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Bridges Shouldn't Fall Down: I-35W Bridge Collapse

June 3, 2009

Heather M. Hunt, ENP
City of Minneapolis 911

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Minneapolis, MN
I-35W Bridge Collapse
August 1, 2007

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- 5:55 pm, August 1, 2007
  - Warm, clear summer evening (90 deg.)
  - Wednesday night rush hour in the city of 368,383 people
  - 10,000 people attending Twins baseball game in the Metrodome ½ mile away
  - Maintenance workers continuing work on the I-35W bridge

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- 5:55 pm
  - Minneapolis Emergency Communications staff meeting had just concluded
  - 17 people on duty in the 911 Center, starting supper breaks
  - Minneapolis Police and Fire responding to “business as usual”

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- Opened in 1967
- More than 1,900 feet long
- Main span: 458 feet
- Average daily traffic: 140,000 vehicles

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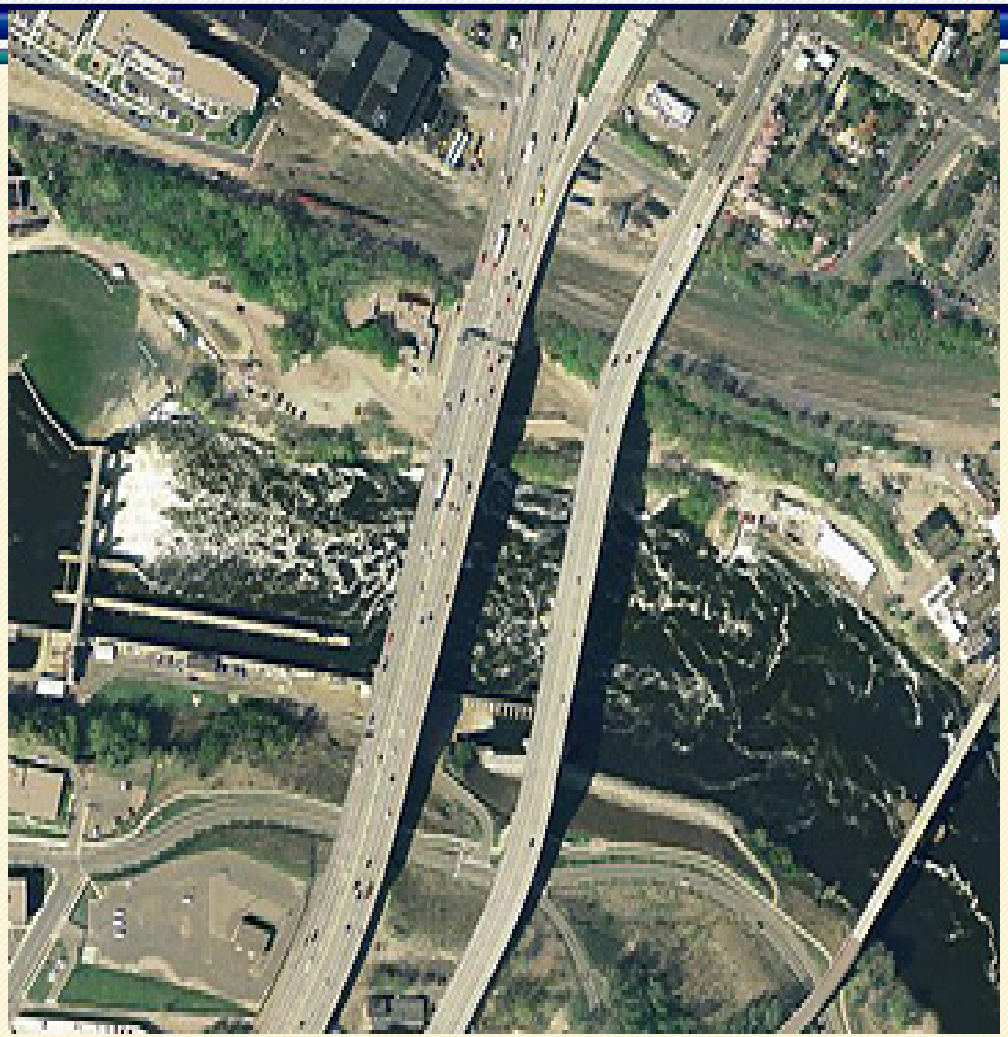
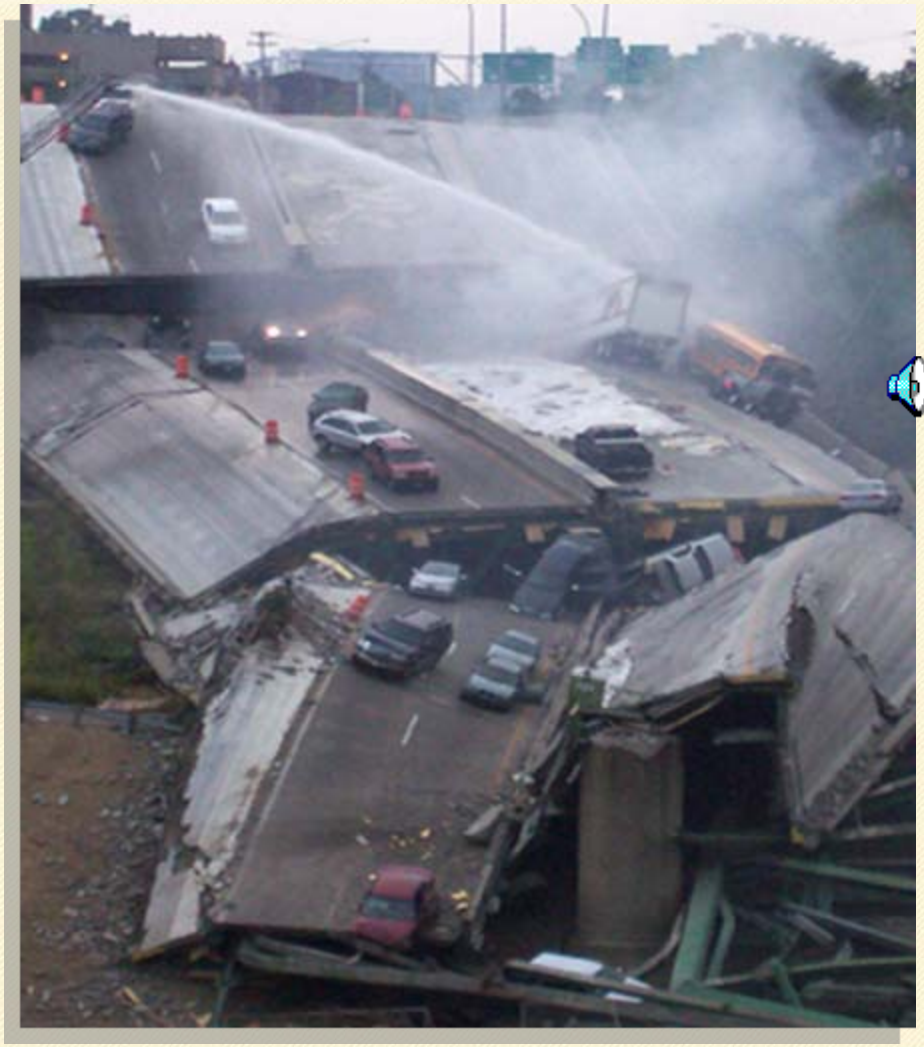


- **Rated in recent years as: ‘structurally deficient, but not in immediate need of replacement’**
- **113 ft. high**
- **Mississippi 390 ft. wide, average 11 ft. depth**



- Entire span collapses into the Mississippi and onto its banks during rush hour.
- 13 deaths
- 86 injuries
- Dozens of vehicles in the water.

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St. Paul
Pioneer Press

- **How we'll proceed**
  - **Montage of scene (done)**
  - **On-scene rescue (response); FD/EMS, then MPD;**
  - **Off-scene (ECC, EOC, and tidbits)**
  - **After-action and tribute**
  - **Q&A**

August 1

- **6:05 p.m. – first 911 call received**
- **6:11 p.m. – first emergency units on scene**
- **6:20 p.m. – Emergency Operations Center (EOC) activated**
  – Unified incident command established at scene (sort of)
- **7:55 p.m. – All survivors removed from scene**

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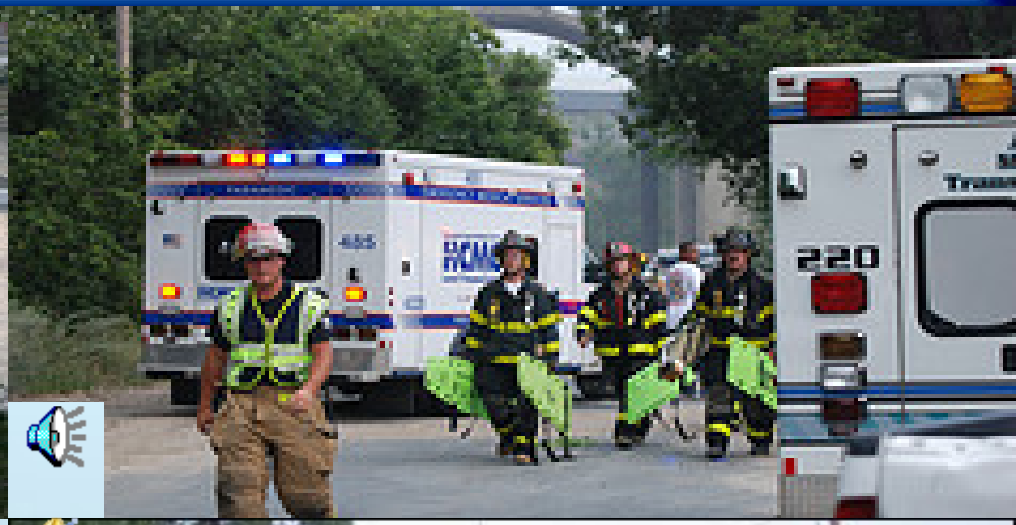

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HAZARDS

Too many to name…

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Firefighting

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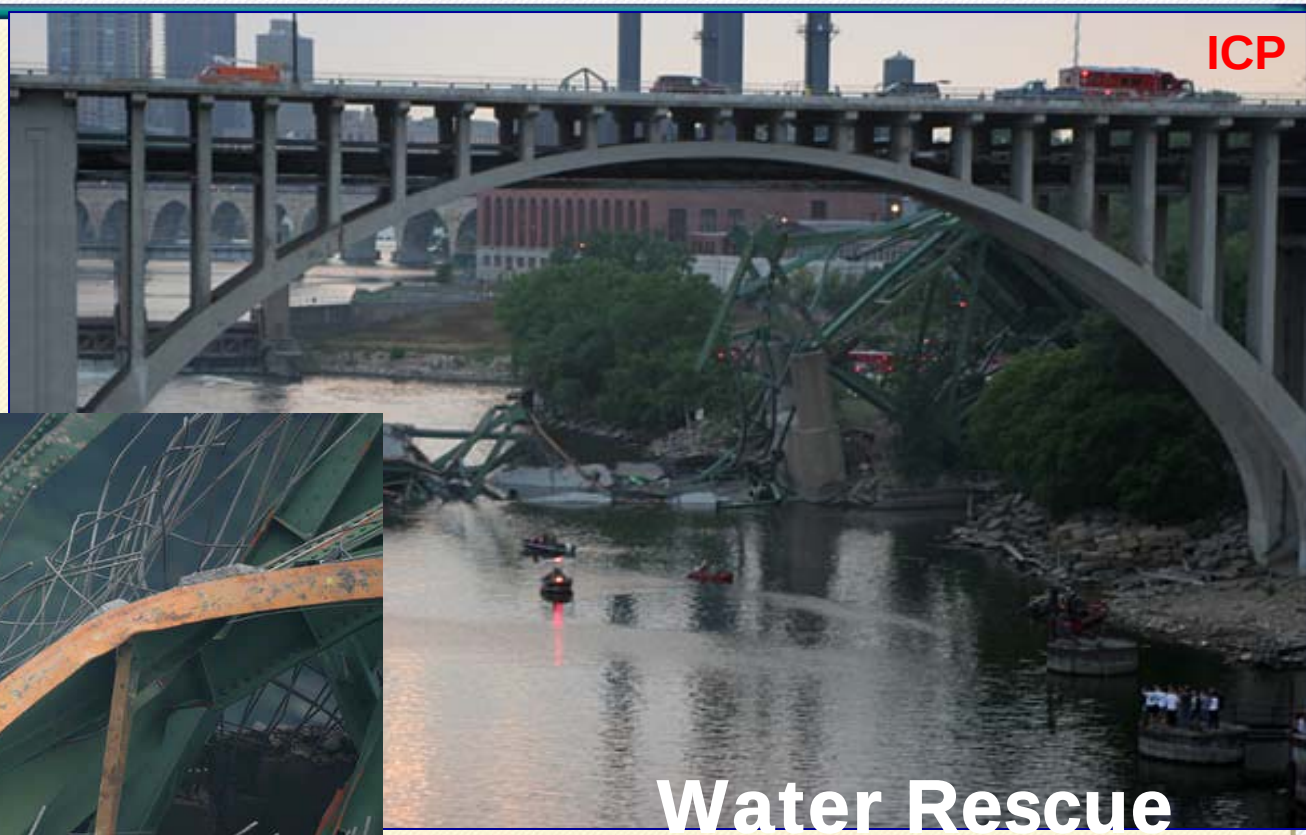

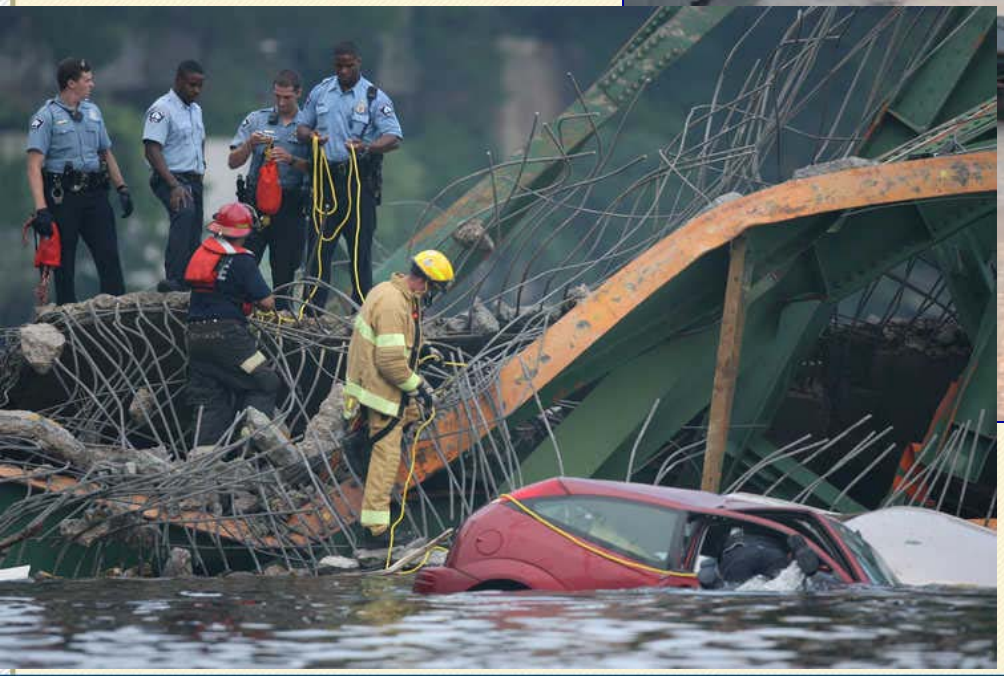

Water Rescue

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DIVISION 3 EAST

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Center Span

- Most vehicles intact
- Initial water rescues by police and civilians
- 1 CPR on span – terminated efforts on scene
- Few serious injuries on center span
- Multiple evacuated by fire boat to shore
- Current and eddies created by debris, rebar, other hazards

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North End

North End

- **Initial critical patients carried on backboards, passed down ladder**
- **Many bystanders and civilians provided medical assistance**
- **No perimeter for first hour**
- **Pickups used to transport at least 7 victims from N downstream side, some went directly to hospital (U of M), some intercepted by EMS once they reached city streets**

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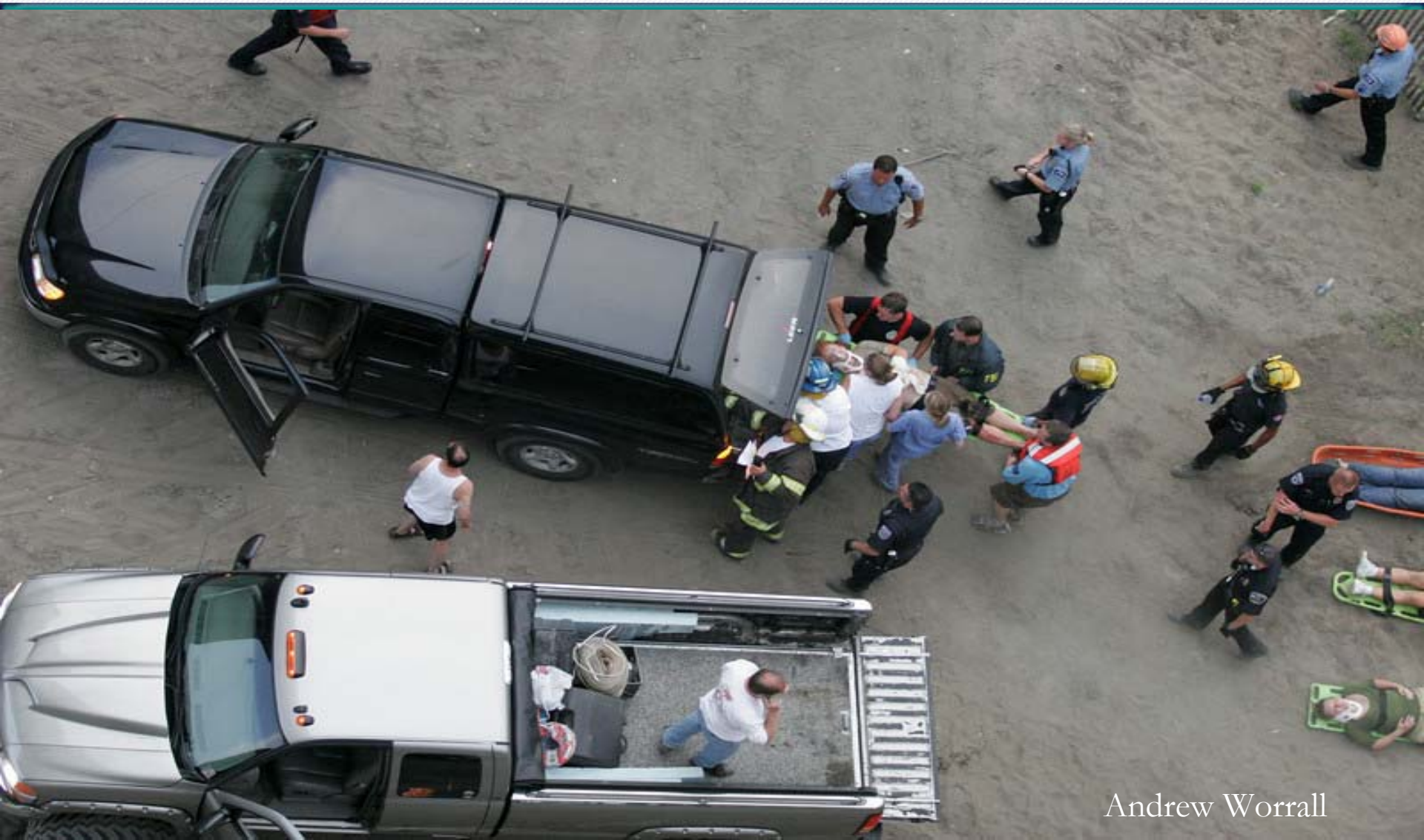

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South End

- South end
  - Rapid civilian evacuation of span
  - Shifting debris, vehicle fires presented challenges
  - School bus evacuated, hasty search turned up no additional critical patients
  - Triage area set up
  - Red Cross assistance (right by building)
  - Staging set up

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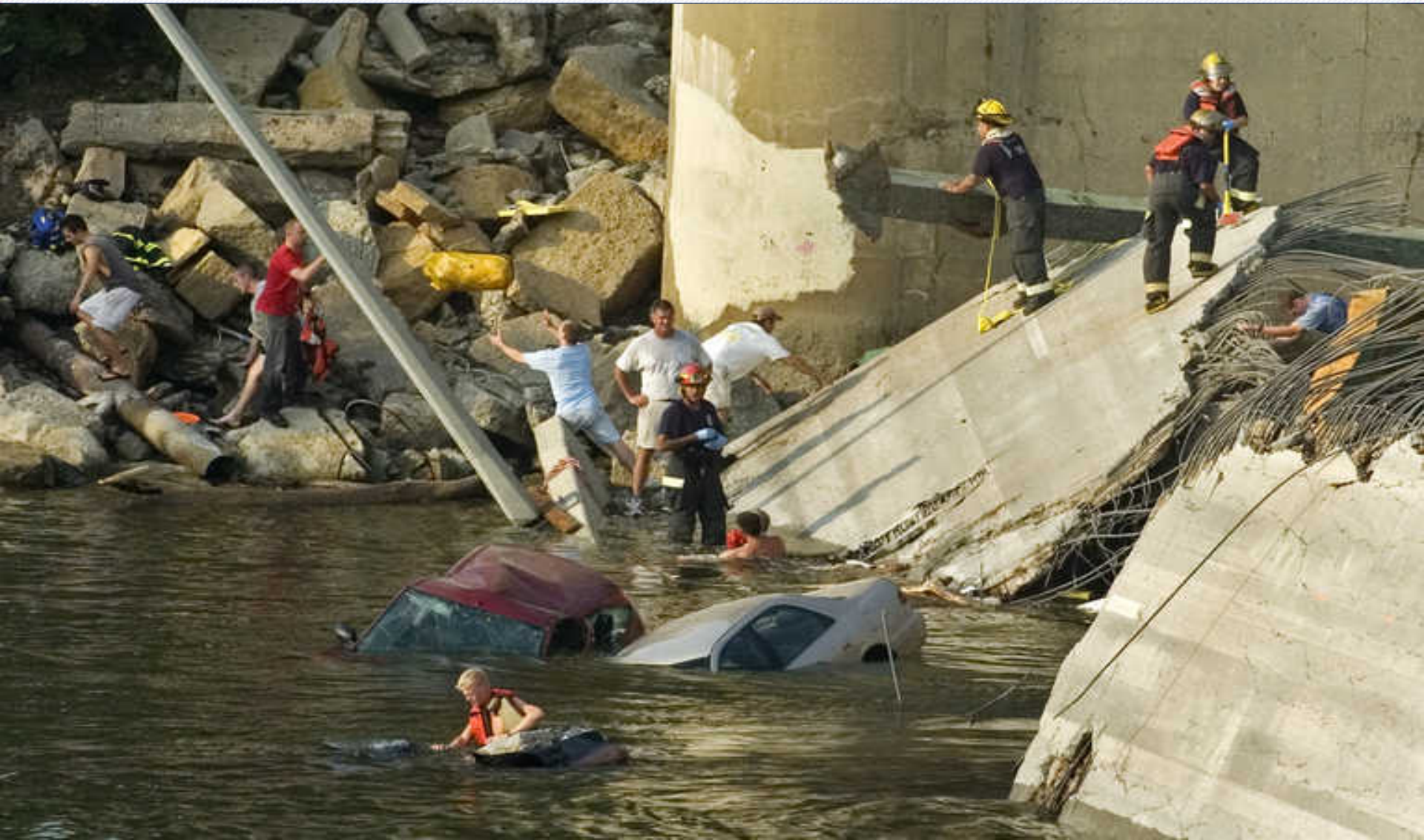

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Minneapolis Fire Department (MFD)

- Established Incident Command once first fire vehicle arrived at scene at 6:11.
- Unified command established on 10th Av. Bridge (ran parallel to I-35W bridge).
- MFD ran IC for first 20 hours.

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Collapsed Structure

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Vehicle fires

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Threat of Hazardous Materials

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EMS

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EMS RESPONSE SUMMARY

- Collapse to last transport:
  - Initial clearing of sectors: 1 h 35 m
  - Last EMS transport: 2 h 6 m
- 50 patients transported by EMS
- 8-13 casualties via other vehicles
- Over 100 patients treated in 24 h
- 13 deaths
- No serious injuries to first responders
- 29 ambulances used in first 4 hours

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EMS CHALLENGES

- Understanding the scene
- Maintaining command
- Sustaining essential communications
- Setting priorities: triage / transportation
- Managing mutual aid response
- Maintaining multiple staging sites
- Coordinating and tracking patient movement
- Overcoming hazards
- Contending with volunteers / self assigned personnel

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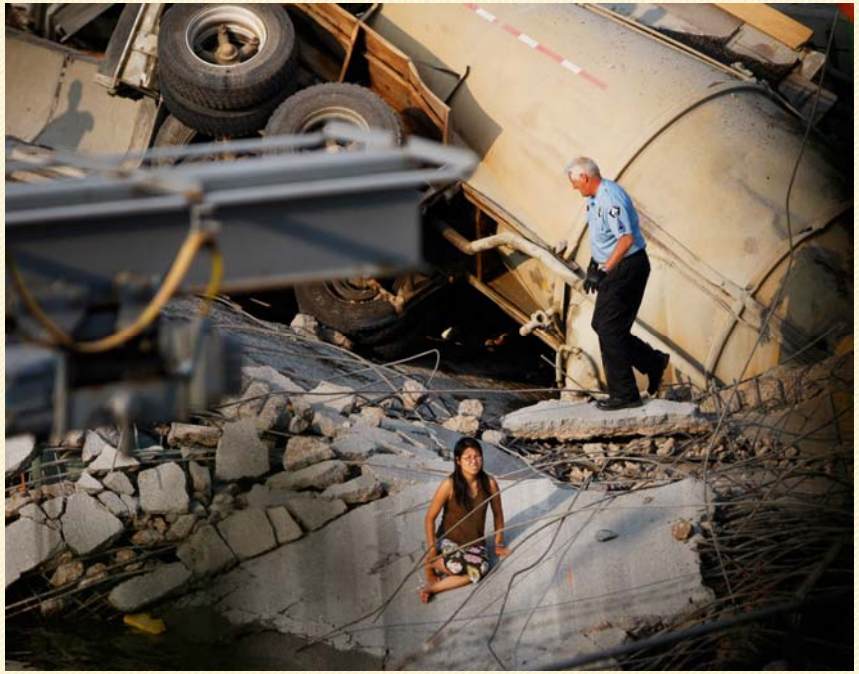
Minneapolis Police

- First arriving officers act as rescuers
- DC Assumes LE Incident Command
- SWAT Call out
- SWAT recons needed for perimeter



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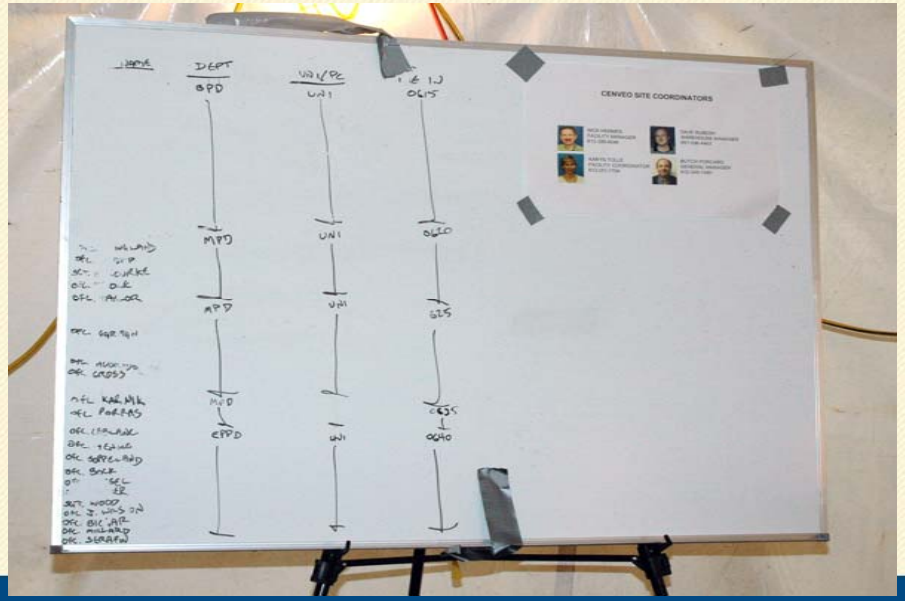
- **MPD chose to NOT co-locate command with Fire**

- **Ongoing Command Post required more than an acre**
- **Supported 500 people 24x7 in first week**



- **Scene Security**
  - **Dogs, Bomb Techs sweep area**
- **Investigations**
  - **1200 calls on reported missing persons within first 24 hours**
  - **List narrowed to eight confirmed missing persons within 48 hours (in addition to five initial fatalities).**

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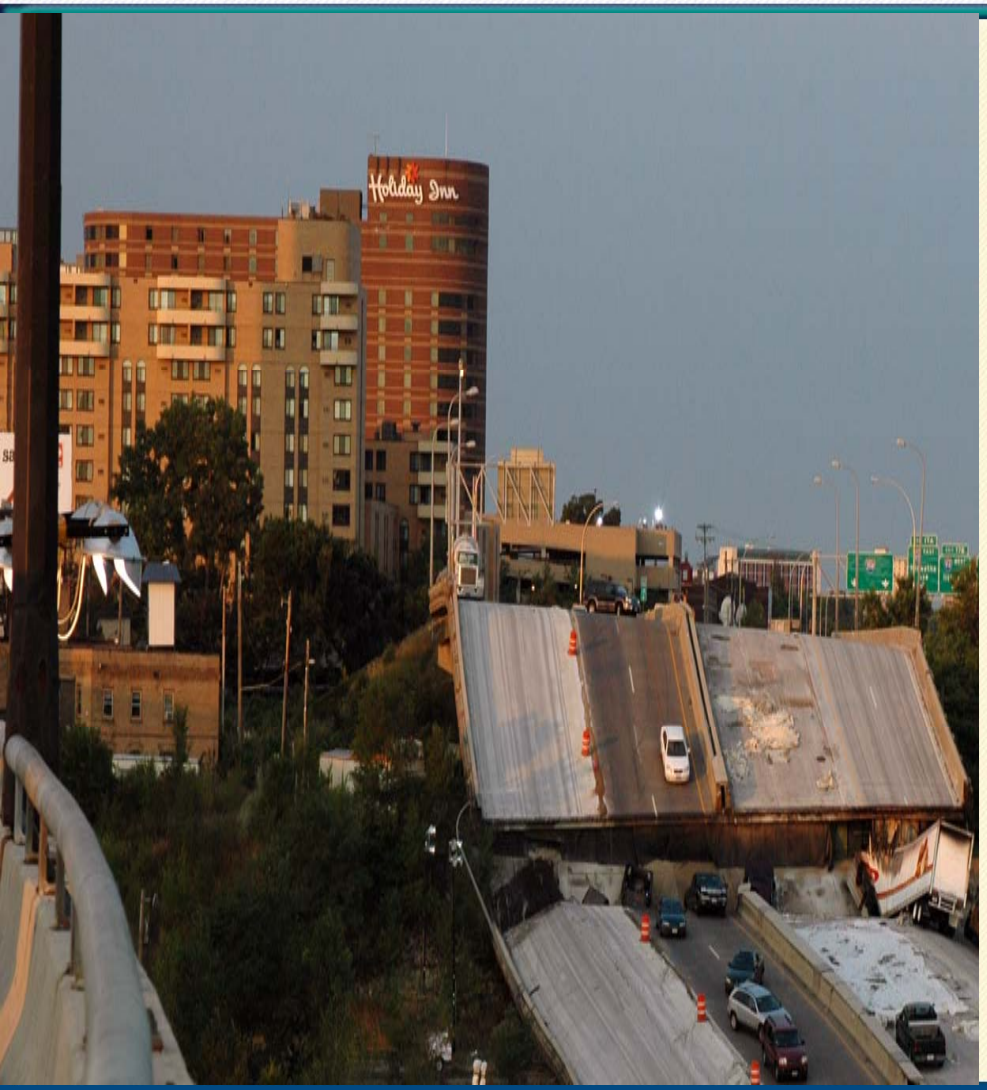

- **Family Assistance Center Goals:**
  - **FIRST Source of Information to families**
  - **Protecting Families from the Media**
  - **Protecting Dignity of the Victims**

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Perimeter Security

- Evidence Preservation
- Safety of Divers
- Protecting Families of victims; Dignity of victims

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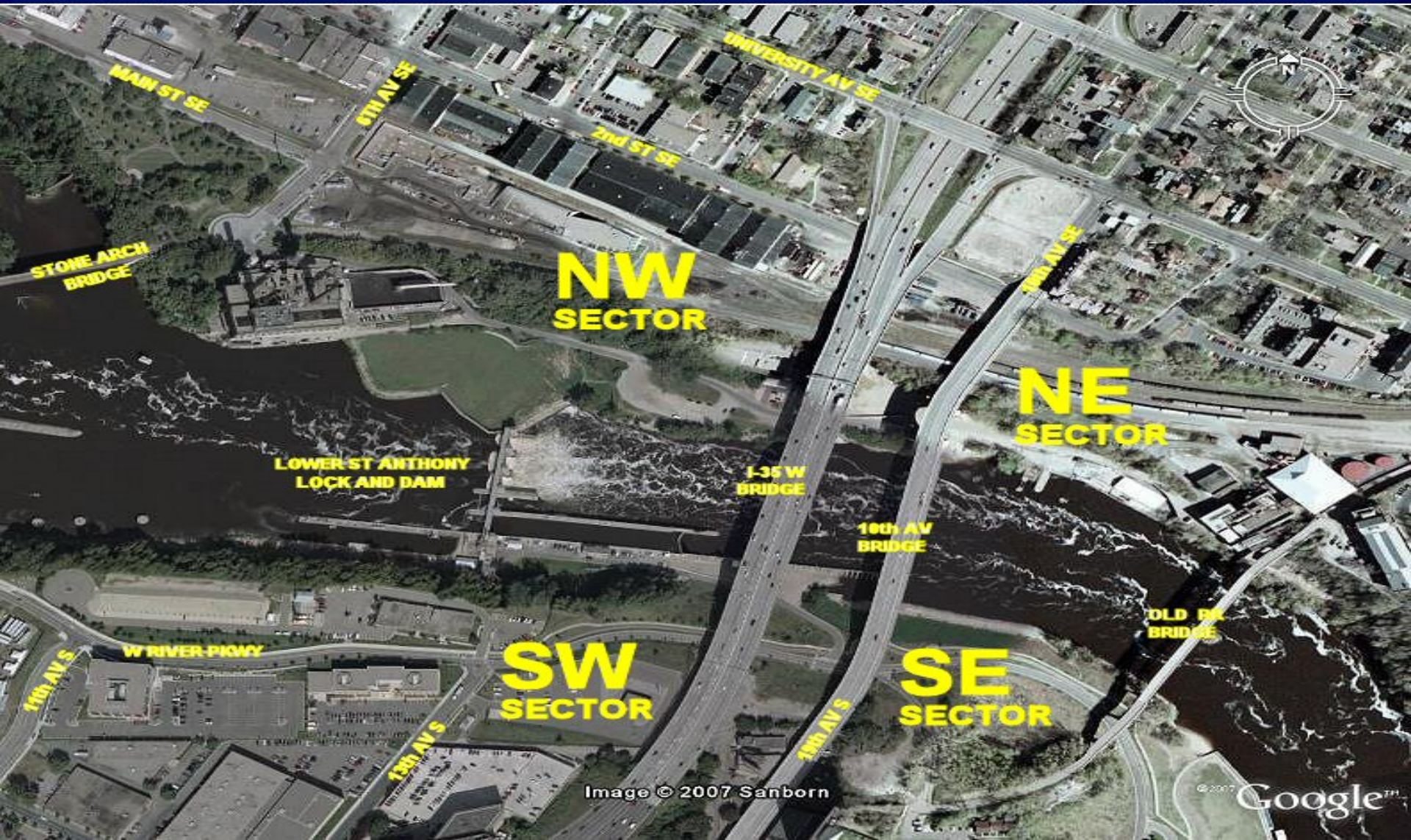

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- Coordination between agencies
- VIP Visits
- Media

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What Made it Work

- **Pre-Trained Staff**
- **Great Relationships**
- **Incredible Community Support**
- **Interoperable Communications**
- **Experience from past disasters**

Now to “off-scene”

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EOC

- Opened at 6:20 p.m.
- Ran 24 hours/day for first four days (not exactly)
- 12 hours/day until closing on Aug. 17.
- EOC stayed in “ready position” until last body was recovered on Aug. 20.

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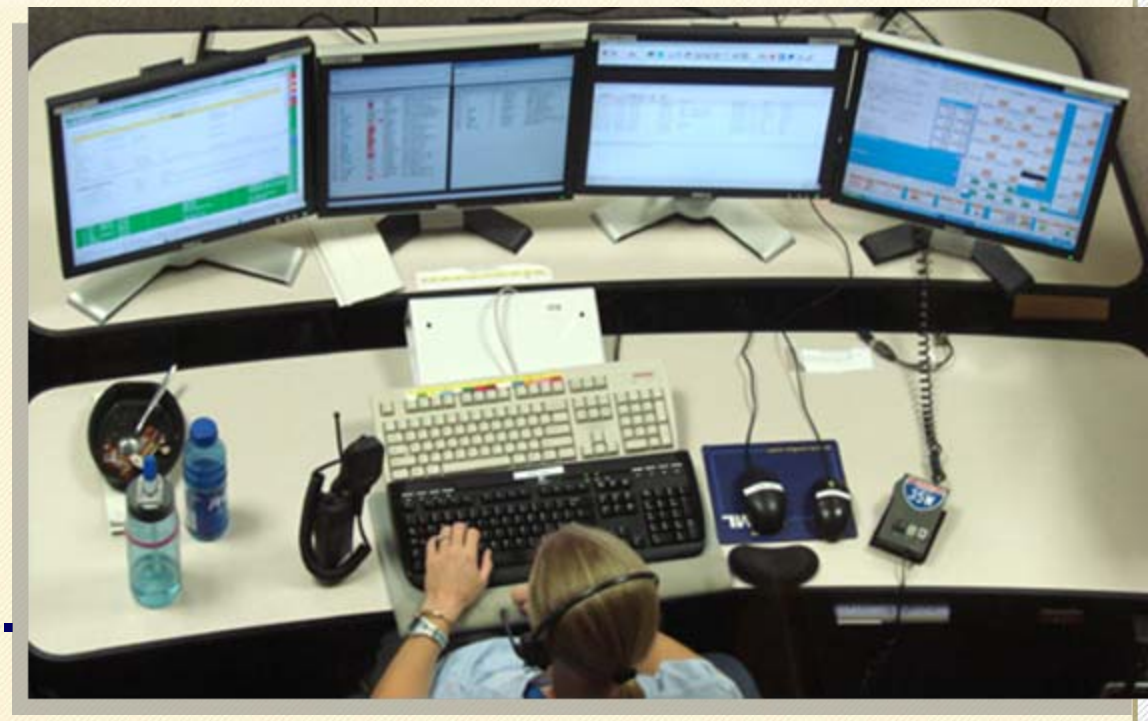

- 911 call volume more than tripled.
- A total of 505 bridge-collapse calls to 911 in first two hours.
- 51 of those calls from people at the scene.
- 311 call center hours extended an hour and over the weekend.

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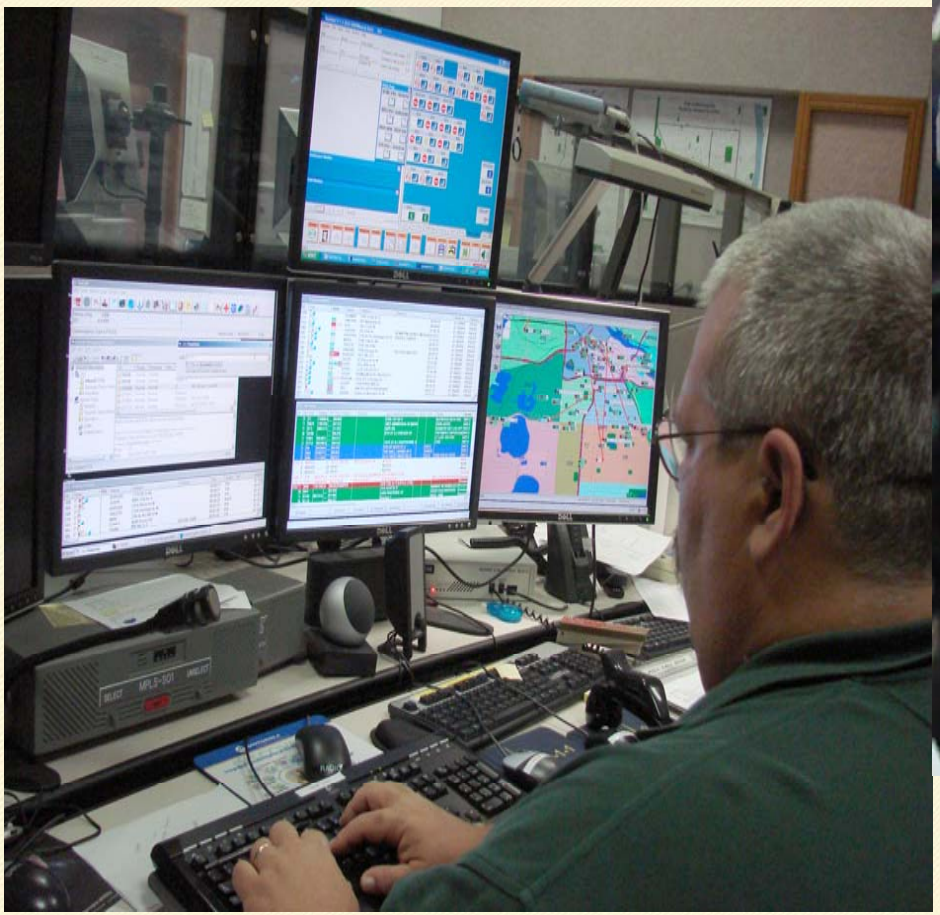
911



Cell Phone Problem

- High volume of calls resulted in citywide disruptions.
- Cell phone capacity beefed up at scene.
- Sprint & Nextel (City's main cell phone providers) added capacity at collapse site.

800 MHz Radios

- Trunked system made it possible for more than 100,000 radio transactions following collapse, with virtually no failure.

Tragedy yet not a Disaster

- Weather
- Traffic / lack of forward motion of vehicles
- Use of automobile restraints
- 'Cushion' of bridge collapsing under vehicles and shocks, seats
- Location of event (proximity to hospitals and resources)
- Luck! (or maybe those priests?!)

The results..?

"Minnesota passed the test."

Saint Paul Pioneer Press, August 20, 2007

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This incident has been examined from many angles and by many experts. The report by the U.S. Fire Administration/Technical Report Series validated many of our own observations:

- **"The excellent working relationships that had been developed through joint interagency training, planning, and previous emergency incidents was one of the primary reasons that response and recovery operations went as smoothly as they did. As one leader commented "We didn't view it as a Minneapolis incident; it was a city/county/state incident."**

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FEMA

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Successes and Best Practices

"Cooperation among first responders, mutual-aid resources, and State and Federal partners was outstanding...

When it came time to pull together efficiently as a team–they did."

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- **Local leaders together had taken the Federal Emergency Management Agency's (FEMA's), Integrated Emergency Management course, and credited it as a major factor in their level of preparedness.**
- **The new 800 MHz radio system streamlined communications and enabled successful connections among a variety of organizations and agencies.** The City of Minneapolis made a substantial down-payment on public protection when it purchased the new radios and system. Emergency responders stated that the system "saved our lives," was "fantastic" and "incredible."

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- **Technology played a major role in managing the response and recovery efforts.** From the real-time situational awareness provided by site video cameras, to the Web-based Geographic Information System (GIS) Common Operating Picture and traffic management systems, to the use of municipal Wi-Fi, technology was tried and tested in the I-35W Bridge incident. The technology not only performed well, it transformed the way response and recovery were handled.

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- **Responders arrived rapidly.** First-responder units arrived on scene quickly and established their respective Incident Commands based on Incident Command System (ICS) principles.
  - (Way to go, 911!)

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- **Local EMS plans worked well.** The Metro EMS Incident Response Plan (IRP) was used successfully by all EMS personnel who responded as mutual aid providers. (Mutual aid agreements are not managed through the IRP.)
- **EMS response was rapid and in sufficient quantity.** Units approached the scene from different directions allowing for a rapid, 360-degree scene assessment.

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- **The Minneapolis EOC, despite issues with its size, was able to operate in a safe and effective manner.**
  - The EOC worked on a schedule that assured the presence of qualified professionals to manage their specialty areas. All EOC personnel were NIMS-trained and had participated in practical exercises.

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Citizen Heroes

- **"As a final note, it is incumbent of any report on the I-35W Bridge disaster to acknowledge the citizen heroes who courageously helped to rescue and provided aid and comfort to survivors during those first awful minutes and hours. Their selflessness is a tribute to them and to their community."**

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Lessons Learned

- **The EOC was of insufficient size to manage a major event.** Jurisdictions should plan for backup EOC facilities that can be used if the primary EOC is inaccessible or too full.
- **The 9-1-1 EOC notification and callup did not occur as it should have** because the center was overwhelmed with calls for assistance, and call lists were not updated.

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Lessons Learned

- **Lack of a true Unified Command.** The fire department positioned early operations from the 10th Avenue Bridge, which was the best location from which to observe and monitor rescue and fire suppression operations. It would have been helpful if police Command had been established with fire Command on the bridge at the beginning of response activities, so that a true Unified Command operation could be managed.

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Minneapolis Wins 911 Institute Outstanding Call Center Award

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- **Minneapolis Fire Department**
- **Minneapolis Police Department**
- **Dr. John Hick, Hennepin County Medical Center**
- **US Fire Administration Final After Action Report (**USFA-TR-166/August 2007)