



CITY OF ANN ARBOR
PUBLIC SERVICES ADMINISTRATION

TO: Milton Dohoney Jr., City Administrator
FROM: Brian Steglitz, Public Services Area Administrator
DATE: September 29, 2023
RE: Analysis of Ann Arbor's Response During Severe Weather Events

On August 7, 2023, Ann Arbor City Council passed Resolution [R-23-293](#), Resolution to Analyze Ann Arbor's Emergency Response During Severe Weather Events and Related Power Outages, directing the City Administrator to provide an analysis of the City's response to severe weather events that have occurred in 2023. This memorandum summarizes Public Services' response actions in the context of the specific elements identified in the Council resolution and includes costs as well as recommendations that would improve the City's ability to respond to a future event.

Description and analysis of how emergency-related communication and coordination occurs between different City departments, the City and DTE, and the City and other community orgs (i.e., Red Cross, AADL)

During each of the severe weather events, internal communications across units was led by the Emergency Management team, operating through the Emergency Operations Center (EOC). However, due to the nature of these weather events, in some instances only a partial EOC was assembled, rather than a full EOC. The EOC channel on Microsoft Teams was useful in conveying and posting information and updates to the EOC. However, the passive nature of this communication puts a burden on the Service Area Administrator and Unit Managers to share relevant information to their teams when it is posted. Also, in the smaller events, the full EOC was not assembled so access to information was limited to only those part of the assembled team.

Examples of good coordination between service units and service areas include coordination between Public Works and Water Treatment during the July 26 event that allowed downed trees to be cleared so that maintenance crews could get to the Water Treatment Plant. Information Technology communicated effectively with Public Services

units to ensure systems like CityWorks were running properly which was critical to triaging downed trees and damaged infrastructure.

Communication with DTE at the executive level (Service Area Administrator and Account Representative for DTE) was frequent and appropriate during the emergency events. DTE was responsive to City requests on how to prioritize some of their work. However, at the operational level communication was less effective. DTE does not communicate their status of power restoration or when it is complete. The only tool available to City staff is their online service update application that is available to all of their customers. Staff found that this application tended to lag significantly so it regularly did not reflect the current status of power restoration.

The only way for City Staff to definitively determine if power is restored to remote facilities and traffic signals is to visit the site. It is labor intensive for staff to drive around the City to evaluate whether power is restored to signaled intersections. As a result some residents were frustrated with the pace that signals are restored to normal operation. Staff also do not receive notifications when power lines are removed from trees blocking roadways which would allow a more prompt response from forestry staff for debris removal and road opening.

Not all downed lines are electrified and owned by DTE. Typically, City staff will contact DTE to investigate a downed line. DTE will take responsibility for removing the line and/or clearing it for forestry staff. When a line is not owned by DTE, the process for removal and clearing is less clear. Delays in opening roads and removing downed trees were caused by uncertainty on whose responsibility it was to remove a downed line. To protect the safety of forestry staff, downed wires need to be cleared for safety by their owner before staff can intervene. AT&T owns a significant amount of telecommunication lines that stretch through the City and communication channels with AT&T were not effective during these severe weather events. This created delays in the City's ability to remove debris and open roads.

Recommendations On Communication

- Make communications viewable by full EOC even when a partial EOC is assembled.
- Re-assess EOC Teams list to ensure that all service units are appropriately represented.
- Consider a stronger or more formal connection between DTE and the City's EOC to facilitate communications at all levels.

- Review DTE’s priority list for restoring power to check alignment with City facility priorities.
- Request that DTE provide frequent updates on power restoration to signals and clearance of power lines on downed trees.
- Develop an SOP for identifying and clearing downed lines not owned by DTE to facilitate tree removal.

Analysis of what systems have been impacted by these events and how the City and/or other community organizations have responded

The following describes Public Services Area infrastructure that were impacted by the severe storm events, including facilities associated with water treatment and resource recovery, signals, stormwater infrastructure, and fiber communication networks.

Water Treatment

- Critical locations have dual DTE feeds and backup power to mitigate the risk of shut-downs during storm events but in the July 26, 2023 storm, both DTE feeds went down. This resulted in reduced raw water capacity, which caused the City to issue its first-ever water restrictions.
- Remote facilities such as pumping stations and dams have local emergency power backups, but require a manual start and stop, so staff must be sent out to operate them when the power goes out and again when it is restored. Barton Dam is the exception which has auto transfer to an emergency generator.
- If storms are accompanied by significant precipitation, and dams are without power, there is urgency in having staff attend to the dams to start the back-up power systems. This is necessary to allow the dams to pass the increased flow to avoid failure or breaches.

Resource Recovery (AKA, Wastewater)

- The resource recovery plant has dual feeds and back-up power as protections against outages, and lift stations have generators which automatically start when necessary.
- High inflow and infiltration into the sanitary sewer system can impact the capacity of the lift stations.
- High river level impacts the capacity of the resource recovery plant.
- Severe storm events increase the risk of NPDES permit violations and sanitary sewer overflows.

Traffic Signals and Streetlights

- Traffic signals and streetlights no longer operate when power is lost. This poses a notable safety concern to the traveling public, no matter their form of mobility.

- When power is lost and then restored to a signalized intersection, the signals automatically operate on an all-way flashing basis until city staff is notified or otherwise determines that power has been restored to that intersection and can re-set to normal operation.
- Signs, lights, and signals may be knocked down and/or damaged during severe conditions, particularly winter storm events, generally by vehicle crashes.

Stormwater Infrastructure

- Public Services staff complete a pre-storm checklist that provides verification that infrastructure in areas with a history of flooding is prepared to mitigate the worst impacts of a storm.
- Pre-storm preparation may include clearing catch basins and notifying contractors that they should clean silt bags to prevent flood risks.
- Severe storm events increase risk of road wash out (for example, overland water flow resulted in road closures where Mallet's Creek impacted Packard Rd.), and culvert capacities may be exceeded.
- Stormwater infrastructure is not designed to handle all size storm events. Local ponding and flooding are expected during severe storm events and typically abates with hours of the storm's conclusion.

Communications

- Fiber and radio communication networks are needed for an effective response to emergency storm situations. In addition to person-to-person communication, the communication network is used to receive notification of damaged or impacted infrastructure through A2FixIt as well as to manage and triage work teams through CityWorks and GIS.
- Fiber communications could be negatively impacted by downed lines.

Street Trees

- The City has over 47,000 street trees. During the February/March event over 1800 street trees were damaged. During the June event just under 200 trees were damaged and in the July event approximately 300 street trees were damaged. Clearing City street trees from transportation infrastructure, downed telecommunications and power lines, and from private property can take both significant resources and time.

Analysis of specific kinds of emergencies that have resulted and how the City or other community organizations have responded (Response Protocols)

City staff has several staffing protocols in place to ensure that it is well-suited to respond when emergency storm events occur.

- The City Administrator makes a declaration of high needs, which works well when there is sufficient advance notice of an emergency event but can be harder during large snow events that quickly develop the capacity for precipitation beyond forecasted accumulation totals, especially when large portions of staff are needed for support.
- Individuals may be asked to hold over after the end of their shift if an event is incoming or occurring toward the end of a shift.
- The City asks for volunteers before mandating that individuals report to work.

Additional protocols to ensure preparedness and effective response for emergency situations:

- Staff checks back-up power systems and fuels vehicles to ensure the City is prepared to respond to various needs.
- Staff empties retention basins to create capacity at the resource recovery plant and reduce the risk of sewage back-ups.
- City job descriptions and union contracts discuss overtime and callout for emergencies.
- Temporary signs and signals are deployed where needed, and service is restored when utility power is returned.

The City has 16 generators for traffic signals, which are refueled every 4-6 hours and removed at night to reduce risk of theft. The City is also able to deploy 50 portable, temporary stop signs at 12 intersections. In all, this provides back-ups for about 30 intersections (during the day) out of 164 signalized intersections in the city.

Recommended actions that would improve the City's responsiveness, preparedness, and resilience to such events in the future

Process

Staff considers several procedural recommendations that could improve the City's responsiveness, preparedness, and resilience to future major storm events:

- Limit travel during severe weather events to keep vehicles off the street and improve the City's response for things like clearing roads and accessing points where service is needed.
- Issue a snow emergency during severe snow events that requires all vehicles to be removed from the streets to facilitate snow removal.
- Promote the Adopt-a-Storm Drain program to neighborhood residents and to encourage residents calling in about blocked drains to clear the drains themselves

if willing and able, to reduce flood risks and ensure the integrity of the storm sewer system.

- Ensure that erosion control and storm preparedness protocols for both non-City and City projects are sufficient and enforced.
- Clear the tree lines around powerlines in strategic locations to allow for improved access and reduced risk to that infrastructure.
- Secure citywide as-needed emergency services through FEMA compliant contracts (allowing the City to receive reimbursement from FEMA when appropriate) to improve the City's response and ability to access resources.
- Develop a Disaster Debris Management Plan. This plan will provide a comprehensive look at how to manage a catastrophic event that includes a determination on both a response to right-of-way impacts as well as private property. Having such a plan in place will ensure the City is best-positioned to obtaining reimbursement through both State and Federal sources if appropriate. Cost to develop this plan is estimated at \$40,000.

Equipment

There are several equipment needs and recommendations vital to ensuring a positive City response to future storm events:

- Consistent and frequent testing of back-up systems (e.g., generators and engines) to ensure their reliability.
- Much of the fleet for snow removal is old and vulnerable. Four of 14 large vehicles were out of service during the March snow event. This impacted the timeline required to clear local roads. Some vehicles also do not have salt dispersing capabilities. Updating the fleet to ensure it is reliable, has all required features, and is fully functional would improve response times.
- Add reflective backplates to signals at signalized intersections to improve visibility and reduce the likelihood of crashes.
- Place and maintain fuel tankards at strategic locations for back-up fueling needs to eliminate reliance on third parties for accessing fuel during events where access to fueling may be limited.

Staffing

One major challenge in responding to major emergency events is ensuring that enough staff respond to various needs. It may be difficult for staff to physically get in, especially when road conditions are dangerous or there is no power. Many staff members live outside the city, some at a substantial distance. Compelling staff to work during emergency events, particularly those that occur over weekends or holidays, can

negatively impact morale. *Some recommendations for improving the ability and willingness of staff to respond to emergency needs include:*

- Soliciting volunteers before mandating that people come in (fewer and fewer people are willing to volunteer to come in, however).
- Offer on-call pay or other financial incentive.
- Provide better accommodations (i.e., the City will pay for hotels for staff who live a certain distance away).
- Allow staff to take home vehicles being used for response activities
- Provide on-site childcare.

Contract Services

The City has several contracts available for emergency response. Forestry possesses one \$500k contract for tree removal and maintenance services, which could be used for emergency services. Use of this contract for emergency services would be a short-term solution and depend on remaining available balance. Re-establishment of the remaining balance for budgeted operation and maintenance services would be required upon use. The City also has hauling contracts that can be used for debris removal. The City does not have contract support for snow removal. In general, the City is capable of handling major snowstorms with its own staff and typically meets service level goals which includes the clearing of major roads and local roads within 24 hours of the storm's completion prioritizing by trash route. Note that these service level goals do not always meet the expectations of the community. Both treatment plants use Utilities Instrumentation Services (UIS) to augment their electrical and control systems technicians' capabilities during severe weather events. UIS staff are on call and dedicated seven trucks and associated staff to support the City during the July 26 storm event.

The City could consider setting up emergency response service contracts, but it is unclear if the City would be successful in developing contract arrangements that are only used in emergency situations. Contractors would be, in essence, on-call but not compensated unless their services were utilized. Without a guaranty of a certain amount of revenue, this may not be an attractive contract arrangement for service providers. Staff recommends that existing contracts with service providers that could support an emergency response event are amended to incorporate emergency response services as needed, but without a firm financial commitment. Since these contractors are already working for the City, they may be more willing to provide support during emergency events without a firm commitment of scope.

Mutual Aid Agreements

The City is a member of MI-WARN, which is a mutual aid agreement with other communities and while focused on water utility support services, it could be used for other needs. The City could exercise use of this agreement in an emergency; however, neighboring communities typically have similar needs during a significant weather event.

Estimate of the total emergency costs incurred by the City in response to prolonged power outages as a result of the major storm events that occurred on Feb 22, March 3, June 25, and July 26, 2023.

	<u>Public Works</u>	<u>Water Treatment</u>	<u>Water Resource Recovery</u>	<u>Signs and Signals</u>
February 22 / March 3, 2023				
Labor	\$228,286.59			\$6,165.05
Labor Overhead	\$545,604.90			\$13,686.41
Equipment Use	\$181,175.36			\$1,331.45
Contract Services	\$555,835.00			
Material Cost	\$71,784.89			\$670.00
Subtotal	\$1,582,686.74			\$21,852.91
June 25, 2023				
Labor	\$19,839.23			\$254.36
Labor Overhead	\$47,415.75			\$564.68
Equipment Use	\$8,678.48			\$128.08
Subtotal	\$75,933.46			\$947.12
July 26, 2023				
Labor	\$23,271.72	\$5,540.38		\$5,929.33
Labor Overhead	\$55,619.40	\$13,241.51		\$13,163.11
Equipment Use	\$14,984.69			\$1,294.57
Contract Services		\$11,460.00		
Materials/Equipment Damaged/Replacement/Repair		\$65,019.92		\$102.00
Subtotal	\$93,875.81	\$95,261.81		\$20,489.01
Generator, Fuel, Natural Gas Costs			\$2,351.00	
Total	\$1,752,496.01	\$95,261.81	\$2,351.00	\$43,289.04
GRAND TOTAL	\$1,893,397.86			