

Train Derailment in Graniteville, SC (Aiken County South Carolina)

Investment:

- Transportation and Road Maps
- Orthoimagery
- Buffer maps for “hot” zones, evacuation, road block maps, search zones, re-occupation maps and curfew zones
- Building corrosion areas for recovery and damage assessment
- Animal and pet retrieval maps

Benefits:

- Identification of populations at risk
- Support for evacuation, response and post event recovery
- Dollar amount incalculable included lives saved, long term exposure limited and overall disaster support.

Beneficiary:

- Citizens affected by the plume from the train derailment
- First Responders were able to more effectively respond to dangers and needs

Data Used:

- All locally created GIS maps for parcels, roads, occupation information, pet locations, addresses and other response information.

Description:

This case study is a companion piece to the SCGIS State Outreach and Strategic Plan. It examines the Graniteville train wreck and chlorine gas release through the lens of how GIS can produce data and methods that will assist the state in being better prepared for such events.



For anyone not familiar with the train derailment and chlorine gas release that occurred on January 6, 2005, a brief synopsis of the incident is included here. It happened in Graniteville, an unincorporated area of Aiken County (SC). Two Norfolk Southern trains collided due to a switching error, whereby a moving train was routed into a

Figure 1 - Graniteville Train Derailment

stationary train on a spur line.

Between 42 and 60 tons of chlorine escaped into the air when a tank car was ruptured in the collision. This chlorine release created a toxic gas cloud, causing casualties in the vicinity of the event, including Avondale Mills, the Graniteville commercial district and residential areas. There were 9 deaths at the time of the incident, 71 hospitalized, and over 500 people treated for exposure. Of those hospitalized, some suffered acute lung injury, and are still being monitored by health officials.

Initially, via reverse-911, residents were notified by telephone to shelter-in-place. In other words, they were told to stay at home and take specific precautions. Once it was clear that people should evacuate, and it was determined what the distance from the event should be for the evacuation zone, another notification was given for people to leave if they were within a certain distance of the event. As Jerry Mitchell of the University of South Carolina stated in his EIP Remarks (March 22, 2006):

“It is highly probable that residents did not know where they were in relation to the accident site and its accompanying mandatory evacuation order. Without a map or extensive local knowledge, residents could not determine where the crash site was located and how far their home was from that site.”

The following matrix shows the dependency of the potential statewide geospatial data sets and their relationship to the activities needed during the Graniteville Derailment emergency.

Table 1 - Graniteville Geospatial Data Considerations

	Potential Statewide data Sets - Data Types				
	Streets	Parcel Maps	Orthos	Address Points	Geocoding
Graniteville Response Activities					
<i>Assesses Populations at Risk</i>	x	x		x	x
<i>Determine Plume Predictions</i>	x		x		
<i>Evaluate Evacuation Factors</i>	x	x		x	x
<i>Provide GIS Support to First Responders</i>	x	x	x	x	x
<i>Support Traffic and Population Control</i>	x		x	x	x
<i>Complete Damage Assessment</i>	x	x	x	x	x
<i>Project Monitoring and Oversight</i>	x	x	x	x	x