

Peer Exchange Report Out Emergency Response

Northeast Bridge Preservation Conference
Newport, RI
2012

Discussion Highlights (note main discussion items)

- 4 DOTs, 5 Industry
- First responders are generally bridge inspectors. Maintenance engineers then determine if it is work that can be done internally (if in house maint exists)
- Conn 3 major events last year, Alfred, Lee and Irene – barrier on hand to shut bridges down immediately if needed. Some steel/materials stockpiled. Some standby emergency contracts – debris removal for storm Alfred. I-95 vehicle fire under structure – had to divert traffic
- Rhode Island, 5 zones with 5 crews covering those zones – have areas ahead of expected event, have on call contractors as well – all established in chain of command. Delaware is very similar – also has put emergency contracts out to bid.
- Mass does not have maintenance forces, have on call maintenance contractor which could function as emergency
- NJ also does not have maintenance forces, have on call contractors, 4 hrs notice, T&M for concrete repairs, scour, steel contractors. One person as coordinator to communicate with FHWA
- Emergency response for damaged steel or reinforced concrete is to protect the public and evaluate
- RI, DE – every bridge has a detour plan preapproved
- Bridge safety makes recommendation to close a bridge
- RI – appointed personnel FEMA trained report to state post for
- DE – TMC makes all decisions – notifies bridge engineers of problems, bridge dept has a preliminary agenda
- Mass has MEMA – they coordinate response between all of the agencies, have reps from all agencies in that building. Everyone but DE seems to have bridge personnel in emergency centers – sensors report directly back to TMC

Discussion Highlights (note main discussion items)

- Discussion on notification procedures for critical.
- Determined if critical situation.
- NH has no criticality scale, either open or closed
- Conn. has levels of criticality for timetable of repairs.
- PennDOT is notified immediately
- Scour is critical
- Scour failure is not necessarily limited scour critical bridges.
- Coordination with local police can be an issue when closing bridges.
- DOT usually monitor the bridges when water reach certain levels.
- Earthquake emergency was performed in PA and RI
- Development of repair details. Usually contracted out.
- Insurance claims are messy.
- Claims money never get back to the Department, usually goes into general fund.
- What happens to the debris?

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Monitoring scour critical bridges during flood events.
- Critical deficiencies are reported to Department Bridge Engineer.
- Emergency center and or plans are in place.
- Operation centers are manned 24/7 and are ramped up during emergency.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Standardization of emergency
- Clearer definition critical finding.
- Establish clear procedures for emergency response.
- Emergency response procedures need to be effective.
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Discussion Highlights (note main discussion items)

- Two main types of emergencies: 1) environmental & natural (floods, scour, etc) and 2) deterioration.
- Response to bridge hits – DOT responds; consultants called in as required. Part of asset management program.
- Need for additional USGS gauge stations.
- Need to find the right person to talk with for a given emergency.
- Concern over putting people in harm's way during a storm event.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- MaineDOT has action plan for critical findings (simple one-page form).
- Scour POA's – Maine DOT practice is to monitor stage height in "yellow" – watch; stage height in "red" – close
- Underwater acoustic imaging – for situations where cannot put a diver in the water
- DOTs are first responders; consultants called in as needed
- Identification of critical vs. non-critical structures (e.g., Potomac River crossings in DC area).
- Centralized statewide asset management system for automated dispatch of proper teams/crews to respond to an emergency.
- Maintain repair inventory (Mabey/Acrow/temporary bridges, other items).
- MaineDOT – comfortable with bridge hit response, leery of level of scour POA information.
- DC – emergency response contractor on board; response within 4 hours. Needed due to limited staffing resources.
- Need for written response protocols.
- NHDOT – wants reasonable scour analysis appropriate for northeast. Need to account for floodwaters carrying large debris which can be more damaging than the storm itself. MaineDOT shares same concern. MaineDOT and NHDOT have experienced large boulders being carried downstream.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Proposed research – device to remotely monitor scour/undermining at bridge foundations? Electronic sensor?
- Potential pitfalls – lack of wireless signal (underwater, under bridge superstructure, remote areas), need to cover large foundation area, susceptible to damage from debris carried by storm.
- Propose survey for northeast states on emergency response protocols. Potential for limited benefit due to high likelihood of states already utilizing similar practices and the reliance on individual state agency departments that may not be common to all states; however, still may be beneficial.
- Identify key personnel (experts) for various emergency response situations? E.g. materials expert, scour expert, bridge hit expert, etc. Identify unusual circumstances that may call for unique expertise, e.g. concrete-eating bugs, etc.
- Propose developing national web site containing key contacts at each state (e.g. materials, bridge design engineer, bridge maintenance engineer, etc.) in a standardized format in order to avoid searching individual state DOT web sites.
- Need for additional USGS gauge stations.
- Need for appropriate scour analysis to account for debris.

Discussion Highlights (note main discussion items)

- Irene
 - MASSDOT –Collins Engineering give a list of all of bridges over water to be looked at ASAP.
 - Discovered settlement, abutment settlement and undermining, bank damage, erosion
 - Bridges were complete loss
 - NYDOT - Advertised Design-Build contract of 13 mile stretch, this area needs to be fixed, fix it!
- NJDOT – Critical Findings, Emergency, Priority 1 (1 month look at). Priority 2 (may require to be looked at within 1 year). No in-house maintenance to repair.
 - Police notify DOT, then DOT sends notification through TMC for closures
- DC DOT – Has not experienced Natural Disaster in the past few years.
 - Bridge hits, damage has not been overall critical; minor scrapes.
 - PR section sends out data
- RIDOT – Floods of March 2010. 500+ year storms were experienced. 5 +/- Bridges were closed for repairs. 3 +/- Bridges replaced. Lacking equipment and tools for emergency inspections. Limited inspection capabilities available. Many lessons learned, working on standard procedures.
 - TMC and Communications gets information out to public
 - If bridge was overtopped, it was an easy call to close. However, the bridge was opened by local police before inspection was able to be performed. RIDOT did not give the permission to open the bridges.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Have previous Bridge Inspection photos and reports database available
 - Have to be able to determine if damage is new or old
- NJDOT – Common Database to hold all data
 - Sharepoint
- RIDOT give Maintenance division first knowledge of necessary work. If they can't perform the work then work will be contracted out.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- RIDOT
 - Wish List:
 - Live Database – running task long of field conditions
 - Freeboard available, time stamp of inspection
- NJDOT's Information Distribution Database
 - Alerts all necessary sections when certain data is available. Certain clearances are given to certain people.
- Rhode Island has Rhode Island Emergency Management Agency (RIEMA)
 - Will activate with approaching storm
 - Emergency Support Functions (ESF) are filled. RIDOT, Department of Health, National Grid, National Guard, State Police, Red Cross

Discussion Highlights (note main discussion items)

- **Deck punching through**
- **CDOT – local area eng and bridge safety inspector comes out, maintenance force makes first call. Sometimes have to do in depth inspection. Maintenance decides what material goes back in, must be on QPL.**
- **RIDOT – subbed out quickly to an emergency contract. Maintenance does the initial work, then done through emergency contract. Don't have an on call contractor. Field people make the call.**
- **Maine – strong maintenance crew, deck punch through they choose product, do it as quickly as possible, they choose materials to use**
- **Joint busts open**
- **CDOT – engineering gets called if there is a need for long term solution**
- **RIDOT – does asphalt plug joints, easy to work with, putting them out just about anywhere you can. Installation is key.**
- **DSBrown – don't get a call for emergency; states stock material to use when they have an emergency.**
- **RIDOT – all work is bid, don't have an on-call contractor, use emergency contract**
- **RIDOT – funding emergency repairs is the real pain, figuring out how to repair it is the easy part. Has become a mini project to do a repair.**
- **A lot of discussion on the bidding and funding process for handling emergency repairs.**

Discussion Highlights (note main discussion items)

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- **Classifying critical findings**
 - PA 0 – 7 Days, 1 – 6 mos
 - CN A -24 hrs ,B – week, C, etc.
 - MD Emergency, Priority, A, B, C
- **Inspector involvement varies**
 - some only document the problem and report to higher level,
- others provide initial classification which then may be changed upon further review
- MD emergency response plan for seismic – list of bridges to inspect
- CN – Heavy rain app on Blackberry Conn Bridge Watch- shows rainfall in zones in-state;
- PA – map of scour critical bridges
- PA – Road condition reporting system
- CN –scour monitoring system on Mystic Report; none many others
- MD - Reporting critical findings to FHWA, SHA uses discretion as to what incidents to report

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- PA – Creates Bridge Problem Reports to alert/update exec. staff and other critical responders
- MD – legislating penalties for companies causing hits
- All states identify perps and seek reimbursement from insurance companies and/or perp
- CN provides key maintenance people with weather alerts (Blackberry based) for advance warning of potential problems
- MD – open end contracts for emergency repairs
- CN – has had access to open end contractors for emergencies
- MD - Local agencies have point of access at DOT for reporting
- Chain of contacts for notifying other agency personnel, other agency and the public about bridge closures
- CN (2), MD (1)– have emergency control centers that can assist in managing emergency responses

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Better system for coordination with other groups (utilities) doing emergency repairs; includes different groups within the agency
- Consider expanded use of use of technology for alerts, communications
- Smartphones for inspectors to remotely reporting issues with visuals to assist decision-makers

Discussion Highlights (note main discussion items)

- Composition of Group: 3-State, 3-Consultants, 1-Contractor, 2-Vendors
- Emergency Response (contracting, insurance coverage, lump sum, specialized equipment)
- Heat straightening
- Emergencies (i.e. Bridge hits, scour, loose concrete over highways)
- Fatigue cracks (drilling holes)
- Materials related to emergency responses (i.e. FRP, polymers, rapid setting concrete)
- Coordination with maintenance for problem bridges

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Heat straightening with lump sum
- Use of specialized equipment
- Established critical findings procedures

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Construction loading guidelines for Contractors during construction
- Heat straightening training

Discussion Highlights (note main discussion items)

- Vermont would Shut the bridge down immediately, if it is muni, they call the city/county
- If muni owns the bridge, different protocol for PennDOT to shut bridge down than if state owned bridge.
- Maryland has procedure, which goes all the way to Governer, if it is a major highway. They can close the local bridges, it is very fast reaction.
- ConnDOT has similar procedure.
- PennDOT has some problems with bridges impacted by oversized loads.
- Long term monitoring of bridges impacted by hits/flooding
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Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Each state has their own procedure established for incident management (NIMS)
- Between states there has been agreement in the past (bridge inspections/maintenance)
- Each state has resources available (engineers and contractors) in place that will come in and help address the issue.
- Vermont has a retainer for engineering and contractors. Expedite contractors, better way of putting contracts together after Irene.
- PennDOT uses road condition reporting system for communicating level of crisis (during PEMA activation used for communicating to other agencies)quantifies emergency situations (winter, flooding, bridge hits);
- Maryland is looking into smart bridges and monitoring with University of Maryland. But still ways out.
- Vermont has couple of bridges being monitored. One interstate bridge that has been instrumented by the university of Vermont. Has issues with the grade of steel. (Lower strength than expected)
- Maryland has a GIS system to identify most utilities crossing the road, but not for all of crossing.
- PennDOT has maintenance priorities the determine when POA and repair is to completed

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Detection equipment for oversize load and warning system. A good way to warn drivers and get them off the road before they get to the bridge.
- Need to create better communication between Utilities which cross the roads and state. Right now there is no good communication, such a water main breaks, gas or oil line crossing, etc. Something that a good GIS system and contact info for each utility (one neck to grab) is identified.
- In case of Earthquake, phone going down, there should be alternative means of communication. So those should be built in with redundancy.
- Make sure the emergency response team headquarter is not located in flood plane or deficient buildings in case of earthquake.

Discussion Highlights (note main discussion items)

- Critical Finding NBIS System Notification Plan in-place (DOT's)
- Interagency issues during significant storm events – DOT interaction with Emergency Operation Center(s) / FEMA
- Limitations of DOT's dealing with Emergency Response Events
- Heat Straightening among DOT's – Programs / Incidents /
- SCOUR Monitoring / Countermeasures
- Fatigue Crack Techniques
- Presstressed Concrete Repairs
- Emergency response

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- RIDOT- Coordination/training with the Emergency Management Agency & FEMA to prepare for Emergency Situations (Hurricane Event, etc.); Perform Mock events (yearly basis) to keep agencies working together/trained
- Secure Contractor(s) ahead of an Extreme Event
- SCOUR Program – Countermeasures (VDOT)
- Use of Pile supported substructures as stream crossings (VDOT / ConnDOT)
- RIDOT – Fatigue Crack countermeasures; drill-out at crack-tip
- FRP use for Prestressed / Reinforced Concrete repairs (RIDOT)
- Centralized Control Centers for Emergency Events

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Secure Contracts ahead of an Event or on a Yearly basis
- Develop a Program to include a Heat Strengthen Contractor
- Further Develop, Share among state DOT's SCOUR Program / Countermeasures
- Evaluate SCOUR as part of Bridge Rehab / Replace
- Environmental concerns / procedures after a Emergency Event