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Determining Emergency Response Needs Based on Pre-Incident Planning

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Abstract

This applied research project utilized descriptive research to address the problem that Mason Fire Department did not have an established pre-incident planning program that connected life-safety risks, equipment needs, and emergency response tactics to the strategic planning process. The purpose of this research was to identify the fundamentals necessary in a pre-incident planning program that supports safe company tactics, budget planning, and training.

After the five questions about pre-incident components, risk management models, department shortfalls, fire protection gaps, and other effects on pre-incident planning were answered with a questionnaire, data from officer manual, journals, and handbooks, it was determined that pre-incident planning can determine fire department resources. Mason Fire Department's plan will encompass a plan that is comprehensive, department wide and can be shared for strategic planning purposes.

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Introduction

The problem is that Mason Fire Department has not established a company level pre-incident planning program that will connect life-safety risks, equipment needs, and emergency response tactics to the Mason Fire Department's strategic planning process; consequently, facilitating incorrect equipment purchases and personnel training. The purpose of this research is the establishment of a pre-incident planning process that supports safe company tactics, budget planning, and personnel training.

Identifying what is occurring in the community is imperative to planning out the fire departments goals and objectives. It is important to understand that because of economic hard times and more stringent budget controls, needless spending and poor planning will lower the elected officials' and the public's trust and confidence in the department. These poor decisions could easily be detrimental to the fire department: especially those who rely on funding such as fire tax levies, of which require a vote by the community.

Because Mason Fire Department wants to maintain the public's trust and spend tax payer dollars wisely, determining pre-incident planning will be a hands on approach on determining emergency response needs of which will give Mason's chief officers a foundation for planning. In order to determine the relations between emergency response needs and pre-incident planning descriptive research will be utilized to answer the following five questions: 1) What are the components of pre-incident planning that provide information on the number of personnel, equipment, and tactical considerations for the hazard scene and fire department planning, 2) How do risk management models mesh with and provide information for pre-incident planning, 3) How can shortfalls such as company tactics, equipment, and training identified in pre-incident planning be organized in a format so that they can be cumulatively summarized for the purpose

of fire department planning, 4) What are the methods of closing the gaps in fire protection concurrently and prospectively, 5) How do alternative construction methods, occupancy separations, property zoning, and built-in fire protection systems effect pre-incident planning and future resource needs. By answering these questions it's possible to determine if pre-incident planning can be used to help with decisions such as strategic planning, training, and company tactics.

Background and Significance

The City of Mason is a growing city in Warren County, Ohio. Warren County is composed of several townships, villages, and cities, with a combined population of 158,000 people. More specifically, Mason is 18 square miles with a population of 32,000. Mason is expected to grow do to its strong economic potential such as being located near (less than 30 miles) two major airports, two major cities, and two major interstates. Mason has at least 1,100 acres of undeveloped land zoned for office and industrial development. (www.imaginemason.com, 2008) Not only is Mason attractive to businesses, it is also an attractive place to live. Mason ranks as 2007's top 100 of best places to live in the United States. Currently Mason has two large industrial parks as well as several upper scale housing developments that are either near completion or just beginning. Because of these factors, Mason Fire Department needs to rapidly conduct pre-incident planning of these areas and provide administration with emergency response needs.

The City of Mason Fire Department responds to 3,700 calls for service annually, utilizing a work force of 27 full time employees and 14 part time employees. Mason Fire Department has two stations that house either an engine or quint and one advanced life support (ALS) ambulance. Each piece of fire apparatus is staffed with a minimum of four firefighter-

paramedics and each ambulance is staffed with a minimum of one firefighter-emergency medical technician and one firefighter-paramedic. There is at least one acting EMS response vehicle and one fire command officer on duty at all times. The total operating budget is 5.8 million. Fees for EMS transports recover approximately $600.000 of the operating budget with the rest coming from a fire tax levy that is voted on every five years.

Understanding that the Mason Fire Department is funded through a voted tax levy is one of the most important underlying elements in this research. Mason Fire Department's budget planning not only goes through considerable discretion from the chief officers and city administration but from city council members and the public. Fire department funding comes from a tax that is assessed each house or property owner. Every five years elected officials must decide on how they will place this tax on the ballot. This places the operations of the department and the level of fire and EMS service the citizens want into their hands.

Because of this tax levy structure and citizens actually voting on what kind for fire and EMS system they want, there is considerable pressure on the elected officials and chief officers to show the public that their money is being spent wisely. Collecting accurate data and information about what community risks currently exist and what is coming in the future is essential. Another caveat to this whole process is that Mason's fire department is being pushed to meet the National Fire Protection Association's (NFPA) 1710 on turnout times and response times; however, due to the failure of an additional tax levy in the November, 2008 election that was going to be used to fund personnel for a third station, meeting NFPA 1710 is not achievable. However, what can be achieved with comprehensive pre-incident planning is accurate information, maximization of current resources, community involvement, and firefighter safety. As the fire crews conduct accurate pre-incident surveys and fire administration extracts pertinent

data form those plans, the tax payers will see their money spent wisely on fire and EMS protection; therefore, elected officials will be more willing to place a tax levy on the election ballot.

Literature Review

In order for research to be comprehensive, determining emergency response needs based on pre-incident planning must be dissected into two basic components. First, pre-incident planning must be understood. Lastly, one must understand what data is available for determining risk. Risk is directly associated with emergency response needs. To begin, pre-incident planning is defined by the National Fire Protection Association (NFPA) as a document containing general and detailed information to be used by emergency responders to determine the resources and actions necessary to control a situation in a specific occupancy (NFPA 1620, 2003). In summary, the pre-incident plan shall consist of organized data collected by the organization (NFPA 1620, 2003). Lastly, in order for the plan to be effective the organization must take the data collected and prepare the plan that can be utilized by personnel during response and training exercises (NFPA 1620, 2003).

In accordance to the NFPA definition, pre-incident surveys easily connect field operations and needs to strategic planning and gap analysis. Pre-incident planning is associated with key functions of the fire service such as budget planning, training matrixes, and resource needs. More specifically, pre-incident planning gives firefighters the advantage of being prepared for the possible hazards associated with the target area versus having to react to an incident that is occurring (Brannigan, 2007). This same concept is similar to budget planning. If the fire chief or organization doesn't plan out the financial outlay for the organization, there will be constant turmoil as well as the labeling of an unpleasant reputation called managing by

crisis. Fire chiefs can easily minimize organizational disasters such as major purchases and sudden personnel increases by knowing the community risks and demands. Pre-incident planning is a practical way of doing the same thing for firefighters. Francis Brannigan (2007) relates to this idea by describing his experience as a naval officer who quickly realized that in order to be safe and effective with limited resources and training, he and his crew needed to minimize fire ground surprises by learning everything possible about the potential problems ahead of time. Pre-incident planning not only prepares the firefighters, if properly utilized in training activities and distributed throughout the organization it could easily provide a snap shot of the community.

An important factor to remember about pre-incident planning is that it is a comprehensive process of gathering and evaluating information and then developing procedures based on that information (International Fire Service Training Association (IFSTA), 2007). Pre-incident planning familiarizes the company personnel with what is in the response area and the associated hazards with the area (IFSTA, 2007). While personnel are conducting pre-incident plans, training is actually occurring. Accurate pre-incident planning forces the personnel to recognize building construction, fire protection systems, building components, egress and exit points, and manufacturing processes (IFSTA, 2007). A company officer can utilize the pre-incident plan to provide feed back to the fire chief about training weaknesses and other needs within the fire company.

The last component of pre-incident planning involves the data elements that are contained within the plan. Pre-incident planning contains numerous data sets such as building or area demographics, utilities, hazards and owner information; however, for this research pre-incident planning that contains items such as resource needs-including outside resources, initial strategies

for effective fire containment, life hazards problems for occupants and firefighters, and factors that would limit the fire department operations would be ideal for identifying gaps in fire protection (Smoke, 2005). Smoke (2005) emphasizes the need to document and communicate resource needs for the identified hazards as well as any specialized training needed for the personnel. The last point that Smoke (2005) emphasizes in regards to pre-incident planning is that an all hazards approach needs to be followed. Departments should be prepared to deal with other situations that are likely to occur with the jurisdiction (Smoke, 2005).

The second element to determining resource needs: equipment, personnel, and training are based upon the risks associated with community. Overall, fire chiefs must pre-plan or otherwise try and forecast what resources are needed to prepare the community against hazards as well as mitigate those hazards if something does occur (Smoke, 2005). Typically, Mason Fire Department will be taking an all hazards approach; human-made and natural, within the community; however, the community risk assessment for this research will focus on life and property hazards associated with fire.

The IFSTA manual (2007) indicates that the terms hazards and risks are used interchangeably. Hazards generally mean the source that causes damage, injury, or disruption (IFSTA, 2007). Risk is the possibility or chance that there will be damage or disruption from the hazard (IFSTA, 2007). The Royal Society (as cited in Wilsher, 1997, p. 4) summarizes risk as "a combination of the probability, or frequency or occurrence of a defined hazard and the magnitude of the consequences of the occurrences; in other words, Risk = Probability x Consequences".

The activities carried out by the company officer and personnel are an extension of the fire chief. The only difference is that the fire companies are in the community providing a hands

on approach to identifying risks, resource needs for those risks, and if a company officer understands his or her role he or she will identify the weaknesses of the personnel and communicate training needs. When the company officer is conducting pre-incident planning, risk assessment and gaps in fire protections can be identified if the officer keeps these basic steps in mind: 1) risk identification, 2) who are the people-citizens, employees, firefighters, etc. affected by the risk, 3) outside of the human element what other areas that will be affected, 4) identify the hazards that cause the risk, 5) prioritize the risk (IFSTA, 2007). A company officers job is to know the territory and the hazards associated with it. Clear expectations of pre-incident planning can easily provide data for identifying community risks, resource needs, and gaps in fire protection.

In order to bring pre-incident planning and fire department resource needs together, data collected can not be isolated to just the fire companies. A methodology must be utilized to collect data from the field in order to complete a risk management model for the department and community. There are numerous methods, models, and formulas that any fire department can utilize to identify the needs for resources. A recent tool called RHAVE (Risk Hazard and Value Evaluation) was created by collaboration between the U.S. Fire Administration and the Commission on Fire Accreditation International (U.S. Fire Administration, 2001). RHAVE is a software-based program used by local public policy-makers who choose to collect useful information and data regarding the identification and assessment of fire and related risks within their community (U.S. Fire Administration, 2001). RHAVE is used to determine what values are exposed to loss in a community, what the probabilities are of an event occurring, and what the consequences of such an event could be on the community if they occur (U.S. Fire Administration, 2001). RHAVE produces a model from three aspects of a building: their size

and construction; their contents; and their occupants' presence and activities (U.S. Fire Administration, 2001). All of these components are included in a well constructed pre-incident plan.

A simple but very important technique that can easily help identify or close gaps in fire protection of which is generally included in pre-incident planning is the needed fire flow for the structure and the actual flow of the water system. ISO's (Insurance Services Office) formula is "NFFi = (Ci)(Oi)(X+P)i where NFFi is the needed fire flow in gallons per minute; Ci is a construction factor that depends on the construction of the structure under consideration; Oi is an occupancy factor that depends on the combustibility of the occupancy; and (X=P)i is and exposure factor that depends on the extent of exposure from and to adjacent structures" (NFPA, 2008, p. 15-24). Although the ISO levels and specific requirements do not fall within the purpose of this research, be aware that ISO ratings can be influenced by pre-incident planning (ISO, 2008). Lastly, it is important to understand that ISO is a leading source of information about risk. ISO supplies data, analytics, and decision-support services for insurance, financial firms, real estate professionals, health services, government, and human resources. Water requirements have other implications as well. Robert Barr and John M. Eversole (2003) allows planners to determine, "how many pumping engines will deliver how many gallons per minute or how many firefighters are needed to handle hose lines or operate large stream appliances" (p. 1029).

Additional methods to determine resource needs and pre-incident planning techniques can range from simple graphs to complicated building codes. Determining future resources can easily be performed if fire departments conduct pre-incident planning on areas and buildings under construction. During the building phase the actual building construction, fire protection

system, and blue print are accessible (Bierman, 1998). Clifford Harvey (1992) explains that if a fire department has a solid understanding of how a fire will be extinguished, we will able to consciously develop fire protection systems for our cities and make decisions on how well we want fire protection. There are three ways a fire is extinguished. They are: it goes out by itself; it goes out or at least controlled by sprinklers; or it is extinguished by a manual attack (Harvey, 1992). Pre-incident planning draws attention to this awareness. Pre-incident planning will reveal that maybe the best plan of action will be one of three strategies let the fire go out on its own and protect the exposures, complete the extinguishment if the sprinkler system has worked, or make either a defensive or offensive attack on the fire.

The fire risk matrix referenced in the NFPA Handbook (2008) deserves attention because it provides a model based on probability and severity. This gives the fire department a summary of the building hazards, the frequency of which it might occur, and the severity of impact if it does occur (See Appendix A). Although this tool is most useful in planning, if used universally by fire companies and the chief, there will be an understanding of the building hazards, resource needs, training requirements, and prevention needs.

Outside influences that may affect pre-incident planning and the demand for resources include changes in construction methods, building codes, rezoning, and built in fire suppression systems. These items will present unique challenges as well as they may decrease the need for resources. As noted by Clifford Harvey (1992), sprinklers play a big role in stopping the advancement of the fire. The hazard assessment of a newly designed building may lead to a less aggressive pre-incident planning because the building codes led to a specific type of construction or the correct number of egresses and fire protection systems (Brannigan, 2007). On the contrary, changes in building construction may lead to buildings in the community that are built

faster but are more likely to fail during fire conditions. For example, buildings that have lightweight truss roofs are "more susceptible to early failure" (Brannigan, 2007, p.136) of which places firefighters and the occupants at risk. Because of these new construction techniques, pre-incident planning must be up-to-date in order to identify these hazards. Lastly, zoning regulations directly affect pre-incident planning and resource needs by "pushing" (Brannigan, 2007, p.47) more hazardous occupancies into certain areas or fire districts; therefore, creating the need to have fire companies equipped and training properly so they can handle emergencies in their designated area.

Procedures

This applied research project employed descriptive research methodologies in order to a) identify the components of pre-incident planning that provides information on the number of personnel, equipment, and tactical considerations for the hazard scene and fire department planning, b) understand how do risk management models mesh with and provide information for pre-incident planning, c) identify and organize shortfalls such as company tactics, equipment, and training identified in pre-incident planning in an organized format so that they can be cumulatively summarized for the purpose of fire department planning, d) describe methods that close the gaps in fire protection, e) describe how alternative construction methods, occupancy separations, property zoning, and built-in fire protection systems effect pre-incident planning and future resource needs.

Overall, this research takes in the assumption that the concept of pre-incident planning is understood. A combination of data and information about pre-incident planning, resource needs, identifying training needs, and strategic planning was obtained from the cited resources. These resources are listed and include books, manual, the Internet, professional publications, and a

questionnaire. Because Mason Fire Department is a new career agency with the fire chiefs having less than one year with the department, this research is completed from a viewpoint that the fire resource demands from the community are not yet known.

The questionnaire was generated for the purpose of collecting data from other fire departments on the broad terms of what data elements that they include in their pre-incident planning process, how they get the data, and how the data is used to determine needs such as resources, training, and strategic planning for the department. In order to determine the survey population, the Great Lakes Division of the International Association of Fire Chiefs was chosen. This division was chosen because Mason Fire Department belongs to that division as well as it would decrease the chance of terminology differences. This level of membership was chosen do to pre-incident planning and resource needs falling within a policy driven processes. The anticipated size of the survey population would be too large to survey. After the contact list of this division was obtained it was determined that the entire membership was not too large-138; therefore, the questionnaire was emailed to the entire membership of the Great Lakes Division. There were a total of 138 surveys emailed on September 12, 2008 with a total of 38 completed responses by September 26, 2008. This equals a participation rate 27.5 %. The survey deadline was two weeks from the date emailed. The survey began with a brief letter stating its purpose. The letter states: Hello, my name is Craig Bryant. I am the Deputy Chief of Operations for Mason Fire Department, Ohio. I am completing my second National Fire Academy Executive Fire Officer research paper and I need your assistance in helping me gather data. Attached you will find a survey. The primary goal of this survey is to gather information about pre-incident planning and how information contained within the pre-plan can be utilized for fire department strategic planning. This survey is not going to be utilized to show any shortcomings in any

agency that responds. I am trying to gather data on how pre-incident planning and strategic planning of fire protection can intertwine.

It would be very much appreciated if you would take a few minutes and complete this survey. Please have the member/employee of you organization who is the most familiar with your pre-planning and strategic planning processes complete this survey.

The questionnaire asked the following questions: 1) size of population served; 2) Locality type; 3) Number of responders in your department; 4) what is the rank structure of your department; 5) may I contact you for clarification and additional information if necessary; 6) if you answered yes to question #5, what is your contact information; 7) does your department have a pre-incident planning process; 8) what are the components of your pre-incident planning process; 9) if you have other major components to your pre-incident planning not listed above please list those; 10) how often does your department update the pre-plans; 11) how does your department conduct pre-incident planning; 12) please list the other documents that you utilize for pre-plans; 13) does your fire prevention bureau provide you information that you utilize in your pre-incident planning; 14) does your department have either an informal or formal process that takes information obtained from the pre-plans and transfers it to your department's strategic planning process and/or the budget plan; 15) does your department have either a formal or informal process that utilizes the information obtained from the pre-plans for closing gaps in your department's fire protection services; and 16) what methods whether formal or informal does your department use to identify hazard risks and personnel and equipment needs for the fire protection system of your community? Please see Appendix B for the complete questionnaire. Appendix C lists the departments that volunteered to list contact information if clarification is needed on the responses.

The limitations of this research include a low number of participation as well as the contact list was not as inclusive as anticipated. The limited number of response about what roll the fire prevention bureaus have in pre-incident planning is limited. This research could easily be enhanced if the survey population was expanded to the entire International Fire Chiefs Membership. After completing research on pre-incident planning and determining resource needs, a follow up questionnaire would have narrowed the focus to include how the communications between fire companies and the chiefs of the department occur.

The literature in this research did not specifically indicate methods that combine pre-incident planning data with the strategic plan of determining resource needs. The method to share and use this information is up to the individual agency. Otherwise, this research tends to imply that any agency that has a pre-incident planning process has determined fire response needs. Lastly, this research does have implication that pre-incident planning can help with determine resource needs, training needs, and budget planning; however, this concept is limited to the current demographics of the community. In order to be comprehensive about determining resources, fire chiefs must gather data from places such as economic development, engineers, and planning departments.

Results

What are the components of pre-incident planning that provide information on the number of personnel, equipment, and tactical considerations for the hazard scene and fire department planning? Questions #8 of the questionnaire contained data choices that participants could select if their pre-incident planning program had those components. Each element will be listed (Table 1) with the percentage of those that chose a particular element as well as the number of participants that chose the element.

Table 1

Basic Pre-Incident Planning Components

Components	Percent	Count
Occupancy name and address	100%	38
Occupancy type	94.7%	36
Number of occupants	42.1%	16
Contact information	89.5%	34
Utility shutoff and location	100%	38
Construction type	92.1%	35
Roof Construction	73.7%	28
Age	31.6%	12
Height and area	65.8%	25
External exposures	57.9%	22
Internal exposures	50.0%	19
Needed water flow	57.9%	22
Number and size of hose lines	7.9%	3
Hydrant flow	36.8%	14
Hydrant location	7.9%	3
Apparatus needs	26.3%	10
Staging	23.7%	9
Total Participants	100%	38

The results of this table indicate that components that help determine water flow and water flow available, staffing needs, apparatus needs are considerably lower than the other selections.

Although the choices are higher, components such as roof construction and number occupants of which affect life safety and firefighter safety are not included in all pre-incident planning processes. Lastly, the number and size of hose lines component had a very low count. This component would be considered as is part of tactical considerations.

Question # 9 gave participants the opportunity to give other pre-incident planning components specific to their department.

Table 2

Pre-Incident Planning Components Specific to Department

Components
Job assignments for first arrival companies
We also utilize static sources
Knox Box
N/A
Key box, installed fire protection systems
Fixed fire systems (sprinklers, alarm systems, etc.)
Knox box location, hazardous mat locations, any other odd things the firefighters need to know.
Fdc and alarm panel location, floor plans
Specific high hazard contents if applicable
Additional MABAS consideration references, range of addresses and streets if evacuation required
Google earth aerial photo's with 300', 600' and 900' exposure rings
Haz-mat & other special concerns

Chemicals, unique hazards, lock box, FDC and alarm location	
Haz Mat on site and locations, Alarm company information	
Sprinkler components, hazmat, storage & processes	
Haz-Mat profile-Salvage Profile	
Total Responses	16

These results (Table 2) vary from more specific building demographics such as documenting the Knox box location to identifying other hazards such as hazardous materials. Most of these components offer information that may help with determining resource needs, training, and strategic planning. Overall, these results have a major connection that will be important as Mason Fire Department moves forward with pre-incident planning. These fire departments are getting out in their community and learning the area.

How do risk management models mesh with and provide information for pre-incident planning? Risk management helps with pre-incident planning because it sets priorities. According to the research, risk management and pre-incident planning goes together. Depending on the community, some risk management models may reflect a high life hazard. Another model may show that the loss of property or economic impact may be the highest risk. Which risk model or methodology the community utilizes will set the stage for pre-incident planning. A high life hazard may require different strategies and tactics as well as equipment and personnel compared to a risk model that shows property or economic impact as the highest risk. Lastly, risk management models will provide a framework for effective risk mitigation of a situation or building. The best-designed pre-incident survey serves no purpose if it does not fit into the plan of effectiveness. For example, a hazard that requires a significant amount of water for extinguishment but does not have the needed water supply available should not have a pre-

incident survey that focuses on conducting an offensive attack. There is a certain level of acceptable risk in this model; therefore, the pre-incident plan should reflect how to do the most good with the available resources.

How can shortfalls such as company tactics, equipment, and training identified in pre-incident planning be organized in a format so that they can be cumulatively summarized for the purpose of fire department planning? There were no models or methodologies that were discovered on how to organize or summarize information from pre-incident planning to help with fire department planning. The only common denominator discovered was that pre-incident planning needs to be shared department wide. These shortfalls can be addressed by various methods such company training, memos to the fire prevention bureau on issues discovered during the pre-incident planning process, or a letter to the chief addressing a trend that is occurring in the area. The key to organizing information that is a shortfall for the department is to display data collected on charts and graphs and stay informed of frequent or similar issues that keep arising. Mason Fire Department could easily use building height data from pre-incident planning to determine if a longer ladder truck is needed or if a ladder truck is needed at all. Caution should be used when looking at this data. Having or not having certain types of equipment can affect ISO ratings. Lastly, shortfalls should be grouped in organized categories. For example, fire district that has numerous pre-incident plans that identify a first alarm assignment is not enough for the identified risk. This data would be organized into a category identifying personnel or equipment shortfall. Lastly, a fire company that keeps indicating that they have several businesses that store hazardous materials for manufacturing purposes is providing information that they may not be trained in hazardous materials. The department's training program will need to include this type of training as it moves forward.

What are the methods of closing the gaps in fire protection concurrently and prospectively? Pre-incident planning is only one method for closing gaps in the fire protection system. Pre-incident planning does rely on what is happening now or in the immediate future. An important element of pre-incident planning is that if provides the fire companies an immediate awareness of the fire protection weaknesses and strengths in the district. Because Mason Fire Department is such a young department with new leadership, pre-incident planning will be very beneficial. Mason not only needs to have a plan for future fire protection, the department needs to understand what issues exist currently. Table 3 provides examples of how 21 of the 38 departments that participated in the questionnaire responded to the question about their method of closing gaps in their fire protection system. Some of the responses indicate that they do not have a method.

Table 3

Methods to close gaps in fire protection

Method	Number of responses
We conduct table top training over preplans	1
No	7
None, but would like to	1
Yes, as different equipment needs are identified (i.e. standpipe kits, electric ventilation plans, elevator rescue kits, etc) this equipment is budgeted for	1
Informal, we discuss the issues & try to do the best we can with size of our dept.	2
Yes, formal, continuously re-evaluating needs and changes	2

Target hazard information acquired is transferred to our CAD system to be included with dispatch sheet	1
As allowed by local / state law and ordinance	1
Both formal and informal, as information is gathered the determination is made as to whether or not needs can be met through the operating budget or capitol improvement. Often times gaps are not closed at all	1
Not exactly sure what you are asking for	2
Personnel provide input on future equipment needs based on community hazards	1
Yes, Identifies Need for Additional Staff and/or Mutual Aid	1
Total Responses	21

In order to close gaps in fire protection prospectively, Mason Fire Department will need to work closely with economic development and planning departments. As new areas develop, consideration must be given to the fact that is cheaper for a disaster or fire to be prevented versus having to have the resources to respond to it and mitigate the emergency. New technologies and fire suppressions systems should be considered in all new developments. Mason Fire Department should be actively involved in site plan reviews, water system improvements, and pre-incident planning of areas or buildings that are under construction. Lastly, mutual aid and automatic aid agreements will help get additional resources to the incident if the locality does not have the needed resources. It is more economical to share resources than to purchase resources for low probability incidents.

How do alternative construction methods, occupancy separations, property zoning, and built-in fire protection systems effect pre-incident planning and future resource needs?

Construction methods can have both a positive impact and negative impact on the fire service. Construction methods have an underlying catalyst called cost. New construction offers advantages to the builder by reducing costs and the ability to be built fast, for example lightweight trusses and metal studs. However, newer construction such as lightweight trusses fail very quickly in fire conditions, therefore, placing the occupants and firefighters at risk. This changes the strategy and tactics of firefighting of which should be outlined in the pre-incident plan. An advantage of new construction is that better fire resistive materials can be used, therefore, reducing the risk of a fire. In addition, new construction is subject to more regulation on the fire protection system. Unlike older construction that may not have needed or have been mandated to have a fire protection system, newer construction that falls under new building codes may be mandated to have a fire protection system will be better protect the structure from fire. Older construction, especially balloon frame and remodeled buildings dictate resource needs as well as should prompt the need for special attention during pre-incident planning.

Construction types and the presence of fire protection systems should be noted on pre-incident plans. Attention should be given to the resource needs in the sense that if this building catches fire, what will happen to the structure when it is exposed to the fire and what fire protection is afforded by the fire protection system. Knowing this information is not only important for strategic and tactical decisions but is important for developing training programs and identifying gaps in the community's fire protection.

Property zoning plays a big role in resource needs. An area that has nothing but residential zoning may have a need for a certain number or type of resource versus an area that is

zoned for commercial that may need resources such as a ladder truck, haz-mat truck, or pumper. Residential area pre-incident planning may be limited on information such building layouts and internal hazards as compared to a commercial area that offers the ability to have detailed pre-incident plans. Commercial zones may be more likely to have better water distribution system as well as fire protection systems. Residential areas may require the use of water tenders because of the lack of water, versus commercial areas that may need specialized equipment for specialized threats.

Overall zoning has a direct effect on community fire protection and resource needs. Knowing how the community is zoned and what each zone means (Appendix D) can help establish priorities in pre-incident planning such as what areas are zoned as high density residential versus public use or recreation. Occupancy spacing may be very limited in high-density residential areas, therefore, creating a priority of protecting exposures and evacuation.

Discussion

Utilizing the data collected in the questionnaire and the information found in the literature research, pre-incident planning could help Mason Fire Department determine resource needs, training needs, and budget needs. These can all be encapsulated into a strategic plan that begins with the current capabilities of Mason Fire Department to the future needs of the department.

In order for Mason to use pre-incident planning to determine resource needs, it is important to understand two themes that are present in this research and one that is not so apparent. First, pre-incident planning should be comprehensive in content so that it contains major features such “building layout, access, construction features, water supply, occupancy, and any other information to safely manage the event” (Smoke, 2005, p. 291). This information can

be obtained from a variety of methods and sources. These categories help the company officer determine the equipment and personnel needed at the incident. In addition the plan will make the company officer aware of the weaknesses of the crew. According to the research on pre-incident planning and data collected from the questionnaire (Table 1 and Table 2) plans should contain details of the "facility exterior and interior, building conditions, safety hazards, fuel loads, fire protection systems, water supply system, and specific hazards that pose a risk" (IFSTA, 2007, pgs 394-402). Lastly, information to complete a pre-incident plan is not conducted on a linear plane. As noted by the 18 participants that answered the question: please list the other documents that you utilize for pre-plans (Appendix E). Information comes from company drawings, engineering plans, county auditor's website, water tap data, and material safety data sheets (MSDS).

Sharing the information in the pre-incident survey is the second element that will make the process successful. Sharing makes the entire department aware of the information contained in the plan and it communicates the needs-equipment, personnel, and training, to all of those who are affected by the lack of those resources. This includes training officers, chiefs, other company officers, etc. In order for Mason Fire Department to utilize pre-incident planning to determine resource needs, sharing and communicating the needs identified by the fire companies will need to be institutionalized. This element is enhanced by information provided by some of the participants (Appendix F) that answered the question: does your department have either an informal or formal process that takes information obtained from the pre-plans and transfers it to your department's strategic planning process and/or the budget plan? One of the answers to this question is particularly important to this concept. The information obtained by pre-incident

planning is shared with council members in order to justify specialized equipment and additional personnel.

No clear process was identified on how to categorize information contained within the pre-incident plan into a logical process that will make assist in making strategic planning decisions for the department. There are numerous tools that the NPA handbook (2008) recommends for performing a hazard analysis. These include event trees and fire matrixes. However; determining resource needs through pre-incident planning can easily be pushed to the side because of these complicated models and fire risk analysis processes. This is re-enforced by John Watts who describes the technical parameters of fire risk analysis as "very complex and normally involve a network of interacting components, the interactions generally being non linear and multi-directional" (1990, p. 30). Pre-incident planning typically does not contain the statistical and quantitative data necessary to perform a scientific based risk analysis.

By looking at the data collected (Appendix G) from the responses to the question: what methods whether formal or informal does your department use to identify hazard risks and personnel and equipment needs for the fire protection system of your community; hazard analysis comes from a more simplistic and practical method versus statistical and quantitative measures. Lastly, because these methods are commonly used to identify risks, a fire department resource needs must be communicated or extracted beyond the parameters of the fire companies.

In closing, pre-incident planning is only successful as the information put into it and how that information is used. Pre-incident planning that is only utilized for individual fire stations or gets placed in a book detracts from the intended purpose of determining the fire resource needs at the incident. An organization that has a clear plan of communications and a philosophy of sharing all information that will helps the organization provide the best service with the

taxpayer's money will have great success in utilizing pre-incident planning. Based on the information from this research, Mason Fire Department has the opportunity to design a pre-incident planning process that will determine the resource needs to the department.

Recommendations

Mason Fire Department needs to take advantage of the vast amount of pre-incident planning programs available in fire officer manuals, journals, and other departments. Utilizing this information, it is recommended that Mason Fire Department design and implement a pre-incident planning program that contains the information that: provides demographics about the building, identifies the resources that will be needed for the building during an emergency, and outlines priorities and strategies to successfully limit injury, death, and property damage. Lastly, the areas that are high risk should organize Mason Fire Department's pre-incident planning program. There are numerous risk management models available for fire officials so that priorities can be determined.

Once the content of the plan is established, the Mason Fire Department should establish a process that shares the results of the plans so that fire protection weaknesses, deficiencies, and gaps can be identified. There is no better way for Mason Fire Department to perform a fire hazard analysis of the community than to have fire companies perform pre-incident planning throughout their districts and report back the findings. Lastly, in order for pre-incident planning to be successful, this research strongly recommends reviewing pre-incident plans on a regular basis and training on any information discovered during the process. Training prepares the fire department for mitigating emergencies. Training also plays an important role of identifying equipment needs.

In closing, Mason Fire Department will to need to design a process that connects the practical implications of pre-incident planning to the establishment of the priorities in the department's strategic plan. The last recommendation of this research is to use all available resources in order to have a comprehensive pre-incident plan. These resources include fire prevention information, insurance data, blue prints, construction methods, and the city comprehensive plan.

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Appendix A

NFPA Fire Risk Matrix

A. Probability Levels

Probability	Description
Frequent	Likely to occur frequently, experienced (p>0.1)
Probable	Will occur several times during system life (p>0.001)
Occasional	Unlikely to occur in a given system operation (p>10(-6))
Remote	So improbable, may assume this hazard will not be experienced (p<10(-6)
Improbable	Probability of occurrence not distinguishable from zero (p~0.0)

Table A.5.2.5(a), NFPA 551

B. Severity Categories

Severity	Impact
Negligible	Impact of will be so minor that it would have no discernable effect on the facility or its operations.
Marginal	The loss will have impact on the facility, which may have to suspend some operations briefly. Some monetary investments may be necessary to restore the facility to full operations. Minor personal injury may be involved.
Critical	The loss will have a high impact on the facility, which may have to suspend operations. Significant monetary investments may be necessary to restore to full operations. Personal injury and possible deaths may be involved.
Catastrophic	The fire will produce death or multiple deaths or injuries, or the impact on operations will be disastrous, resulting in long-term or permanent closing. The facility would cease to operate immediately after the fire occurred.

Table A.5.2.5 (b), NFPA 551

C. Risk Matrix

Frequent				
Probable				
Occasional				
Remote				
Improbable				
	Neglible	Marginal	Critical	Catastrophic

Key (Risk)

Low

Moderate

High

Figure A.5.2.5, NFPA 551

Appendix B

Pre-Incident Planning Questionnaire

1. Pre-Incident Planning

Hello, my name is Craig Bryant. I am the Deputy Chief of Operations for Mason Fire Department, Ohio. I am completing my second National Fire Academy Executive Fire Officer research paper and I need your assistance in helping me gather data. Attached you will find a survey. The primary goal of this survey is to gather information about pre-incident planning and how information contained within the pre-plan can be utilized for fire department strategic planning. This survey is not going to be utilized to show any shortcomings in any agency that responds. I am trying to gather data on how pre-incident planning and strategic planning of fire protection can intertwine.

It would be very much appreciated if you would take a few minutes and complete this survey. Please have the member/employee of you organization who is the most familiar with your pre-planning and strategic planning processes complete this survey.

My Contact Information is:
Craig Bryant, Deputy Chief
Mason Fire Department, Ohio
cbryant@masonoh.org

2. Default Section

1. Size of Population served?

2. Locality type

- City
- County

- ○ Township
- ○ Town
- ○ Village
- ○ Other

3. Number of responders in your department

Full Time _____

Part Time _____

Volunteer _____

4. What is the rank structure of your department.(check all that apply)

- ☐ Chief
- ☐ Deputy Chief
- ☐ Battalion Chief
- ☐ Captain
- ☐ Lieutenant
- ☐ Engineer
- ☐ Master Firefighter
- ☐ Firefighter

5. May I contact you for clarification and additional information if necessary?

- ○ Yes
- ○ No

6. If you answered yes to question #5, what is your contact information?

_____

7. Does your department have a pre-incident planning process?

- ○ Yes
- ○ No(If no go to Question#8)

8. What are the components of your pre-incident planning process? (Check all that apply)

- ☐ Occupancy name & address
- ☐ Occupancy type
- ☐ Number of Occupants
- ☐ Contact Information
- ☐ Utility shutoff locations
- ☐ Construction type
- ☐ Roof Construction
- ☐ Age
- ☐ Height and area
- ☐ External exposures
- ☐ Internal exposures
- ☐ Needed water flow
- ☐ Number and size of hose lines
- ☐ Hydrant Flow
- ☐ Hydrant location
- ☐ Staffing needs
- ☐ Apparatus needs
- ☐ Staging

9. If you have other major components to your pre-incident planning not listed above please list those here.

10. How often does your department update the pre-plans?

- ○ 1 year
- ○ 2 years
- ○ more than 2 years
- ○ no schedule

11. How does your department conduct pre-incident planning?

- ○ Visit the site only
- ○ Visit the site and utilize architectural plans provided by the site
- ○ Visit the site and utilize architectural plans and other site documents (list documents in the next question)

12. Please list the other documents that you utilize for pre-plans.

13. Does your fire prevention bureau provide you information that you utilize in your pre-incident planning? If yes please explain. If no skip to next question.

14. Does your department have either an informal or formal process that takes information obtained from the pre-plans and transfers it

to your department's strategic planning process and/or the budget plan? If yes please explain. If no skip to next question.

15. Does your department have either a formal or informal process that utilizes the information obtained from the pre-plans for closing gaps in your department's fire protection services? If yes please explain. If no please skip to next question.

16. What methods whether formal or informal does your department use to identify hazard risks and personnel and equipment needs for the fire protection system of your community?

Appendix C

Questionnaire Participants

1.	Kasey Farmer, Assistant Chief 740-862-8596	Tue, 9/23/08 7:50 AM
2.	513-615-3768	Wed, 9/17/08 7:17 AM
3.	Steve Pegram, 937-673-1631	Wed, 9/17/08 6:11 AM
4.	248-634-7722	Mon, 9/15/08 4:40 PM
5.	Rick Danielson 708-352-9229 ext 2222	Mon, 9/15/08 1:45 PM
6.	kevtim@two-rivers.org	Mon, 9/15/08 11:26 AM
7.	bbailey@ofallon.org	Mon, 9/15/08 10:01 AM
8.	330-834-3953 Chief Ted Heck	Mon, 9/15/08 9:05 AM
9.	Roanokechief@verizon.net	Sun, 9/14/08 8:54 AM
10.	715-832-9686	Sat, 9/13/08 9:00 PM
11.	echaase@aol.com	Sat, 9/13/08 5:49 PM
12.	captregis3@sbcglobal.net	Sat, 9/13/08 1:50 PM
13.	nelsonws@troymi.gov	Fri, 9/12/08 10:20 PM
14.	Mark Wolf 937-548-3040	Fri, 9/12/08 2:59 PM
15.	Chief Pat Parker (231) 947-3000 ext. 1235	Fri, 9/12/08 2:43 PM
16.	Ted Whittington (W) 440 951-2287 (C) 440 463-4120	Fri, 9/12/08 2:37 PM
17.	dwinkel@ci.andover.mn.us	Fri, 9/12/08 2:12 PM
18.	wrightj@miftwp.org	Fri, 9/12/08 1:41 PM
19.	mdeloach@brightonareafire.com	Fri, 9/12/08 1:21 PM
20.	937-766-5851 or sbaldwin@woh.rr.com	Fri, 9/12/08 12:10 PM
21.	DC Gary R. Miller 414-286-8944 grmille@milwaukee.gov	Fri, 9/12/08 11:50 AM
22.	Doug Berry @ 734-878-9513	Fri, 9/12/08 11:24 AM
23.	danderson@lwfd.org 630-675-5468	Fri, 9/12/08 11:15 AM
24.	lovell@bainbridgetwp.com	Fri, 9/12/08 11:03 AM
25.	Jim Neidhard email jneidhard@washingtontwp.org	Fri, 9/12/08 10:26 AM
26.	mrichardson@ci.woodbury.mn.us or 651-714-3701	Fri, 9/12/08 10:26 AM
27.	Ch. Cleveland, 330-297-5738 gcleveland@ravenna.ci.oh.us	Fri, 9/12/08 9:57 AM
28.	513-884-1505	Fri, 9/12/08 8:59 AM

29.	Susan Phillips; sphillips@town-menasha.com; 920-720-7125	Fri, 9/12/08 8:54 AM
30.	chief502@ci.lancaster.oh.us	Fri, 9/12/08 8:47 AM
31.	Office (317) 595-3208	Fri, 9/12/08 8:24 AM
32.	fdchief@cityofmarysvillemi.com	Fri, 9/12/08 8:18 AM
33.	Ross81@fuse.net	Fri, 9/12/08 8:14 AM
34.	Frank Prijatel 216-289-8408, fprijatel@cityofeuclid.com	Fri, 9/12/08 8:08 AM
35.	jim.schmidt@ci.marshfield.wi.us or 715-486-2090	Fri, 9/12/08 8:05 AM
36.	pduchoslav@brooklynohio.gov	Fri, 9/12/08 7:57 AM
37.	swalker2QUINCYIL.GOV	Fri, 9/12/08 7:52 AM

Appendix D

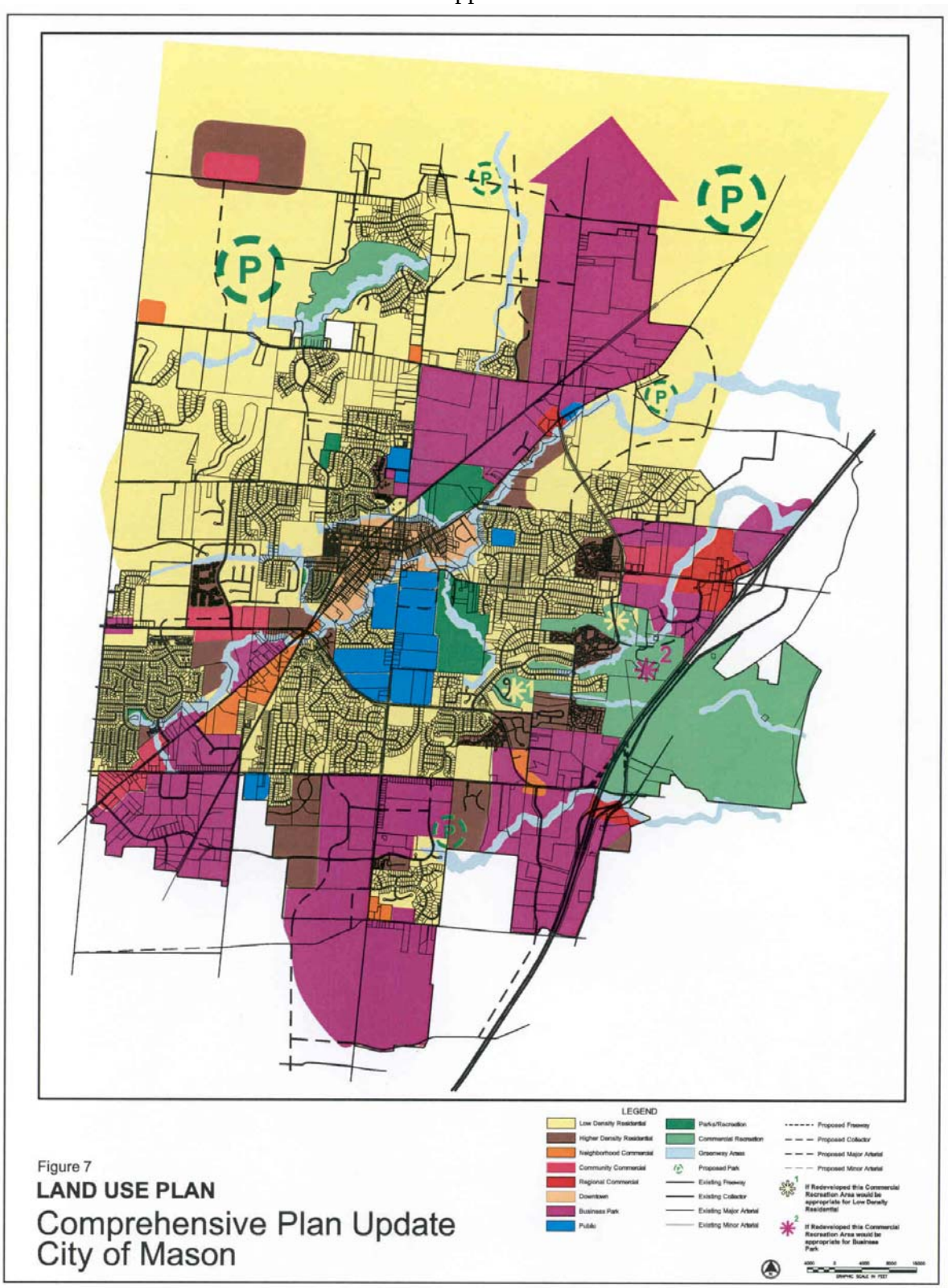

Figure 7

LAND USE PLAN

Comprehensive Plan Update
City of Mason

Land Use	Prominent Characteristics
Lower-Density Residential	• Larger Single-Family Building Lots • Pedestrian Friendly Roads • Sidewalks • Open Space • Religious Institutions • Road Connections Between Subdivisions • Bikeways
Higher-Density Residential	• Religious Institutions • Smaller Building Lots (Single-Family, Town homes, Duplexes, and Some Apartments) • Pedestrian Friendly Roads • Sidewalks • Open Space • Road Connections Between Subdivisions • Bikeways
Downtown	• Cultural Center of Mason • Retail • Office • Limited Loft Apartments • Pedestrian Connections • Pedestrian Friendly (Benches) • Higher-Density Residential • Public Art • Architectural Compatibility
Neighborhood Commercial	• Convenience Retail (Serves Approximately 1-Mile Radius) • Small-Scale Office (Dentist, Doctors, and Professional Services) • Formal Public Spaces • Pedestrian Friendly • Traffic Calming • Architectural Consistency
Community Commercial	• Small-Scale Office (Dentist, Doctors, and Professional Services) • Retail Serves a Larger Consumer Market than Neighborhood Commercial (Serves Approximately 2-Mile Radius) • Traffic Calming • Pedestrian Friendly • Architectural Consistency
Regional Commercial	• Serves Highway Motorists • Retail/Gas Stations • Hotels/Restaurants

Land Use	Prominent Characteristics
	• Minimize Curb Cuts • Limited Pedestrian Circulation
Business Park	• Large Employment Centers • Clean industry • High Tech campus • Opportunities for Start-Up or Small Businesses • Pedestrian Connections • Open Space • Aesthetic Improvements • Efficient Access to Transportation Systems
Commercial Recreation	• Golf Courses • ATP Center • The Beach • Kings Island
Parks/Open Space	• Active and Passive Recreation Facilities • Open Space • Natural Resource Conservation • Greenways • Neighborhood Parks (Serve ½-1-Mile Radius) • Community Parks (Serves 2-Mile Radius)
Public	• Cemeteries • Schools • Public Works

Appendix E

Documents Used for Pre-Planning

1.	County Auditor Website	Tue, 9/23/08 7:50 AM
2.	n/a	Wed, 9/17/08 7:17 AM
3.	Varies, hand drawn plans, plans or sketches provided by building owners	Wed, 9/17/08 6:11 AM
4.	Scaled plans on engine computers (paper backup) includes entry tool use for every possible access point	Mon, 9/15/08 4:40 PM
5.	Tap and Flows on available water supply	Mon, 9/15/08 9:05 AM
6.	records in premise file	Fri, 9/12/08 10:20 PM
7.	May refer to original building plans if needed	Fri, 9/12/08 2:12 PM
8.	blue prints for any changes during remodeling	Fri, 9/12/08 12:10 PM
9.	Review exit plans and brigade operations if applicable	Fri, 9/12/08 11:50 AM
10.	Right to know information	Fri, 9/12/08 11:24 AM
11.	Once a new occupancy is entered it becomes just a site visit unless the bldg in modified	Fri, 9/12/08 10:26 AM
12.	County Auditor's Website and CAGIS	Fri, 9/12/08 8:59 AM
13.	Sara Title 3 reporting and internal documents from occupants	Fri, 9/12/08 8:54 AM
14.	Tier II reports, MSDS	Fri, 9/12/08 8:18 AM
15.	Pictomerty Pictures/ Aerial Photographs	Fri, 9/12/08 8:14 AM
16.	MSDS, Larger Factories have fire brigades and we plan with them	Fri, 9/12/08 8:08 AM
17.	Assessor Office Description/Info.	Fri, 9/12/08 8:05 AM
18.	own site drawings and access	Fri, 9/12/08 7:57 AM

Appendix F

How Information is Transferred to Strategic Planning

1.	no	Wed, 9/17/08 7:17 AM
2.	No	Wed, 9/17/08 6:11 AM
3.	in the planning stages	Mon, 9/15/08 1:45 PM
4.	no	Mon, 9/15/08 11:26 AM
5.	No	Mon, 9/15/08 10:01 AM
6.	Informal. Captain of FPB will review all new construction planned for the community with the County Building Department and then provide me with a summary of this review. Based upon the type of building being planned first due companies could be required to follow construction; FPB, in coordination with the Chief, determine if additional safety requirements need applied to the site/structure. FPB will coordinate all site visits. As our community has continued to expand, both in commercial and residential capacity, long term budget planning has been done to allow for additional personnel & station houses.	Mon, 9/15/08 9:05 AM
7.	N/A	Sun, 9/14/08 8:54 AM
8.	Informal	Fri, 9/12/08 10:20 PM
9.	Regularly scheduled training with the preplans.	Fri, 9/12/08 2:43 PM
10.	Yes, our pre plans have been beneficial in helping us to provide information to the City Council for specialized equipment and or replacement of existing equipment. The pre plans have also helped to justify the needed staffing levels for paid on call staff that responds to all fire and ems incidents in our town.	Fri, 9/12/08 2:12 PM
11.	Yes, formal, meeting with the chief to identify the needs.	Fri, 9/12/08 12:10 PM
12.	formal, PiP are in all stations and front line apparatus	Fri, 9/12/08 11:24 AM
13.	Yes... we practice under a whole system management style	Fri, 9/12/08 10:26 AM
14.	No formal process. When information is obtained, the inspector for that facility enters the information into the preplan book.	Fri, 9/12/08 9:57 AM

15.	No	Fri, 9/12/08 8:59 AM
16.	We go over preplans as part of a training night.	Fri, 9/12/08 8:54 AM
17.	no	Fri, 9/12/08 8:47 AM
18.	No	Fri, 9/12/08 8:24 AM
19.	We informally transfer the preplans to our strategic planning in our Officers training. In this training if an Officer has another view or something to add to a particular preplan that information is evaluated and incorporated into the plan. This has proved to be a valuable asset	Fri, 9/12/08 8:14 AM
20.	Company inspections conducted annually and information obtained is used to update plans.	Fri, 9/12/08 8:08 AM
21.	No	Fri, 9/12/08 8:05 AM
22.	NO	Fri, 9/12/08 7:52 AM

Appendix G

Methods to Identify Hazard Risks and Resource Needs

1.	Word of mouth, training, encourage crew walk through	Tue, 9/23/08 7:50 AM
2.	site visit and the community fire defense plan	Wed, 9/17/08 7:17 AM
3.	General knowledge of the department and community, we are understaffed and under funded to properly address our extremely high call volume and target hazards.	Wed, 9/17/08 6:11 AM
4.	Building department, permit process, annual inspections	Mon, 9/15/08 4:40 PM
5.	No formal process at this time. The District is in the process of developing a pre-fire planning system.	Mon, 9/15/08 1:45 PM
6.	As stated previously, through routine fir inspections, a formal process is used for updating information used for pre-fire planning.	Mon, 9/15/08 11:26 AM
7.	Inspection bureau relays info to personnel on a weekly basis as needed	Mon, 9/15/08 10:01 AM
8.	FPB coordinates with shifts on known changes or concerns. Bat Chiefs are responsible to ensure their crews are reviewing and establishing proper operational procedures related to the situation. Training officer usually will incorporate a review operational drill related to the situation.	Mon, 9/15/08 9:05 AM
9.	Doing walk-thrus at major buildings in the district.	Sun, 9/14/08 8:54 AM
10.	Just daily training	Sat, 9/13/08 5:49 PM
11.	site inspections, past experience	Sat, 9/13/08 1:50 PM
12.	Right to know requirements, coordination with building and planning depts. and fire inspection program	Fri, 9/12/08 10:20 PM
13.	knowledge of community	Fri, 9/12/08 2:59 PM
14.	Use of inspections, training and preplans	Fri, 9/12/08 2:43 PM
15.	Line officers from County departments and Local Chiefs meetings.	Fri, 9/12/08 2:37 PM
16.	The methods used would include the use of pre plan visits and follow up inspections done as often as possible. The Fire Marshal and Fire Chief are very careful to review new construction plans to try and catch any unusual types of construction or occupancy	Fri, 9/12/08 2:12 PM

	that may cause an issue for fire suppression activities. The Fire Marshal had recently been successful in writing a grant submitted to FEMA that allowed us to hire five part time fire inspectors for one year. We were able to inspect every existing commercial/ industrial building in town. The information gathered from the recent inspections has allowed us to update most of the building pre plans that we have on file.	
17.	Building walk thru's by fire companies	Fri, 9/12/08 1:41 PM
18.	We use a lot of automatic mutual aid for our staff to combat actual fires. Our industrial areas are known by the staff. We visit some high hazard buildings on a regular basis. Our community is growing and our constant efforts are into getting our townships to install water mains. We serve 2 townships that are 36 square miles and a city that is 4.5 square miles. They each have a different priority and different way of governing their area. We have computers in our trucks and are working on getting the programs that will deliver the information to the trucks at the scene.	Fri, 9/12/08 1:21 PM
19.	On site visits and evaluating the needs for protection, usually figuring worse case scenario.	Fri, 9/12/08 12:10 PM
20.	Not sure how to answer	Fri, 9/12/08 11:03 AM
21.	We use an online database called Vision	Fri, 9/12/08 10:26 AM
22.	Yes	Fri, 9/12/08 10:26 AM
23.	We have an informal process due to lack of manpower. As pertinent information is obtained, the pre-plan is updated.	Fri, 9/12/08 9:57 AM
24.	Hazard Use Groups	Fri, 9/12/08 8:59 AM
25.	Risks are identified during the visits, initially when the building is built or when we discover a new occupant is in a facility.	Fri, 9/12/08 8:54 AM
26.	Most risks are identified through inspections or through SERC filings. New construction hazards would be identified through the permit and building plans review process as well as acceptance testing.	Fri, 9/12/08 8:47 AM
27.	We do a risk/hazard assessment as part of the accreditation process.	Fri, 9/12/08 8:24 AM
28.	Safety and Health committee reviews for equipment or mutual aid needs at specific occupancies.	Fri, 9/12/08 8:18 AM

29.	By a through company fire inspections of the commercial facilities in our township	Fri, 9/12/08 8:14 AM
30.	Fire inspections, training programs to evaluate capabilities and then improve. The biggest problem is funding.	Fri, 9/12/08 8:08 AM
31.	We are in the process of adding staff and building a new fire station. The primary justification for both of these issues was related to national, state, and local standards or laws. Specifically, NFPA 1710, NFPA 1500 as Adopted by Wisconsin Comm. 30 and our own SOG's. The primary Hazard Risk Analysis mechanisms we are currently utilizing are in our preplans and our emergency operations planning documents.	Fri, 9/12/08 8:05 AM
32.	???	Fri, 9/12/08 7:52 AM