Measuring The Performance Of Fire and Emergency Medical Services In Colerain Township

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ABSTRACT

The problem was, The Colerain Township Department of Fire and EMS, had no way to prove to the public or their organization they were providing a level of service at a quality that was fiscally responsible.

The purpose of the conducted evaluative research was to:

1. Establish a baseline of service area descriptors for the community of Colerain Township.
2. Establish a baseline of performance measurement for the Colerain Township Department of Fire and EMS.
3. Identify those specific productivity measures that would effectively gauge a base level of cost for service delivery.
4. Through the process of benchmarking, identify comparables with a set group of other like fire departments nationally.
5. Analyze the data received to identify performance gaps.

The procedure involved the identification and comparison of fifteen fire and emergency medical services departments based on residential population, jurisdictional square mileage, force compliment and types of services offered. Benchmarking information was obtained from publications of the International City County Management Association and direct contact with the departments.

The results revealed measurable differences in the amount of paid staffing per 1,000 population served, the amount of structure fires by occupancy type, increased response times to fire calls and a higher than recommended amount of square mileage served by each of Colerain Township's four fire stations.

Recommendations were made to increase the number of paid line staff on duty, increase the ratio of fulltime to part-time personnel, the use of peak load staffing for emergency medical services and the use of EMS only positions for ambulance staffing. All of the staffing increases would improve overall operational effectiveness and eliminate the variability of minimum staffing that was identified during the research.

Additional recommendations that were made include, the addition of two new stations in the more densely populated response areas, reassigning some of the jurisdictional boundaries for each station, the development and distribution of public reports that show performance comparisons with other departments instead of strictly financial information and increasing the automatic first alarm response areas with mutual aid departments.

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INTRODUCTION

"In a time of drastic change it is the learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists". (The longshoreman/philosopher Eric Hoffer)

In the context of fire service delivery, many of the "learned" ones in fire service administrative management are those who were educated in the second half of the twentieth century. If these individuals have not continued to keep their professional education and managerial skills up to date through life- long learning, they are most likely wedded to traditional attitudes and ways of operation. Many of the "learned" ultimately may see their departments become stagnant or fall behind others as they are equipped to manage in a world that no longer exists.

In contrast, many of the emergency services departments led and managed by the "learners" are more likely to thrive and prosper in the future. ***An important tool to foster an entire set of learners within an emergency services department is performance measurement.*** Performance measurement can provide the proper means for a fire department to continuously improve the effectiveness and efficiency of its services.

The problem was, The Colerain Township Department of Fire and EMS, had no way to prove to the public, elected officials or their organization they were providing a level of service at a quality that was fiscally responsible. Convincing our constituents that we are efficiently using their tax dollars to provide an effective level of service will be the key to success with current or future funding requests.

The purpose of this research was to analyze prudent "benchmarking" facts about the Colerain Township Department of Fire and EMS and develop a comparison with other similar fire departments that would show some level of fiscal prudence.

Benchmarking is the search for practices that lead to superior performance. For public fire and emergency medical services, it is an extremely powerful process for improving performance. In its simplest form, it involves comparing performance across organizations to measure one's own achievements and identify ways to improve. Although benchmarking was developed in the private sector, it is ideally suited to the public sector because of public agencies willingness to share information.

Although local governments produce volumes of information in line item budgets, few of these documents offer information that citizens or elected officials can use to determine the value they receive for their tax dollar. Benchmarking is the application of the *Consumer Reports* concept to the public sector. It gives

elected officials, department administrators as well as citizen/consumers comprehensive, accurate and reliable information about services.

The research method that was chosen for this applied research project was evaluative in nature and meant to satisfy these specific investigative objectives:

1. Establish a baseline of service area descriptors for the community of Colerain Township.
2. Establish a baseline of performance measurement for the Colerain Township Department of Fire and EMS.
3. Identify those specific productivity measures that would effectively gauge a base level of cost for service delivery.
4. Through the process of benchmarking, identify comparables with a set group of other like fire departments nationally.
5. Analyze the data received to identify performance gaps.

Background and Significance

> In order to survive in today's society; organizations, companies, and individuals must change and grow. Fire departments have long been rooted in the soil of tradition and the mindset of "if it's not broken, don't fix it." This thought pattern in the fire service must change in order to thrive and survive. (Vatter, 1996, p.1)

In today's fire service environment, emphasis is placed on doing more with less. The public has come to expect the fire service to provide more non-traditional services along with professional, efficient fire suppression and emergency medical services in their time of need. As increases in call volume and service request become a reality, we find that our limited resources become prey to our boundaries of financial wizardry. Inevitably, departments face the task of asking for more public support through funding increases. The time of expecting our communities to pass levies just because "we" are the fire department and we are here to help you, are long gone. We as the fire service need to do a better job of proving accountability for funding and providing the need for additional resources. Asking and answering the question, "what factors are needed to prove fiscal prudence and performance", should be the bases to start.

> In the private sector, the drive for excellence can be summed up in one of the goals of the quality movement, the provision of the best service or product at the least cost, to ensure the preservation of the business organization and the jobs of its employees in a highly competitive environment. Best service/least cost sounds like cutback management and trying to do more with less. The quality movement has demonstrated, however-in both the private and public sectors-that service processes can be substantially enhanced to meet the needs and improve citizen/ customer satisfaction. This satisfaction is often translated into the willingness by citizens and their elected officials to support service needs. One might ask, "Of what relevance are private sector business management techniques to the public sector, particularly specialized emergency services?" An example of the fire

> service's effort to enhance the value of the fire department to the community has been the incorporation of emergency medical care into the fire service. The success of fire's involvement in EMS is attested to by the fact that in departments that provide EMS care, EMS accounts for the bulk of the department's workload and represents a significant source of citizen support and satisfaction for the fire/EMS department. (MIS Report/ ICMA 1993)

Literature Review

The literature review that was used in preparation for this research paper included text books, journal articles, periodicals, data report manuals and direct contact to other fire departments themselves. By far the greatest resources of information on this research topic came from the International City County Management Association.

The *MIS Report, Benchmarking: Achieving Superior Performance in the Fire and EMS Service, International City/County Management Association,* explained the concept of benchmarking and its relationship to total quality management. It discussed the application of benchmarking to fire and emergency medical services, also providing a sample benchmarking survey and results.

> Although comparative reviews are not a new concept in the public sector, benchmarking is. All levels of government use comparative information to support decisions. Most of the comparisons, however, focus on resources rather than on performance. The most common resource comparisons in the fire service are per capita costs, the number of firefighters per 1,000 population and the number of firefighters assigned to each piece of apparatus. A primary difference between comparative resource analysis and benchmarking is the extent to which the latter focuses on methods for improving performance. Benchmarking seeks to identify best practices and then implements those practices to enhance performance.

The most common example of benchmarking in the public sector is the development of pay and compensation plans. Many municipalities survey comparable communities to establish competitive pay ranges for various job classifications. Some care is usually taken to survey communities that are comparable in population and part of the local labor market.

The pay survey methodology illustrates both the value and the danger of inappropriate comparative analysis. Pay surveys tend to place upward pressure on compensation packages. Each time a community conducts a survey there is significant pressure on local administrators and elected officials to increase compensation to keep up with the competition. Pay surveys have a ratcheting effect, a built-in process for continuous improvement that creates pressure to constantly meet or exceed the compensation benchmark established by each new survey. Performance benchmarking surveys have a similar benchmarking effect: the identification of service gaps leads to improved service.

The danger in compensation surveys, particularly pay surveys, is that they are seldom tied to measures of performance. For example not all firefighters perform the same services (fire, EMS, inspections) or perform these services at the same level of skill. Performance levels vary greatly from one jurisdiction to another, and these variations are not necessarily related to resource expenditures. Comparative pay surveys are flawed if they do not take these differences into consideration.

The ICMA has a program for comparative performance measurement that has developed standard performance indicators for specific areas such as service provider descriptors, community risk reduction indicators, fire suppression indicators, EMS descriptors and indicators. Identifying the correct and specific data points to collect was a critically important step in the research process. Further review of the Comparative Performance Measurement; Fiscal Year 2000 Data Report from the ICMA indicated that many factors influence the comparability of data in fire and EMS.

- *Building stock* differences can have a major impact on the difficulty of providing fire protection services. Industrial structures are more likely to be involved in fire or hazardous materials events; thus, jurisdictions with a relatively high percentage of industrial structures may have higher incident rates. The age and height of the building stock is also important. Older structures are less likely to meet current fire codes or to be equipped with fire detection and suppression systems. Taller structures may pose additional challenges for safe entry and fire suppression.

- *Geography* – The layout of the community's streets the underlying terrain, the fire/EMS station locations, and the flow of traffic- can significantly affect the ability of one jurisdiction to achieve the same level of service as another.

- *Staffing* can vary in the number of people assigned per fire apparatus, the minimum scheduled to work each day, the percentage of sworn vs. civilian staff, and the percentage of volunteers.

  There are also unique physical, political, and demographic characteristics of each jurisdiction that influence performance. Examples include unusually good or bad weather conditions, new state and federal mandates, major cuts in budgets, and income level.

Additional resources used that contributed to the specific selection of data points were Municipal Management Series publications, Public Management periodical, and The 10-Point Test of Financial Condition: An Easy To Use Assessment Tool For Smaller Cities, Government Finance Review.

Not only were descriptive data points needed for the services provided to the community but descriptive data was needed about the community itself. Several local sources were able to provide needed community information. The Colerain Township, Hamilton County, Ohio: Profile of General Demographic Characteristics: 2000, U.S. Census Bureau Report, was instrumental in providing specifics on residential population, median household income, make up of the population by percentage of type such as juveniles, below the poverty level and the unemployed.

The Hamilton County offices of Regional Planning and Zoning were contacted and provided reports for the literature review that specified the amount of housing that was owner occupied, the amount of housing that was rental property, commercial and industrial property use percentages as well as information pertaining to multi family, multi story dwellings.

PROCEDURES

The initial research for this Ohio Fire Executive Program (OFE), Applied Research Paper (ARP) began online utilizing the card catalog of the Learning Resource Center (LRC) in Emmitsburg, MD, looking for articles in journals, reports, books and periodicals to learn about benchmarking for performance measurement.

The local branch of the Hamilton County Public Library was used to obtain the relevant material from the LRC through the interlibrary loan program. After receiving the material from the LRC, several references were found with regard to the International City/County Management Association (ICMA) and the available information on fire service benchmarking. One extremely important item available was a performance measurement report for the year 2000, done by the ICMA, specifically on participating agencies for the fire and EMS service. Coincidentally the year of this report matched the most current and accurate data that was available for Colerain Township which was the year 2000.

After obtaining a copy of this performance measurement report it was found to contain performance measurement data for 113 jurisdictions across the United States. This data included all of the items that would be needed for an external department comparison with The Colerain Township Department of Fire and EMS. The primary purpose of this report was to provide a common platform for analyzing service delivery and then use this information to identify government practices that contribute to high performance. To these ends, the jurisdictions sought data from similar jurisdictions against which to compare their own performance on various services. As a result, participants could identify service areas where their performance is below that of other jurisdictions, and identify other jurisdictions that could be sources of information about potentially better service delivery practices.

The ICMA, Comparative Performance Measurement, Fiscal Year 2000, Data Report, was chosen as the instrument for data collection for the following reasons,

> The participating governments of the ICMA, had voluntarily joined together to provide a wide variety of data sets. An extensive effort was made by the participants in each jurisdiction to agree on a common set of data elements and definitions.
> An explicit attempt was made to screen out responses for which a jurisdiction had used the wrong definition or otherwise had provided incorrect data. As part of the electronic data-cleaning process, computerized logic checks were applied to the data submitted, and jurisdictions were contacted to resolve the error issues.

The next procedure addressed was the selection of the sample group or identification of the benchmarking partners that would be used for comparison. External comparisons involve collecting and analyzing performance information from other fire and emergency medical departments. The ICMA reports,

> "Finding comparable agencies in the local area, becomes more difficult as the size of the jurisdiction increases. For entities with a population of more than 60,000, it is frequently necessary to move outside the state and region to find comparable organizations".

It may have been possible to stay within our own region for the comparable organizations, but widening the search outside the region broadened our perspective.

Using the Fiscal Year 2000 Data Report from the ICMA, fifteen fire and emergency medical services departments were selected for a national comparison. The factors used for choosing the like organizations were:

- Residential population served
- Jurisdictional square mileage
- Type of services offered and force compliments used.

Of the 133 communities that provided information to the ICMA those identified for comparison and data collection were:

- Bloomington, Minnesota
- Bryan, Texas
- Burnsville, Minnesota
- Champaign, Illinois
- Davis, California
- Flagstaff, Arizona
- Hoover, Alabama
- LaMesa, California
- Merced, California
- Odessa, Texas
- Portsmouth, Virginia
- Redmond, Washington
- Redwood City, California

- Sioux City, Iowa
- Woodbury, Minnesota

The ICMA clarifies the following with regard to the collected data contained within its report,

> "Readers will find that many of the graphs and tables in this report display data according to service quality, they will also find that this report does not endorse any particular service level as the benchmark to which all jurisdictions should aspire. This is because, in local government, appropriate level benchmarks vary greatly based on such factors as citizen preferences, council and board priorities, local tax resources, and state imposed spending limits."

For these reasons when viewing the data charts used for comparison with Colerain Township you will notice that only those jurisdictions that provided needed information for at least one of the data points were included in each of the tables and graphs. This means that while a jurisdiction may be counted among those submitting data for a particular service area, the jurisdiction may not appear in every graph and table for that particular service area. For those graphs and tables in which the jurisdiction's name does not appear, values may not appear in every row and column.

RESULTS

> "Choosing a benchmark is a critical consideration. In some instances, the highest standard of comparison should be used. In other instances, it might be better to use a lower standard of performance, remembering that benchmarking and organizational improvement are ongoing processes. If an organizations existence is threatened by poor performance and a very competitive external environment, then the wisest course might be to target the highest benchmark as a goal. If the situation however is not a question of continued existence then pragmatic arguments can be made for adopting a lower standard in some instances.
>
> First, if the gap between the benchmark and an agency's performance is too great, the shock can be considerable. Managers when confronted with comparative gaps may be shocked to the point of disbelief by the information. Benchmarking the best practices may produce performance gaps of 30 percent or greater for many organizations. When the gaps are large, it is best to step back from the data, determine the reasons for the gap and design a program that will incrementally, but continuously, close the gap over a period of time.
>
> Second, pragmatism dictates that the benchmark chosen should be a function of the amount of change an organization can absorb at one time. Trying to catch up to the performance leaders is more change than many agencies can handle. If the performance gap is greater, it is better to implement a single, solid improvement than to partially implement several changes."(ICMA, MIS Report 1993 p.10)

Determining performance gaps is a fairly simple task once all of the data has been compiled. A performance gap is the difference between how an agency is performing and how the other agencies represented in the tables and graphs are performing. Comparative measures were constructed for results by dividing the performance of The Colerain Township Department of Fire and EMS in a particular service area, by the performance of a benchmarked agency or group of agencies in the same area. An example exhibit on performance gaps configuration is shown below.

Measuring performance gaps

When a smaller number of some measurable factors are desirable (costs, injuries, deaths), calculate the difference as follows:

$$\frac{\text{Your performance}}{1 - \text{Benchmark performance}}$$

When a larger number is desirable (inspections, public education), calculate the difference as follows:

$$\frac{\text{Your Performance}}{\text{Benchmark Performance} \quad -1}$$

A negative result indicates that a performance gap exists while a positive result indicates superior performance.

Exhibit used from ICMA, MIS Report, Benchmarking: Achieving Superior Performance in the fire and EMS service, v25/n2, February 1993, pg9

TABLE 1: Jurisdictional Profile

Table one below, represents selected demographic information that was used to identify comparable jurisdictions from the 133 jurisdictions available in the ICMA data report.

NOTE: For precise definitions of service–specific terms, see glossary

Table - 1

Jurisdiction	State	Residential Population	Signif. Daily non-res. influx	Daytime Population	Square Miles	Population Density	Median Houshold Income	Percentage InJurisdiction			Owner Occupied Housing	Total General Fund Operating Expenditures (in millions)	Form of government
								Juveniles	Below Poverty Level	Unem-ployed			
Portsmouth	VA	98,100	Yes		30	3,281	34,127	27%		4.30%	51%	$111.40	Council-Mng
Odessa	TX	96,838	No		36	2,663	24,346	29%	19%	5.20%	57%	$36.40	Council-Mng
Bloomington	MN	88,545	Yes	125,000	38	2,312	41,736	21%	4%	1.6%	66%	$38.90	Council-Mngr
Sioux City	IA	82,697	No		52	1,590	48,100	28%	13%	1.60%	60%	$31.60	Council-Mng
Redwood City	CA	78,000	Yes		34	2,294	74,800	22%	12%	1.50%	59%	$46.20	Council-Mng
Bryan	TX	65,660	No		43	1,513		20%	22%	1.4%	46%	$30.70	Council-Mngr
Champaign	IL	63,502	No		17	3,714	22,967	18%	20%	2.7%	44%	$33.50	Council-Mngr
Merced	CA	63,330	No		20	3,208	27,673	35%	25%	13.2%		$18.40	Council-Mng
Hoover	AL	62,241			37	1,695				1.2%	63%	$34.20	Mayor-Council
Colerain Twp	**OH**	**60,144**	**Yes**	**72,000**	**43.5**	**1,383**	**54,844**	**27%**	**9.50%**	**4.5%**	**79%**	**$17.40**	**Trustees-Mngr**
Burnsville	MN	59,300	Yes		27	2,196				1.7%	65%	$20.00	Council-Mngr
LaMesa	CA	59,210	No		9	6,367	40,933	21%	9%	5.0%	45%	$20.90	Counci -Mngr
Davis	CA	58,629	Yes	69,599	10	5,863	54,900	18%	24%	2.3%	31%	$22.10	Council-Mngr
Flagstaff	AZ	52,701	Yes		66	799	34,952	25%		4.5%	51%	$26.00	Council-Mngr
Woodbury	MN	46,836	No		36	1,301	51,014	32%	3%	2.10%		$17.10	Council-Elected Exec
Redmond	WA	44,020	Yes	80,912	17	2,645	81,572	25%	4%	3.60%	58%	$41.30	Mayor-Council
Average		67,484.56		86,878	32	2,677	45,536	25%	14%	3.1%	55%	$33.81	

Residential Population- Colerain, with a population of 60,144, ranks in the middle half of the researched departments but below the collective average of 67,484.

Population Density – Represents the number of people per square mile of area served. The highest population density of the research group was LaMesa California with a density of 6,367 for nine square miles. The average density of the surveyed group was 2,677; Colerain is below this average at 1,383.

Square Miles of Jurisdiction – Colerain at 43.5 square miles was higher than the average jurisdictional square miles of 32.

Owner occupied housing – Colerain had the highest percentage of owner occupied housing for the research group. Owner occupied housing has a reduced incidence of fire due to better maintenance of the property.

TABLE 2: Service Delivery Descriptors

For fire and EMS, many jurisdictions indicated that they serve a population larger, or smaller, than the population of the jurisdiction. Where an alternative population served was reported, this was used in all subsequent calculations. In table 2, the services provided to larger or smaller areas are indicated by the following codes:

Key: Service provided to a large/ smaller population:
F Fire services. (e.g., suppression, prevention)
EMS Emergency Medical Services
O Other (e.g., hazardous materials response, search and rescue)

NOTE: For precise definitions of service–specific terms, see glossary

Table - 2

			Residential Population						Land use of square miles served		
Jurisdiction	State	ISO Rating	For Fire Service	For EMS Service	Services provided beyond jurisdiction area	Provided to area beyond jurisdiction	Sq miles of area served for fire surpression services	Population density for supression services	Agricultural/open space	Residential	Commercial/industrial
Flagstaff	AZ	2	52,701	52,701	No		66	799	Not Available	Not Available	Not Available
Colerain Twp	**OH**	**2**	**60,144**	**60,144**	**No**		**43.5**	**1,383**	**14.30%**	**47%**	**8.20%**
Hoover	AL	2	63,150	63,150	Yes	F,EMS,O	36.7	1,720	6.00%	59.00%	20.00%
Champaign	IL	2	63,502	63,502	Yes	F,EMS,O	21.7	2,926	Not Available	Not Available	Not Available
Merced	CA	2	63,330	63,300	No		20	3,207	Not Available	Not Available	Not Available
LaMesa	CA	2	59,210	59,210	No		9.3	6,367	Not Available	Not Available	Not Available
Redmond	WA	3	65,611	65,611	Yes	F,EMS,O	44.5	1,474	10.00%	75.00%	15.00%
Bloomington	MN	3	88,545	88,545	No		38	2,330	30.20%	36.60%	33.20%
Redwood City	CA	3	82,785	82,785	Yes	F,EMS,O	34.5	2,400	20.00%	60.00%	20.00%
Davis	CA	4	64,094	64,094	Yes	F,EMS,O	133	482	56.80%	32.90%	10.30%
Sioux City	IA	4	82,697	82,697	Yes	O	52	1,590	Not Available	Not Available	Not Available
Bryan	TX	4	65,660	121,862	Yes	EMS	43	1,513	37.00%	43.00%	20.00%
Odessa	TX	4	96,838	125,988	Yes	F,EMS,O	36	2,663	30.00%	65.00%	5.00%
Woodbury	MN	4	46,836	46,836	No		36	1,301	Not Available	Not Available	Not Available
Burnsville	MN	4	59,300	59,300	No		27	2,196	22.80%	39.30%	22.20%
Portsmouth	VA		98,100	98,100	No		30	3,270	Not Available	Not Available	Not Available
Average		3	69,531	74,864			42	2,226	25.2%	50.9%	17.1%

Services Provided – Colerain provided all of the same services as the studied departments. Fire suppression, prevention, hazmat, public education, are some examples. Colerain provides total EMS to its service area as did most of the departments but some reported contracting with outside agencies for service.

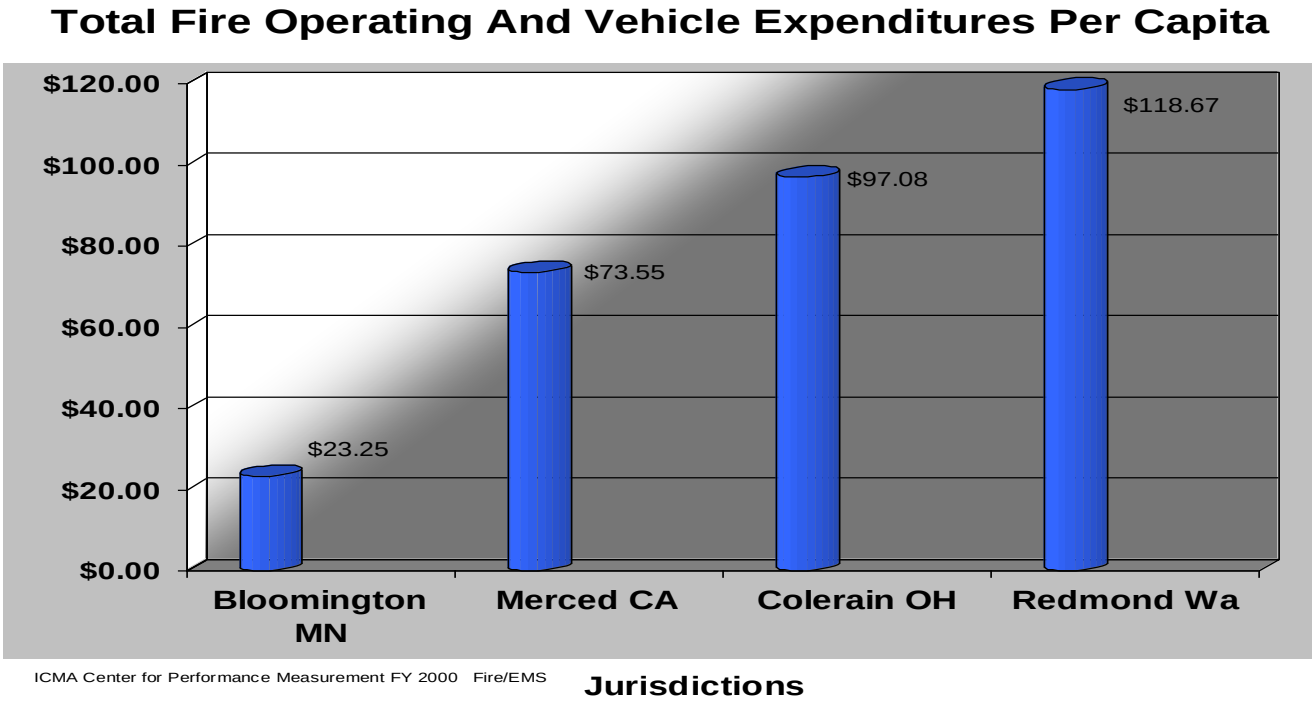
TABLE -3 : TOTAL FIRE OPERATING AND VEHICLE EXPENDITURES PER CAPITA

Expenditures may vary owing to a variety of factors, including range of services provided, number or severity of fires, staffing per station or per apparatus, local labor markets and agreements, reliance on volunteers, and equipment maintenance and replacement schedules.

Capital expenditure data is requested for purchase and replacement of fire vehicles and apparatus. Internal accounting for these transactions varies and may be reflected in either lump-sum payments or annual contributions to a lease-purchase or equipment replacement fund.

NOTE: For precise definitions of service–specific terms, see glossary

Table - 3



Included in this category are salaries and benefits, overtime, all paid leave and all other operating costs- facilities maintenance, data processing, fleet maintenance, training, communications, hazmat, and other expenses that are charged to the fire department. Colerain comes in at $97.08, the highest was Redmond Washington at $118.67, and the lowest was Bloomington Minnesota at $23.25.

TABLE 4: NUMBER OF FIRE STATIONS

The number of stations does not necessarily reflect the number of stations staffed on a daily basis. In many jurisdictions, stations are used for special purposes only, such as emergency medical services (EMS), aircraft rescue, wildland firefighting, or volunteer response.

NOTE: For precise definitions of service–specific terms, see glossary

Table - 4

Jurisdiction	State	Residential population	Square Miles	Fire stations	Separate EMS Stations	Total Stations	Square miles per station	Population per station
Burnsville	MN	59,300	27	2	0	2	13.5	29,650
Woodbury	MN	46,836	36	3	0	3	12	16,278
Flagstaff	AZ	52,701	66	6	0	6	11	8,783
Colerain Twp	**OH**	**60,144**	**43.5**	**4**	**0**	**4**	**10.8**	**15,036**
Bryan	TX	65,660	43	4	0	4	10.7	16,415
Sioux City	IA	82,697	52	7	0	7	7.4	11,813
Bloomington	MN	88,545	38	6	0	6	6.3	14,757
Merced	CA	63,330	20	4	0	4	5	15,832
Hoover	AL	63,150	37	8	0	8	4.6	7,893
Odessa	TX	96,838	36	8	0	8	4.5	12,105
Champaign	IL	63,502	17	5	0	5	3.4	12,700
Redwood City	CA	82,785	34	5	5	10	3.4	8,278
Davis	CA	64,094	10	3	0	3	3.3	21,364
Portsmouth	VA	98,100	30	9	0	9	3.3	10,900
LaMesa	CA	59,210	9	3	0	3	3	19,736
Redmond	WA	65,611	17	6	0	6	0.4	10,935
Average		69,531	32	5	0	6	6	14,530

Number and types of stations – Colerain had the fourth largest protection area of the researched departments and next to the largest square miles per station at 10.8 miles. The ISO benchmark for protection area per station is 7.0 square miles. Colerain ranked as the seventh largest population per station at 15,036.

TABLE – 5: FIRE APPARATUS AND MINIMUM STAFFING

Total staffing does not necessarily relate directly to the number of fire and EMS vehicles, apparatus, or stations because many of these are used for special purposes only or are held in reserve (e.g., for when another piece of apparatus is being repaired). Apparatus of the same type may be staffed at different levels depending on such factors as proximity of other stations, fire risk in the area, or use of volunteer staffing.

NOTE: For precise definitions of service–specific terms, see glossary

Table - 5

Jurisdiction	State	Res. Pop. served for fire service	Ladder Trucks		Engines		Quints/ Comb.		Ambulances		Minimum staffing for in-service equipment				Minimum staffing:constant or variable				Regular use of overtime	Use peak load staffing for ambulances on daily or weekly basis
			No. Reg / In Service	Standby/reserve	No. Reg/In Serv	Standby/ reserve	No. Reg/In Serv	Standby/ reserve	No. Reg/In Service	Standby/ reserve	Ladder Trucks	Engines	Quints	Ambulances	Ladder Trucks	Engines	Quints/Comb.	Ambulances		
Portsmouth	VA	98,100	3	NA	10	NA	0	NA	4	2	3	3	NA	2	C	C	NA	C	Yes	No
Odessa	TX	96,838	1	0	6	2	2	0	4	3	0	3	3	2	V	V	V	C	No	No
Bloomington	MN	88,545	5	0	6	3	0	0	0	0	4	3	NA	NA	V	V			No	No
Redwood City	CA	82,785	2	0	5	2	0	0	0	0	4	3			C	C			No	
Sioux City	IA	82,697	2	1	7	3	0	0	0	0	3	3	NA	NA	V	V			No	
Bryan	TX	65,660	1	0	4	2	0	0	3	2	3	3	NA	2	C	C	NA	C	Yes	No
Redmond	WA	65,611	0	0	6	1	1	0	6	1	NA	3	3	2					Yes	
Davis	CA	64,094	0	0	3	3	0	0	0	0	NA	4	NA	NA		C			No	
Champaign	IL	63,502	2	1	5	2	0	0	0	0	2	3	NA	NA	V	V	C	C	Yes	
Merced	CA	63,330	1	0	4	0	0	0	0	0	2	2	NA	NA	C	V	C	C	Yes	
Hoover	AL	63,150	2	1	8	5	2	1	3	2	3	3	3	2	C	C	C	C	Yes	No
Colerain Twp	**OH**	**60,144**	**1**	**0**	**4**	**2**	**0**	**1**	**4**	**1**	**5**	**4**	**0**	**2**	**V**	**V**	**NA**	**C**	**No**	**No**
Burnsville	MN	59,300	0	1	0	0	2	2	2	1		NA	2	2	V	NA	C	C	No	No
LaMesa	CA	59,210	0	0	3	2	1	0	0	0	NA	3	4	NA		C	V		No	
Flagstaff	AZ	52,701	1	1	5	2	1	0	0	0	3	3	3	NA	C	C	C	NA	Yes	No
Woodbury	MN	46,836	1	0	6	0	0	0	3	0	2	2	NA	0	V	V			No	No

Fire Apparatus and Staffing – Colerain has the highest minimum staffing for ladder trucks and comparable staffing levels for all other equipment. The major difference with most of the researched departments is that minimum staffing is constant. Colerain, though among the highest for staffing, still has variable minimums, meaning that personnel are moved to different apparatus for certain responses.

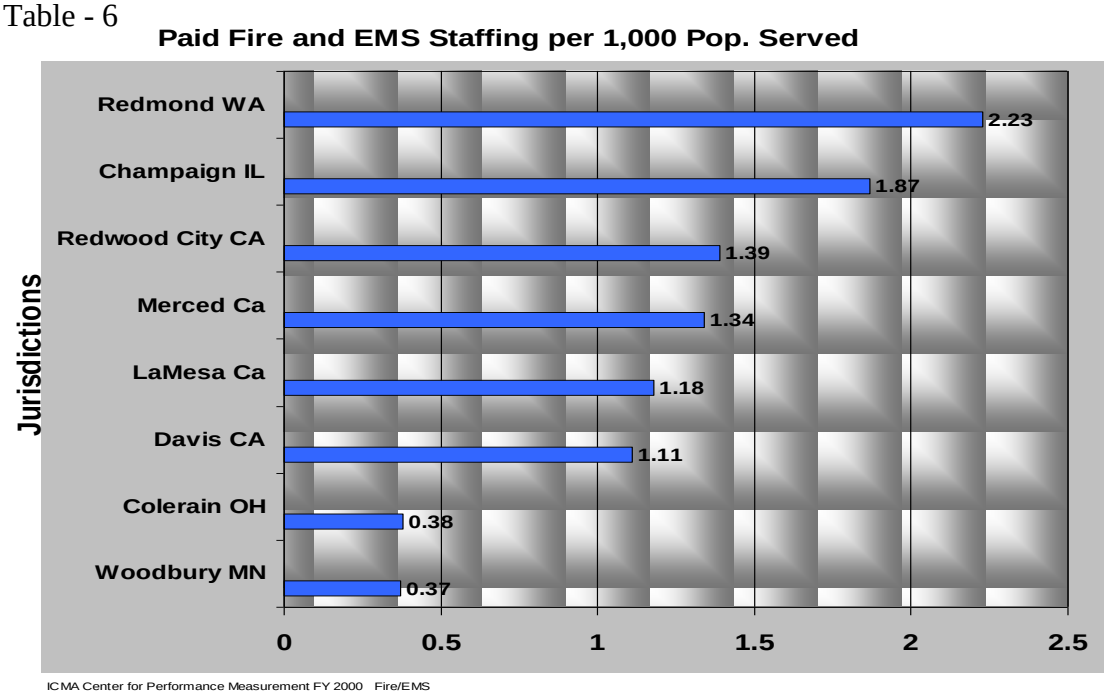
TABLE – 6: PAID FIRE STAFFING PER 1,000 POPULATION SERVED

Total staffing does not necessarily relate directly to the number of fire and EMS vehicles, apparatus, or stations because many of these are used for special purposes only or are held in reserve (e.g., for when another piece of apparatus is being repaired).
Staffing per population served is based on the residential population of the area served for fire and EMS. Jurisdictions with large daytime populations of tourists or area employees may show a higher staffing ratio.

The following table shows the data for sworn fire staff, civilian fire staff and total fire staff (when a sworn/civilian breakout was not available). These data are for paid staff only and thus may understate the actual staffing available in jurisdictions with a heavy reliance on volunteers. Ratios per 1000 population in this table are shown only where the population served for fire suppression is the same as the population served for EMS.
In some instances, jurisdictions may not have reported hours paid as requested in the definitions. Where including those hours would have compromised the integrity of the data, the hours were removed from the data set.

NOTE: For precise definitions of service–specific terms, see glossary

Table - 6



Paid Fire and EMS Staffing per 1,000 Population Served – Colerain at .38, ranked second lowest in this category just above Woodbury Minnesota at .37. The highest in this category was Redmond WA at 2.23 which has proportionately the lowest population and third highest budgeted operating funds of all of the researched departments.

TABLE – 7: RESIDENTIAL STRUCTURE FIRES PER 1,000 POPULATION SERVED

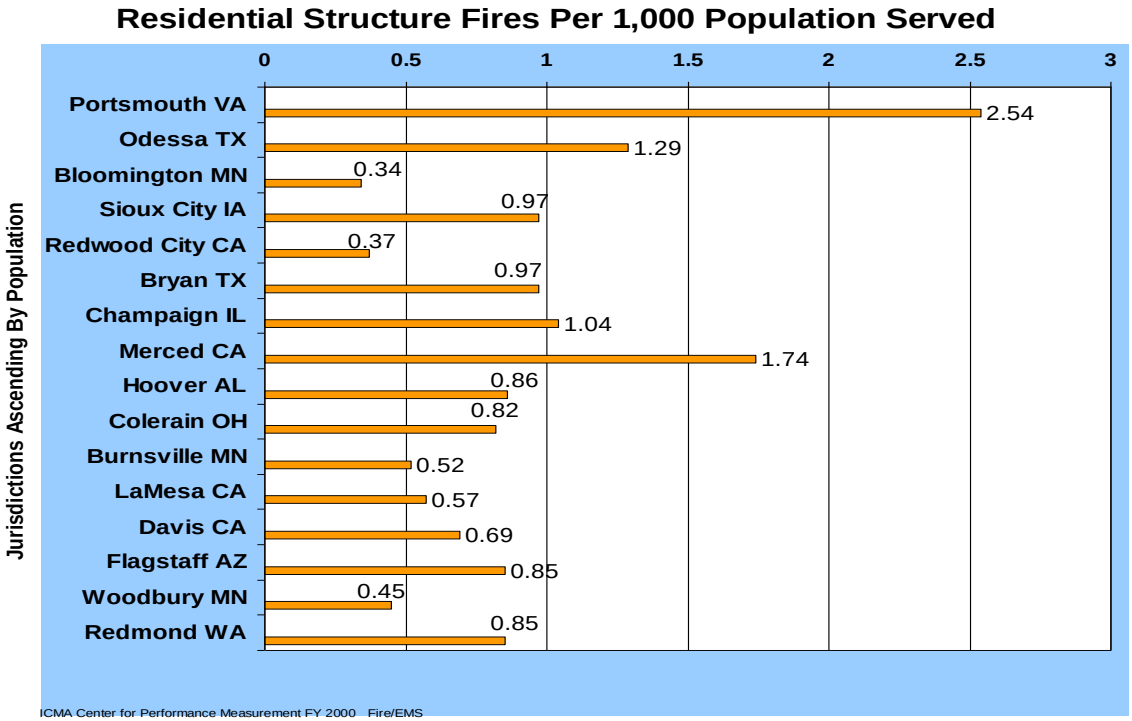
The total number of incidents includes those in which the fire was out on arrival. Variations among jurisdictions may occur for a number of reasons, including:

- Age of housing stock, presuming that older structures may be more prone to problems with electrical wiring and be constructed under less stringent or fire- resistant building codes.
- Population density or number of persons per room, with a higher density indicating a more intensive use of the properties, increasing the risk of fire.
- Climatic differences, with jurisdictions experiencing more severe heat or cold having more intense use of heating or cooling equipment, increasing the risk of fire associated with such use.

Jurisdictions with a similar population and similar number of incidents may have differing ratios of residential structure fires per 1,000 population served, depending on the number of people per household.

NOTE: For precise definitions of service–specific terms, see glossary

Table – 7



Structure Fires by Occupancy Type Residential Of the twelve departments reporting in this category, Colerain came in with the sixth lowest number of one and two family residential structure fire incidents at 56 and the fifth highest for multi-family dwellings at 17. Colerain was also observed to have the sixth lowest number of residential structure fires per 1,000 residential structures.

TABLE – 8: TOTAL RESIDENTIAL DWELLING STRUCTURE FIRE INCIDENTS

The total number of incidents includes those in which the fire was out on arrival. Variations among jurisdictions may occur for a number of reasons, including:

- Age of housing stock, presuming that older structures may be more prone to problems with electrical wiring and be constructed under less stringent or fire- resistant building codes.
- Population density or number of persons per room, with a higher density indicating a more intensive use of the properties, increasing the risk of fire.
- Climatic differences, with jurisdictions experiencing more severe heat or cold having more intense use of heating or cooling equipment, increasing the risk of fire associated with such use.

NOTE: For precise definitions of service–specific terms, see glossary

Table - 8

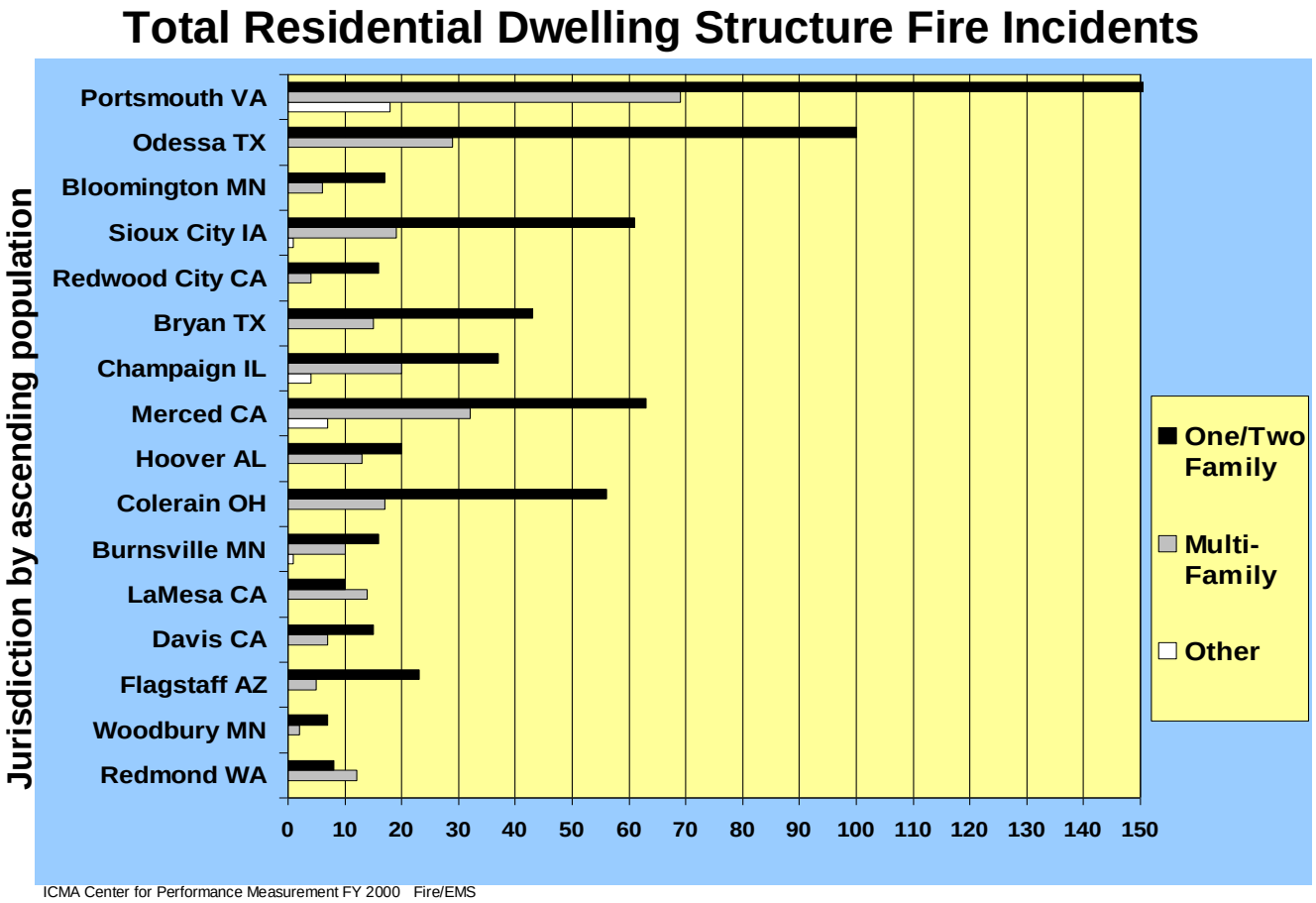


TABLE – 9: ONE AND TWO FAMILY RESIDENTIAL STRUCTURE FIRE INCIDENTS: FIRE OUT ON ARRIVAL, CONFINED TO ROOM OF ORIGIN, OR CONFINED TO THE STRUCTURE OF ORIGIN.

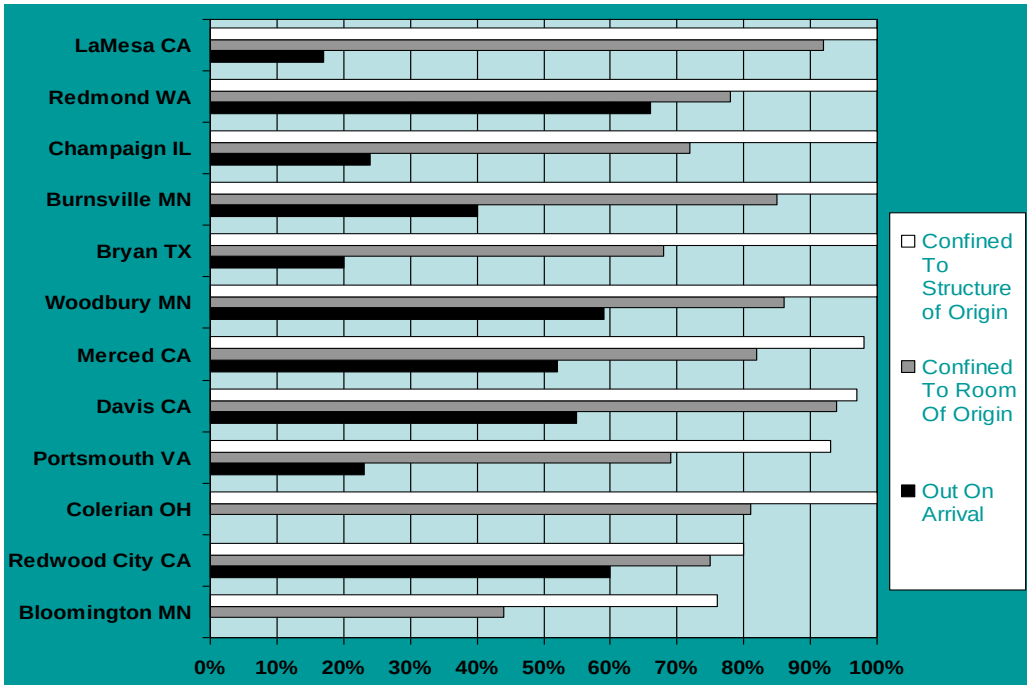
The total number of incidents includes those in which the fire was out on arrival. Variations among jurisdictions may occur for a number of reasons, including:

- Age of housing stock, presuming that older structures may be more prone to problems with electrical wiring and be constructed under less stringent or fire- resistant building codes.
- Population density or number of persons per room, with a higher density indicating a more intensive use of the properties, increasing the risk of fire.
- Climatic differences, with jurisdictions experiencing more severe heat or cold having more intense use of heating or cooling equipment, increasing the risk of fire associated with such use.

Table 9 includes only those jurisdictions that were able to provide data for all categories of fire disposition or flamespread.

NOTE: For precise definitions of service–specific terms, see glossary

Table - 9 **One and Two Family Residential Structure Fire Incidents:**



ICMA Center for Performance Measurement FY 2000 Fire/EMS

Structure fires by outcome - Colerain reported no structure fires were out on arrival compared to Redmond Washington who reported the highest at 65%. Colerain, at 81%, had the fifth highest percentage of fires that were confined to the room of origin. The highest was Davis CA at 94%. Colerain and 5 other of the twelve departments report 100% of fires for the year 2000 were confined to the structure of origin.

TABLE – 10: TOTAL COMBINED COMMERCIAL AND INDUSTRIAL STRUCTURE FIRE INCIDENTS PER 1,000 COMMERCIAL AND INDUSTRIAL STRUCTURES.

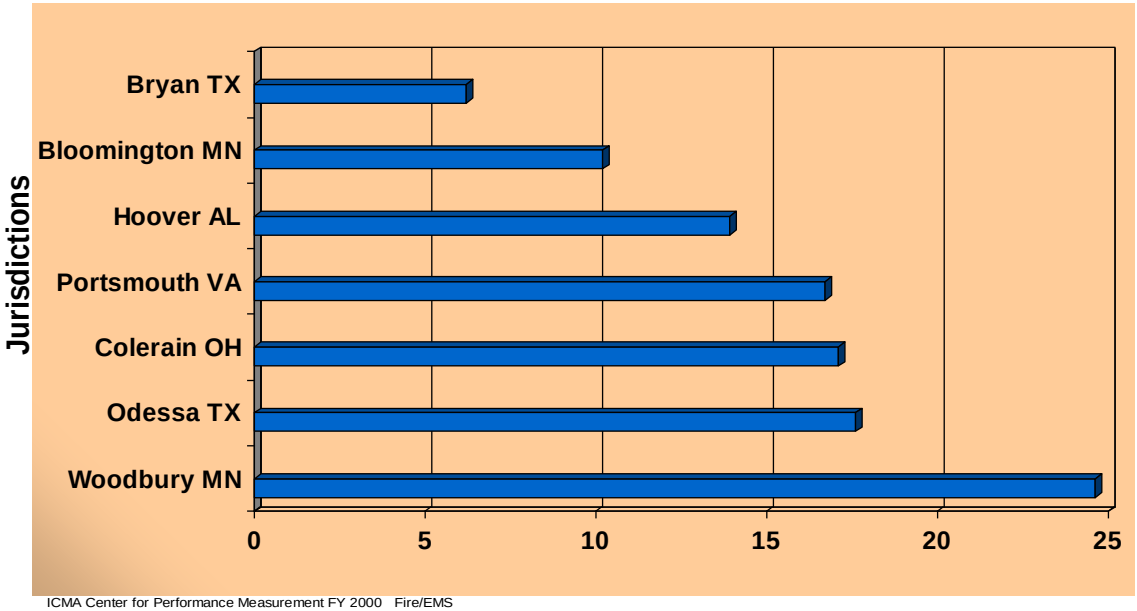
Because some jurisdictions are unable to separate commercial and industrial structure and/or incidents, both are reported in the same data. All of the information has been combined for reporting purposes.
The total number of incidents includes those in which the fire was out on arrival.
Variations among jurisdictions may occur for a number of reasons, including:

- Age of housing stock, presuming that older structures may be more prone to problems with electrical wiring and be constructed under less stringent or fire- resistant building codes.
- Population density or number of persons per room, with a higher density indicating a more intensive use of the properties, increasing the risk of fire.
- Climatic differences, with jurisdictions experiencing more severe heat or cold having more intense use of heating or cooling equipment, increasing the risk of fire associated with such use.

NOTE: For precise definitions of service–specific terms, see glossary

Table - 10

Total Combined Commercial and Industrial Structure Fire Incidents Per 1,000 Commercial and Industrial Structures



ICMA Center for Performance Measurement FY 2000 Fire/EMS

Structure Fires by Occupancy Type Commercial and Industrial - Colerain has the third highest total combined commercial and industrial fire incidents per 1,000 commercial and industrial structures.

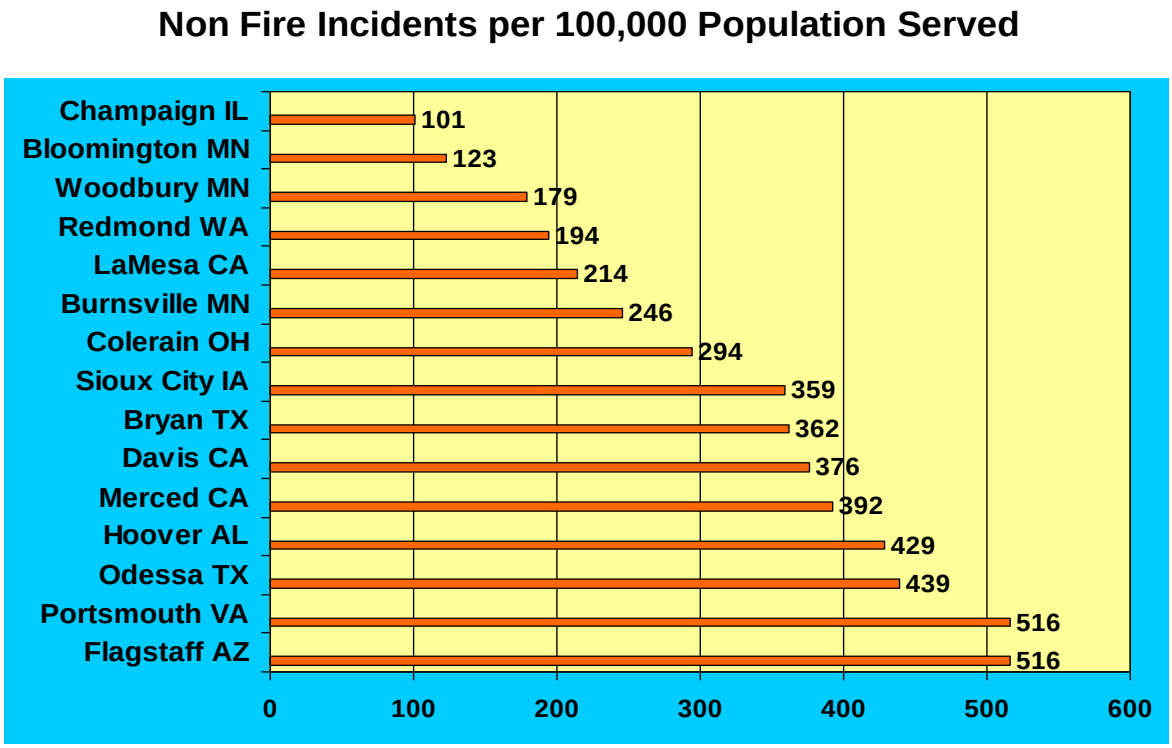
TABLE – 11: NON – STRUCTURE FIRE INCIDENTS PER 100,000 POPULATION SERVED.

Variations among jurisdictions may occur for a number of reasons, including:

- Role in providing medical response and or transport
- Age and health of the population
- Provision of additional non-fire services or the public perception that those services are provided.

NOTE: For precise definitions of service–specific terms, see glossary

Table – 11



Total responses to fire calls – Colerain had the second lowest false alarms as a percentage of total fire responses at 21%. Davis California had the lowest at 5%. The highest was Champaign Illinois at 88%.

Colerain has the seventh lowest non-fire incidents response per 100,000 population of the fifteen departments researched. This category requires response of equipment and personnel to such calls as EMS assist, turn off hydrants, ect...

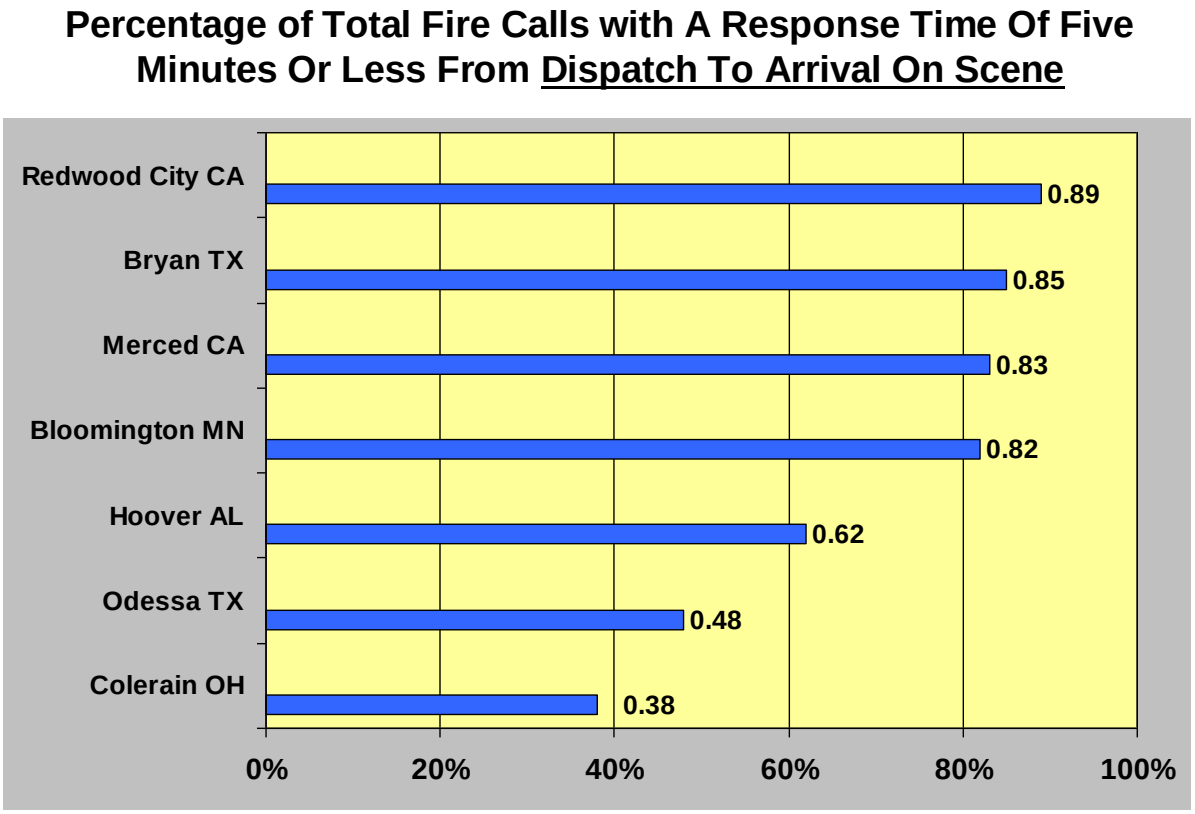
TABLE – 12: PERCENTAGE OF TOTAL FIRE CALLS WITH A RESPONSE TIME OF FIVE MINUTES OR LESS FROM DISPATCH TO ARRIVAL ON SCENE.

Many factors influence response time, including weather conditions, width and layout of the streets, station locations, and population density. Jurisdictions with a limited area to be served may also be able to provide faster responses.

All data on responses are represented emergency and non-emergency calls within 5 minutes. There are no zero values among the data, blank lines represent either a non-response or a not available.

NOTE: For precise definitions of service–specific terms, see glossary

Table – 12:



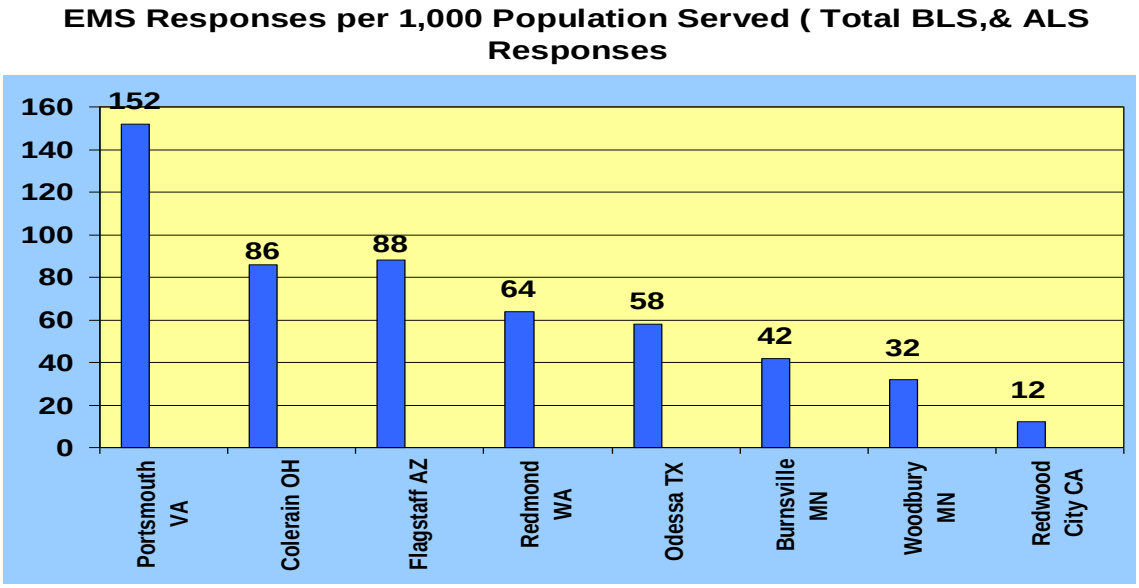
Response Time – Colerain has the lowest percentage of calls responded to in five minutes or less from dispatch to scene. This time involves a delay due to turn out time. Turn out time is the amount of time it takes for crews to get dressed and on the apparatus before actually responding. This delay could be as much as one to one and a half minutes.

TABLE – 13: EMS RESPONSES PER 1,000 POPULATION SERVED: TOTAL BLS, ALS, RESPONSES.

Responses per 1,000 population served are based on the population served for EMS. In some cases, this differs from the population served for fire services.

NOTE: For precise definitions of service–specific terms, see glossary

Table – 13



ICMA Center for Performance Measurement FY 2000 Fire/EMS

Jurisdiction	State	Fire Department Transport	Primary Level of ServiceProvided by Engines and Ladders	Ambulance Service Provider	Fire Department ambulances	Fire Ambulances Staff
Redmond	WA	Yes	ALS	Private		
Woodbury	MN	Yes	BLS	Fire/Vol	3	2
Colerain Twp	**OH**	**Yes**	**ALS**	**Fire**	**5**	**2**
Odessa	TX	Yes	ALS	Fire	7	2
Portsmouth	VA	Yes	ALS	Fire	6	2
Burnsville	MN	Yes	BLS	Fire	3	2
Bryan	TX	Yes	BLS	Fire	5	2
Hoover	AL	Yes	BLS	Fire	5	2
Flagstaff	AZ	No	ALS	Private		
LaMesa	CA	No	BLS	Private		
Merced	CA	No	BLS	Private		
Davis	CA	No	BLS	Private		
Champaign	IL	No	BLS	EMS		
Redwood City	CA	No	BLS	EMS		
Sioux City	IA	No	BLS	EMS		
Bloomington	MN	No	FR	EMS		

Emergency Medical Services Descriptors and Indicators

Colerain provides EMS services and transport with fire department personnel as do six other departments in the researched group. Only five of the departments provide ALS service with engine company personnel. All others provide at a minimum BLS with the

exception of Bloomington Minnesota that reports a first responder level of service. All departments that provide transport services use the same level of minimum staffing.

Of the departments reporting EMS response activity, Colerain had the second highest per 1,000 population served. Portsmouth Virginia had the highest at 152/1,000, and they have a significantly higher population density than Colerain.

DISCUSSION

One goal of benchmarking, naturally, is to permit comparisons among benchmarks developed through performance measurements. Although two locations may have similar populations, so many other variables exist that you must question the extent to which direct comparisons really mean anything. Such questions as the following arise: What makes jurisdictions comparable? And to what extent do comparisons with an established benchmark make sense for my own jurisdiction? Taking it a step further, what level of performance is considered to be significantly different from the established benchmarks.

Issues like these underscore the importance of making performance measurement and of obtaining accurate data on valid benchmarks. The ICMA's Performance Management Consortium will not simply use members' averages on particular criteria as benchmarks. A range of values will be published, not on a single criterion. Physicians for instance have learned not to give one ideal weight for any one individual but to give a range that the healthy person should fall within. This practice prevents some of the interpretation problems encountered when comparing individual measures against a single value.

Remember that regardless the quality of the data or validity of benchmarks that no data are ever perfect, direct comparisons against absolute standards should only be done to find red flags and small differences must not be taken as meaningful. Also, never expect to make perfect direct comparisons. Either you will come away disappointed, or you will be misled by numbers that you assume are highly accurate performance indicators of particular services in unique jurisdictions.

An example of a standard direct comparison difference found in the research analysis is the square mile per station coverage. The Insurance Service Office (ISO) recommends that engine companies be located within 1.5 miles of the built upon areas of the community. The 1.5-mile standard translates into an area of approximately 7 square miles per station.

Gap analysis using the ISO standard indicates that over 50% of the departments surveyed, substantially exceed the ISO standard. Analysis of station coverage in The Colerain Township Department of Fire and EMS indicates wide variability in coverage. The coverage data suggests that most of the cities do not have a coverage standard for their departments.

The ICMA reported:

> It is not unusual to find wide disparities in station coverage. Some of the differences are a function of density and risk factors, while others result when communities phase out obsolete and redundant stations as modern apparatus replace outdated motorized equipment. Development of a station coverage standard might lead to a more cost-effective deployment of resources.

RECOMMENDATIONS

As the literature review and research has shown many variables can be applied to the benchmarking factors that are used to show how a department measures up to like departments. To obtain real value from benchmarking all participants must be willing to except change and make a commitment to follow through. An organization's environment and culture must be receptive to change. Successfully implementing a quality process depends upon and naturally causes, a change in the organizational culture and in the traditional ways of doing things.

Recommendations will be made for policy, practice or programs based strictly on the figures and facts found by the research parameters of this particular study. The way the recommendations should be implemented and all of the allied factors that would be needed or associated with implementing these recommendations will not be addressed in this report.

The first set of recommendations will be directed toward the staffing concerns that were found during analysis of the benchmarking numbers.

- Colerain Township should increase the number of paid line staff on duty to handle increased call volumes and improve the number of paid staff per 1,000 populations served ratio. Although there appears to be no set standard number, the figure for Colerain is out of the norm for the other departments.
- Increasing the number of paid staff would also improve effectiveness in the areas of suppression and safety. This increase in staff would allow for a possible reduction in the number of fires that are uncontrolled beyond the room of origin by having more personnel on scene in the initial stages of the first alarm to accomplish more tasks in a shorter time frame.
- Increase the ratio of career personnel to part-time personnel on duty which will decrease the variability of minimum staffing.
- Examine the possibility of an EMS only position to staff ambulances. This would relieve the need for cross trained personnel to cover different equipment and improving the variable minimum staffing.
- Examine the possibility of peak load staffing, especially for EMS units, on a daily basis to compensate for multiple call volume deficiencies created by variable minimum staffing.

- Examine the possibility for regular use of overtime to make minimum staffing constant instead of variable.
- Staffing increases would also be needed to compensate for the station increase recommendation in later sections.

The next set of recommendations will be directed toward the numbers review on station locations.

- Colerain Township should add two new stations in the more densely populated areas. This will reduce the 15,036 population per station ratio.
- The addition of stations would also reduce the 10.8 square mile protection area per station to under 7.0, meeting the ISO benchmark.
- Examine the possibility of reassigning station coverage areas to improve response time and run volume coverage for the current four stations already in use.

Additional recommendations should be addressed towards the development of goals based on the benchmarking findings and the communication of these goals and findings.

- Analyze benchmarking data to develop goals that may be presented to effect outcomes in budget deliberations to improve service.
- Analyze comparative performance data to set targets of performance in specific areas.
- Instead of reporting strictly financial information to the public, develop and distribute reports that show how The Colerain Township Department of Fire and EMS performs in comparison to other similar departments.

The last group of recommendations deals with the area of overall response

- The previously mentioned station additions will increase the percentage of runs that can be responded to in five minutes or less from dispatch to on scene arrival.
- Faster response times will increase the number of fires that are controlled before they spread from the room of origin.
- Increasing the current size of the existing automatic response areas by mutual aid companies on first alarms. This will reduce response distance and time for first arriving units.

As is with many kinds of research, once we start asking the right questions and getting answers, we find that we come up with many additional questions that would lead to additional research. This applied research project was definitely now exception to the rule. The following points represent additional items that would benefit The Colerain Township Department of Fire and EMS.

- Fire service personnel injuries with time lost per 1,000 incidents.
- Number of non-emergency calls that could have received an alternate means of response vehicle.

- Residential structure fire incidents as percentage of total structures per district response area.
- Response time and dollar loss correlation for each district.
- Residential arson incidents per 1,000 populations served.
- Incident disposition percentage of false alarms compared to percentage of total fire incidents.
- Type and amount of fire company activities on a daily basis.
- The assignment of a cost per activity for each responding company.
- Rescues and recoveries performed by type per 1,000 population served.
- Percentage of calls that have response time of six minutes or less.
- Percentage of calls that have a response time of eight minutes or less.

In the EMS services the following ideas surfaced for additional research.

- Response to EMS calls by patient age breakdown.
- Percentage of patients in cardiac arrest that have a pulse upon arrival of definitive care.
- Percentage of EMS response times that are five minutes or less.
- Percentage of EMS runs that are responded to while returning from other details.
- The assignment of cost per activity for each EMS unit.
- Percentage of run activity per median household income for each community or neighborhood.
- On scene care time related to outcome of definitive care treatment.

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APPENDIX - A

GLOSSARY

The definitions that appear below are taken directly from the FY 2000 data collection templates. All jurisdictions that reported data agreed to submit information that adheres to these definitions, even if their local definition of the term differs somewhat.

General Descriptors

Contract services: These are services provided by an organization directly compensated by the jurisdiction.

Franchise services: These are services provided by an organization given the right to operate within the jurisdiction but receiving no direct compensation from the jurisdiction.

Land use: Agricultural, residential, commercial, industrial, or other uses of area served. This will affect speed of travel and provision of services.

Minimum/constant fixed post basis: This is the minimum number of positions required to provide staffing on a continuous basis, 24 hours a day, seven days a week. For example, if your jurisdiction requires a minimum deployment of 10 engines and the minimum staffing per engine is 4 persons, then the fixed post staffing for engines is 40.

Population of area served: This is the number of individuals served by department. If the department provides services to an area larger or smaller than the residential population of the jurisdiction, the residential population served will be higher or lower than the population of the jurisdiction. If your department provides fire services to a neighboring town, this number would include the residential population of the neighboring town. The best source of population information is your planning department.

Population density: The number of people per square mile in the area served.

Staffing

Civilian: Personnel who are not sworn (see "Sworn" below). Include both supervisory and nonsupervisory civilian staff. This includes full-time and part-time personnel regardless of source of funding.

FTEs: full-time equivalent staffing is calculated on the basis of hours paid. Hours paid are to be reported regardless of source of funding. All types of hours paid are to be included: regular; overtime; sick, vacation, and other paid leave; and any other hours paid. Some jurisdictions staff on a 48- or 56-hour work week; FTEs are calculated based on a 40-hour week because this standardizes the data regardless of the number of hours in a work week.

Hours paid: This includes full-time and part-time personnel regardless of source of funding. Include all types of hours paid – regular; overtime; sick, vacation, and other paid leave; and any other hours paid.

Sworn: Sworn staff applies to suppression, hazmat, and EMS personnel. Even if the EMS/EMT/paramedic personnel are non-sworn, they should be counted here. If dispatch personnel are sworn, they are counted under sworn staff. Include both supervisory and nonsupervisory sworn staff.

Expenditures

Total operating and vehicle expenditures include the following:

- **Total operating expenditures**. Include salaries and benefits, overtime, all paid leave, and all other operating costs – facilities maintenance, data processing, and fleet maintenance where those expenses are charged to the fire department. Include training academy, fire communications, hazmat, and other expenses if those expenses are charged to the fire department.

- **Capital expenditures for replacement vehicles or purchase of new vehicles**. These expenditures are reported only if they are charged to the department and have been added to the fleet. Expenditures for fire boats, helicopters, and other vehicles used for suppression are to be reported.

- **Expenses for fire services that are not charged to the fire department**. An example of expenditures to be reported here is fire pension contributions that are in the finance department budget.

Service Descriptors

ALS stations: Stations from which advanced life support responses originate. Since advanced life support is a step beyond basic life support, all ALS stations are also counted in the BLS station category.

Arrival on the scene: This term refers to the first responding unit.

Arsons: Fires that upon investigation were determined to be caused by arson and reported as such to the FBI under the Uniform Crime Reporting (UCR) system. Do

not report fires reported to National Fire Incident Reporting System (NFIRS) as incendiary or suspicious unless upon investigation they have been determined to be arsons.

BLS stations: Stations from which basic life support responses originate.

Call entry: This is the time at which the fire/EMS call taker answers the call.

Commercial structures: Count here public assembly property (amusement/recreation centers, stadiums, gymnasiums, churches, clubs, libraries, museums, court rooms, restaurants, nightclubs, terminals, theaters, studios), educational property (nurseries; kindergartens; boarding, trade, vocational, and other schools; colleges; and universities), institutional property (hospitals, nursing homes, foster homes, orphanages, prison cells, rehabilitation centers, mental institutions, and homes for the retarded). Include stores and offices and storage properties (warehouses). Include commercial properties under construction. (Includes all NFIRS fixed property classifications 100-189, 200-249, 300-369, 500-599, 800-899).

Dispatch: This is the time at which the process of dispatching responding units has been completed.

Emergency calls: As used in this document, this term encompasses all calls dispatched as emergency calls for fire service (lights and sirens), regardless of whether the response status was changed en route (e.g., due to weather or traffic conditions).

Hazmat incidents: A reportable hazmat incident is one in which all of the following conditions apply:

- A material is present that is suspected to be other than ordinary combustible materials or combustible material by-products, and
- The material is in such a state, quantity, or circumstance that, if left unattended, it is presumed to pose a threat to life, health, property, or the environment, and
- Specialized hazmat resources were or should have been dispatched or used for assessing, mitigating, or managing the situation.

Industrial structures: Manufacturing property regardless of whether the work is preformed by machine or hand, whether done in the factory or in the home, whether sold at wholesale or retail. Includes all factories and industrial structures under construction. (Includes all NFIRS fixed property classifications 600-689, 700-799).

Nonemergency calls: As used in this document, this term refers to all calls for fire service that are not classified as emergency calls.

Nonfire incidents: Incidents that require the dispatch of equipment or personnel to respond to a request. Examples of incidents to report here are a request for assistance with EMS and a request to turn off a fire hydrant.

Nonstructure fire incidents: Fires in public mailboxes, dumps, landfills, open land, fields, water areas, railroads, roads, parking lots, airports, and oil fields. Count mobile property fires here, including passenger road transport vehicle, freight road transport vehicle, rail transport vehicle, and air transport vehicle, and heavy equipment vehicle fires.

Out-on-arrival incidents: Fire incidents in which the fire is out by the time fire staff arrive on the scene. These incidents were to be reported in a separate category, not reported in the questions asking about extent of flamespread.

Overhead: Activities, staff, and expenditures considered a part of overhead include facilities management, fleet management, finance/payroll, human resources, information technology, purchasing, risk management and management not directly involved in the supervision of fire/EMS personnel or activities.

Rescues and recoveries: A rescue is the retrieval of a living person. A recovery is the retrieval of a body. Jurisdictions were instructed to provide information regardless of whether the jurisdiction has a dedicated team that is exclusively devoted to rescue operations. Many departments perform rescues and do not have a dedicated team. Rescues and recoveries performed with aircraft are not included in the totals.

Residential dwelling structures: One- and two-family dwellings, multifamily dwellings, and other residential dwellings.

- **Residential one- and two-family dwelling structures**. Private dwellings and duplexes each occupied by members of a single family group, with total sleeping accommodations for not more than 20 people and rooms rented to not more than two outsiders per unit. Row houses, townhouses, garden apartments, and other similar units shall be counted here if there are only two units. A mobile home and a travel trailer not in transit and used as a dwelling should be counted. (Includes all NFIRS fixed property classifications 410-419).

- **Residential multifamily dwelling structures**. Multifamily dwelling structures are defined as three or more units that are located within common fire division walls and under a common roof or that have a common basement. Multifamily dwellings are quarters for families living independently of each other. They may be referred to as apartments, condominiums, flats, tenements, or any other name. (Includes all NFIRS fixed property classifications 420-429).

- **Other residential dwelling structures**. Rooming houses, boarding houses, hotels, motels, inns, lodges, dormitories, and home hotels that serve a transient population as well as other property that cannot be classified in one of the above categories (NFIRS

fixed property classifications 430-499 and 400 and 409). Although NFIRS includes children's playhouses and tents, these have been specifically excluded from the template definitions.

Structure fire incidents: Includes only incidents where the type of situation found was a structure fire (NFIRS type 11). This category includes any fire incident inside a building or structure, whether or not there was structural damage to the building. Total structure fire incidents comprise residential, commercial, and industrial structure fires and *include* false alarms.

APPENDIX - B