THE RESPONSE TO THE 2011 JOPLIN, MISSOURI, TORNADO

LESSONS LEARNED STUDY

20 December 2011

FEMA

ADMINISTRATIVE HANDLING INSTRUCTIONS

The title of this document is *The Response to the 2011 Joplin, Missouri, Tornado Lessons Learned Study*.

The information gathered in this report is designated as unclassified, in order to maximize information sharing with partners within and outside government. This type of information sharing supports the Federal Emergency Management Agency (FEMA) Strategic Plan, Initiative 4, to enhance FEMA's ability to learn and innovate as an organization.

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EXECUTIVE SUMMARY

On Sunday, May 22, 2011, a catastrophic Enhanced Fujita-5 (EF-5) tornado struck the City of Joplin, Jasper County, and Newton County in southwest Missouri in the late afternoon. With winds in excess of 200 miles per hour (mph), the ¾-mile-wide tornado cut a 6-mile path of destruction through central Joplin. The tornado caused 161 fatalities and approximately 1,371 injuries as of May 27, 2011, making it the single deadliest U.S. tornado since 1947. Thousands of structures were destroyed or damaged, from single family homes to apartment buildings to large retail and public buildings, including St. John's Regional Medical Center, the Home Depot, and Wal-Mart.

In the aftermath of the tornado, emergency responders and the public began conducting search and rescue operations in damaged buildings and provided medical care and shelter for survivors. The tornado overwhelmed the capabilities of the City of Joplin, Jasper County, and Newton County, requiring a massive response from Federal, State, county, local, private sector, non-profit, and voluntary organizations. Personnel from more than 400 public safety organizations deployed to Joplin to assist with response and recovery operations.

The Lessons Learned Study Process

The Federal Emergency Management Agency (FEMA) National Preparedness Assessment Division (NPAD) of the National Preparedness Directorate contacted Region VII to offer support to identify preliminary findings related to the Whole Community's and FEMA's contributions to the Joplin tornado response. With the approval of Region VII Regional Administrator Beth Freeman, a joint Region VII – NPAD team conducted in-person interviews, analyzed data, and identified preliminary findings.

Preliminary Findings

The team has identified 22 preliminary findings in this report, which are listed in Table 1 and described in Section 2. The team has identified the following major strengths demonstrated during the response:

- Regional capabilities enabled emergency responders to meet the needs of survivors immediately after the Joplin tornado.
- The City of Joplin used social media and other innovative mechanisms to communicate emergency information to the public and conduct outreach to support long term recovery.
- Participation in the National Level Exercise 2011 (NLE 11) helped to prepare Federal, State, regional, local, and private sector personnel respond effectively to the Joplin tornado.
- The Federal Coordinating Officer (FCO) assigned dedicated FEMA liaison officers (LNOs) to key Joplin officials (e.g., City Manager, School Superintendent) that strengthened coordination between the city and FEMA.

The team has identified the following major areas for improvement demonstrated during the response:

- Incorporating Joplin response operations into an existing declared disaster (DR-1980) offered both benefits and challenges for FEMA response operations.
- The Joint Field Office (JFO) – Division structure employed to manage FEMA operations for the Joplin tornado experienced coordination and control challenges, primarily in the initial stages of the response.
- The lack of available, experienced personnel to replace the Incident Management Assistance Team (IMAT) and augment the JFO staff resulted in operational challenges for the JFO.
- The JFO lacked personnel with sufficient warrants to provide the effective contracting support necessary for the Joplin response.

Figure 1: **New home construction in Joplin, September 2011. (Source: FEMA)**

Table 1: Preliminary Findings

2.1	Regional capabilities enabled emergency responders to meet the needs of survivors immediately after the Joplin tornado.
2.2	Emergency medical services and medical personnel from Joplin and mutual aid agencies established field triage and medical treatment for survivors in the midst of major damage to the city.
2.3	The thousands of mutual aid responders and volunteers who self-dispatched to Joplin immediately after the tornado enabled Joplin to conduct response operations, but presented challenges for incident management.
2.4	The Joplin Fire Department integrated mutual aid partners and created new tactical procedures that enabled it to meet the city's needs after the tornado.
2.5	The City of Joplin used both traditional mechanisms and social media to communicate emergency information to the public and conduct outreach to support long-term recovery.
2.6	The magnitude of the fatalities overwhelmed the capabilities of county coroners and presented challenges for the Disaster Mortuary Operational Response Team.
2.7	AmeriCorps provided critical support to Joplin, including managing thousands of self-dispatched volunteers.
2.8	Voluntary organizations established a mass shelter for the hundreds of animals made homeless by the tornado.
2.9	Communications and power in Joplin were restored very quickly after the tornado.
2.10	Participation in NLE 11 helped Federal, State, regional, local, and private sector personnel respond effectively to the Joplin tornado.
2.11	Incorporating Joplin response operations into an existing declared disaster (DR-1980) offered both benefits and challenges for FEMA response operations.
2.12	The JFO – Division structure employed to manage FEMA operations for the Joplin tornado experienced coordination and control challenges, primarily in the initial stages of the response.
2.13	The lack of available, experienced personnel to replace the IMAT and augment the JFO staff resulted in operational challenges for the JFO.
2.14	The JFO and the JDO lacked the systems and procedures necessary to effectively manage the large amount of information that each received.

Table 1: Preliminary Findings (Continued)	
2.15	Data and analyses from previous disasters were not available to inform JFO decision-making.
2.16	FEMA and State personnel indicated that Department of Homeland Security audits after the response period is closed are causing concerns about eligibility.
2.17	FEMA Public Assistance and Expedited Debris Removal programs confused some State and local officials and the public.
2.18	The JFO lacked personnel with sufficient warrants to provide the effective contracting support necessary for the Joplin response.
2.19	Staffing presented a number of challenges for the JFO and the JDO.
2.20	The FCO assigned dedicated FEMA liaison officers to key Joplin officials (e.g., City Manager, School Superintendent) that strengthened coordination between the city and FEMA.
2.21	The JDO and FEMA Region VII conducted a dedicated day of community outreach, which was valuable for survivors and staff.

Figure 2: Tornado damage in Joplin. (Source: FEMA)

SECTION 1: INCIDENT OVERVIEW

1.1 Profile of Joplin, Missouri

The City of Joplin is located in Jasper County, Missouri, in the southwest corner of the State, near its borders with Arkansas, Kansas, and Oklahoma. Joplin has a population of 49,024. The daytime population swells to 270,000 while the population within a 40-mile radius of Joplin is 400,000, making it Missouri's fourth largest metropolitan area. The area's major industries include agriculture, education, health and social services, manufacturing, and retail trade. Two hospitals, St. John's Regional Medical Center and the Freeman Health System, provide medical care to the region and serve as the city's emergency medical services (EMS) provider. Joplin is home to Missouri Southern State University (MSSU), Ozark Christian College, and Messenger College. Founded in 1843, Joplin is located at the junction of Interstate 44 and U.S. 71, and along historic Route 66.

Figure 3: Map of Joplin, Missouri, and the Four Corners Region. (Source: Google Maps)

The Joplin area is located within "Tornado Alley," a part of the central United States that experiences a high frequency of tornadoes each year, typically in late spring and occasionally in early fall. Meteorologically, this region is ideally situated for the formation of supercell thunderstorms that produce tornadoes rated EF-2 or higher.

1.2 The May 22, 2011, Tornado

On Sunday, May 22, 2011, cold and warm fronts clashed throughout the central United States, creating a supercell thunderstorm that tracked from southeast Kansas to southwest Missouri late in the afternoon and evening. The storm generated several tornadoes, wind damage, and flash flooding across southwest Missouri. The National Weather Service (NWS) Storm Prediction Office issued a tornado watch at 2:40 p.m. Eastern Daylight Time (EDT) indicating that conditions were favorable in parts of Arkansas, Kansas, Missouri, and Oklahoma for tornadoes.

Late in the afternoon, storm chasers and spotters reported multiple vortices west of Joplin. By 5:45 p.m. EDT, Joplin/Jasper County Emergency Management had begun coordinating with the NWS to track a tornado that had formed west of Joplin. The NWS Forecast Office in Springfield issued a tornado warning for Joplin at 6:17 p.m. EDT, providing residents with 24 minutes of lead time in advance of the tornado. Outdoor emergency sirens sounded in Joplin at 6:17 p.m. EDT and again at 6:31 p.m. EDT. At 6:41 p.m. EDT, the EF-5 tornado touched down in Joplin with winds in excess of 200 mph. The path of the entire tornado was 22.1 miles long and up to 1 mile in width. As the tornado moved through the City of Joplin, it was rated EF-4/EF-5, with a damage path 6 miles long and up to ¾ mile wide.

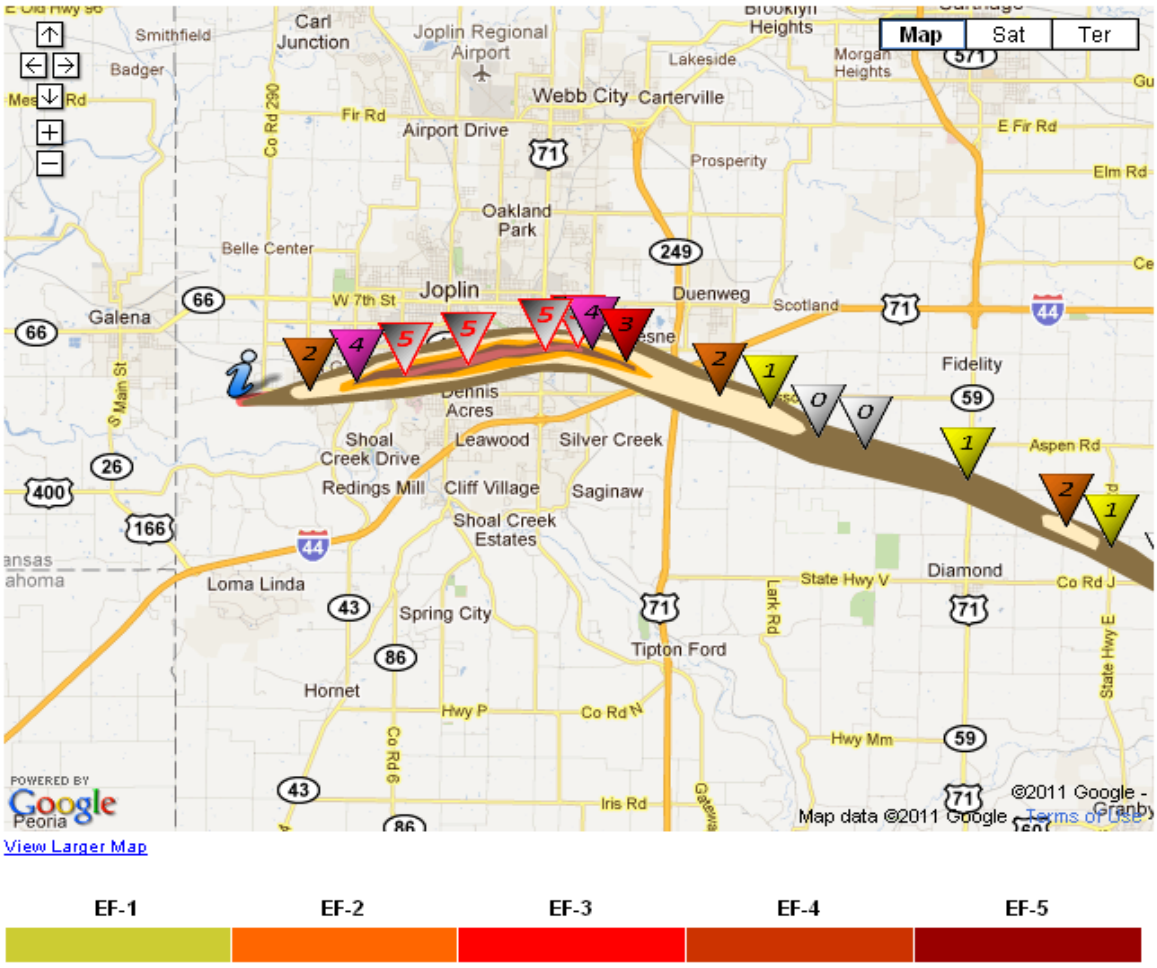

Figure 4:Track of Joplin Tornado. (Source: NWS)

1.3 Impact of the Tornado

The tornado resulted in catastrophic loss of life and destruction during its 6-mile track through Joplin. The tornado caused 161 fatalities and 1,371 injuries as of May 27, 2011, making it the single deadliest U.S. tornado since 1947 and the seventh deadliest in U.S. history, according to the National Oceanic and Atmospheric Administration. Thousands of structures were destroyed and damaged, from single family homes to apartment buildings to large retail and public buildings, including St. John's Regional Medical Center, the Home Depot, and Wal-Mart. The loss of life would have likely been significantly higher had Joplin High School not held its graduation ceremony at MSSU instead of its building. The high school building was destroyed while two other schools suffered significant damage. In the aftermath of the tornado, emergency responders and the public began conducting search and rescue operations in damaged buildings and provided medical care and shelter for survivors.

The EF-5 tornado destroyed 4,380 homes and damaged an additional 3,884. It uprooted structures from their foundations, leaving only anchor bolts on the ground. Many other buildings, including pre-cast concrete wall construction, metal buildings, concrete and brick masonry, and

wood-frame construction, suffered partial or complete collapse. The area impacted by the tornado spanned nearly 30 percent of Joplin and generated an estimated 3 million cubic yards of debris.

The EF-5 tornado caused severe damage to several health care facilities, including the St. John's Regional Medical Center and the Ozark Center. Five patients and one visitor were killed when the tornado struck St. John's. Hospital personnel evacuated 183 patients from the damaged hospital within 90 minutes after the tornado. The Empire District Electric Company reported the loss of 130 transmission poles throughout the city. As a result, approximately 18,000 customers were left without power immediately after the tornado. The extreme destruction forced thousands of residents to find lodging with families or friends. The American Red Cross established a shelter at MSSU for 300 residents displaced by the tornado.

1.4 FEMA's Response

FEMA had been conducting disaster response and recovery in Missouri in the months prior to the Joplin tornado. Severe winter storms in January and February 2011 led President Barack Obama to issue a major disaster declaration (FEMA-DR-1961) for 59 counties throughout the State on March 23, 2011. FEMA Administrator Craig Fugate appointed Libby Turner as FCO, and a JFO was established in Columbia, Missouri. Several weeks later, spring storms brought damaging tornadoes and flooding to Missouri, principally in the southern tier. On May 9, 2011, President Obama issued a major disaster declaration (FEMA-DR-1980) for five counties in Missouri. Administrator Fugate appointed Turner as the FCO for DR-1980, with the JFO continuing to operate from its offices in Columbia.

Figure 5: **FEMA Administrator Craig Fugate surveys a damaged fire station with a Joplin firefighter. (Source: FEMA)**

On the evening of May 22, 2011, shortly after the tornado, FEMA Headquarters, Region VII Administrator Freeman and FCO Turner had a series of telephone calls to discuss how FEMA could support response operations in Joplin. The State of Missouri had the option to request that the Joplin event be added to DR-1980 or it could have requested that the president issue a new disaster declaration. Administrator Fugate issued an amendment to DR-1980 on May 23, 2011, which provided Individual Assistance, debris removal, and emergency protective measures funding to individuals in Jasper and Newton counties.

1.5 The Whole Community Approach

Presidential Policy Directive 8: National Preparedness states that effective responses to natural and man-made disasters require an "all-of-Nation" approach that leverages all available capabilities in a coordinated and efficient way. FEMA Administrator Fugate noted, "What we really need to be doing is planning for disasters that go beyond our capabilities." To achieve this, FEMA established the Whole Community approach in an effort to incorporate the capabilities of the entire community and move beyond traditional, government-centric disaster management models.

FEMA prioritized this approach as one of four initiatives in its Strategic Plan for Fiscal Years 2011–2014. Administrator Fugate stated, "We know that non-governmental organizations, like faith-based and non-profit groups, and private sector entities, possess knowledge, assets and services that government simply cannot provide." The Whole Community approach emphasizes the ability to access non-traditional resources and apply them in innovative ways to save lives and sustain communities after catastrophic disasters. FEMA evaluated the Whole Community approach for the first time during NLE 11.

The Joplin tornado response offers an opportunity to identify Whole Community contributions and solutions to a catastrophic incident. The State of Missouri had not suffered from a disaster of this magnitude or anything approaching it for at least a decade. Similarly, the City of Joplin had suffered from severe weather, but nothing approaching this magnitude. The Joplin tornado, as the single most deadly tornado in the United States in over half a century, overwhelmed the capabilities of the City of Joplin and Jasper County. However, as the following preliminary findings demonstrate, the Whole Community responded to Joplin and Jasper County in their hour of need. This only transpired because of the preparedness partnerships that had been developed among Federal, State, local, private sector, voluntary, and non-profit entities.

1.6 About This Lessons Learned Study

A joint FEMA Region VII and NPAD team collaborated to collect and review data, and to identify preliminary findings. The team conducted in-person interviews with FEMA Region VII, JFO, State, and local officials. This report contains the preliminary findings identified by the team. These preliminary findings illustrate the commitment of Federal, State, local, private sector, and voluntary personnel to meet the needs of disaster survivors after the Joplin tornado. Appendix A lists Lessons Learned and Good Stories identified by the NPAD team that are candidates for inclusion on FEMA's *Lessons Learned Information Sharing* (*LLIS.gov*) system. Appendix B lists acronyms used in this report.

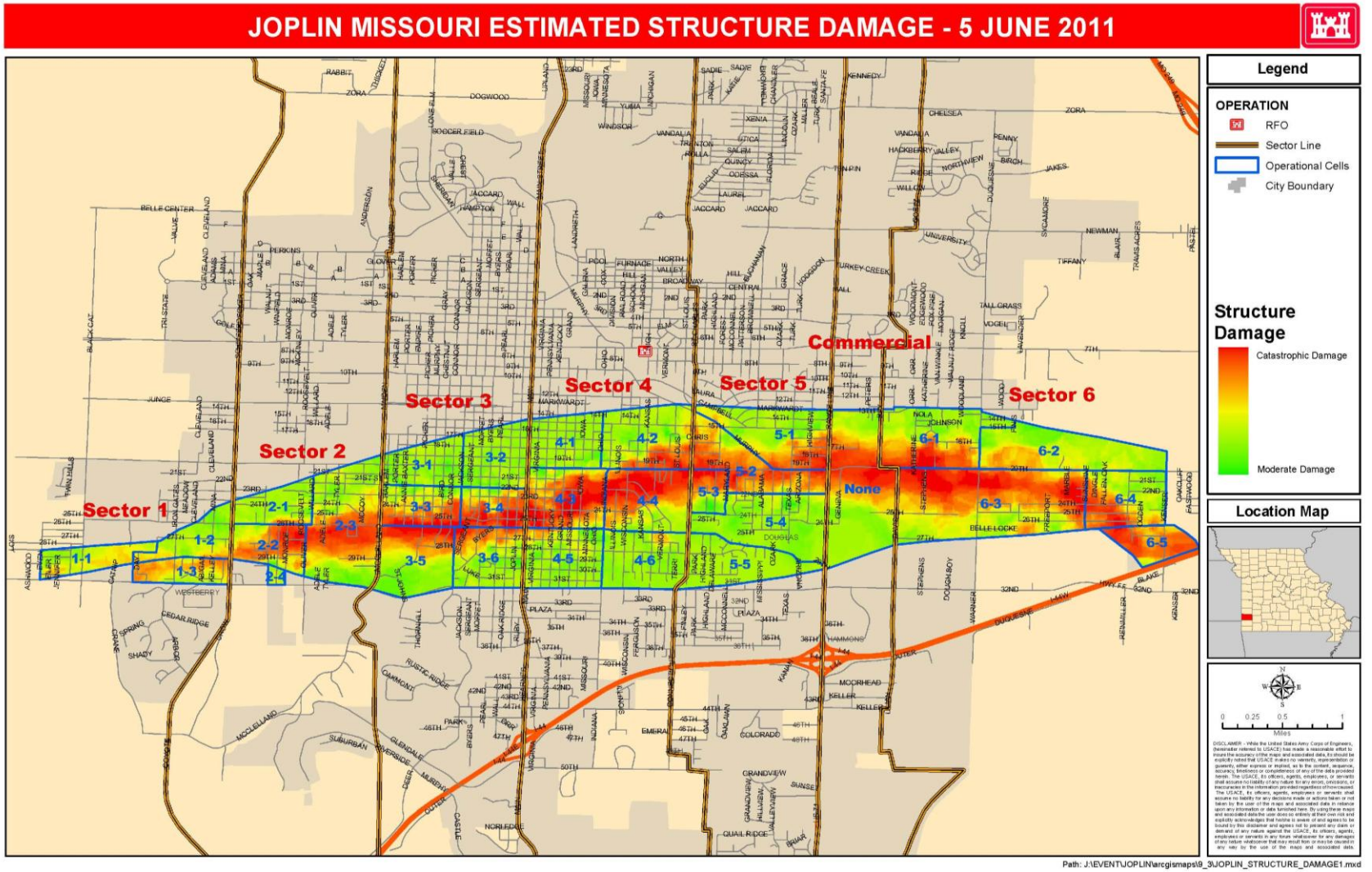

Figure 6: Map of Estimated Joplin Structure Damage. (Source: USACE)

SECTION 2: PRELIMINARY FINDINGS

Preliminary Finding 2.1: *Strength:* Regional capabilities enabled emergency responders to meet the needs of survivors immediately after the Joplin tornado.

Discussion: Southwest Missouri jurisdictions had undertaken a number of regional preparedness initiatives that proved instrumental for the response to the Joplin tornado. The 18 counties and other jurisdictions within Missouri Homeland Security Region D have collaborated extensively on grants, exercises, training, and other preparedness activities that built regional resources and capacity. The Region D Regional Homeland Security Oversight Committee provided grants for the establishment and maintenance of regional response teams. For example, the committee has provided several grants to the Southwest Missouri Incident Support Team (IST), which has funded training, equipment, and other activities. City and county emergency management and response agencies had received incident command system and other training, particularly from FEMA's Emergency Management Institute. The State and region also cultivated robust community preparedness programs, such as Citizen Corps and AmeriCorps. Joplin and Jasper County officials participated in regular exercises, including NLE 11 only days before the tornado. Jasper County and Joplin also participate in Four Corners Emergency Management, which includes emergency managers from Missouri, Arkansas, Kansas, and Oklahoma.

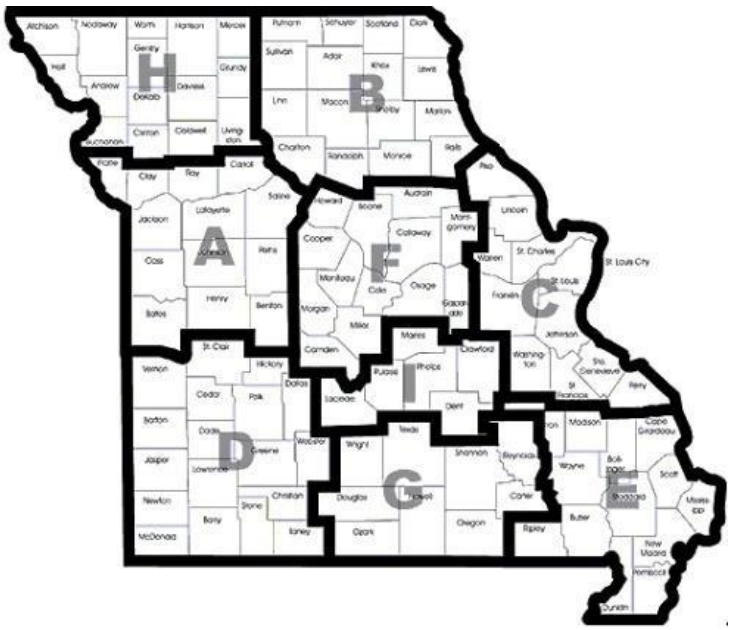

Figure 7: Map of Missouri Homeland Security Regions. (Source: State of Missouri)

Immediately after the tornado, Joplin and Jasper County activated their mutual aid agreements with their regional partners through these structures. The Southwest Missouri IST proved particularly valuable for supporting incident command and for restoring communications at the Joplin/Jasper County emergency operations center (EOC). The Southwest Missouri IST relied on the training and equipment funded through grants from the Department of Homeland Security (DHS) and distributed by Region D. The Region F IST deployed to the Joplin EOC to supplement the assistance provided by the Southwest Missouri IST. The IST used its satellite capabilities to augment communications to the Joplin/Jasper County EOC.

Four Corners Emergency Management managed requests from Joplin for assistance. The Crawford County Health Department deployed nurses and portable vaccine refrigerators to Joplin. Greene County deployed 110 response personnel from the Sheriff's Office, the Office of Emergency Management, the Highway Department, Building and Development Services, and Public Information. ICS and other training received from FEMA provided the foundation that enabled a rapid, effective, and coordinated regional response. A Joplin official noted that the regional exercises were "exceptionally valuable" for tornado response operations.

The Whole Community response to the Joplin tornado was built upon the preparedness structures and activities that Joplin, Jasper County, and its regional partners had spent years constructing. Had the region, along with the State and FEMA, not made these investments, the response to the tornado would not have achieved this degree of effectiveness. As one Joplin official noted, "We expect that we will be on our own for the first 48 hours of a disaster. But people getting here so fast enabled us to get the job done." This incident illustrates how regional structures can be the building blocks for Whole Community responses.

Preliminary Finding 2.2: *Strength:* EMS and medical personnel from Joplin and mutual aid agencies established field triage and medical treatment for survivors in the midst of major damage to the city.

Discussion: The tornado caused severe damage to the St. John's Regional Medical Center and other health care facilities in Joplin. The St. John's Regional Medical Center suffered catastrophic damage to its exterior and interior, resulting in 6 fatalities, the complete loss of power, flooding, and natural gas leaks. The EMS response was also impacted since St. John's and Freeman Health System operate Joplin's EMS. The Ozark Center, which provides behavioral health and autism services, was also destroyed.

Figure 8: **The entrance of St. John's Regional Medical Center after the tornado. (Source: FEMA)**

St. John's personnel evacuated 183 patients from the destroyed facility within 90 minutes of the incident. These personnel established triage operations in the parking lot outside

the medical center to provide assistance to hospital patients and other injured survivors. In addition, medical personnel moved critical patients to Freeman Health System, located approximately 1 mile from St. John's, as well as to the St. John's Hospital in Springfield. Volunteers used pickup trucks, ambulances, and any other undamaged vehicles to transfer patients. Further, approximately 70 agencies provided ambulance services to the City of Joplin following the tornado.

Figure 9: St. John's Regional Medical Center modular hospital units. (Source: FEMA)

The damage to St. John's Regional Medical Center forced medical and EMS personnel to adopt creative, *ad hoc* solutions to treat the massive number of injured, particularly since people who were unaware of the damage to the center continued to transport injured to it. Area health care facilities and triage centers quickly reached maximum patient capacity. The Freeman Health System relied on emergency generators to treat approximately 400 victims in the first few hours after the tornado. EMS and medical personnel established field triage locations throughout Joplin to treat victims, including at Memorial Hall, McAuley Catholic High School, and the parking lots of Home Depot and Lowe's. Medical and EMS personnel improvised due to the lack of medical supplies. According to news reports, approximately 200 people received medical treatment in these makeshift centers following the tornado. Some ambulances parked in the impact zone and treated the injured rather than attempting to transport them.

Additional medical response assets began arriving in Joplin to support the provision of medical care. The State of Missouri activated the Missouri 1 Disaster Medical Team (MO-1 DMT) to assist medical response operations. The MO-1 DMT deployed an 8,000-square-foot, 60-bed mobile field hospital, the only of its kind in the nation. Purchased with U.S. Department of Health and Human Services (HHS) grant funds, the hospital had been fully deployed for the first time only days before as part of NLE 11 (see Preliminary Finding 2.10). St. John's medical staff began treating patients in this facility on May 29, 2011.

Preliminary Finding 2.3: *Area for Improvement:* The thousands of mutual aid responders and volunteers who self-dispatched to Joplin immediately after the tornado enabled Joplin to conduct response operations, but presented challenges for incident management.

Discussion: The Joplin tornado response resulted in the deployment of mutual aid response personnel from more than 400 public safety organizations. In addition to the regional mutual aid response (described in Preliminary Finding 2.2), responders from across Missouri and other states deployed to Joplin. Missouri requested and received assistance from Illinois, Kansas, Oklahoma, and other states through the Emergency Management Assistance Compact (EMAC). Within 24 hours of the tornado, more than 800 police cars, 300 ambulances, 400 fire trucks, and 1,100 responders had arrived in Joplin to contribute to response operations.

Figure 10: **Missouri National Guard soldiers and mutual aid responders after the tornado. (Source: Missouri National Guard)**

The very large amount of mutual aid benefitted Joplin response operations, but it presented several challenges as well. First, many responders self-dispatched to Joplin and began performing tasks without coordinating with local incident command. Second, some responders lacked the equipment and training to conduct operations, particularly search and rescue, safely and effectively. Various search markings were used, rather than standard search markings. Consequently, some structures were searched multiple times as subsequent teams did not recognize the markings of the previous team(s) at the site. A Joplin official commented that he saw structures with five sets of markings, only one of which was correct. The search may have been conducted more quickly had search personnel followed check-in procedures. Freelancing by responders and volunteers also raised potential safety issues during search operations.

The City of Joplin worked with the Southwest Missouri IST and other local mutual aid partners to establish staging areas and check-in procedures. They employed standard ICS procedures to manage the large influx of mutual aid responders and volunteers. The daily development and distribution of the Incident Action Plan provided an additional means for Joplin officials to manage mutual aid responders.

Preliminary Finding 2.4: *Strength:* The Joplin Fire Department integrated mutual aid partners and created new tactical procedures that enabled it to meet the city's needs after the tornado.

Discussion: The tornado destroyed two of the Joplin Fire Department's five fire stations, as well as the accompanying apparatus. Despite this diminishing capability, the Joplin Fire Department had to respond to the large area of devastation as well as continue to support areas of Joplin that were not damaged by the tornado. Automatic and mutual aid from fire departments throughout southwest Missouri began arriving throughout the evening and into the night after the tornado. The Southwest Missouri IST included a command-level officer who assisted with fire response operations. Mutual aid from rural fire departments proved especially valuable since they typically possess tankers; this enabled them to be self-sustaining within the area impacted by the tornado. Within a day of the tornado, more than 400 fire trucks had deployed to Joplin to provide mutual aid.

The Joplin Fire Department integrated mutual aid fire personnel to support the response operations in the impact zone and throughout the city. The department established a system in which combination teams of Joplin and mutual aid fire personnel serviced calls. These integrated teams maximized the contribution of mutual aid responders, many of whom were unfamiliar with Joplin. Further, the mutual aid and donated equipment allowed the Joplin Fire Department to maintain full operations at the two destroyed stations. The Pierce Manufacturing Company loaned two pumper trucks to the city, while FEMA provided modular structures that could temporarily replace the two destroyed stations.

Preliminary Finding 2.5: ***Strength:*** The City of Joplin used both traditional mechanisms and social media to communicate emergency information to the public and conduct outreach to support long-term recovery.

Discussion: City officials used press conferences, press releases, and news alerts to disseminate emergency information to the public and to response partners. The city also distributed this information through email and posted it on the city's Web page and Facebook page. The Facebook page contained posts exclusively by the city about sheltering, disaster recovery centers, volunteer and donations opportunities, applying for FEMA assistance, and other critical information. The city also used the page to provide phone numbers for Joplin residents who were attempting to locate family members or share information. Individuals could comment on these posts but could not create their own posts. The city's Facebook page also proved invaluable for engaging with those outside the region who wished to support the Joplin response.

Several weeks after the tornado, the city created a Twitter account that provided it with an additional social media mechanism for disseminating public information. The city Tweeted about volunteer opportunities, town meetings, and general information for the public, such as about a class on how to protect against home repair contractor fraud.

The use of both traditional and social media proved especially valuable for informing the public about FEMA's Expedited Debris Removal (EDR) program (see Preliminary Finding 2.17 for more about EDR). Joplin, in partnership with FEMA, developed fact sheets and other products about debris and demolition that provided information from news releases in a consumer-friendly format. These products were distributed at locations throughout Joplin where they would reach those most impacted by the disaster. The city's public information officer (PIO) leveraged other local PIOs and Region VII's Federal

Interagency Emergency Support Function (ESF) #15 Working Group to distribute this information through their respective networks.

The city used Facebook, Twitter, and YouTube to supplement information disseminated through these traditional methods and at public meetings. For example, on June 6, 2011, Joplin hosted a Town Hall Meeting for 2,000 residents at the MSSU campus. City staff distributed Right of Entry forms and addressed residents' concerns regarding the debris removal process. The following day, the city posted answers to questions posed by the audience on its Facebook page. Further, the Joplin City Manager posted a video message on the city's YouTube channel that explained the correct procedures and guidelines for debris removal and answered citizen's concerns and questions about this process. The City Manager posted two additional YouTube videos that answered questions about personal property insurance and the EDR program.

Joplin and its partners employed traditional and social media in a complimentary manner to ensure that the public received the necessary information about response and recovery operations. Further, Joplin and its partners modified their public information strategy over time to ensure that the information reached the targeted audience.

Preliminary Finding 2.6: *Area for Improvement:* The magnitude of the fatalities overwhelmed the capabilities of county coroners and presented challenges for the Disaster Mortuary Operational Response Team (DMORT).

Discussion: Shortly after the tornado struck Joplin, the coroners of Jasper and Newton counties established a temporary morgue on the campus of MSSU. The counties requested that HHS deploy a DMORT to assist with fatalities, which were expected to climb significantly as bodies were recovered from collapsed structures, particularly the Home Depot and Wal-Mart stores, which had yet to be searched. Within 2 days of the tornado, HHS had deployed a DMORT; a Disaster/Deployable Portable Morgue Unit; and a Family Assistance Team. Law enforcement officers assisted fatality management operations by transporting bodies to the morgue.

Despite the increased resources, coroners and DMORT personnel could initially process 2–3 victims per day. Coroners allowed family members to identify victims, but stopped this practice after a family made a mistaken identification. This further delayed the identification of victims and notification of families, which frustrated individuals who suspected that a family member was among the deceased but instead remained on the missing persons list. Missouri Governor Jay Nixon directed the Missouri Highway Patrol to take responsibility for the missing persons list and to identify the status of each individual on it. In less than 2 weeks, the Highway Patrol had confirmed the status of each of the 268 individuals on the list, whether the individual had survived the tornado or was deceased. By June 4, 2011, the fatality management operations had been completed, which allowed the supporting Federal, State, and county personnel to transition to their pre-disaster operations.

The difficulties encountered by Federal, State, and local entities after the Joplin tornado indicate the need for additional refinement of mass fatality planning and operations. The Whole Community may have been involved in mass fatality operations, but the

operations did not proceed as efficiently as they could have. In some cases, response personnel, volunteers, and even citizens were enlisted to participate in the recovery of bodies despite not having any fatality management training. Further, some FEMA and other disaster workers may not have been prepared for performing their tasks after a mass casualty incident. FEMA made mental health counseling available for its personnel, although some noted that improvements in this area are needed. For example, it was suggested that mental health counseling for FEMA personnel could be a designated part of a Disaster Recovery Center. Finally, mass fatality operations in Joplin should be studied and used to inform Whole Community catastrophic planning.

Preliminary Finding 2.7: ***Strength:*** AmeriCorps provided critical support to Joplin, including managing thousands of self-dispatched volunteers.

Discussion: In the aftermath of the tornado, a very large number of volunteers spontaneously descended on Joplin to participate in response and, later, recovery operations. These volunteers were motivated, in part, by television broadcasts. Many of these lacked the training, supplies, and affiliations necessary for disaster response operations. AmeriCorps personnel from 6 different teams established and managed a Volunteer Reception Center on the MSSU campus, which received 3,000 volunteer intake forms within its first 16 hours of operation. AmeriCorps also created a database to track volunteer registrations and hours that enabled Joplin to meet FEMA reimbursement requirements for local match. By August 4, AmeriCorps's volunteer management efforts had registered more than 46,778 people who performed more than 178,000 hours of volunteer work. In addition, its members managed a donations warehouse at MSSU.

AmeriCorps provided other critical services to Joplin. The AmeriCorps St. Louis Emergency Response Team worked with MSSU to establish a Missing Persons hotline that became operational on the morning after the tornado. AmeriCorps also provided remote call support after the United Way's information line became overwhelmed by the call volume. Together, these AmeriCorps activities are illustrative of the strong partnerships that have been built among Federal, State, local, and voluntary organizations by the Missouri State Emergency Management Agency and FEMA Region VII. These partnerships are the building blocks of Whole Community solutions, as the Joplin experience powerfully demonstrates.

Preliminary Finding 2.8: ***Strength:*** Voluntary organizations established a mass shelter for the hundreds of animals made homeless by the tornado.

Discussion: The tornado left hundreds of animals orphaned or abandoned in Joplin. Voluntary organizations collaborated with State and local government agencies to begin animal rescue and shelter operations the next day. On May 23, the Missouri State Emergency Management Agency (SEMA) requested that the Humane Society of Missouri, which is the lead for the State's ESF #17 (Animals in Disaster), deploy a 15-person Disaster Response Team to Joplin to assist with pet search and rescue operations. The Joplin Humane Society and Joplin Animal Control established an animal shelter on the MSSU campus. This shelter was co-located with an American Red Cross shelter, which allowed tornado victims to shelter with their pets. The next day, the Joplin

Humane Society and the American Society for the Prevention of Cruelty to Animals (ASPCA) established a shelter for animals rescued from the disaster area. The shelter consisted of large metal warehouses next to the Joplin Humane Society Adoption and Resource Center. The U.S. Department of Agriculture's Animal and Plant Health Inspection Service provided technical assistance on such issues as trapping displaced pets, resource ordering, and monitoring heat concerns at pet shelters.

Further, the Missouri Veterinary Medical Association (MVMA) deployed three Missouri Volunteer Veterinary Corps (MOVVC) veterinarians to care for animals sheltered at MSSU. The MVMA also provided veterinarians, technicians, and assistants to the ASPCA emergency animal hospital and shelter. Other voluntary agencies assisted with animal rescue and shelter operations, including the American Humane Association, RedRover, and the Humane Society of the United States. The Executive Director of the Joplin Humane Society reported that, "For the first 3 weeks we had 12 vets from dawn to dusk. Some came from out-of-state and weren't licensed (in Missouri), so they worked as techs."

The population of sheltered animals grew rapidly in the weeks after the tornado as volunteers rescued pets. It increased from 486 animals on May 28 to 1,308 on June 21. The shelter returned 823 pets to their owners. The Joplin Humane Society and ASPCA held a major adoption event for the remaining pets on June 25 and 26, which drew more than 5,000 potential adopters from states throughout the Midwest. The event placed all 739 animals in need of a permanent home. The collaboration between Federal, State, and local government agencies and voluntary organizations to care and shelter the animals impacted by the tornado illustrates the Whole Community approach in action. The diversity of agencies and resources brought to bear on the challenge demonstrates how Whole Community solutions can be implemented after a catastrophe.

Preliminary Finding 2.9: *Strength:* Communications and power in Joplin were restored very quickly after the tornado.

Discussion: The tornado caused major damage to the communications, power, and other infrastructure in Joplin. More than 130 transmission poles were destroyed, many of which were snapped at their base. Fifty cellular towers stopped functioning due to the tornado, 10 of which were destroyed. Natural gas lines throughout the impacted area had been broken, resulting in a large number of gas leaks. On the morning after the tornado, approximately 18,000 Empire District Electric Company customers remained without power. Importantly, a significant amount of infrastructure in adjacent areas survived the storm, which supported response and relief operations.

Communications and power companies began working immediately after the storm to restore Joplin's infrastructure. Empire District Electric Company teams and mutual assistance from other power teams throughout the Midwest worked to restore power to the Joplin area. Wireless communications providers deployed emergency teams, temporary cell towers, and communications trucks to the Joplin area to restore communications. Sprint's Emergency Response Team provided Joplin public safety

officials with satellite phones and wireless devices. Companies also deployed representatives to the State EOC to coordinate effectively with State agencies.

Severe weather conditions periodically halted these restoration activities in the days after the tornado. Significant progress was achieved within a week after the tornado, with power restored to more than 10,000 customers and 80% of the damaged gas lines capped. The prompt restoration indicates a strong partnership between the State and private sector companies. FEMA Administrator Fugate cited restoration operations in his testimony to Congress about Whole Community solutions.

Preliminary Finding 2.10: *Strength:* Participation in NLE 11 helped Federal, State, regional, local, and private sector personnel respond effectively to the Joplin tornado.

Discussion: From May 16–19, 2011, DHS/FEMA sponsored NLE 11, which simulated a catastrophic earthquake in the New Madrid Seismic Zone. Prior to NLE 11, FEMA Region VII and the State of Missouri developed the *Joint FEMA Region VII and State of Missouri New Madrid Earthquake Response Operations Plan*. The Region VII Federal family and the State of Missouri conducted this joint initiative to establish a unified Federal and State concept of operations for a catastrophic earthquake. Through this planning initiative, Region VII and the State of Missouri officials formed strong relationships that proved valuable during the response to the Joplin tornado.

During NLE 11, Missouri emergency management and response agencies exercised critical plans and procedures, including mass casualty evacuation, mutual aid, and EMAC procedures. When the tornado struck Joplin only 3 days after NLE 11 concluded, officials employed the resources, systems, and procedures that they had used in the functional exercise. They could leverage the partnerships that had been part of NLE 11. As a Joplin official stated, "Everyone was in the [Joplin] Emergency Operations Center for NLE 11."

NLE 11 and other periodic exercises ensured that Joplin officials knew which regional assets were available and how to activate and employ them in the most expeditious manner. Many of these assets were purchased through FEMA grant programs. As described in Preliminary Finding 2.2, the Missouri 1 DMT mobile field hospital had been exercised at the Branson Airport during NLE 11. Only days later, the field hospital was deployed to Joplin to treat survivors. Missouri also utilized the patient moving and tracking systems for Joplin that it had tested in NLE 11.

Numerous private sector and voluntary organizations that participated in NLE 11 also provided critical assistance in Joplin after the tornado. Cellular communications companies participated in NLE 11 at the State EOC and then worked to restore communications in Joplin after the tornado. Similarly, the Missouri Public Private Partnership activated the Missouri Business Emergency Operations Center (BEOC) to facilitate private sector support to disaster response operations in Joplin. The BEOC deployed representatives to FEMA Region VII, its Regional Response Coordination Center (RRCC), and SEMA. Participation in NLE 11 only days before prepared the BEOC for these activities.

After the tornado, the City of Joplin Building Department requested assistance from the Structural Assessment and Visual Evaluation (SAVE) Coalition, a group of volunteer

engineers, architects, building inspectors, and other professionals that assist SEMA with building damage inspections. The SAVE Coalition had participated in NLE 11. From May 26–28, 23 SAVE teams logged more than 1,100 hours by working with a City of Joplin representative to inspect damaged buildings. SAVE volunteers inspected more than 6,300 structures in Joplin, evaluating 38% of these buildings as unsafe, 6% as accessible with restrictions, and 56% as safe. The City of Joplin Building and Neighborhood Improvement Supervisor stated, "The SAVE Coalition's quick response absolutely saved the City of Joplin. We were overwhelmed by the sheer magnitude of evaluating thousands of damaged structures, and we had no idea how much information we would have to quickly provide."

FEMA Administrator Fugate remarked, "Nobody knew it, but when that exercise concluded on Thursday, not more than 3 days later, many of the same things that were exercised for NLE 11 were put into place when the tornadoes hit Joplin."

Preliminary Finding 2.11: *Area for Improvement:* Incorporating Joplin response operations into an existing declared disaster (DR-1980) offered both benefits and challenges for FEMA response operations.

Discussion: FEMA, State, and local officials identified both the benefits and the challenges that resulted from including Joplin within DR-1980. Most importantly, placing the Joplin response within a declared disaster enabled FEMA to leverage the resources of a standing JFO to begin operations within hours of the disaster. The JFO had the staff, logistics, and support structure that allowed an immediate response to the no-notice event. Consequently, the JFO could begin its response activities immediately; it did not have any delays or require assistance from the RRCC.

State and local officials noted the benefits of including the Joplin response within DR-1980 as well. Joplin officials lauded FEMA's rapid, proactive response. One stated, "FEMA was here immediately…I have never seen anything like this. Usually, we have to beg to open the FEMA tap." Further, State officials noted the efficiency of using a single disaster declaration; a new disaster declaration would have resulted in some counties being included in two disaster declarations, which would have been a complicated situation.

However, despite these benefits, some FEMA officials observed that incorporating the Joplin response within DR-1980 presented a variety of challenges. An ongoing weather system remained over Missouri and the region for several days before and after the Joplin tornado. Had a household already received FEMA assistance for DR-1980 and begun rebuilding, only to be damaged a second time by an event included in the declared disaster, the household would still have been subject to the caps on total assistance for DR-1980. JFO officials worried that such a situation could have unfairly impacted some households, although such a situation did not occur.

The inclusion of the Joplin tornado in DR-1980 raised the question of when the incident period for the disaster should be closed. Further, FEMA will not be able to determine its costs for the Joplin response easily because they are subsumed within the larger DR-1980 response. The expansion of DR-1980 through, ultimately, eight amendments made the Incident Action Plan (IAP) extremely complex. Including the Joplin tornado within DR-1980 forced a JFO that had been staffed for recovery operations to bring in additional staff and begin conducting response operations. These dual missions—recovery for the flooding in Southeastern Missouri and response for the Joplin tornado—presented challenges for staffing, as described below.

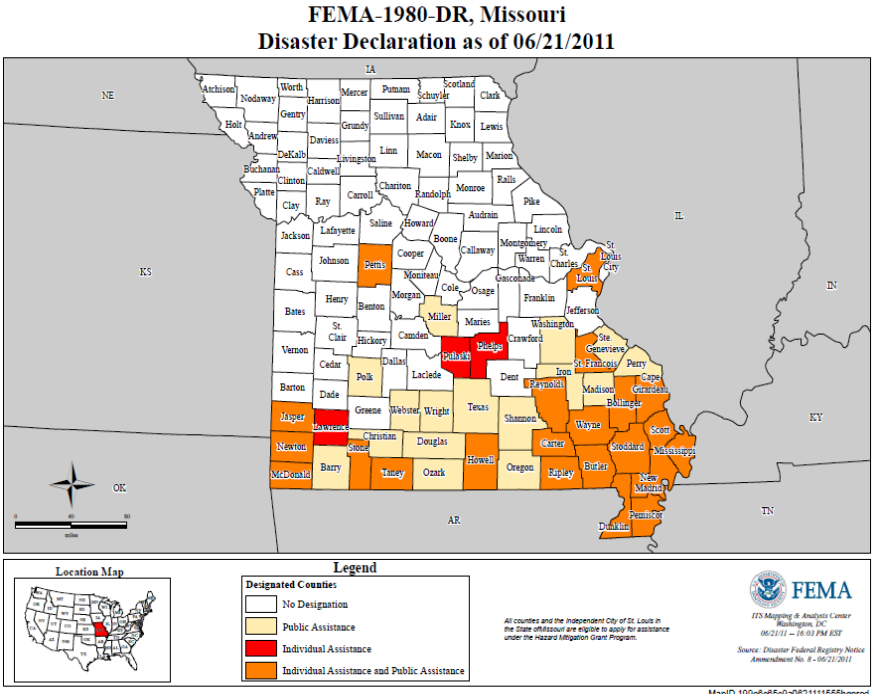

Figure 11: **Map of DR-1980. (Source: FEMA)**

Finally, FEMA needs to undertake additional planning and coordination needs to occur to ensure that JFOs can conduct effective operations in complex declarations similar to DR-1980. State and local officials need to be educated on the pros and cons of adding on incidents into an existing declaration. FEMA should provide its leaders with guidance that helps them better plan for the specific JFO management and staffing issues if the option is selected.

Preliminary Finding 2.12: *Area for Improvement:* The JFO – Division structure employed to manage FEMA operations for the Joplin tornado experienced coordination and control challenges, primarily in the initial stages of the response.

Discussion: FEMA Region VII and the JFO decided to establish the Joplin Division Office (JDO) in Joplin to manage FEMA response operations for the tornado. The JDO reported to the JFO's Operations Section, following both ICS principles and JFO procedures. The JFO deployed the Region VII IMAT while Region VII personnel deployed directly from the regional office in Kansas City. Both arrived in Joplin early on the day after the tornado and began establishing the Joplin Division. These were soon supplemented by the National IMAT, Disaster Assistance Employees (DAEs), and other FEMA personnel.

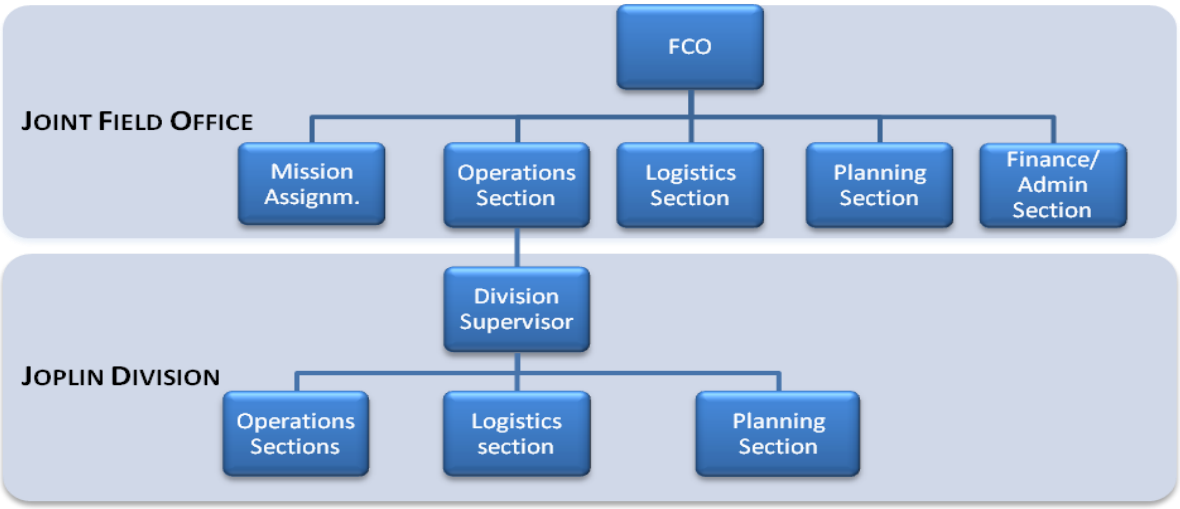

Figure 12: JFO – JDO Structure. (Source: FEMA)

Communications and information sharing between the JFO and the JDO proved to be challenging during the initial response. Some JFO personnel indicated that they lacked visibility into the JDO and thus did not know with whom they should coordinate. Further, with the JDO reporting to the JFO Operations section, the other sections in the JFO had to work through Operations to receive information about Joplin. JFO sections had limited ability to coordinate directly with their respective JDO group. Consequently, this organizational structure led to "bottlenecks" that inhibited the flow of information both within and between the JFO and the JDO. Ultimately, the FCO had to intervene to ensure effective communications among the staffs of the JFO and JDO. These issues were compounded by disagreements about whether the responsibility for certain planning or other processes resided with the JFO or with the JDO.

Several factors contributed to these issues between the JFO and JDO. First, neither the JFO nor the JDO followed standard IAP "Planning P" processes as defined in the Incident Management Handbook (IMH). This indicates the need for renewed training on IAP processes as well as the proper use of Incident Command System (ICS) forms by personnel who serve as on IMATs, or in the operations or planning sections. Second, JDO personnel were typically of Type II skill level and managers within the Regional office, while JFO personnel were typically of Type III skill and either lower ranking within the Regional office or DAEs. Third, personnel were uncertain about how the relationship between the JFO and JDO should be managed. Others noted that while the IMH includes relevant doctrine, the doctrine lacks the clarity necessary for responses such as those for the Joplin tornado. Fourth, the distance and travel times between the two locations contributed to a degree of disconnect between the two staffs. Fifth, turnover among DAEs who were staffing positions in both the JFO and the JDO made it difficult to build and maintain cohesion among the staffs.

Preliminary Finding 2.13: *Area for Improvement:* The lack of available, experienced personnel to replace the IMAT and augment the JFO staff resulted in operational challenges for the JFO.

Discussion: The IMAT operational concept calls for teams to remain at the incident location until the situation is stabilized. FEMA Region VII deployed its IMAT to the JFO in Columbia to support flood recovery operations prior to the Joplin tornado. IMAT personnel occupied key positions within the JFO, including the deputy FCO, and the chiefs of the operations, logistics, and planning sections. After the tornado struck Joplin and the incident was included in DR-1980, the decision was made to deploy the IMAT to Joplin since this was exactly the type of mission for which the team had been designed. The IMAT team included a team lead, an operations section chief, a planning section chief, a logistics section chief, and leads for external affairs, public assistance, and individual assistance. Consequently, the JFO lost key personnel, their historical knowledge, and continuity as its overall mission was expanding.

After the IMAT deployed to Joplin, the JFO encountered difficulties finding qualified personnel to fill the vacant positions. Multiple national events had exhausted FEMA's disaster workforce. This also contributed to a rocky transition in operations and, to a certain extent, the JFO–JDO issues described in Preliminary Finding 2.12. Some FEMA personnel were unclear about whether a regional IMAT retains command and control when it deploys from a standing JFO.

FEMA personnel noted that the operational concept for deploying IMATs should be reviewed. For example, in this case, the IMAT could have been released from the JFO for another incident in the region—a distinct possibility, given the active weather systems. Some personnel commented that the Region and JFOs depend on the IMAT too much. However, addressing this challenge may depend on the availability of qualified personnel through the Automated Deployment Database (ADD) and the implementation of the FEMA Qualification System. Finally, it was noted that the National IMAT served as a beneficial force multiplier during the initial response operations.

Preliminary Finding 2.14: *Area for Improvement:* The JFO and the JDO lacked the systems and procedures necessary to effectively manage the large amount of information that each received.

Discussion: The JFO and the JDO relied on email and voice communications as their principal mechanisms for managing information during the Joplin tornado response. These systems have limitations as information management systems that should result in a common operating picture (COP) for the JFO and the JDO. For example, FEMA personnel stated that the size limits on their email inbox were often exceeded, leading them to either not receive or lose track of important emails. Similarly, DAEs serving in key positions often did not have smart phones that enabled them to receive email while performing their field duties. Other DAEs encountered various difficulties receiving and using FEMA laptop computers. Consequently, information was not managed in a manner that resulted in a COP. For example, JDO leaders received data from Staging, Logistics, and the Housing Task Force that tracked the same housing units but reported conflicting

numbers. This lack of fidelity of the data and, thus, the absence of a COP can damage FEMA's credibility with State and local officials.

JFO and JDO officials stated that JFOs should possess an information management system similar to those used in State and local EOCs, such as WebEOC. FEMA has been managing disasters for decades, but has no means to access tactical data in a timely manner. Such a system should show information from diverse sources, for the entire mission rather than parts of it, and incorporate maps. Clearly, JFOs and the JDO require more sophisticated systems that will enable them to manage—and reconcile—data from diverse sources. This requirement will only increase as data from social media play an increasing role in disaster response and recovery operations.

Preliminary Finding 2.15: *Area for Improvement:* Data and analyses from previous disasters were not available to inform JFO decision-making.

Discussion: JFO officials stated that FEMA personnel have tremendous knowledge and experience. A disaster worker with a certain level of experience will know what happens, when it should happen, and how to manage it because they know the technical issues. However, FEMA lacks the institutional processes to collect common data points from each disaster, analyze the data, and determine the average costs for typical response and recovery missions. FEMA personnel do not have access to the historical analyses of the costs of disasters or predictive modeling to assist decision-making. Consequently, FEMA personnel are not aware of the full costs of missions and, thus, are less likely to consider alternative solutions during disasters. FEMA personnel do not have access to historical data, cost data, process data, or other similar kinds of data. Consequently, FEMA encounters the same problems during disaster responses over time.

FEMA Headquarters should perform historical analysis using data from each disaster. This should result in predictive modeling that includes common data elements that typically occur during response and recovery operations. These data should be categorized by geographic region and type of event, among other categories. This effort should also produce analysis that includes key questions by phase, which can be used to inform decision-making. FEMA Headquarters should capture historical data from every event in a database that FEMA personnel can access. Recovery strategy and doctrine should address how these historical analyses should be employed during disaster operations. Further, the historical data should incorporate information about State and local preparedness and mitigation activities; this could lead to refined preparedness and mitigation metrics. Finally, senior JFO personnel should receive a packet that summarizes key, relevant historical data upon receiving a disaster assignment.

There are several FEMA initiatives that can contribute to the tracking of historical data. The National Processing Service Center develops a document for each disaster that summarizes key data; however, this document is not widely disseminated. Similarly, FEMA developed a database of historical housing costs, although it has not been kept current. The American Red Cross has developed a database that includes common data points collected in damage assessments over time. This enables senior American Red Cross officials to anticipate the requirements of a disaster before they arrive at the event.

Preliminary Finding 2.16: *Area for Improvement:* FEMA and State personnel indicated that DHS audits after the response period is closed are causing concerns about eligibility.

Discussion: DHS Office of Inspector General (OIG) auditors may review eligibility for funding for up to 3 years after a disaster. These audits may challenge and even overturn FEMA field decisions about eligibility, which can force the State to return funds. This is creating the impression that decisions about eligibility during the response period are only temporary; these decisions may be overturned years later by auditors.

FEMA, State, and local officials expressed their concerns about the DHS OIG audits and their impact on FEMA's relationship with states and localities. DHS OIG audits that overturn FEMA field decisions raise the question, according to one State official, of who determines eligibility rules, FEMA or the OIG? Some State officials believe that FEMA program officials lack confidence in their eligibility decisions because of the audits. Some FEMA field representatives may be reluctant to make complex eligibility decisions in the absence of burdensome documentation from applicants.

Caution on the part of FEMA officials due to audits has conflicted with the City of Joplin's desire to rebuild as quickly as possible. FEMA officials have advised Joplin officials about the importance of complying with FEMA guidelines and procedures about eligibility, anticipating a DHS OIG audit in the future. To Joplin officials, this advice makes FEMA reimbursement seem like "a game" because requests had to be modified and then revised again.

Both FEMA and State officials emphasized that FEMA field decisions about eligibility should be supported in the face of OIG audits unless fraud is involved. Rules about FEMA field eligibility decisions should include language regarding good faith and intent, such as "decision made at the time with the information at hand." FEMA Headquarters should also have a policy team to support field decisions under review by the DHS OIG. Further, FEMA should consider streamlining its documentation requirements for receiving disaster assistance. It should also work with State and local emergency managers to identify opportunities to educate potential applicants before a disaster about application requirements.

Preliminary Finding 2.17: *Area for Improvement:* FEMA Public Assistance and EDR programs confused some State and local officials and the public.

Discussion: The day after the tornado, FEMA authorized Individual Assistance, debris removal, and emergency protective measures for Jasper and Newton counties, which were impacted by the Joplin tornado. On May 31, 2011, FEMA authorized EDR, a pilot program that increased the Federal cost share for all debris removal from 75% to 90% for areas with extensive or catastrophic damage. EDR applied to the first 75 days of operations, or for the period beginning May 22, 2011, through August 7, 2011. This program was modeled after "Operation Clean Sweep" implemented in the southeastern United States after the spring 2011 tornadoes. EDR and Clean Sweep allow the increased cost share for removing debris from qualifying parcels of private property and rights-of-way within a defined area for a specified period of time. Missouri Governor Nixon directed the Missouri National Guard to coordinate and supervise the removal of

debris in Joplin. Numerous Federal, State, and local agencies participated in the debris removal effort.

EDR presented a number of challenges for JDO, State, and local officials due, in large part, to the fact that it was a pilot program. FEMA did not release the final EDR concept of operations until June 24, 2011—33 days into the 75-day period covered by EDR. Further, the pilot program guidance changed numerous times, making it difficult for FEMA field personnel to explain the program to potential applicants. State and local officials had difficulty understanding the distinction between FEMA's definitions of debris and demolition. FEMA funds debris removal for reasons of health & safety and economic recovery, but funds demolition only for health & safety reasons.

Figure 13: **The impact of EDR on a Joplin intersection. (Source: FEMA)**

FEMA's definitions of debris and demolition proved problematic due to restrictions on the duplication of benefits established in the Stafford Act. In this case, the city is responsible for recouping insurance proceeds from property owners who received insurance money for debris removal but had the debris removed for free under EDR. Insurance payments can vary from company to company, and even policy to policy. However, insurance companies do not make the distinction between debris and demolition that FEMA does. JFO officials coordinated with the Missouri Department of Insurance and the city in an attempt to address this gap and its impact on the public. JFO officials noted that if FEMA plans to employ EDR in future disasters, it should work with State insurance commissioners to develop a definition of debris and demolition that meets the needs of homeowners. It was suggested that FEMA work with the National Association of Insurance Commissioners on a coordinated definition.

Officials observed that the convoluted EDR rules impacted FEMA's reputation and risked the overall effectiveness of the initiative. They noted that EDR, like all pilot programs, had "bugs" that need to be worked out. Despite these challenges noted above, Joplin completed debris removal for all private property by August 7, 2011, thus meeting the EDR deadline for 90% Federal cost sharing. This success resulted from the cooperation and coordination that spanned Federal, State, and local governments, along with the private sector, voluntary organizations, and Joplin residents.

Preliminary Finding 2.18: *Area for Improvement:* The JFO lacked personnel with sufficient warrants to provide the effective contracting support necessary for the Joplin response.

Discussion: DHS qualifications for contract officers have reduced the number of FEMA field personnel who hold contract warrants, none of whom are DAEs. FEMA Region VII's contract officer received his warrant approximately 2 weeks after the tornado struck Joplin. The lack of field personnel with warrants presented significant difficulties for the JFO, particularly in the early phases of tornado response operations. To address this issue, the JFO sought and received the approval of the DHS Chief Financial Officer to increase the purchase limit on contract officers' government credit cards for 3 days.

JFO personnel commented that remote contract support from Headquarters is easier and more effective for smaller disaster than for larger ones. In this disaster, the JFO required greater, dedicated contract support from Headquarters. Unfortunately, Headquarters was not sufficiently responsive to the JFO's contract needs, forcing JFO personnel to spend a very large amount of time on warrants. FEMA Headquarters should provide dedicated field support to JFOs during large disasters rather than cursory answers to reasonable questions.

Preliminary Finding 2.19: *Area for Improvement:* Staffing presented a number of challenges for the JFO and the JDO.

Discussion: The assignment of responsibility for Joplin to the JFO in Columbia and the subsequent establishment of the JDO resulted in several staffing issues for the JFO. As described in Preliminary Findings 2.12 and 2.13, the JFO needed to expand staffing to support the JDO and replace staff that had deployed there. Further, the JFO, which had been oriented toward recovery operations, now needed to be staffed to support intensive response operations. The JFO and the JDO sought staff from the Region VII and National cadres. However, multiple active national events had tapped out some FEMA cadres, leaving some JFO positions unfilled or vacant for significant periods of time. For example, the JFO Planning Section could not acquire personnel to staff the Situation Status Cell; consequently, the JFO did not monitor social media such as Facebook and Twitter during Joplin response operations.

Further, utilizing ADD to staff the JFO with DAEs presented other challenges as well. Some DAEs deployed to the JFO were inexperienced or unqualified for their assignment. DAEs are reluctant to turn down an assignment because that would be reflected in the permanent ADD record and, thus, make them less likely to receive future assignments. Consequently, DAEs may accept an assignment even if they recognize that they are

unqualified. This forced the JFO to provide these staff members with on-the-job training or find an assignment for which they were qualified.

Finally, the JFO had several personnel who had serious medical issues, including hospitalizations during the deployment. These medical issues indicate that FEMA cadre managers need to be more cognizant of the well-being of personnel. FEMA also needs more effective medical screening for deployments.

Preliminary Finding 2.20: ***Strength:*** The FCO assigned dedicated FEMA liaison officers (LNOs) to key Joplin officials (e.g., City Manager, School Superintendent) that strengthened coordination between the city and FEMA.

Discussion: After a disaster, local officials want details that can be provided by an LNO who has no other assigned responsibilities. A Joplin official noted that working with FEMA can be "daunting" because "people don't understand how FEMA works" and that its disaster personnel rotate frequently. The FCO assigned dedicated LNOs to senior Joplin government officials shortly after the tornado struck. The LNOs provided these officials with a single POC into FEMA, which facilitated the sharing of information between FEMA and the locality. City officials could turn to the LNO whenever they had questions about FEMA programs rather than being forced to find the appropriate JDO program person. The LNOs worked with the local officials to help them navigate the various requirements and deadlines for receiving assistance from FEMA. The LNOs strengthened the situational awareness of the JDO by alerting it to the city's priorities and concerns. JFO and JDO officials noted that the ability to build a personal rapport with the city officials was critical for the effectiveness of the LNO.

FEMA should make the assignment of an LNO to senior local government officials a common practice for disaster operations, depending on the size of the disaster and local conditions. The LNO should serve as their POC for questions and information about FEMA support; the LNO should not be assigned any other disaster responsibilities. The LNO should be a direct report to the FCO or, as in Joplin, the Division supervisor. This position would be akin to a special assistant to the FCO. JFO officials noted that having this LNO report through External Affairs or another section would dilute their overall effectiveness. Personnel serving in this capacity must have the interpersonal skills to work with senior local officials, including the ability to convey that they understand the local needs and how FEMA can address them. It is important for FEMA to communicate in plain language and common terminology how it can assist local officials. The JFO Standard Operating Procedure and other relevant guidance should be revised to include situations when the FCO assigns an LNO to local government officials.

The LNO should have standard materials that he or she can provide to the officials, such as checklists and fact sheets on how to work with FEMA, what to ask for, and how to keep track of deadlines and requirements. The LNO should provide the local officials with an updated organization chart of the JFO and/or JDO whenever their senior staff is replaced. This can ease the burden on local officials who are trying to manage disaster response and recovery operations in their jurisdiction. Finally, the FEMA Office of External Affairs, Intergovernmental Affairs, should collaborate with a local government professional association to develop a brief guide for local officials about FEMA disaster

assistance. This guide should be brief, focus on key questions local officials will face after a disaster, and be modeled after similar guides developed for governors.

Preliminary Finding 2.21: *Strength:* The JDO and FEMA Region VII conducted a dedicated day of community outreach, which was valuable for survivors and staff.

Discussion: On May 31, 2011, only 9 days after the tornado, FEMA Region VII conducted a dedicated day of community outreach. Seventy-three Region VII personnel deployed from their office in Kansas City to join with JDO personnel to conduct community outreach operations. The Region VII personnel distributed flyers in English and Spanish that described how to register for Federal disaster assistance, crisis counseling, legal assistance, and other resources. Several interviewees cited this event as being helpful for Region VII personnel who were not directly involved in the disaster and who had not seen the disaster damage firsthand. FEMA should consider making this a standard practice for large-scale disasters, particularly for less-experienced FEMA personnel.

APPENDIX A: LESSONS LEARNED

FEMA maintains the *Lessons Learned Information Sharing* (*LLIS.gov*) system as a means of sharing lessons learned and innovative practices with the emergency management and homeland security community. The following topics have been identified as Lessons Learned and Practice Notes that should be shared on the *LLIS.gov* system.

Lessons Learned

- Emergency Public Information: Using Social Media to Communicate Critical Disaster Information
- Joint Field Office Operations: Assigning Liaison Officers to Assist Local Governmental Officials
- Volunteer Management: AmeriCorps St. Louis's Management of Volunteers after the Joplin Tornado

Practice Notes

- Emergency Medical Services: The Missouri Disaster Medical Assistance Team's Deployment of a Mobile Field Hospital after the Joplin Tornado
- Incident Management: The Southwest Missouri Incident Support Team
- Pet Sheltering: Joplin, Missouri's, Establishment of a Shelter after a Tornado
- Public Information: The FEMA Joplin Division Office's and City of Joplin's Dissemination of Debris Removal Information after the Joplin Tornado
- Recovery Operations: Joplin, Missouri's, Plan for Demolition of Residential Structures Damaged by the Joplin Tornado

APPENDIX B: ACRONYMS

Acronym	Meaning
ADD	Automated Deployment Database
ASPCA	American Society for the Prevention of Cruelty to Animals
BEOC	Business Emergency Operations Center
COP	Common Operating Picture
DAE	Disaster Assistance Employees
DHS	U.S. Department of Homeland Security
DMT	Disaster Medical Team
DMORT	Disaster Mortuary Operational Response Team
EDR	Expedited Debris Removal
EDT	Eastern Daylight Time
EF	Enhanced Fujita
EMAC	Emergency Management Assistance Compact
EMS	Emergency Medical Services
EOC	Emergency Operations Center
ESF	Emergency Support Function
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
HHS	U.S. Department of Health and Human Services
IAP	Incident Action Plan
ICS	Incident Command System
IMAT	Incident Management Assistance Team
IMH	Incident Management Handbook
IST	Incident Support Team
JDO	Joplin Division Office
JFO	Joint Field Office
LLIS.gov	*Lessons Learned Information Sharing*
LNO	Liaison Officer
MOVVC	Missouri Volunteer Veterinary Corps
mph	miles per hour
MSSU	Missouri Southern State University
MVMA	Missouri Veterinary Medical Association
NLE	National Level Exercise
NPAD	National Preparedness Assessment Division
NWS	National Weather Service
OIG	Office of Inspector General
PIO	Public Information Officer
POC	Point of Contact
RRCC	Regional Response Coordination Center

SAVE	Structural Assessment and Visual Evaluation
SEMA	State Emergency Management Agency