

NYC Rapid Repairs Program - Utilizing GIS for Hurricane Sandy Relief

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Background



- **October 29, 2012**

- **Hurricane Sandy impacts New York City**

- Thousands of residents without heat, power, or hot water
- Approximately 60,000 residential buildings in the FEMA surge zone
- Residents forced to vacate homes or remain in unacceptable living conditions
- CB&I began hurricane preparedness maps

- **November 9, 2012**

- **New York City Mayor Michael Bloomberg established the Rapid Repairs Program**

- Program offers free emergency repairs to eligible residential structures damaged by Hurricane Sandy

Rapid Repair Program Eligibility

1. **Must be residential property owner in designated affected area**
 2. **Have a FEMA registration number**
 3. **Units must be free of standing water and structurally sound**
- **Residents applied by calling 311, online, or designated registration centers**
 - **Due to large number of displaced residents and those living without adequate services, it was imperative that repair work began immediately**

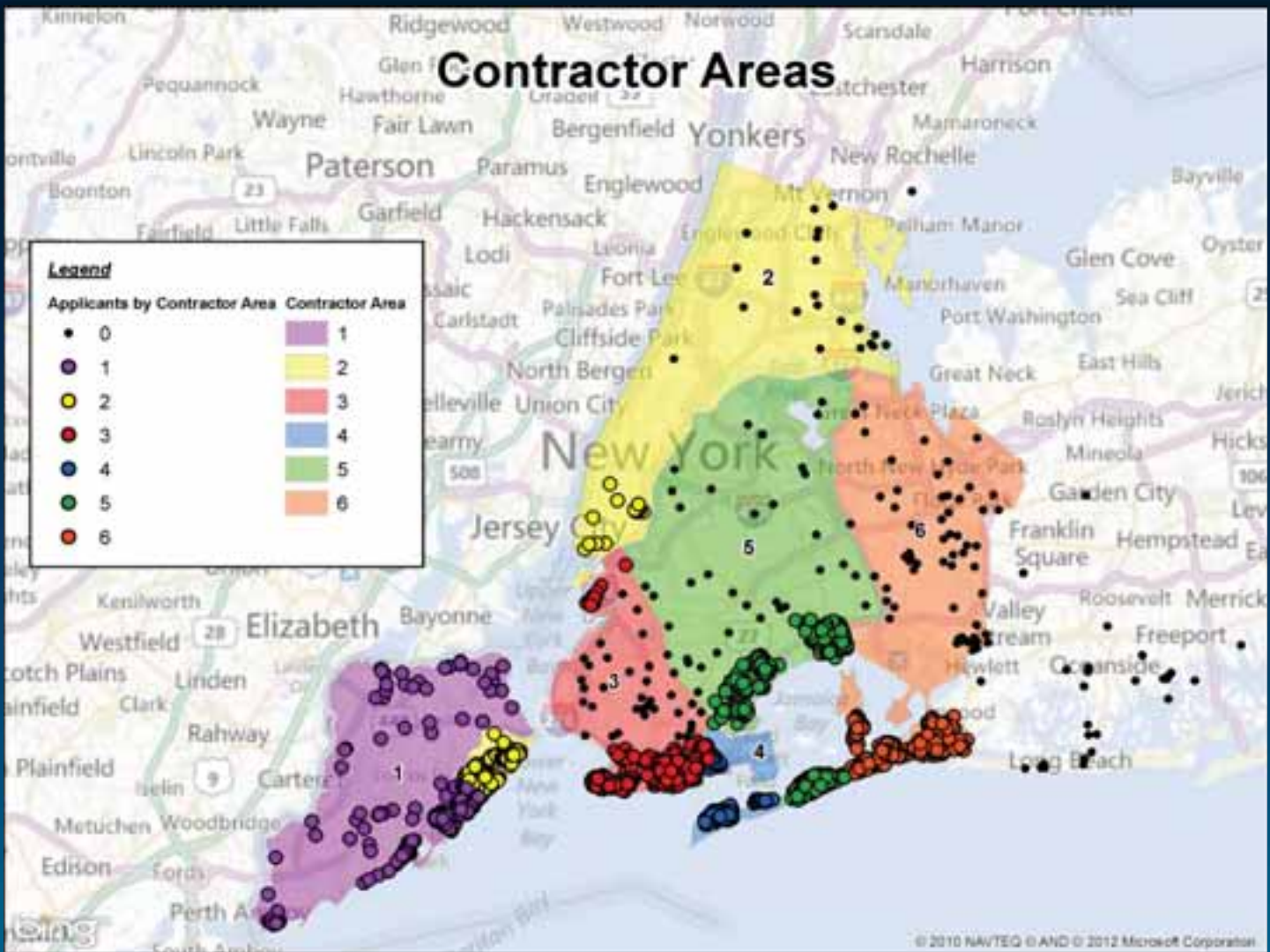


Events Timeline

- **November 13, 2013**
 - NYC direct contracted 9 large construction firms
 - Registration was open for affected residents
- **November 20, 2012**
 - CB&I GIM team arrives in NYC
 - Began mapping applicant locations and contractor areas immediately upon arrival for meeting with Mayor that evening
- **November 24, 2012**
 - The first construction repairs began



Initial Contractor Map



CB&I's Role

- **CB&I selected for overall Program Management of NYC Rapid Repairs Program**
 - **To assist NYC in management and control of this massive effort**
 - **EHS, Project Controls, Customer Service, Communications, *Data/Information Management*, Standard Protocols, Quality Assurance Quality Control, and FEMA Accounting**
- **Initial goal was to have repairs done by the end of 2012**

Geospatial & Information Management

- **Provide GIS and Information Management support for entire organization**
- **Includes**
 - **Mapping**
 - **Interactive website development**
 - **Mobile data collection**
 - **Environmental databases**
 - **Information management systems**

How GIS Helped

- Overall data management and GIS services were key in the implementation and success of the Program
- Acted as the “Pivot Point” on the how/when/where/what properties would be accessed for quick and efficient repairs
- In the simplest form, GIS was used to show progress throughout the project, with early emphasis focused on creating regional status maps

Neighborhood Map



Rapid Repair Areas

- **Initial maps created by Work Orders per contractor**
 - Grouped buildings by Work Order
- **Block Maps**
 - Large areas divided by roads
- **As the program progressed, NYC was divided into smaller divisions call Rapid Repair Areas (RRAs)**
- **The areas were fairly large in the beginning**
- **Eventually reduced in size to over 400 individual RRAs**
- **These areas were distributed among the contractors**
- **Intent was to have the RRAs be a small enough size that a contractor could visit those buildings in a small timeframe**

Rapid Repair Areas



Daily Map Production

- Each day 440 new maps, one for each RRA, were created and distributed to the contractors electronically
- Communicated which properties were accessed, scheduled, and completed for that day
- Began as a LONG process...
 - Typical completion time was around 10pm every night
- Utilized the new Data Driven Pages feature
 - Easy setup and consistency throughout
- Process was modified along the way
 - New completion time was 7pm

Daily Map



Information Management System (IMS)

- **SQL Server based IMS using cloud infrastructure to facilitate rapid deployment, access and scalability**
- **Custom schema to support unique project information requirements**
- **Integration with multiple data sources: SharePoint, FEMA, NYC, Public, Contractors**
- **Daily consolidation of applicant status and construction invoices from each of the 9 independent Contractors**
 - **Using a variety of information collection processes, from custom mobile applications to spreadsheets**
- **The IMS consolidated all information for analysis and presentation using GIS.**

Final Statistics

- **By January 8, 2013, the Program had registered 15,000 property owners and completed repairs on more than 4,000 residential units**
- **Approximately 12,000 property repairs completed by March 2013, representing nearly 20,000 residential units**
- **Upon completion 17,000 eligible applicants applied in the NYC Rapid Repairs Program**
- **Without GIS and the robust data management process, the Rapid Repairs Program would have been difficult to accomplish**