, personal communication, July 1996).

TVF&R staffs 22 career fire stations with 28 career companies, supervised by three battalion chiefs. In addition, there are two all-volunteer stations, and four career stations have associated volunteer companies in the station. The district employs 263 uniformed response personnel, 93 other employees (fire prevention, administration, emergency management, and training staff), and 110 volunteers. This team is responsible for the protection of a resident population of 410,000 spread over 232 square miles, and real property valued in excess of \$20.5 billion. The protected area ranges from urban cities of 60,000+ population, through the high-tech “Silicon Forest” and sparsely populated farming communities. Response volume is approximately 27,000 incidents per year, of which approximately 17,000 are dispatched as emergency medical events. Responding with all advanced life support companies (at least one paramedic on each company), the TVF&R provided EMS care to approximately 14,000 persons in 1999-2000.

Managed by an aggressive group of relatively young, business oriented chief officers, TVF&R strives to incorporate business practices derived from the private sector, and to impose upon itself a degree of accountability believed to be uncomfortable for many other governmental units. However, the district has had

difficulty identifying performance measures and benchmarking standards that would allow it to compare its performance to other, similar organizations with any degree of reliability and validity.

Because of the manner in which TVF&R is managed, line supervisors are believed to bear some different responsibilities than their counterparts in traditional fire departments. Serving 10 cities with a limited staff, TVF&R's Fire Chief is physically unable to attend every city council meeting and public event. Division Chiefs serve as official representatives to these jurisdictions, and often delegate liaison responsibilities for governmental bodies, community organizations such as Chambers of Commerce, and official citizen bodies such as Community Participation Organizations to line captains and lieutenants. These officers must be armed with sufficient information to adequately represent the district before these bodies. In addition, each station captain is personally accountable for the operational performance of his or her station, against such factors as reflex time, report completion, and workload management. Assisted by fire prevention and community service specialists, line companies are also expected to plan and deliver prevention programs addressed to the specific needs of their communities. This requires them to have a full understanding of the specific problems of those communities, and to possess data in excess of what might otherwise be provided in a single city fire department.

The purpose of this research project was to develop a menu or list of analytical reports that would provide the desired management information to the appropriate managers at useful intervals. Historical and action research methods were used to answer the following questions:

1. What statistical reports of operational performance do the managers and supervisors within Tualatin Valley Fire & Rescue desire?
2. At what frequency should these reports be delivered?
3. What statistical reports of operational performance do managers and supervisors of other large fire and EMS organizations regularly receive and rely upon?

BACKGROUND AND SIGNIFICANCE

Throughout the United States, citizens demand greater accountability for the effective and efficient utilization of the dollars they contribute to the common good through the payment of taxes. More prevalent in some states than others, the demand for increased governmental performance is particularly true in the State of Oregon. Over the last decade, using the initiative petition process, citizens have systematically limited the ability of state, county and local governments to provide services without demanding increased tax contributions.

TVF&R is an independent municipal corporation with plenary taxing power, and is accountable to a five member Board of Directors elected by the citizens at large. This structure makes the district more directly accountable to the citizens, while at the same time limiting its fiscal flexibility. With one available income stream derived from real property taxes, and one service line to deliver, the district cannot utilize the alternative revenue streams or “rob Peter to pay Paul” strategies available to other types of municipal corporations.

TVF&R has a long history of employing technology to enhance its operational and prevention activities. The district has utilized a computerized records management system (RMS) of one sort or another since 1984. However, until recent years, the RMS

was primarily utilized as a repository and recall device for site or incident specific data. There was very little analysis performed on the data that was collected, and little or no information was provided to line managers and supervisors (company officers, battalion and district chiefs, and their non-uniformed counterparts).

In 1997, TVF&R formed a new unit, called the “Infomatics and Quality Improvement,” (hereafter, IQI) consisting of a staff Battalion Chief unit manager and one Infomatics Analyst. This new unit was created with several mandates involving continuous quality improvement, procurement of a complete new, Y2K compliant records management systems, and international accreditation. The mandate relevant to this paper was to “bring some science to the way we make decisions about the deployment of apparatus and personnel who respond to calls for service from our citizens” (Austin, D.M., personal conversation, January 1997). Much of the unit’s early activities involved researching and procuring a replacement for the district’s two legacy RMS systems, both of which were not Y2K compliant.

In November 1999, after a complex and laborious implementation process, TVF&R began live (actual, as opposed to test) utilization of its new RMS. This system collected comprehensive data concerning response activities (fire, EMS, hazardous materials, and public services), non-response activities of line companies, occupancy and inspection data and activities, regular and overtime work assignments, and the district’s water supply system.

For computer technology to result in something more than a digital depository of related data elements, that digital data must be processed in to information, or “useful form of data” (Moriarity, 1995 48). Using a spreadsheet consisting of rows (for example, one row per emergency incident) and columns (one column for each data

element) as an illustrative paradigm, an organization of any size produces a quantity of data that is simply overwhelming. For example, TVF&R collects up to 475 data elements on each of 14,000 emergency medical patients each year. This results in a possible 6,650,000 individual data points that might be considered.

For these data points to become information useful to supervisors and managers, they must be extracted from the database, processed (calculations performed), and presented in an appropriate format. Often, particularly when the consumers of this newly provided information are new to the process of using statistical data, it is necessary for those who conducted the analysis to educate the users on how the data was derived and processed, so that they will understand and have confidence in this new set of tools. These processes are the essence of the work of the IQI Unit.

Almost immediately, managers and supervisors recognized the potential for utilizing the data captured by the new system, and began to request IQI to prepare a variety of reports. These requests arrived at a rate that was found to be astounding, given the lack of such data in the years immediately preceding implementation of the new RMS. Very quickly, the available work hours of IQI unit were consumed by the preparation of detailed, specially prepared one of a kind reports.

From within senior management ranks, there came a desire for regular reports about industry standard performance parameters, as part of an effort to benchmark organizational performance against similar organizations. This necessitated a strict triage or prioritization of requests for custom reports. It also required a search for industry standard analytical practices and benchmarking models or protocols. This search was not particularly successful, for it revealed little in the way of industry consensus about performance measurement. Those measures that were identified as

usual or customary throughout the industry were either rejected or found to be of limited value because of inherent inaccuracies, unclear meaning, or other reasons. No useful industry standard benchmarks could be identified.

Accordingly, it was decided to “seed” the notion of data driven management throughout the district’s staff, and begin the process of internally defining and developing performance measurement standards. A focus group consisting of senior managers and IQI staff defined a set of standard monthly reports. These reports were prepared each month and distributed to each manager, supervisor, and work group throughout the organization. That process led to frequent discussions about the nature of report content, the quality of underlying data, and the frequency and scope of distribution, which in turn led to the activities carried out in preparation for writing this applied research paper.

LITERATURE REVIEW

The difficulty of evaluating the adequacy of local government services has been a topic of much discussion. Organizations such as the International City Managers Association, the American Society of Public Administration, the National Academy of Public Administration, and the Government Standards Accounting Board have all addressed the topic (Ammons, 1995, foreword).

Much has been written about computerization and the development of data collection systems in the fire and EMS services (Coleman and Granito, 1988; Kittleson, 1990). In a profound statement, President Phil Schaenman of the TriData Corporation, a well known international fire service consulting firm, reports that “The computer has been described by some officers as the fourth major technological change to

significantly improve fire protection, the other three being the internal combustion engine, the centrifugal pump, and the radio” (Coleman and Granito, 1988, 42).

The transition to the use of the computer in the fire service has not been easy. Moriarity (1995, 48) describes a variety of scenarios in which computer system implementations have produced or worsened various day-to-day tasks of fire service organizations. “The common tendency is to put the cart before the horse and commit to a given favorite computer platform without assessing the holistic information needs of the organization” (Moriarity, 1995, 49). This “ready, fire, aim” approach to decision making is frequently encountered in the fire service (Bruegman, 1990, 46). Rather than using a structured planning and decision making process (investigation, development of alternatives, evaluation of alternatives, and implementation of a plan), we pick a computer platform or software suite and, after painfully implementing it within our organizations, we struggle to figure out ways to get system to give us the information we want (Bruegeman, 1990, Moriarity 1995). “The focus should be on the information, not a given computer platform (IBM vs. MAC vs. Unix®, etc.)” (Moriarity 1995, 49).

Unfortunately, in addition to our industry’s inherent tendency to look at platforms rather than capabilities, we have been led in that direction by national and state leaders. For example, the early U.S. Fire Administration selected the Macintosh platform for the development of numerous data products. At present, though, the USFA has moved toward solutions based on data base specifications rather than platform oriented solutions. Today, National Fire Information Reporting System (NFIRS-5) software can be built on any computer platform provided that the resulting data meets the NFIRS-5 standard. Products that achieve this standard are eligible for USFA certification (USFA, http://www.nfirs.fema.gov/nfirs_vendorstart.htm, undated).

It has been recognized that “good information management system design starts with the desired results and works backward” (Truty, 1997, 26). However, the focus of most of the substantive literature concerns itself with system design, with an emphasis on hardware and on data to be entered in to the database, and database element identification. Where data outputs are described, they are primarily oriented toward executive officers and policy makers such as city managers and elected officials (Coleman and Granito 1988, 150-160). In discussions where the use of data is considered, the focus is on utility applications such as justification of additional resources, or simplistic cross-tabulations of data points such as “per capita rate of fire by occupancy [classification] and by cause” (Coleman and Granito 1988, 165; Schaenman, 1974, 61). Oftentimes these measures are less than intuitive in nature. As an example, one frequently discussed measure is the number of firefighters per capita. It is unclear whether a higher ratio is good or bad. Does a high ratio hallmark better fire protection, or inefficient use of resources?

More importantly, there is a dearth of discussion on the preparation, dissemination, and utilization of performance data for and by operational supervisors, even though at least one investigator has identified that “The greatest amount and fields of Information are needed at the mid-management level, management of stations” (Kittelsohn, 1990, 10.) However, even this paper fails to address needs for operational performance data, revealing a heavy emphasis for non-operational or logbook data (Kittelsohn, 1990, 33-34).

The wildland firefighting community has addressed the information management problem from the fire manager’s perspective under the leadership of the U. S. Forest Service. In 1992, the USFS Washington Office Fire and Aviation Management Branch

completed a project called the “Information Management Strategy Project.” This project used an engineering methodology to “determine the information needs of fire managers and formulate them in to a comprehensive set of models or blueprints that could be used to plan and coordinate the use of applications, data, and technology, while considering the broader requirements of the Forest Service, F&AM, and the fire managers” (Calvin, 1995, 4).

The problem of data collection versus management information in the fire service is not limited to the United States. Walker (2000, 26) describes how fire officers in the United Kingdom are “conditioned to accepting the inadequacies of [information] systems that were not designed to produce what has been asked for in a particular way.”

The emergency medical services community, both fire-based and others, has been a bit more oriented toward information system output. It is possible that the involvement of physicians, with a research and scientific orientation, are partially responsible. Also contributing to the emphasis on analytical information was the Highway Safety Act of 1966 (P.L. 89-54), and the Emergency Medical Services Systems Act of 1973 (P.L. 93-154), both of which identified and required system evaluation as an essential element, and as a criteria for funding under the respective statutes.

In the years since the early federal EMS acts, nearly every state EMS office has made some approach to standardizing data collection. These range from very weak efforts (Oregon Administrative Rules Chapter 333 requires agencies to collect data on each patient but there is no requirement that the data be computerized, analyzed, or forwarded to a central repository), to mandatory statewide reporting and aggregation requirements such as those in place in Maryland, Utah, and Pennsylvania (Oregon

Administrative Rules Chapter 333; Swor, 1993). Ramsey and New provide an overview description of Maryland's system in a useful chapter on Data Collection and Management in a handbook for EMS physicians (Swor, 1993). Using the Uniform Prehospital Data Set published by the National Highway Traffic Safety Administration (NHTSA) as a starting point, these statewide systems require data of the type that is useful to line supervisors if it is analyzed and distributed (NHTSA, 1996). This contrasts with the NFIRS reporting system, which collects much information, but which reports information mainly of interest to policymakers and demographers. On the other hand, the USFA has for years collected and collated this policy-level data from states to prepare national summaries, while there has been no such effort made to collect and collate a national EMS information base.

In 1988, Valenzuela (1989, 134) reports on the process utilized to identify information needs for the Tucson Fire Department. "Fire Administration personnel and medical researchers within the Section of Emergency Medicine [of the Arizona Health Sciences Center, University of Arizona] were asked to designate the type of data they needed on a frequent basis and would find useful." Included in the list of potential users of data are the TFD Medical Battalion Chief and the TFD Physician Medical Director (Valenzuela, 1989, 123). This is the first mention in the literature of a process to define information needs of line supervisory personnel and the frequency with which it should be delivered.

For the last 10 years, America's police services have become substantially more data driven. Under the direction of Police Commissioner William Bratton, the CompStat program revolutionized resource management and supervisor accountability within the New York Police Department (NYPD) (Silverman, 1999, p.11). This program has

spread in various forms to law enforcement agencies across the country, large and small alike (Gottlieb, Arenberg and Singh, 1998), and was a winner of the both the Harvard Innovations In American Government Program in 1966, and Vice President Gore's "Hammer Awards" in 1998 (<http://ksgwww.harvard.edu/innovations/winner/cony96.htm>; <http://www.policyworks.gov/org/main/mg/intergov/awards/compstat.htm>). In many police departments today, one or more detective "crime analysts" is assigned to explore police incident data and make recommendations concerning staffing, deployment, and other resource allocation. (Gottlieb, Arenberg and Singh, 1998)

More recently, the Commission on Fire Accreditation International (CFAI), a joint venture of the International Association of Fire Chiefs and the International City – County Management Association (ICMA), has begun to collect baseline statistical data from departments applying for accreditation. CFAI's baseline data collection tool is reproduced as Appendix A. However, this data base is quite small in relation to the number of fire service organizations in the United States, there being only 38 accredited fire departments as of this writing, and perhaps an equal number of candidate organizations (which have submitted benchmarking data and are in the process of becoming accredited by which have not yet achieved accreditation).

PROCEDURES

The desired outcome of this research was to develop information concerning utilization of operational performance data by line supervisors and managers, both within and outside of Tualatin Valley Fire & Rescue. This information was to be used to develop a standard menu of performance reports for operational supervisors and

managers, and to develop a methodology for benchmarking operational performance among similar fire and EMS organizations.

Historic research was employed through the conduct of a literature review to ascertain if other investigators had already developed similar standard menus for utilization by fire and EMS officers, and to identify any benchmarking standards or protocols that may have been developed. This research was initiated in the Learning Resource Center of the National Fire Academy, Emmitsburg, Maryland. Additional research was performed in the Staff Library at Tualatin Valley Fire & Rescue, in the Portland State University College of Urban and Public Affairs, and through the use of on-line library access and internet search engines.

Action research was used to gather two pieces of survey data. First, a survey instrument (Appendix B) was distributed to 25 line supervisors and chief officers within Tualatin Valley Fire & Rescue. Recipients were asked to complete the survey anonymously and return it to the investigator. This survey listed a series of reports from the district's RMS that had been distributed for a four-month period during the seeding process discussed earlier in this paper. Respondents were asked to rate each of those reports as to their utility or usefulness, and the frequency at which the respondents desired to receive the reports. In addition, respondents were afforded an opportunity and verbally encouraged to identify other reports not regularly produced and distributed as part of the seeding process.

Second, a survey instrument (Appendix C) and explanatory letter was mailed to 50 fire departments selected from the mailing list of the Metro Section of the International Association of Fire Chiefs. Selection of departments to be surveyed was conducted in a pseudo-random fashion by providing the prepared mailing labels for

more than 200 Metro departments to a clerical specialist unfamiliar with other fire departments and asking her to select 50 in no particular order. The survey package, which was ambiguously directed to the “chief operations officer”, contained a letter of explanation, three survey instruments, and three return envelopes. The letter requested that the chief operations officer respond to the survey directly, and request two other individuals to respond - one a battalion, district or division chief, and one a company level officer (Lieutenant, Captain or equivalent. The survey asked a series of questions about information collection and dissemination within the department.

RESULTS

Research Question 1. Supervisors and managers within TVF&R responded to the survey instrument as follows:

TABLE 1: Response to Internal Customer Survey (Report Content)

REPORT CONTENT	SUPERVISORS			MANAGERS		
	E	D	N	E	D	N
Response company reflex (turnout) performance	5	12	1	7	2	0
Response company response performance by response zone	1	17	0	6	3	0
Response company time on task for non-response activities (logbook summaries)	0	13	5	6	3	0
Response company time on task for incident response	0	15	3	7	2	0
Incident reports open or not initiated by company and shift	7	11	0	5	3	0
Incident inventory by jurisdiction	2	16	1	9	0	0
Incident inventory by Neighborhood Association or Community Participation Organization	0	18	0	9	0	0
Incident distribution by hour of day	0	4	14	9	0	0
Incident distribution by day of week	0	4	14	9	0	0
Incident distribution by geographic distribution and incident type (GIS pin map)	0	16	2	9	0	0

Research Question 2. Supervisors and managers with TVF&R provided the following information with respect to the frequency of report distribution:

TABLE 2: Response to Internal Customer Survey (Report Frequency)

REPORT FREQUENCY	SUPERVISORS					MANAGERS				
	D	W	M	Q	A	D	W	M	Q	A
Response company reflex (turnout) performance	0	1	6	11	0	0	1	8	0	0
Response company response performance by response zone	0	0	1	17	0	0	1	8	0	0
Response company time on task for non-response activities (logbook summaries)	0	0	1	17	0	0	1	8	0	0
Response company time on task for incident response	0	0	1	17	0	0	1	8	0	0
Incident reports open or not initiated by company and shift	0	4	14	0	0	1	1	8	0	0
Incident inventory by jurisdiction	0	0	17	1	0	0	1	8	0	0
Incident inventory by Neighborhood Association or Community Participation Organization	0	0	17	1	0	0	0	8	1	0
Incident distribution by hour of day	0	0	1	17	0	0	0	3	6	0
Incident distribution by day of week	0	0	1	17	0	0	0	3	6	0
Incident distribution by geographic distribution and incident type (GIS pin map)	0	0	12	6	0	0	0	3	6	0

Research Question 3. Of the 150 potential respondents, there were 38 (25.3%) responses. Responses were tabulated as follows.

Table 3: Responses to Metro Department Survey (Current Data Provided)

REPORTS CURRENTLY PROVIDED TO YOU	SUPERVISORS N = 17		MANAGERS n=21	
	Y	N	Y	N
Incident types	5	12	16	5
Causes of fires and injuries	2	15	16	5
Incident distribution (time of day, day of week)	0	17	4	17
Incident distribution (by zone or geography)	2	15	5	16
Response company reflex (turnout) performance	2	15	2	19
Response company time on task for non-response activities (logbook summaries)	0	17	0	21

Response company time on task for incident response	0	17	1	20
Incident reports open or not initiated by company or shift	3	14	5	16
Incident inventory by jurisdiction, neighborhood or citizen participation organization	0	17	1	20
Incident geographic distribution by incident type (GIS pin map)	0	17	8	13

Table 4: Response to Metro Department Survey (Frequency of Reports Provided)

FREQUENCY OF REPORTS CURRENTLY PROVIDED TO YOU	SUPERVISORS N = 17					MANAGERS n=21				
	D	W	M	Q	A	D	W	M	Q	A
Incident types	0	0	0	0	5	0	0	0	7	9
Causes of fires and injuries	0	0	0	0	2	0	0	4	6	8
Incident distribution (time of day, day of week)	0	0	0	0	0	0	0	0	0	4
Incident distribution (by zone or geography)	0	0	0	0	2	0	0	0	1	5
Response company reflex (turnout) performance	0	0	0	2	0	0	0	0	1	1
Response company time on task for non-response activities (logbook summaries)	0	0	0	0	0	0	0	0	0	0
Response company time on task for incident response	0	0	0	0	0	0	0	0	0	1
Incident reports open or not initiated by company or shift	0	0	2	1	0	0	0	3	2	0
Incident inventory by jurisdiction, neighborhood or citizen participation organization	0	0	0	0	0	0	0	1	0	0
Incident geographic distribution by incident type (GIS pin map)	0	0	0	0	0	0	0	0	0	8

Table 5: Response to Metro Department Survey (Reports Desired)

REPORTS THAT WOULD BE USEFUL TO YOU	SUPERVISORS N = 17		MANAGERS N=21	
	Y	N	Y	N
Incident types	6	11	18	3
Causes of fires and injuries	4	13	18	3
Incident distribution (time of day, day of week)	6	11	18	3
Incident distribution (by zone or geography)	2	15	21	0
Response company reflex (turnout) performance	16	1	20	1
Response company time on task for non-response activities (logbook summaries)	17	0	21	0
Response company time on task for incident response	15	2	20	1

Incident reports open or not initiated by company or shift	16	1	17	4
Incident inventory by jurisdiction, neighborhood or citizen participation organization	8	9	21	1
Incident geographic distribution by incident type (GIS pin map)	5	12	17	4

Table 6: Response to Metro Department Survey (Desired Report Frequency)

FREQUENCY WITH WHICH YOU WOULD LIKE TO SEE REQUESTED REPORTS	SUPERVISORS N = 17					MANAGERS N=21				
	D	W	M	Q	A	D	W	M	Q	A
Incident types	0	1	4	1	0	2	9	5	2	1
Causes of fires and injuries	0	0	0	0	4	0	2	10	5	1
Incident distribution (time of day, day of week)	0	0	0	5	1	0	1	14	3	0
Incident distribution (by zone or geography)	0	0	0	1	1	0	3	12	5	1
Response company reflex (turnout) performance	1	4	12	0	0	0	5	14	1	0
Response company time on task for non-response activities (logbook summaries)	0	5	10	2	0	1	3	12	5	0
Response company time on task for incident response	0	2	13	0	0	1	4	10	4	1
Incident reports open or not initiated by company or shift	2	11	4	0	0	13	5	2	0	0
Incident inventory by jurisdiction, neighborhood or citizen participation organization	0	0	8	0	0	1	0	19	1	0
Incident geographic distribution by incident type (GIS pin map)	0	0	0	4	1	0	0	15	1	1

All narrative comments provided by respondents are summarized in Appendix D.

DISCUSSION

The results of the internal survey were consistent with the investigator's expectations. Managers and supervisors were generally satisfied with the standard menu of reports being delivered by the IQI unit (Appendix E). Most data was desired on a monthly basis. Respondents in the management ranks were generally more interested in district-wide measurements such as response performance such as

response performance in urban and rural zones, incident inventory reports. Supervisors were interested in company reflex or out-of-chute times and time-on-task tabulations.

A significant number of hand-note suggestions were made for additional reports. Most of these related to reports that had in the past been prepared by the IQI unit on a one-time or special project basis, or as an ad hoc query for a particular purpose. Most of these additional reports requested involved the application of geographic information systems (GIS) technology to incident location data, in support of an ongoing evaluation of the deployment of special resources (technical rescue teams and equipment, hazardous materials resources, and hydraulic extrication tools).

Although some hand written notations indicated reluctant understanding of the need for these particular reports, supervisors deemed least useful daily reports dealing with RMS non-compliance (failure of companies to complete incident reports before end of shift, as required by department operating guidelines. This is believed to be associated with both the daily nature of these particular reports and the enforcement nature of these reports, which require supervisors to apply some degree of coercion to non-compliant personnel.

The results of the external survey were startling. With the exception of summary information distributed once per year (several hand-notes on surveys indicated that stations and management level officers received copies of departmental annual reports containing information similar to that described in the survey), very few line supervisors and managers received or utilized operational performance data individual. This result may be attributed to the limited survey sample and response, which may have produced data not representative of large fire departments generally. Or, it may reflect the difficulties that the fire service has experienced with developing management

information processes (which in turn is illustrated by the dearth of information found during the review of literature on this topic). Generally speaking, external respondents expressed a desire for more information than they currently receive, and for those items that they regularly receive, they expressed a desire to receive the information more frequently. Managers generally wanted more information related to agency-wide performance, while supervisors (company officers) wanted information about work unit performance and time on task.

One department, the Orange County (CA) Fire Authority, obviously well in to performance management themselves, provides excellent periodic performance data to its managers. In recognition of this, and because it is a good example for others, I have reproduced it at Appendix 6.

Several of the editorial comments addressed the concerns of collective bargaining units, although there was no consistent theme. Several supervisors (ordinarily members of the bargaining unit) noted that this information would be of great interest to the bargaining unit. Managers, conversely, indicated their belief that their bargaining unit would be greatly distressed if this type of information were collected and disseminated.

RECOMMENDATIONS

A variety of recommendations can be derived from the information discussed above. Within Tualatin Valley Fire & Rescue, the regular distribution of the menu of performance reports contained in Appendix E should be continued. The set of management reports distributed should be refined and expanded. The process of utilizing small groups of managers, supervisors, and others to suggest possible report

contents, followed by distribution of reports and soliciting recipient feedback, should be continued.

The desire of fire service managers and supervisors for additional performance data was clearly presented by respondents to the external survey. However, the limited size of the sample precludes the drawing of strong generalized conclusions from this single study. Accordingly, an organization with sufficient resources to support an in-depth survey of management and supervisory information in the fire service should address the questions present in this report.

Third, the existing data collection effort of the Commission on Fire Accreditation International should be further refined, and expanded to embrace the fire service of the United States and other countries participating in the Commission. It would be very beneficial for fire and EMS agencies in the United States to benchmark their performance against similarly constructed and situated agencies. And, given the differences in fire service management structure throughout the industrialized nations of the world, it might be possible to identify additional best practices that could be adapted to other countries and organizational forms.

Although beginning to embrace the concept of organizational management based in part on the use of performance data, the fire service in the United States lags far behind private industry, where virtually every decision is driven by management information. It is time for today's fire service leaders to become educated and involved in the development and use of performance data as they manage their communities' emergency response and prevention organizations.

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APPENDIX A

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Commission on Fire Accreditation International



Commission on Fire Accreditation International

Benchmarking Survey

c/o International Association of Fire Chiefs
4025 Fair Ridge Drive
Fairfax, VA 22033-2868
(703) 273-0911, extension 310

The Commission on Fire Accreditation International (CFAI) needs your help!!!

The Commission on Fire Accreditation International has been evolving for nearly a decade. One of the developmental components of the accreditation model is the creation of benchmarks for use within the fire service as a means for performance measurement. Benchmarking is a process of collecting and analyzing information that can be utilized as performance measurements and to compare the department with other organizations.

The Commission on Fire Accreditation International has identified several areas within an assessment of a department that are indicative of performance and industry trends. These will be categorized by size and type of organization. The collection and establishment of these important benchmarks will depend on the input of the fire service community. Your help is needed! Do your best to fill in the information requested. If you do not have access to information for a certain area, or are not involved in that type of program, please leave the box blank. Do not be discouraged if you cannot complete the entire survey. Any information is helpful to us!

Thank you in advance for your participation in this process.

Completed surveys should be sent to:

Commission on Fire Accreditation International
International Association of Fire Chiefs
4025 Fair Ridge Drive
Fairfax, VA 22033-2868

Questions about the survey or the Commission on Fire Accreditation International should be referred to Andrea A. Walter at the aforementioned address. Andrea can also be reached at (703) 273-0911, by FAX at (703) 273-9363, and on e-mail at CFireAI@AOL.COM.

**Benchmarking
Survey**

Instructions For Completing the Benchmarking Survey

General Information:

The general information section should be completed with attention to accurate contact information. Any questions about the information contained in the survey will be addressed to the individual named in this section.

Demographic Information/Data:

This section seeks to gain background information about the department and the community served. The demographic information is important in conjunction with the statistical information so that the benchmarks can be established and comparisons made for similar organizations.

Population Served—Using the most current census, list the population of your community or jurisdiction served.

Total Number of Personnel—This number will be the total number of personnel within your department. It is then broken down into segments including uniformed, paid, volunteer, civilian, paid on call and sworn.

Total Number of Calls—This figure should be the total number of calls run by a jurisdiction within the last complete calendar or fiscal year. It is then broken down into suppression, EMS and other types of incidents.

Urban, Suburban or Rural

Urban is defined as a highly developed area that includes, or is appurtenant to, a central city or place and contains a variety of industrial, commercial, residential and cultural uses. Densities of urban areas are usually 2,000 persons per square mile and have central cities of 50,000 persons or more.

Suburban is defined as a predominantly low-density residential area located immediately outside of and physically associated with an urban area or a city. Densities in a suburban area range from 500-1000 persons per square mile.

Rural is defined as a sparsely developed area with a population density of less than 100 persons per square mile and where land is undeveloped or primarily used for agricultural purposes.

Square Miles in Jurisdiction—This figure is the total number of square miles within your service area or jurisdiction.

Minimum Staffing—This figure is the minimum number of personnel on duty each day. The minimum staffing for each type of apparatus is the minimum number of personnel required to place the unit in service.

Income Per Capita of Jurisdiction—This figure is the average income per person who resides within the jurisdiction. This information can usually be obtained through the Community Development Department or the Finance Office.

Type of Department—Mark the appropriate box for your department. If other, please fill in the type in the space provided.

**Benchmarking
Survey**

Demographics/Data Continued:

Calls Per Year-Check the appropriate boxes for your department.

Property Types in Department's Jurisdiction-Mark the appropriate boxes for your department.

Work Schedules-Mark the appropriate box for your department.

Shift Schedules-Mark the appropriate box for your department. If other, please fill in the type in the space provided.

Cultural Diversity-The cultural diversity chart is for the ethnic and gender breakdown of the department as a whole and the community served.

Number of Stations in Jurisdiction-This figure is simply the number of stations within your service area or jurisdiction.

Total Department Budget-This figure is obtained from the total department budget for the last full calendar year or fiscal year.

Total Fire Loss (annual)-This figure is obtained from the total direct fire loss, in dollars, within the jurisdiction for the last full calendar year or fiscal year.

Number of Activities Annually-Activity is defined as emergency responses, service calls, public education, preplans, inspections, smoke detector installation/checks, hydrants.

Number of Firefighter Deaths/Injuries (annual)-This figure is obtained from the total firefighter deaths/injuries for the last full calendar year or fiscal year.

Number of Civilian Deaths/Injuries (annual)-This figure is obtained from the total civilian deaths/injuries for the last full calendar year or fiscal year.

Level of EMS Provided/Transport of Patients-Check the appropriate box for your department.

Average Alarm Processing Time

Alarm Processing Time- The elapsed time from the receipt of an alarm by the dispatch center and the notification of specific fire companies that are needed to respond.

This figure is obtained by calculating the total amount of time for departments to process all alarms received in the last full calendar year or fiscal year. This number should then be divided by the total number of alarms received to calculate the average alarm processing time.

Average Turnout Time

Turnout Time- The portion of response time when fire or emergency service companies are donning personal protective clothing and boarding their apparatus. The time begins once the companies have been given their assignments and ends when they begin travel time.

This figure is obtained by calculating the total number of minutes for departments to turnout for all alarms received in the last full calendar year or fiscal year. This number should then be divided by the total number of alarms received to calculate the average turnout time.

Benchmarking
Survey

Demographics/Data Continued:

Average Response Time

Response Time- The total amount of time that elapses from the time that a communications center receives an alarm until the responding unit is on the scene of the emergency and prepared to control the situation.

This figure is obtained by calculating the total number of minutes for departments to respond to all alarms received in the last full calendar year or fiscal year. This number should then be divided by the total number of alarms received to calculate the average response time.

Average Response Time for First Arriving Unit- This figure is calculated the same as average response time, however, use only data related to first arriving units.

Average Response Time for Second Arriving Suppression Unit On Scene- This figure is calculated the same as average response time, however, use only data related to second arriving suppression units.

Other Services Provided- Please list services provided by your department other than suppression.

General Information

Department Name	<input style="width: 100%;" type="text"/>
Chief of Department	<input style="width: 100%;" type="text"/>
Person Completing Survey	<input style="width: 100%;" type="text"/>
Address	<input style="width: 100%; height: 40px;" type="text"/>
Telephone	<input style="width: 100%;" type="text"/>
Fax	<input style="width: 100%;" type="text"/>
Date Completed	<input style="width: 150px;" type="text"/>
IAFC Member #	<input style="width: 150px;" type="text"/>

**Benchmarking
Survey**

Demographic Information

Population Served	<input style="width: 100%;" type="text"/>		
Total Number of Personnel	<input style="width: 100%;" type="text"/>		
Paid Volunteer	<input style="width: 100%;" type="text"/>	Civilian Paid on Call	<input style="width: 100%;" type="text"/>
Total Number of Calls	<input style="width: 100%;" type="text"/>		
Suppression Other	<input style="width: 100%;" type="text"/>	EMS	<input style="width: 100%;" type="text"/>
is Your Area, Urban, Suburban or Rural?	<input style="width: 100%;" type="text"/>		
Square Miles in Jurisdiction	<input style="width: 100%;" type="text"/>		
Minimum Staffing Per Shift	<input style="width: 100%;" type="text"/>		
for engines/pumpers	<input style="width: 100%;" type="text"/>		
for ladders/trucks	<input style="width: 100%;" type="text"/>		
for heavy rescue squads	<input style="width: 100%;" type="text"/>		
for ambulances	<input style="width: 100%;" type="text"/>		
Income Per Capita of Jurisdiction	<input style="width: 100%;" type="text"/>		
Type of Department	<input type="checkbox"/> Career <input type="checkbox"/> Volunteer <input type="checkbox"/> Combination <input type="checkbox"/> Federal/Military <input type="checkbox"/> Industrial Fire Brigade <input type="checkbox"/> Other _____		
Are There Any Companies Exceeding:	<input type="checkbox"/> 1,000 calls per year # of companies _____ <input type="checkbox"/> 2,000 calls per year # of companies _____ <input type="checkbox"/> 3,000 calls per year # of companies _____ <input type="checkbox"/> 4,000 calls per year # of companies _____		

**Benchmarking
Survey**

Property Types in Department's Jurisdiction
(check all that apply)

- Residential
- Commercial
- Light Industry
- Heavy Industry
- Marine
- Wildland
- Agriculture/Farming
- Rural
- Urban
- Suburban

Which of the Following Work Schedules (hours per week) Does Your Department Use for Operation/Line Personnel?

- 40
- 42
- 48
- 52
- 56
- 72

Which of the Following Best Describes Your Shift Schedule?

- 24 Hours On, 48 Hours Off
- 24 Hours On, 24 Hours Off
- 3 Days, 3 Nights, 3 Off (10 Hour Days, 14 Hour Nights)
- 3 Days, 3 Nights, 3 Off with a "Kelly" Day
- 8 Hour Shifts
- Other (specify) _____

What is the Percentage Breakdown of the Following For Your Agency?

	Female	Male	Community
African American	_____	_____	_____
American Indian	_____	_____	_____
Asian/Pacific Islander	_____	_____	_____
Caucasian	_____	_____	_____
Hispanic	_____	_____	_____

Benchmarking
Survey

Data

Please Provide Figures for the Following:

Number of Stations in Jurisdiction

Total Department Budget

Total Fire Loss (annual)

Number of Activities Annually

Number of Firefighter Deaths (annual)

Number of Firefighter Injuries (annual)

Number of Civilian Fire Deaths (annual)

Number of Civilian Fire Injuries (annual)

What Level of EMS Does the Department Provide?

- First Responder
- Basic Life Support
- Advanced Life Support
- Does Not Provide EMS

Does Your Department Transport Patients?

- Yes
- No

APPENDIX B



**INFOMATICS & QUALITY IMPROVEMENT
CUSTOMER SURVEY – OPERATIONS DIVISION
DEVELOPING A MANAGEMENT INFORMATION PRODUCT LINE**

The purpose of this survey is to assist in the development of a “product line” for the Infomatics and Quality Improvement Unit. Your input will help to determine which reports will be produced and at what interval they will be provided. For each item, please rate the *utility* of the report as essential (E), desirable (D), or not helpful (N) to you in the performance of your managerial or supervisory responsibilities. Then, indicate the *frequency* with which you would like to receive the report – daily (D), weekly (W), monthly (M), quarterly (Q) or annually (A).

Rank of Member Responding to Survey: _____

REPORT CONTENT	UTILITY	FREQUENCY
Response company reflex (turnout) performance	E D N	D W M Q A
Response company response performance by response zone	E D N	D W M Q A
Response company time on task for non-response activities (logbook summaries)	E D N	D W M Q A
Response company time on task for incident response	E D N	D W M Q A
Incident reports open or not initiated by company and shift	E D N	D W M Q A
Incident inventory by jurisdiction, neighborhood..... or citizen participation organization	E D N	D W M Q A
Incident distribution by hour of day.....	E D N	D W M Q A
Incident distribution by day of week.....	E D N	D W M Q A
Incident geographic distribution by incident..... type (map presentation)	E D N	D W M Q A
Other: please describe	E D N	D W M Q A
1.	E D N	D W M Q A
2.	E D N	D W M Q A
3.	E D N	D W M Q A

Please feel free to add as many additional reports as you wish on the back of the paper. Please rate each additional report you describe as to UTILITY and FREQUENCY. Thank you.

APPENDIX C



**INFOMATICS & QUALITY IMPROVEMENT
METRO FIRE DEPARTMENT SURVEY
DEVELOPING A MANAGEMENT INFORMATION PRODUCT LINE**

The purpose of this survey is to assist in the development of a "product line" for Tualatin Valley Fire & Rescue's Infomatics and Quality Improvement Unit, which analyzes performance data and reports that data within and outside the organization. We are attempting to learn what statistical reports would be most useful to fire service line supervisors (company officers) and managers (battalion, division, district, chief officers). The survey consists of two parts. Part I asks about reports you **currently** receive within your fire department. Part II asks about reports you would **like** to receive, that would help you to carry out your responsibilities for supervision and management within your organization.

Rank of Person Responding to Survey: _____

PART I – REPORTS CURRENTLY PROVIDED TO YOU

REPORT CONTENT	RECEIVE	FREQUENCY
Incident types	Y N	D W M Q A
Causes of fires and injuries	Y N	D W M Q A
Incident distribution (time of day, day of week).....	Y N	D W M Q A
Incident distribution (by zone or geography).....	Y N	D W M Q A
Response company time on task for non-response	Y N	D W M Q A
activities (logbook summaries)		
Response company reflex (turnout) performance)	Y N	D W M Q A
Response company time on task for incident	Y N	D W M Q A
response		
Incident reports open or not initiated by company	Y N	D W M Q A
and shift		
Incident inventory by jurisdiction, neighborhood.....	Y N	D W M Q A
or citizen participation organization		
Incident distribution by hour of day.....	Y N	D W M Q A
Incident distribution by day of week.....	Y N	D W M Q A
Incident geographic distribution by incident.....	Y N	D W M Q A
type (map presentation)		
Other: please describe	Y N	D W M Q A
1	Y N	D W M Q A
2	Y N	D W M Q A
3	Y N	D W M Q A

PART II – REPORTS THAT WOULD BE USEFUL TO YOU

REPORT CONTENT	Y	N	WOULD BE USEFUL	FREQUENCY
Incident types	Y	N	D	W M Q A
Causes of fires and injuries	Y	N	D	W M Q A
Incident distribution (time of day, day of week).....	Y	N	D	W M Q A
Incident distribution (by zone or geography).....	Y	N	D	W M Q A
Response company time on task for non-response activities (logbook summaries)	Y	N	D	W M Q A
Response company reflex (turnout) performance)	Y	N	D	W M Q A
Response company time on task for incident response	Y	N	D	W M Q A
Incident reports open or not initiated by company and shift	Y	N	D	W M Q A
Incident inventory by jurisdiction, neighborhood or citizen participation organization	Y	N	D	W M Q A
Incident distribution by hour of day	Y	N	D	W M Q A
Incident distribution by day of week.....	Y	N	D	W M Q A
Incident geographic distribution by incident type (map presentation).....	Y	N	D	W M Q A
Other: please describe	Y	N	D	W M Q A
1	Y	N	D	W M Q A
2	Y	N	D	W M Q A
3	Y	N	D	W M Q A

Please feel free to add as many additional reports as you wish in the space below or on a separate piece of paper. Please label each response as to whether it is a report you currently receive or would like to receive, and the frequency at which you receive or would like to receive it. If you would like to receive a copy of the final report, please attach a business card.

Please return the completed survey in the envelope provided to:

Battalion Chief Skip Kirkwood
 Manager, Infomatics & Quality Improvement Unit
 Tualatin Valley Fire & Rescue
 20665 SW Blanton Street
 Aloha, OR 97007

Questions can be directed to me at (503) 642-0314, or via electronic mail to skip.kirkwood@tvfr.com. Thank you for your participation in this project.

APPENDIX D

SUMMARY OF REQUESTS FOR ADDITIONAL REPORTS, COMMENTS AND OTHER REMARKS

FROM INTERNAL SURVEY

- “When we get AVL I’d like to see where along with what”
- “Need more maps and graphs – the figures get tiring.”
- “I hate seeing that daily report about reports that aren’t done!”
- “Sometimes the data quality looks like a problem. That’s the users, not the computer.”
- “Would like to have EMS patient outcome data.”
- “I’ve really come to use this stuff when looking at crew performance.”
- “I’d like to see an accurate report of how much of the 24 hour day is actually spent working.”
- “The CPO and neighborhood statistics are nice when we go to their meetings and they want a report from us. The citywide information was too general.”

FROM EXTERNAL SURVEY

- “We get some of this now, but only once a year. It’s too late to do anything about slow get out times then.”
- “Our union would freak out if we were collecting all of this big brother data on what they do!” (from a manager)
- “Our union could use data like this to overcome the idea that all we do is sit around and play checkers.” (from a line company officer)
- “Our DP section is so far behind in getting run reports entered that whatever came out would be useless.”
- “Data entry for our ambulance billing takes up all the time our clerical staff have to give.”
- “Sure would be nice to see where our incidents take place, at different times of the day. We have a busy downtown during the day, but it’s dead at night. All the calls go to the residential neighborhoods, but the stations stay where they are.”
- “I can’t imagine what I’d do with all that data, but I’d like to get it.”