LEVERAGING GIS TECHNOLOGY DURING HURRICANE RESPONSE

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HURRICANE HELENE

- Approximately 1.4 million without power
- Just under 24% of the population
- Nearly everyone was impacted - directly or indirectly

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## MAJOR HURDLES

- Loss of power
- Disruption in communication – cell phones, (public) internet
- Widespread tree/wind damage
  - Power down for extended period of time
  - Traffic lights out/down
  - Many roads unpassable due to debris
  - Tremendous amount of cleanup required
- Impact FAR EXCEEDED expectations

FIRST REQUEST – A MAP

- Put together map data for DOT cleanup
- "No Go" zone - beautification-sensitive areas
- Clearly mark DOT-owned roads outside "No Go" zones
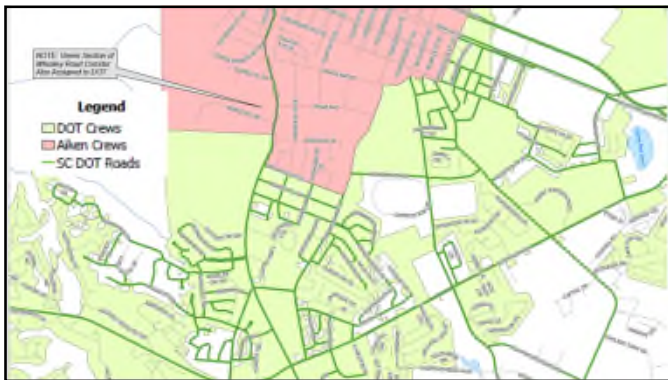
SECOND REQUEST – GIS DATA

- Data request for storm debris cleanup contractor
- Highlighted "No Go Zones"
- Provided roads, municipal boundary, broke the city into smaller cleanup zones
- **Data request tells us they are using GIS in their operation** – not just asking for a static map

CONTRACTORS WHO USE GIS

- Ask for access to their map services
- See where they are working
- Info on storm debris loads, issues, etc. *
  - They take their debris to different location than the city
- Helps give ready answers when asked – what is going on? Where are crews working right now

THIRD REQUEST - APPLICATION

- Provide way to **communicate** cleanup efforts to the public
- Help manage expectations
- Show the public what is being done "Live"
- "Where are they now?"
- "When will they be in my neighborhood?"
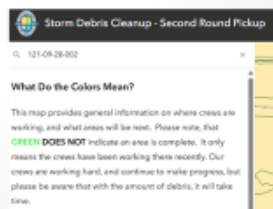- "They left and we still have a lot of debris!"

STORM DEBRIS CLEANUP "TRACKER"

- Helps manage expectations
- Provides answers to common questions

STORM DEBRIS TRACKER

- Provides reassurance
- Message: we are always working somewhere, and we will **NOT** forget you – we will be back
- Continually updated map

Route: 14 of 33
Route: **14**
Status of Route: **Debris Pickup Currently In Progress**
Order of Completion: **14**

Crews Will Return to Gather More Debris

Multiple passes (rounds, or cycles) of work are required in each route area. The **top priority** is the safety and well-being of our citizens. This determines the strategy for debris clearing work on every pass for each route. For example, on the first pass, the most important safety issue could be clearing debris off the actual road. On the next pass, the top concern may be clearing debris causing visibility issues on approach to an intersection, etc.

Please know that crews will continue to make additional passes through each route area, until all areas have been made safe, and all debris cleared.

STORM DEBRIS TRACKER – "QUICK WIN"

- Already had yard debris app – rebranded as storm tracker
- Pre-existing workflow meant equipment already on hand (in-vehicle internet, mobile devices)
- Used pre-defined cleanup zones from trash/recycle
- Workers and community already familiar with the concept

DRONES AND DEBRIS PILES

- Used drones to collect aerial imagery
- Created 3D models to estimate debris piles
- Used Drone2Map and SkyBrowse
- Measurements within 0.1%

DEBRIS LOAD MONITORING

- Monitor trucks dropping debris loads at dump location
- Usually requires 2 people
  - One to take notes and maintain records
  - One to climb ladder or be on scissor lift to inspect load (percent filled)
  - Work stops on wind/rain days – can't inspect, can't take loads
- Repurposed camera unit (four cameras) that was not put in service yet

CAMERA DEBRIS LOAD MONITORING

- Camera unit monitored loads, only 1 person required
- Weather no longer a factor – no work stoppage
- Labor cost savings approximately $3,500
- Visual (recorded / documented) verification of load capacity

CAMERA – NEXT TIME

- Verkada camera system includes AI
- Set up in / out camera counter – count trucks entering / leaving
- Use incoming traffic lane and outgoing traffic lane
- Additional verification and documentation

SUCCESS BRINGS REQUEST

- Other departments already had basic familiarity of GIS
- "Hey would it be possible to…"
- Great ideas expanding understanding of what is possible
- Road closure/blockage app

ROAD CLOSURE APP

- Assigned people to enter / update road closures
- Spun up in an hour
- Used ESRI's ArcGIS Solutions
- Data **MUST** be current to be trusted and used
- **MUST** identify data steward – someone responsible for content

NEW SOLUTIONS – BUILD BEFORE EVENT

- People in the field working very long hours
- People will use what they are familiar with
- Develop and provide apps **ahead of time** and use them
  - Field exercises
  - Tabletop exercises
- Road Closures App – **WAS STILL A WIN**
  - Demonstrated GIS quick response capability to assist
  - Showed creativity of city employees
  - Eyes open to future opportunities

ARCGIS SOLUTIONS

- Solutions for many applications including emergency management
- Comes with ArcGIS Online subscription – no additional cost
- Data structure, maps, data collection tools, editing and viewing apps already developed

Emergency Management Operations

Damage Assessment

Emergency Data Management

Road Closures

ADDITIONAL REQUESTS

- EMD – any GIS data on status
- Problem: requesting from many communities, different data structures, how will data be updated, etc.
- Solution: ESRI ArcGIS Solutions – common data structure, low cost of entry, proven solutions, utilizes web services so data stays up to date

SUMMARY

- Best way to ensure success – use / modify existing tools and resources to meet the need
- Ensure content delivered is kept current, and community will keep coming back
- Foster opportunities **NOW** for future engagement with field exercises, tabletop exercises, and other agencies/organizations

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