

The Day After: Recovery Efforts at St. John's Mercy Joplin

Steve Bollin, Regional VP, Mercy East Community



Joplin Tornado

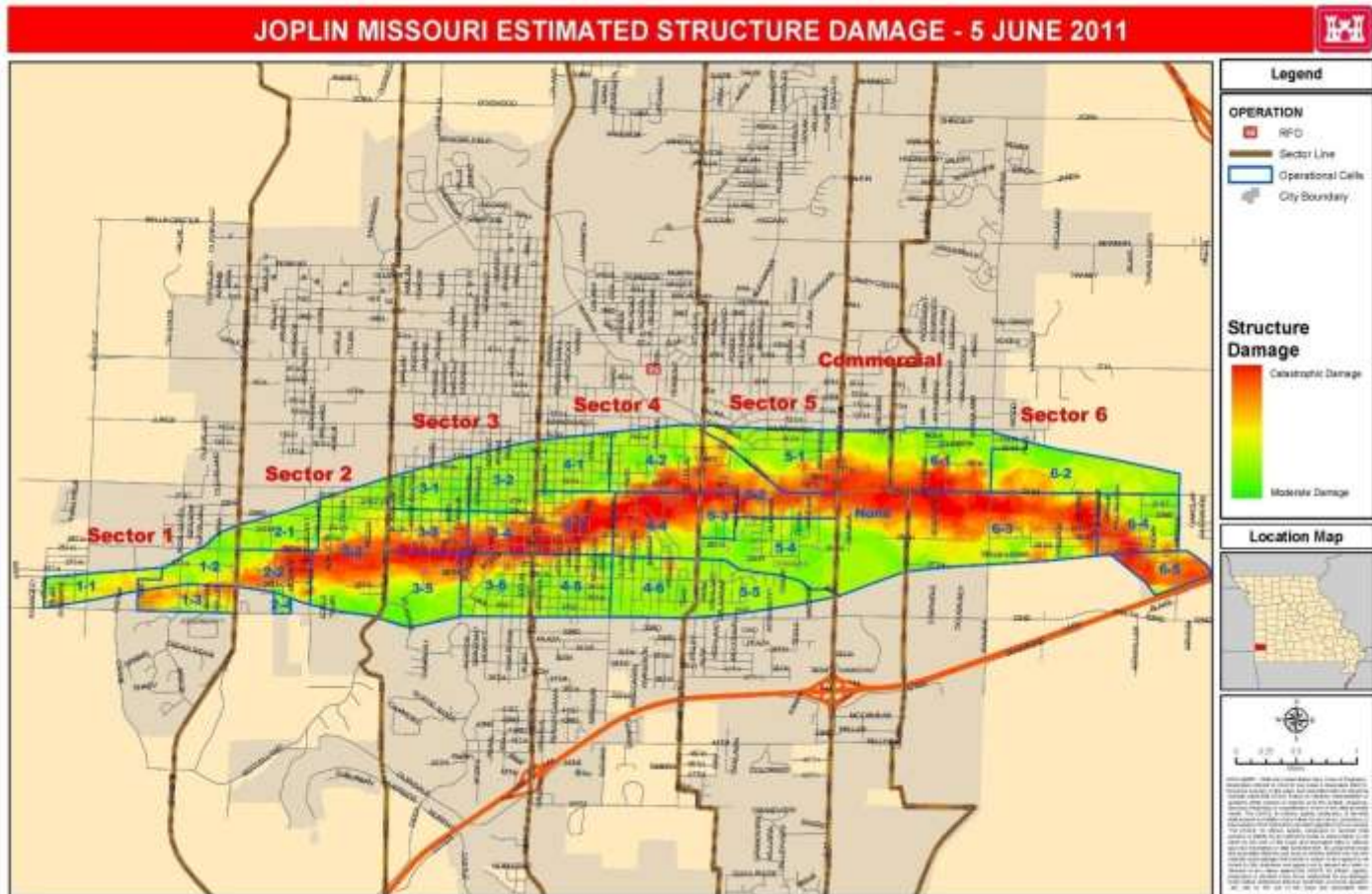
- May 22, 2011 around 5:30PM, a large tornado developed west of Joplin, MO
- Rapidly grew into a multi-vortex funnel, with winds increasing to 200mph within 30 minutes of forming

Joplin Tornado

- One of the fastest developing and deadliest EF-5 tornadoes on record
- At its peak when it crossed Range Line Road, it was a mile wide and had winds estimated between 225 and 250 miles per hour
- EF-5 damage corridor began just before St. John's Mercy Hospital

Joplin Tornado Path

St John's Mercy in Sector 3



Coworkers, Patients, and Visitors

- At the time the storm hit, there were about 250 coworkers, 175 patients, and an unknown number of visitors in the building
- Coworkers had about 5 minutes to prepare patients and take cover
- Patients were moved into hallways and covered with blankets

Duration of Tornado

- Coworkers recounted that the tornado was over the hospital for about 45 seconds
- Winds estimated in excess of 200 mph were blowing through the building
- Equipment, supplies, beds were blown across, through, and around the building

Rescue Effort

- All patients were evacuated within 90 minutes and transferred to other hospitals
- 5 patients on ventilators died due to power failure
- Although there were multiple injuries reported, no coworkers died
- One visitor died

Exterior of Hospital

- Structure remained standing, but with major damage
- Nearly all windows and doors were broken
- Entry to building completely unsecured
- Large amounts of debris remained
- Downed power lines around the perimeter
- Damaged vehicles posed significant obstacle
- Roofs of buildings were peeled away

Unsecured Entrances



Unsecured Buildings



Vehicles Destroyed



Two week-old Hospital Shuttle Destroyed



Other Hospital shuttles moderately to severely damaged



Vehicle Damage

Not all vehicles left behind belonged to St. John's coworkers, patients, or visitors



Vehicle Damage

- Roughly 250 vehicles remained on site after storm
- All vehicles parked on site received at least moderate damage; some vehicles were piled several high up on top of each other and against the building
- Oil, gasoline, antifreeze, other chemicals were leaking out of damaged vehicles

Vehicle Damage

- All St. John's Security and Maintenance vehicles sustained some type of damage
- No patient transportation vehicles were operable
- Maintenance gator and John Deere tractor were damaged but operable
- Security vehicles were operable but had no windows

Interior of Hospital

- Building infrastructure shifted at some points
- Concrete floors were reported by coworkers to have moved vertically during the tornado
- Contents of sanitary pipes sucked out and blown throughout building
- Walls collapsed throughout, blocking routes of evacuation

Interior Damage

Walls and Ceiling collapsed



Interior of Hospital

- Debris strewn about hallways and rooms, including equipment and furniture



Recovery Process

- Securing the Area
- Short Term Hospital Planning
- Property Recovery

Securing the Area

- By early Monday morning, the hospital was cleared of patients and visitors, although coworkers continued to try to gain access for supplies or personal items
- Building access was virtually unlimited due to windows and doors being blown out
- Minor looting was being reported, although no obvious loss of property was noted
- Media initially were an obstacle, contributing to traffic issues and occasionally coming too close to buildings

Securing the Area

- First efforts were to establish Command Centers to begin recovery efforts
- Multiple locations were set up, including at the existing hospital site
- Multiple requests for Security presence or support kept coming, which overwhelmed St. John's Joplin Security Team
- Call went out to the rest of the Mercy system requesting Security Officers for Joplin
- First officers arrived on site Monday evening

Securing the Area

- Multiple outside organizations sent officers to assist with Security, including KC and St. Louis SWAT Teams, Cerner, Missouri National Guard
- Security Officers were used primarily for traffic control and limiting access at the main entrance onto the hospital campus

Securing the Area

- Initial Security was not sufficient, especially at the Hospital Campus
- By Wednesday, a 4 foot snow fence was erected around the hospital, which did not provide the security needed
- Rest of campus, including the Medical Office Buildings, were still unsecured

Securing the Area

- Plans were quickly completed to install a 6 foot chain link fence around all damaged structures, with gates to limit traffic
- Completion of the fence took about two weeks,
- Once completed, it allowed Security Team to maintain better control over site access
- Arrival of two replacement vehicles improved overall area patrolling

Securing the Area

- Mercy Contractors (DeWitt and McCarthy) brought in construction trailers to be set up as Command Center offices
- Multiple generators were brought in to provide electricity
- Heavy equipment was brought in to begin debris cleanup

Securing the Area

- Vehicles were checked for injured or dead, then removed from against building and relocated to parking lots
- On Wednesday, onslaught of owners and tow trucks began arriving to check / reclaim vehicles
- Very few vehicles were drivable
- Difficulty providing Security to accompany owners / Insurance Agents / Tow trucks

Short Term Planning

- Initial work resulted in coordinated efforts to remove hazardous materials (including radioactive materials), controlled substances, and other items of strategic value
- Plywood and other materials were brought in to begin blocking off entrances

Short Term planning

- Massive supply effort was organized by ROi (Resource Optimization and innovation), Mercy's system supply division
- ROi had completed disaster planning months earlier, so within an hour of the call for assistance, a truck loaded with supplies was on its way to Joplin

Short Term Planning

- Decision was made by Senior Leadership get the hospital back up and running
- Missouri National Guard offered the use of a Field Hospital developed during Desert Storm
- Planning began to site and make the Field Hospital operational

Short Term Hospital Planning

- Completed negotiations to bring modular buildings from Texas for Outpatient Services
- Mobile services included surgical suite, pharmacy, imaging, Lab, and Nutrition Services
- Support by ROi was critical – without their involvement the Field Hospital would not have opened within 1 week of the storm

Short Term Hospital Planning

Construction crews also were involved:

- New parking lots were built in days
- A new helipad was laid and made operational
- Electricity, water, and sanitary sewers were all completed in very short order
- Ramp to the modular OR suite was built overnight
- Trailer units were tied down to prevent wind damage

Short Term Hospital Planning

Construction team also was involved:

- Refrigeration units were installed for Food storage
- Dining Hall Tent and serving areas were assembled
- Mobile showers were installed
- IT services were reinstalled – Electronic Medical Record was back online at time of Field Hospital opened on Sunday

Property Recovery

- In order to begin property recovery, safety assessments were initiated at the site
- Multiple forms of debris – glass, organics, building materials, insulation – would need to be removed before recovery could begin
- Hazardous wastes were present, including fluids from damaged vehicles

Debris at the Main Entrance



Vehicle near Cancer Center Entrance



Debris Piles



Property Recovery

- Initially buildings were considered to be structurally unsound (until proven otherwise)
- Numerous hazardous wastes were present inside the building, with other unknown dangers suspected
- Existing debris, coupled with continued falling debris, contributed to a dangerous environment inside the buildings

Property Recovery

- First few days concentrated on removal of larger debris from around buildings
- Some internal cleanup began on lower levels, including cleaning out of main hallway, and removal of some equipment, instruments, and trays from surgery
- Engineers began the work of assessing the various structures

Property Recovery

- Some entry into the buildings was allowed to retrieve specified items of value, but otherwise they were declared off limits
- One arrest and one termination occurred as a result of unauthorized entry
- Interior of buildings were hot, humid, dirty and in some locations toxic
- Anyone entering buildings was required to wear protective equipment

Property Recovery

- By Wednesday, preliminary engineering assessment showed the buildings were safe enough to enter for some Recovery activity
- By Thursday, Environmental Recovery was on site to begin the work of assessing the interior of buildings for safety hazards
- Early indications of mold and asbestos were identified, prompting addition of respirators to protective gear

Property Recovery

- Iron Mountain was brought in on Thursday to begin recovering salvagable Medical Records for sanitizing
- Command Center began compiling a list of requested items for salvage, both work-related and personal; eventually renting a site in Joplin for owners to claim recovered (and sanitized property)

Property Recovery

- By Friday, significant heavy equipment, manpower, and materials were in place to continue the cleanup effort, including boarding up of windows and doors
- Focus for the weekend switched to preparing the Field Hospital for opening by Sunday
- After the opening and Memorial Day weekend, efforts switched back to recovery process

Lessons Learned

- COMMUNICATION!!!
- Assumptions about the immediate post-disaster environment
- Security
- Projectiles during the storm

Lessons learned: Communication

- No land lines, spotty cell phone service made communication difficult
- Different brands and types of radios, making it nearly impossible to have reasonably efficient communication on site with Command enter and each other
- No alternative power for battery charging

Future State: Communication

- Planning is underway to select a standard radio type with multiple frequencies for all Mercy Security departments
- Likely will use UHF frequency to minimize dependence on cell phone service
- Alternative power charging sources such as solar panels will be obtained

Lessons Learned: Assumptions about Post-disaster Environment

- Disaster Planning typically does not take into account the type and amount of debris, especially vehicles
- Loss of generators left no source of emergency lighting
- Location of emergency supplies
- Many coworkers worked long hours with no relief

Assumptions about Post-disaster Environment

- Exit Signs were blown away along with most of the ceiling tiles
- Emergency Lighting not working due to loss of generators
- Evacuation was extremely difficult

Future State: Disaster Planning

- Include large debris removal, including destroyed vehicles, as part of plan – vehicles in some cases will require body search
- Storing emergency supplies in accessible locations
- Having replacements available, especially for local coworkers who need to attend to their own damaged homes

Future State: Disaster Planning

- Exit signs wall-mounted with battery backup
- No emergency lighting, including stairwells –
Emergency lighting , including stairwells, will have battery backup
- Other ideas, such as emergency floor lighting, luminescent exit guides, will be considered

Lessons Learned: Security

- Security forces were quickly overwhelmed
- Loss of vehicles made it difficult to respond quickly to distant areas
- Rapid response team took time to organize and mobilize
- No organized Security post to coordinate activity

Future State: Security

- Same radio brand and model across Mercy for Security Officers
- Each location assigned a unique frequency
- Several public and private emergency channels

Future State - Security

- Same uniform for all Mercy Security officers
- Rapid Response team being developed
- Old Mammography van is being converted into a Mobile Command Center

Lessons Learned: Projectiles

- Multiple items became projectiles – rocks, furniture, branches, vehicles, chillers
- Baseball thrown at 90 mph has the potential for doing damage
- Projectiles moving at 200 mph can cause catastrophic damage

7 Ton Projectile



Lessons Learned: Projectiles

- Disaster planning needs to be revised to consider the effect of projectiles, especially where people are taking cover
- Evaluate where items are stored – for example, storing excess construction and building repair supplies in storage space on top of a building
- Consider using high-strength shatter-resistant windows

Final Thoughts

- Modular building was completed last week, hospital services moved out of tent and into the new buildings this week
- Mercy will rebuild in Joplin
- Property has been purchased to build a new facility, and design of new 150 bed hospital is underway
- Emphasis on sustainability, better protection

Final Thoughts

- Lessons learned from this disaster are being used to plan more effectively for future events
- All Disaster plans are being reviewed and modified



Questions?