



# BORDER DROPPING

**A Report to the Madison Mayor and City Council  
by the Madison Fire Department  
on the issue of Border Drops, which could facilitate the closest,  
most appropriate resource being sent, regardless of the jurisdiction.**



**March 1, 2015**

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**T**he concept of reducing response time through border dropping was proposed by the Dane County Executive and other elected officials in response to discussions regarding increasing public safety as it relates to fire responses within Dane County. In response to these proposals, Fire Chief Steven Davis met with Mayor Paul Soglin to discuss this issue. Together they proposed the Madison Fire Department undertake an internal study about border dropping to determine its feasibility, including whether it would enhance the safety of the residents of Madison, and what changes within the current operating configurations between the City of Madison and neighboring departments would need to be identified to meet the goal of increasing public safety.

On the surface, the act of removing jurisdictional borders and sending the closest, most appropriate resource appears to be a straightforward task; yet when researched, it becomes much more complex.

This report focuses upon several aspects of the discussions between Mayor Soglin and Fire Chief Davis. It specifically covers the criteria of:

- Minimum staffing
- Response levels
- Training
- Technology challenges
- Use of automatic/mutual aid currently being employed in Dane County
- Other operational items specific to the City of Madison

### **Dane County Fire Departments: Operations and Deployment**

Fire departments are classified as Career Departments, Combination Departments (paid personnel with volunteers), or Volunteer Departments. Based on the classification, a department is expected to meet the professional objectives outlined within National Fire Protection Association (NFPA) Standards. Career Departments operate under NFPA 1710. Combination and Volunteer Departments operate under NFPA 1720 standards.

The City of Madison and the Dane County Airport Fire Department are the only classified career fire departments in Dane County. All of the other 26 fire departments within the county are classified as either combination departments or volunteer departments, depending upon how they incorporate combinations of full-time staff, part-time staff, paid on-call staff, volunteers, and/or interns. Based upon these classifications, the City of Madison is the only fire department operating under NFPA 1710 Standards. The National Fire Protection Association Standard 1720 is what is used by almost all of the surrounding departments. This standard states that departments that serve populations greater than 1,000 must respond with a minimum of 15 personnel with a response time of 9 minutes.

Operationally, the Madison Fire Department, in compliance with NFPA 1710 (5.2.4.2), has established a *minimum* deployment of 3 fire engines, 2 ladder trucks, 1 medic unit, and 1

command vehicle (chief officer) as the initial assignment for a structure fire. Each vehicle deployed is considered to be an Operating Unit as defined by NFPA 1710 (5.2.3) with minimum staffing levels consisting of 4 personnel (1 Lieutenant, 1 Apparatus Engineer, and 2 firefighters) on each engine and ladder deployed, 2 firefighter/paramedics on a medic unit, and a Chief Officer and aide on the command vehicle. This initial response of 24 firefighters responding immediately upon notification meets the NFPA 1710 standards.

This initial full alarm deployment allows for:

1. Establishing Incident Command.
2. Establishing an uninterrupted water supply maintained by a pump operator at all times.
3. Establishing an effective and appropriate water flow (operated by a minimum of two people)
4. Personnel to provide support for each attack and backup line, hydrant connection, assist in locating hose lines, utility control, and forcible entry.
5. Minimum of two personnel for search and rescue of the premise.
6. Minimum of two personnel to raise ground ladders for rescue or access and perform ventilation.
7. If an aerial device (ladder truck) is operated, one person to maintain primary control of aerial ladder at all times.

### **Daily Staffing**

The MFD has 82 personnel on duty covering the City's thirteen fire stations. These 82 firefighters operate under one Standard Operating Guideline (SOG) manual and one Policy and Procedure Manual established for consistent operations of the fire department. The 82 firefighters on duty are trained to one Department standard based on a two-year training plan.

The City of Madison Fire Department's Standard Operating Guidelines may conflict with the SOGs of outside agencies.

Current trends in staffing Combination and Volunteer Departments, may not allow for neighboring departments to consistently meet staffing levels required by the Madison Fire Department and NFPA 1710. All of the fire departments within Dane County have a proud history of providing fire protection to their communities; however, they are not immune to issues with recruitment and retention of members. Many Dane County fire departments are actively employing several methods to recruit and maintain members, including the use of stipends, Madison College student interns to augment staffing, full-time firefighters, paid on premise (part-time) staff, and paid on-call members and volunteers. Since this is not the

model used by the City of Madison Fire Department, a study would need to be completed as to the successes and operational issues of the departments and how they compare to Madison.

If the City of Madison and Dane County communities would choose to establish a borderless system for response, there will be the potential for large financial commitments from the municipalities surrounding the City of Madison. Most of the financial commitment would come in the form of staffing response vehicles to the NFPA 1710 standards: a minimum of four fully-trained responders per one fire apparatus. The differences in the NFPA 1710 and NFPA 1720 staffing models will create a challenge for all communities.

### **Auto-Aid, Mutual Aid, and MABAS**

**Automatic Aid** is assistance that is dispatched automatically by a contractual agreement between two fire departments, communities, or fire districts. This differs from Mutual Aid. The use of Auto-Aid in some models does not always mean “*closest and most appropriate.*” Currently, Auto-Aid is being used as a mechanism to assist the Authority Having Jurisdiction (AHJ) by augmenting a single department’s initial response of personnel. It also is used county-wide as a tool to establish a “depth of coverage” for a community. The “depth of coverage” allows a community experiencing an emergency to utilize another community’s resource, leaving local resources available for another emergency if needed.

**Mutual Aid** is assistance dispatched upon request by the responding fire department. It’s an agreement between all of the communities in Dane County that basically allows any community to call for help with an emergency. The document that was signed in the 1960s stands true to this day. The agreement does not allow for interagency billing. A community, if requested for assistance, cannot take a “pass” on a response. Conversely, agencies are able to say they cannot respond due to unforeseen circumstances under the Automatic-Aid and the MABAS systems.

The **Mutual Aid Box Alarm System (MABAS)** is designed to deploy responses when the AHJ becomes overwhelmed or stricken by an incident. Minimum standards are set for responders training for this program. The system is designed to deplete resources in a more predictable fashion. Units are sent from further locations so that every community keeps a response resource locally and available to handle another emergency. Comparing this simple response with minimum standards to Auto-Aid or border dropping is not a fair comparison. Several area fire departments have stringent response minimums before a member can respond to a call. If a closer fire department does not hold the same standard, then the



original department's citizens are being served at a reduced level, lower than what the community and Fire Chief has adopted as their standard. The application of border drops should be set with the expectation that the responding agencies are all at the same level of standards from the start, as opposed to only once they are completely stricken (at which time MABAS would be deployed).

Current expectations would be that if a border drop takes place, all the responders would have the same training, the same staffing levels, and all would deliver the same service. This concept is a challenge for Dane County because of the large differences in recommended staffing models by the NFPA.

### **Training/Recruitment/Retention**

Another area that will require an expense—of both money and time—is training. The State of Wisconsin requires a firefighter to receive only 60 hours of training. The use of MABAS increases that requirement to an additional 36 hours of training to meet the State Firefighter 1 certification. It should be noted that these certifications are the very *minimum* necessary to meet very broad standards, and additional training needs to take place for firefighter development.

Currently, the recruits who go through the Madison Fire Department Training Academy not only exceed the State requirements but also meet the Firefighter 2 certification. Applicants to the Madison Fire Department participate in a rigorous hiring process prior to being recommended by the Fire Chief and approved by the Police and Fire Commission (PFC) to become a member of the MFD. Upon a conditional offer of employment, the successful applicant also will have passed a background check and a thorough physical exam before they start the recruit academy. MFD recruits then attend a challenging 17-week academy. Upon successful completion of the academy and prior to being placed in a fire station, the recruit will have successfully completed the rigorous standards set by the Department, standards set by the State to have passed Firefighter I and Firefighter II certification, and will be licensed as a State of Wisconsin licensed emergency medical technician (EMT). All personnel participate in ongoing training utilizing the two-year training plan developed by the Training Division. All of these drills build upon the operations at various types of emergency situations. On average, company-level training exceeds 200 hours per firefighter.

The Dane County fire departments do participate in a Dane County Fire Training Officers organization. This organization could benefit all departments if we choose to look at a borderless dispatching model. This group could be tasked with developing ongoing training plans that could incorporate or augment the current MFD two-year training plan. One of the barriers that would need to be addressed is the training time. The MFD (by contract) trains its firefighters during daytime regular work hours. Most other departments in Dane County host training at night when their members are available.

Annual requirements for personnel performance standards vary between departments. Annually, MFD personnel are required to participate in either personal performance standards or company standards. These standards are prescribed activities working either as part of a team (company standards) or on an individual basis (personal performance standards) that measure a minimum fitness and performance level. Individuals and/or companies who do not demonstrate proficiency are given additional training and fitness plans before retaking the standards. This annual testing ensures that crews are functionally able to initiate fire ground actions, as well as maintain a minimum physical fitness level.

The MFD has also adopted the IAFF/IAFC Firefighter Health and Wellness initiative. The initiative is designed for each individual to maintain a fitness level appropriate to maximize their performance. The Department has a staff of Peer Fitness Trainers who assist each individual with a personally designed health and wellness program. Working in conjunction with this group are additional certified trainers who are providing input and assistance in making an even healthier workforce within the MFD. Additionally, all of our recruits go through rigorous fitness testing with the University of Wisconsin-Milwaukee's Human Performance and Sport Physiology Laboratory. The intent of this testing is to develop a fitness baseline for the recruit and use the information acquired to possibly forecast deficiencies in the recruit that can be used as predictors for future workplace injury. Programs are then developed to help the recruit minimize injuries in the future. The MFD would encourage all participants in a borderless dispatch system to adopt the same standards.

### **Technology Challenges and Opportunities**

Another issue that must be addressed with the current model as it pertains to border drops is the interoperability of radio frequencies used. The City of Madison currently utilizes 800 MHz and the County agencies utilize VHF. The current model of using "patches" has created challenges, and with the redesign of DANECOM, there is potential for a reduced ability to set up patching across different bands. Both systems would be required to use non-trunked talk group channels. The county system has only one tactical analog channel that will be allowed inside a structure when firefighting operations are involved. The interoperability challenges that all departments may face in the future is unknown.

### **Pre-Alerting/Quick Dispatching**

Response time includes alarm answer time, alarm process time, turnout time, travel time, and time to initiate action on scene. Alarm answer time (the amount of time to answer the call) and alarm process time (the duration from the time the phone call is answered until the information is transmitted to the responding agency/personnel) is wholly impacted by the Dane County Communications Center. Turnout time (the amount of time from notification to the responders until the time travel to the scene begins), travel time, and the time it takes to initiate action is impacted by the fire and the supporting infrastructure of the community (water supply, roads, etc).

In 2013, The Dane County Fire Chiefs' Association formed a committee to study methods of receiving alarms/getting paged for alarms more quickly from the Dane County Communications Center. The majority of fire departments in Dane County rely on a paging system that alerts their members that there is an emergency in their jurisdiction in which they need to "muster for" and respond. The "pre-alerting" would occur immediately after the address and nature of the incident became known. Members would start making their way to the station while additional information was being gathered by the Dane County Communications call taker. Pre-alerting enables responders to begin turnout time sooner and reduce overall response time. The call taker is still able to get additional information while the responder is making their way to their station or vehicle to begin traveling to the incident.

Since the vast majority of Dane County departments are staffed with volunteer or paid on-call staffs that respond from their homes, simply paging them will not guarantee a faster response. The best reported (but not proven) time for departments without in-house staff to begin response in a fire apparatus was estimated at four minutes. While this time may not sound overly significant, it does add to the time for responders to get to the scene, resulting in a much longer response time overall.

This concept explains why a geographically closer resource may not be the quickest resource to dispatch. The delay comes on the front end of the response time, as unstaffed stations need responders to first arrive at the station to staff a vehicle.

### **Center Line vs. Address Point Map Layers**

In 2014, the problems of prolonged response times were discussed on many levels. Since implementation of the Tri-Tech CAD in April 2013, the Madison Fire Department has noticed prolonged process times. One of the stated causes was the difficulty of the Dane County Communications Center to determine which agency should be responding for areas that were border areas. As implemented, the system relied on "center line" data layers to determine the jurisdiction in which an incident was occurring. Using center line layers, dispatchers often had to verify the recommendations being made from CAD, often causing delays or errors. If center line layers continued to be used, the ability to page the agency that was physically closest, regardless of jurisdiction, would minimize the delay of using center line layering.

With the help of the City of Madison Information Technology working with the County Land Information Office, address point layering has been implemented, greatly reducing delays and errors pertaining to incidents occurring on the borders of multiple jurisdictions. This implementation has helped reduce the processing time of the dispatchers and has allowing for quicker response overall.

## **The Next Steps:**

Providing the City of Madison and surrounding communities with a borderless dispatch system has potential in Dane County following the purchase of the new Computer Aided Dispatch system utilized by the current Dane County 911 Center.

For a borderless system to function properly there are several things that all communities need to address:

- A geographically closer station or unit does not guarantee a faster response. We would need to study the exact response time differences between a fully-staffed facility and a partially- or un-staffed facility. There may be times that the differences are staggering.
- With a large variety of fire department response times in Dane County, we need to establish a set of criteria for data collection such as “What defines a response time?” and “What is acceptable for each community?”
- Consistent staffing models need to be agreed upon by all communities. The City of Madison has an established standard of four firefighters per fire apparatus (NFPA 1710). It is reasonable for the City of Madison to expect the same response from outside agencies as we currently provide under Auto-Aid, Mutual Aid, or MABAS.
- Each community will need to develop and implement an ongoing fitness program for each employee. These programs should include individual fitness plans and annual medical exams. Many departments in Dane County may already require these standards; we need to gather additional data.
- Agencies will need to develop personal and company performance standards to ensure responders are meeting a minimum standard that is agreed upon by all agencies.
- Dane County fire departments currently have a training officer organization. The group meets every other month and could/would develop a common core training program, standard operating guidelines, and policies for all Dane County fire departments to function seamlessly on an emergency scene.
- Dane County will need to address the DaneCom radio system to ensure that all Dane County Fire Departments can communicate. Radio interoperability will be a critical requirement for borderless dispatching to occur.
- All fire departments in the County will need technology support from the Dane County 911 Center to ensure that all of the technology, such as vehicle AVL and

CAD systems, is functioning properly. The departments will also need support to ensure radio and alerting (paging) systems are functioning at full capacity.

- The equipment involved from various departments would require some outlay for startup cost as well. Minimally, adapters for hoses to be connected to different department apparatus would need to be purchased. The expected outlay of cost should not be considered excessive. Nonetheless, there will be a cost.

### **In the Meantime:**

Of the 28 fire departments that respond to emergencies in and around Dane County, there are approximately 80 automatic aid agreements. Some of these agreements augment staffing levels, and some provide for a “depth of coverage” for a community. Some of the agreements in place are due to the geographical location of one agency over another. The Dane County Fire Chiefs have met several times in recent months to discuss borderless dispatching and automatic/mutual aid. The group is committed to continuously evaluating response planning and serving our communities. The majority of the Fire Chiefs represented feel very strongly that it is their responsibility to define and provide the very best service for their community’s needs.

## Glossary

**Auto-Aid**—A contractual agreement between municipalities that defines a response. This may be for specific equipment and/ or personnel.

**DANECOM**—the trunked radio system currently being built out by Dane County. The area fire departments will utilize this as their radio communications.

**Defensive Operations**—Crews perform activities to limit spread of the fire, typically sacrificing the building on fire to save other buildings not yet involved.

**Emergency Medical Technician**—A person licensed to perform basic life support, advanced life support, or paramedic level care based on successful completion of coursework and testing.

**Engine Company**—A piece of Fire Apparatus that carries personnel and equipment to the scene. It also carries hose and has onboard pump. Primary function at a fire is extinguishment.

**MABAS**—Mutual Aid Box Alarm System. A system which assists departments with pre-planning for emergency situations by providing organized mutual aid within our County and throughout the Midwest. In addition to incident response pre-planning (box alarm cards), the MABAS System provides standardized radio communications, personnel accountability, and contractual agreements between all members.

**Ladder Company**—A piece of fire apparatus that has an aerial device on the top. This may be a straight ladder or a platform. Primary function at a fire incident is ventilation, search and rescue.

**NFPA**—National Fire Protection Association. An international non-profit organization whose mission is to reduce fire and other hazards by providing and advocating consensus codes, standards, research, training, and education.

**NFPA 1710**—Standard for organization and deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the public by career fire departments.

**NFPA 1720**—Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments.

**Offensive Operations**—Crews take an aggressive strategy to attack the fire. This is when companies typically operate inside the building.

**Paid-on-Call Firefighter**—Member is compensated at a pre-determined wage. This may also include incentives as well as retirement plans.

**Pre-Alert**—The act of notifying agencies that an incident has been reported in their response area. Currently only 4 incident types are “pre-alerted”: structure fires, vehicle fires, outside fires, or significant rescue.

**Structure Fire**—A fire that occurs within or is part of a constructed property.

**Volunteer Firefighter**—Member with no or little compensation for serving as a firefighter or EMT.