

Alamance County Vulnerability Assessment

UNC Institute for the Environment
Spring 2012 Capstone



Alamance County Vulnerability Assessment Capstone Team

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Executive Summary

Any community, regardless of size, location, or demographics, can be subject to unforeseen natural or technological disasters. The populations affected by these disasters will inevitably vary depending on the nature of the event. In 2003, after the destruction caused by Hurricane Isabel, the Federal Emergency Management Agency (FEMA) initiated an Emergency Preparedness Demonstration (EPD). Two years later, the most costly natural disaster in U.S. history—the infamous Hurricane Katrina—reinforced the need to gain an understanding of obstacles preventing vulnerable populations from being prepared in times of disaster.

Through part of the EPD project, FEMA worked with MDC, Inc. in conjunction with the University of North Carolina’s Center for Sustainable Community Design (CSCD) at the Institute for the Environment (IE) to create a vulnerability assessment tool. The FEMA-funded *Community Based Vulnerability Assessment* tool, produced by MDC, Inc. and the UNC Institute for the Environment has proven useful for understanding community response to disaster scenarios.

Since January, our capstone team of six undergraduate students has used the FEMA-funded guide to develop a vulnerability assessment for Alamance County, North Carolina. The guide emphasizes the importance of identifying socially vulnerable populations as well those that may be physically vulnerable and learning how individuals, as well as communities as a whole, respond in times of disaster and emergency.

To begin the vulnerability assessment process, we completed 11 worksheets provided in the assessment tool, based on our own web research. The purpose of the worksheets was to compile county information such as known hazards, critical facilities, existing emergency management procedures, and county demographics. We also identified leaders in the county who could serve as potential key informants. These individuals were contacted and those who responded were interviewed by team members with CITI (Collaborative Institutional Training Initiative) training, to gain insight into Alamance County’s response to disasters and vulnerable populations.

Through our findings, we were able to obtain a preliminary picture of social and physical vulnerability in Alamance County, detailed in the assessment that follows. Physical vulnerability can refer to populations residing in structurally compromised houses or it can refer to critical facilities, such as schools, hospitals, or nursing homes. On the other hand, some populations may be at risk for less tangible reasons, such as age or income. We found the largest of these socially vulnerable populations in Alamance County to be the elderly and individuals with disabilities. Other key socially vulnerable populations, however, include economically vulnerable (low-income) populations, immobile (lack of transportation) persons, and non-English speaking populations.

Using the data collected through our research, we also created a series of county maps. The maps outline where certain critical facilities are located, and (to the extent that data was available) locations of certain vulnerable population. The purpose of the maps is to provide a visual representation of the distribution of facilities and populations in the county.

In addition to identifying vulnerable populations, an important aspect of our work was to understand how the county as a whole prepares for, handles, and responds to disasters. The interview component of our assessment was especially useful in gleaning knowledge about Alamance County’s routines in dealing with disasters. The most common emergencies dealt with in the county tend to be weather, public health, or transportation-related. From interviews with officials in various departments, it is apparent that communication is important to the people in

Alamance County who deal with emergency planning and response. Depending on the type of emergency, this communication can include people in charge of law enforcement, fire marshals, public health officials, and social services workers, but it can also include coordinating with emergency shelters, the local emergency planning committee (LEPC), citizen emergency response teams (CERT) and the local Red Cross, to name a few.

Communication with the general population in times of emergency is inherently more difficult, given the wide range of communication pathways people use. Alamance County currently has a voluntary registry to notify and provide assistance for special needs citizens, but the need for a more comprehensive system was expressed by several county officials during the interview portion of our assessment.

Our main recommendation for Alamance County, to improve preparedness and response to disasters, would be to implement a call-out system for all citizens. Such systems can provide information via different lines of communication including phone calls, text messages, emails and social media updates to reach a large portion of the population and have the potential to reach non-English speaking populations.

Furthermore, a general increase in education and public awareness concerning emergency situation procedures in the county would be beneficial to all citizens. For officials handling local disasters, a series of county maps displaying the locations of vulnerable populations as well as critical and structurally vulnerable facilities would be beneficial for easy identification of areas to focus aid during emergencies.

A more comprehensive overview of recommendations is given in the full vulnerability assessment report.

Project Description

The ENST 698 capstone at UNC-CH is a semester-long team project that involves background research, in-depth analysis, outreach, and production of concrete evaluations in relation to an environmental or social issue presented by a community client. Consisting of five or more team members, project teams are assigned an area of study from a primary client. The intent of the study is to provide improvements, suggestions, or a greater scope of knowledge on the issue of interest.

The team spends the early weeks of the semester organizing a work plan that spans the entirety of the semester and provides a clear schedule of accomplishments and goals relevant to the needs of the client. The capstone instructor is present to provide guidance and resources needed for work progression in the framework of the plan, as well as to act as the liaison between primary contacts and the project team.

Recent major disasters have highlighted the difficulty communities may face in preparing for and responding to disasters effectively, and in protecting vulnerable populations such as low-income, elderly, and mobility-limited, among others. The Disaster Vulnerability Assessment group focused on conducting analysis and providing recommendations to the Alamance County Emergency Management regarding disaster preparedness, response, and vulnerability of particular populations as well as relevant critical facilities. The group was subdivided into two teams: The Interview group, tasked with formulating interviews and gathering primary information from key community informants, and the Secondary Data group, tasked with doing background research,

populating vulnerability assessment worksheets, and producing maps with ArcGIS. Near the beginning of the semester, the capstone team met with Alamance County Emergency Management Coordinator David Leonard to consult on the direction of the project and formulate a work plan.

Key informant interviews were conducted by the Interview Team to gain more information about preparing for disasters, responding to disasters, discovering vulnerable populations specific to a region, and discerning any suggestions for improving the current system. Knowing how interviewed officials respond to disasters and assist vulnerable populations, the team members gained insights into the current state of disaster response in Alamance, driving our goals of research and providing a foundation to build a community tool with recommendations for the county.

The Secondary Data team employed a community-level guide on conducting such an analysis, developed by researchers at MDC Inc. and the Center for Sustainable community Design (UNC Institute for the Environment). This FEMA-funded guide grew out of a demonstration project that sought to understand the barriers preventing low-resource communities from preparing for disasters and to identify promising strategies to diminish gaps in emergency response. With the completion of the vulnerability assessment worksheets, the team was able to produce vulnerability profiles of Alamance County in the forms of maps and written analyses. The synthesis of the products from the two teams is embodied in the following disaster vulnerability tool created for Alamance County.

County Profile

Early accounts from the British Explorer John Lawson of what would eventually become Alamance County described the area as having rich land that would be capable of holding "some thousands of families." The Sissipawah tribe, about whom little is known, occupied the area around the Haw River prior to European settling.

Beyond the First Americans, Alamance was first settled by religious groups including Quakers, Presbyterians, Lutherans, and German reform settlers. These early settlements were located in areas near modern-day Alamance towns of Snow Camp, Belmont, and Mebane. The Colonial period in the county was marked by several bouts of war including militia members sent to fight in the French and Indian War and later, the Battle of Alamance. That battle took place on May 16, 1771 between Governor Tryon and a group of poor North Carolina farmers, known as "The Regulators."

The Battle of Alamance was a brief preview of what was to sweep the nation five years later in the American Revolution. During the revolution, Alamance County (what was at the time Orange County) witnessed several more battles including the Battle of Lindley's Mill, which ended the Revolutionary War in North Carolina.

Alamance County was formed in 1849. Previously it had been considered the western part of Orange County. The line separating the counties is 9 miles west of Hillsborough. Agriculture, transportation with the building of the Atlantic and North Carolina railroads, and textile mills were the largest industries in the county after the Revolutionary War.

In 1860, approximately 33% of the county's population was slaves. Alamance County had over 230 lives lost during the Civil War. Reconstruction put the south into a recession, and Alamance County was no exception. Alamance County was declared to be in insurrection in July 1870 by Governor William Holden because of racial and political tension in the county, which led to the murder of two

men. Holden was the first governor to be removed from office in the history of the U.S. because he arrested over 100 people, but ignored court orders by the State Supreme Court to have them charged in court.

New mills provided new job opportunities and technological innovations such as electrical power and advancements in transportation and the railroad system all helped boost Alamance County's economy at the end of the 19th century. The first steam-powered mill opened in Alamance County in 1882. Alamance Plaids, which were developed in the 1850s, remained popular up until World War II and this textile business provided good job opportunities for the area. New towns and cities formed around the growing mill industry. In 1889, Elon College, which is Elon University today, was founded in Alamance County.

During the 1950s, the Greensboro sit-ins were one of the most famous events in the Civil Rights Movement. Greensboro is not in Alamance county but very close by. Many of the textile mills began to close in the 1970s and there was a shift in the local economy. New industry and jobs in high-tech manufacturing and business have taken their place.

Social Vulnerability

Definition of Social Vulnerability

Within the definition of vulnerability exist two types of vulnerability, social and physical. Social vulnerability is defined as the susceptibility of a population to various emergencies, hazards and disasters based on their social characteristics such as income, age, language ability, and physical disability. Demographic factors like these influence the social vulnerability of a population by hindering the ability of specific groups of people to respond to emergencies, primarily by impairing the group's mobility and/or communication. Social vulnerability varies across space, and different types of social vulnerability can affect people differently according to the type of emergency. For these reasons, integrating and engaging socially vulnerable populations into critical social networks is an important task for emergency planners.

Analysis of Findings from Worksheets and Other Sources

The worksheets completed as part of this Vulnerability Assessment are useful in identifying vulnerable populations within Alamance County. The worksheet below, entitled "Community Demographics Survey," is especially helpful in identifying *socially* vulnerable populations in Alamance, with the most notable statistics highlighted below. Additionally informing this section are interviews with officials in Alamance County, the Alamance County's 2020 Plan, and additional tables from the 2010 Census. Findings from these sources will be analyzed in the subsections below.

Elderly and Physically Disabled Populations

It is important to note at the beginning of this section that the elderly and physically disabled—including blind, deaf and hard of hearing, and cognitively impaired—populations of Alamance County are not one and the same, nor do they necessarily overlap. The populations were grouped together here primarily because they require similar kinds of support in emergencies (e.g., requiring direct aid for transport during an emergency) and are vulnerable in similar ways (e.g., impaired alertness to emergencies) (MDC, 31).

According to the 2010 Census cited in the worksheet below, 14.61% of the population in Alamance County is above the age of 65. This segment of the population is expected to explode over the next two decades as the baby boom generation enters its retirement years, with that statistic reaching 20% by 2020 (Destination 2020). Alamance County’s own Emergency Medical Services projects that the growth of the elderly population will have a significant impact on the emergency services provided by the county (Destination 2020). Similarly, the physically disabled population of Alamance County constitutes 14.05% of the general population, though there are no strong indicators that it will increase in the coming years.

Worksheet 3: Community Demographics Survey

Group	%Alamance County	% NC	% USA
Physically Vulnerable:			
Elderly (65+)	14.61%	12.94%	13.04%
Single Head of House*	10.69%	10.09%	9.56%
Physically Disabled	14.05%	13.20%	11.95%
Institutionalized Persons	0.56%	1.19%	1.10%
Economically Vulnerable			
Median household income	\$44,058	\$43,326	\$50,046
Households living below poverty line	12.13%	11.96%	10.49%
Vehicle unavailability	7.51%	6.59%	9.08%
Culturally and Historically Vulnerable			
Non-English speaking	5.89%	4.81%	8.72%
Ethnicity:			
Hispanic	11.00%	8.39%	16.35%
Non-Hispanic	89.00%	91.61%	83.65%
Race:			
African-American	18.77%	21.48%	12.61%
American-Indian	0.67%	1.28%	9.50%
Asian-American	1.22%	2.19%	4.75%
White	71.08%	68.47%	72.41%
Two or more races	2.08%	2.16%	2.92%
Other	6.18%	4.42%	6.19%
Structurally Vulnerable			
Residents living in mobile homes	13.98%	14.00%	6.55%
Other			

* Defined as Single householders (male and female) with own children under 18 years

Economically Vulnerable Populations

12.13% of the population in Alamance County is living below the national poverty line, which has several significant implications for social vulnerability. Pertaining to emergencies in particular, a large section of the population living below the poverty line likely overlaps with the population living in mobile homes or substandard housing (see section on structural vulnerability below), which has obvious implications for their vulnerability to natural disasters. Economically vulnerable populations also tend to overlap with immobile populations, which will be described in the

following section (2010 Census, Vehicles Available and Household Income Table). Additionally, people living below the poverty line have lower purchasing power, which can have a direct impact on the household's ability to buffer themselves with extra food and supplies against extended emergencies such as being snowed or flooded in, for example. According to the State of the County Health Report 10,317 households received Food and Nutrition Services from the state in 2010, representing a significant population that, in the case of an emergency, would have hindered access to critical resources (Alamance County Health Department, 1).

Immobile Populations

There are 4,494 households in Alamance County with no access to a vehicle, representing 7.51% of the population (2010 Census). Immobile populations are vulnerable in the event of an emergency because often emergencies push people out of their homes into shelters or emergency care, which is problematic if the household has no available form of transportation. The burden of transportation for this population often falls on the county's emergency services, which can be dangerous since this causes more people to be out in an emergency for longer periods of time. One public official identified this lack of a strong transportation network for the immobile population of Alamance as the largest area that goes inadequately addressed in emergency planning.

Non-English Speaking Populations

Conservative estimates suggest that from the year 1990 to the year 2000 the Hispanic population of Alamance County grew by over 1100%, from 736 to 8,835, increasing from 1% of the population to 4% (Destination 2020). Today, the non-English speaking population of Alamance County is 5.89%, a whole percentage point higher than the percentage for North Carolina (2010 Census). Language diversity can pose some serious challenges to the county's provision of social services, including emergency services. Populations that do not speak the official language of a community are socially vulnerable to emergencies if the community does not make a point of communicating in multiple languages during emergencies. Alamance County has acknowledged this trend in its Destination 2020 Plan, suggesting that hiring bilingual employees and creating bilingual informational materials for the county in the areas of emergency management, education, law enforcement and public safety could be helpful.

Highlighting Socially Vulnerable Populations in Alamance County

Statistically speaking, the largest vulnerable populations are the elderly and physically disabled. However, from the perspective of county officials engaged in emergency planning the populations that need the most attention from the county are the immobile population and, as will be discussed below, the population living in mobile homes. This is reflective of the *type* of emergencies most often faced by Alamance County, since the greatest risks posed by weather-related emergencies are to safe transportation and safe shelter. Additionally, it is logical that these populations would be identified as needing to be highlighted since, according to county officials, there is still so much room for improvement in providing for these populations. Specific recommendations for integrating these vulnerable populations into stronger networks of emergency care will be discussed in a later section.

Physical Vulnerability

Definition of Physical Vulnerability

Physical vulnerability refers to the people and property at risk if a disaster or an emergency occurs (MDC 23). The physical vulnerability of Alamance County was considered by looking at its historical susceptibility to natural disasters. The majority of the data came from the National Climate Data Center (NCDC) Storm Events database and the Alamance County Hazard Mitigation Plan. The primary hazards for Alamance County (in order of likelihood) are: thunderstorms, hurricanes and flooding, winter storms, wild fires, tornados, drought, and earthquakes. Severe weather events cause the most architectural damage each year in Alamance County.

Analysis of Findings from Worksheets

The worksheets (see Appendix, Worksheets 5 and 6) serve to list and rank vulnerable populations, dangerous storm events, and potential economic cost of damages in Alamance County. In this section, the worksheet findings are analyzed and explained.

Storms

The primary weather events that affect Alamance County are storms. Storms include thunderstorms, hurricanes, winter storms, and tornados. There have been five recorded tornado events in the county since 1975. The total estimated damage from these occurrences is \$1.03 million (NCDC Storm Events). The damage incurred from the storm is dependent upon the storm's severity and the region(s) that it hits. A large proportion of the population in Alamance County is elderly, individuals who may be unable to evacuate in the case of a storm. Furthermore, there are 133 mobile home parks in the county, each of which is very susceptible to serious structural damage and loss of life, even from relatively weak storms. Hurricanes and tropical storms have also hit Alamance County and have caused significant amounts of property damage. However, contrary to storm or tornado events, people are typically warned before a hurricane hits and thus are able to prepare accordingly.

Flooding

Flooding often results from heavy rain and storms in Alamance County. The amount of damage incurred varies depending on the geography, amount of rain, and condition of the area's soil before the storm. There have been 25 flooding events in the county recorded between 1993 and 2011. One example of flooding in the county occurred in February 1998 when the Haw River flooded and caused widespread power outages of varying lengths in the county (NCDC Storm Events). Flooding has caused significant property and crop damage in Alamance County. While riverine flooding is the most common type of flooding event in the area, flash floods can also occur. Flooding vulnerability can be reduced by additional focus on land use in floodplains. Special attention must be paid to residential and commercial development so that they are not placed in flood prone areas. Alamance County has focused on reducing susceptibility by regulating commercial or private use of at-risk land.

Windstorms

Windstorms have caused considerable property damaged in Alamance County. The total for estimated physical damage since 1957 is \$237,000 (NCDC Storm Events). These events are often connected to thunderstorms, but can occur on their own as well. The effects of windstorms are difficult to minimize with local hazard mitigation initiatives, but raising public awareness regarding

their importance can have a significant impact for recovery and protection of life through improved preparation. The physical vulnerabilities in Alamance County can be minimized with proper planning and education.

Highlighting Physically Vulnerable Populations in Alamance County

Given that strong storms are the most common natural disaster in Alamance County, populations living in structurally vulnerable housing, such as mobile homes, are at the highest risk for injury, property damage, and loss of life. As previously mentioned, there are 133 mobile home communities in the county, each of which is vulnerable to strong winds and flooding that can come with strong thunderstorms. There are other sections of the population that are very physically vulnerable due to their dependence on agriculture for well-being or their proximity to potentially hazardous sites, such as the Alamance County Landfill or a facility housing harmful chemical materials.

In 2000, 23% of all new homes in Alamance County were mobile homes and 2.68% of all housing was considered to be substandard, in other words, not up to local building or housing code (Destination 2020 GF-13). Today, 13.98% of the population lives in mobile homes, more than double the national average (2010 Census), yet below the average in the state of North Carolina of 16.4% (Destination 2020 GF-12). These two segments of the population – those living in mobile homes and those living in substandard housing – are especially vulnerable to storm-related emergencies, since their shelters are poor protection from violent or extreme weather. This population is especially vulnerable to flooding because of the impermanent and unstable nature of their housing.

Harvested cropland is also a concern for physical vulnerability in the county because it is a major source of income for many residents. Such residents are often unwilling to leave their land, which poses a risk to their health, and they may suffer from significant economic set backs as well. Alamance County has 8.1% of harvested cropland as a percentage of total land area in the county. This value is also below the North Carolina average of 13.2%. (Destination 2020 GF-23)

There are other populations in Alamance County that are also at risk in terms of physical vulnerability due to their proximity to specific sites. Individuals living near waste disposal sites and landfills are at additional risk due to potentially contaminated runoff from such sites. Recreational water quality is at risk in such areas due to their proximity to trash disposal sites. Flooding on any scale is also a serious concern for those living in these areas. In the event of a catastrophic failure of such a site, those living in the surrounding area will be disproportionately affected by the waste generated.

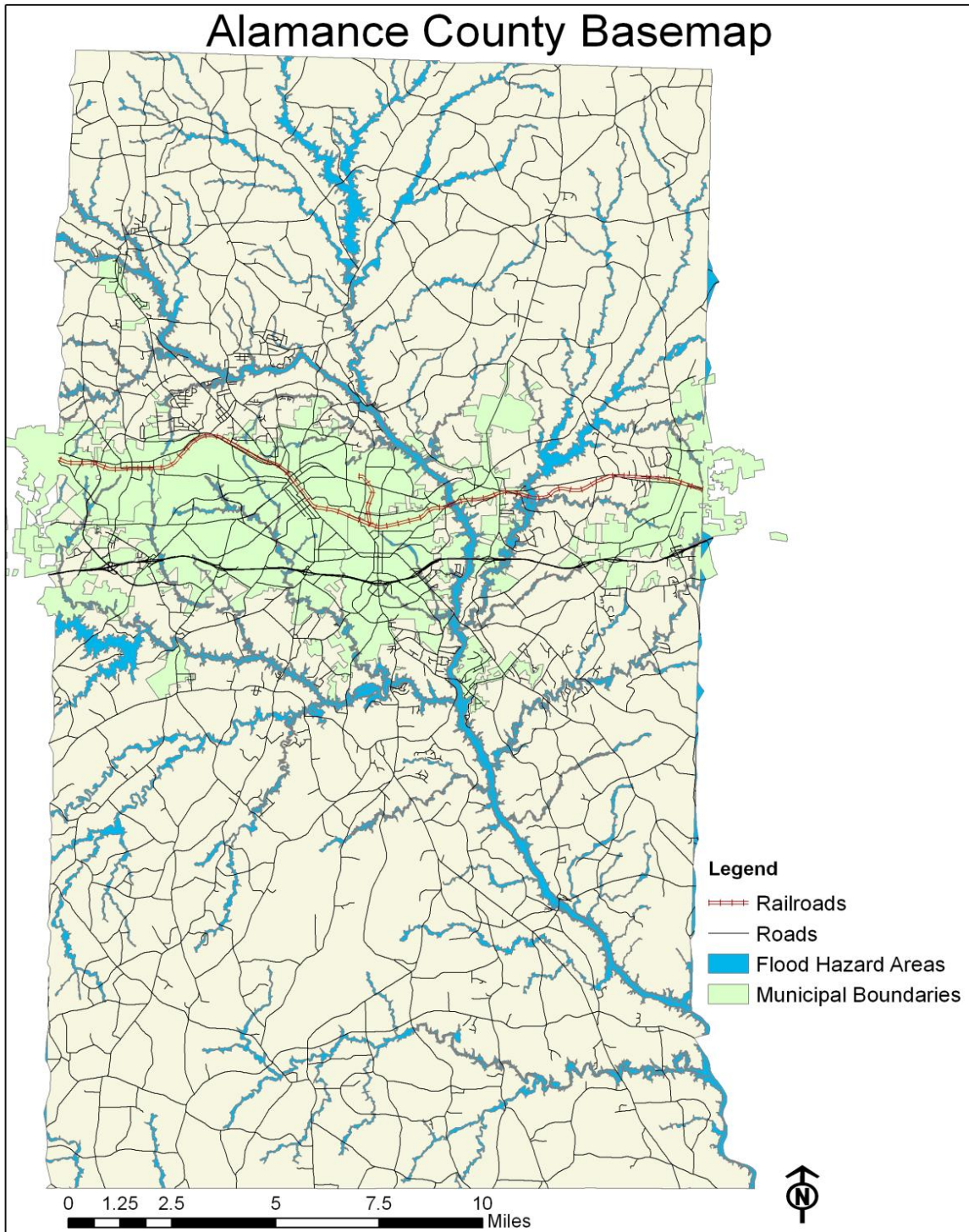
Maps

The intent of the following maps is to provide a general view and awareness of the geographic location of critical facilities in Alamance County, in light of environmental and natural threats. Understanding the physical location of critical facilities can help users of the assessment tool to discern which populations are the most vulnerable. Geographic features such as area, floodplains, and infrastructure (roads/railroads) were taken from UNC GIS Data Finder. The locations of the critical facilities were gathered independently and geocoded to addresses using GIS software. All maps were built in ArcGIS 10.

(Maps begin on next page)

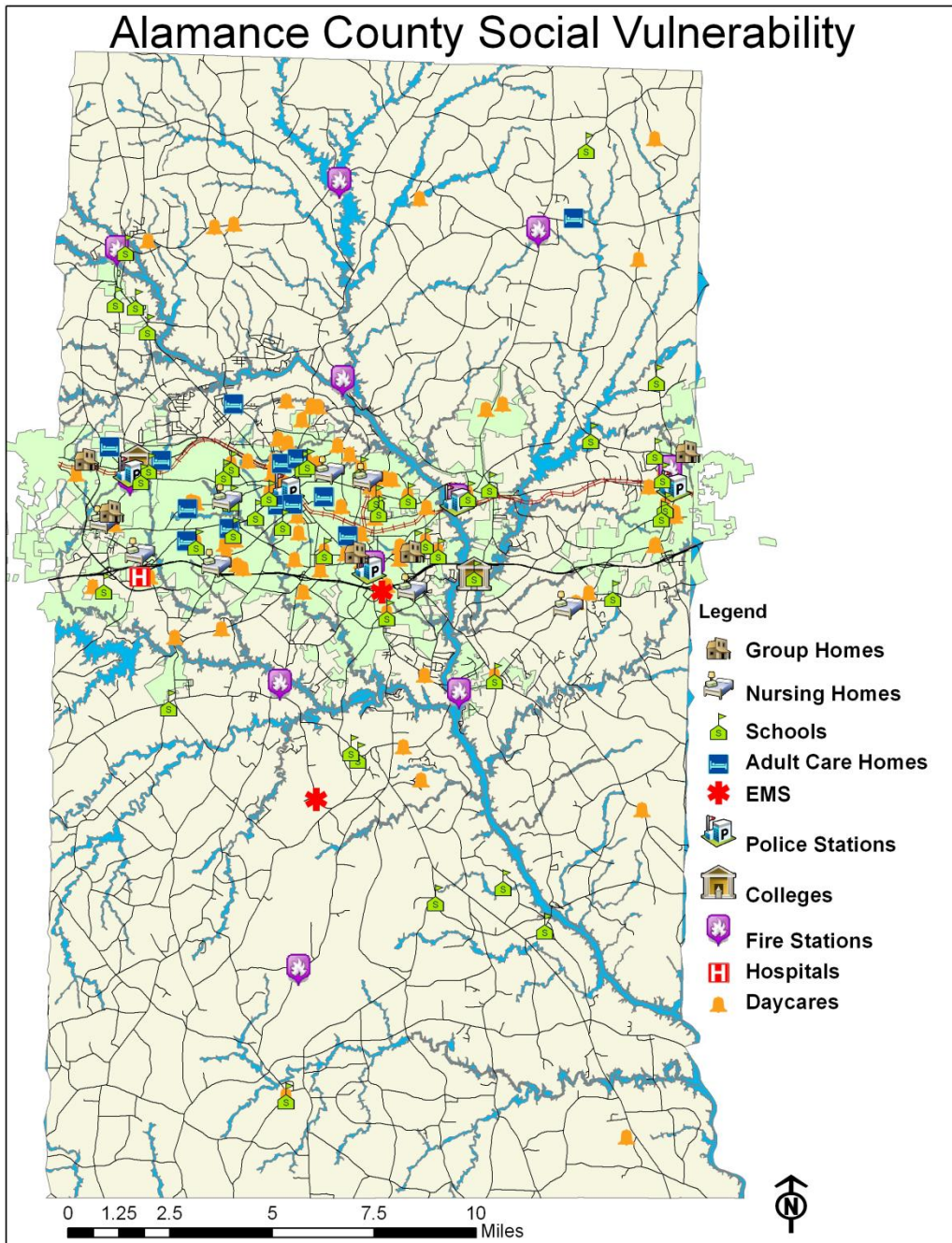
Basemap

The basemap of Alamance County serves as the foundation for all subsequent maps, portraying the municipal boundaries of towns, major roads, and passenger railroads within the county. Furthermore, the basemap showcases the flood hazard zones for the county in order to ascertain their proximity to critical facilities and physically vulnerable sites. (UNC GIS DataFinder)



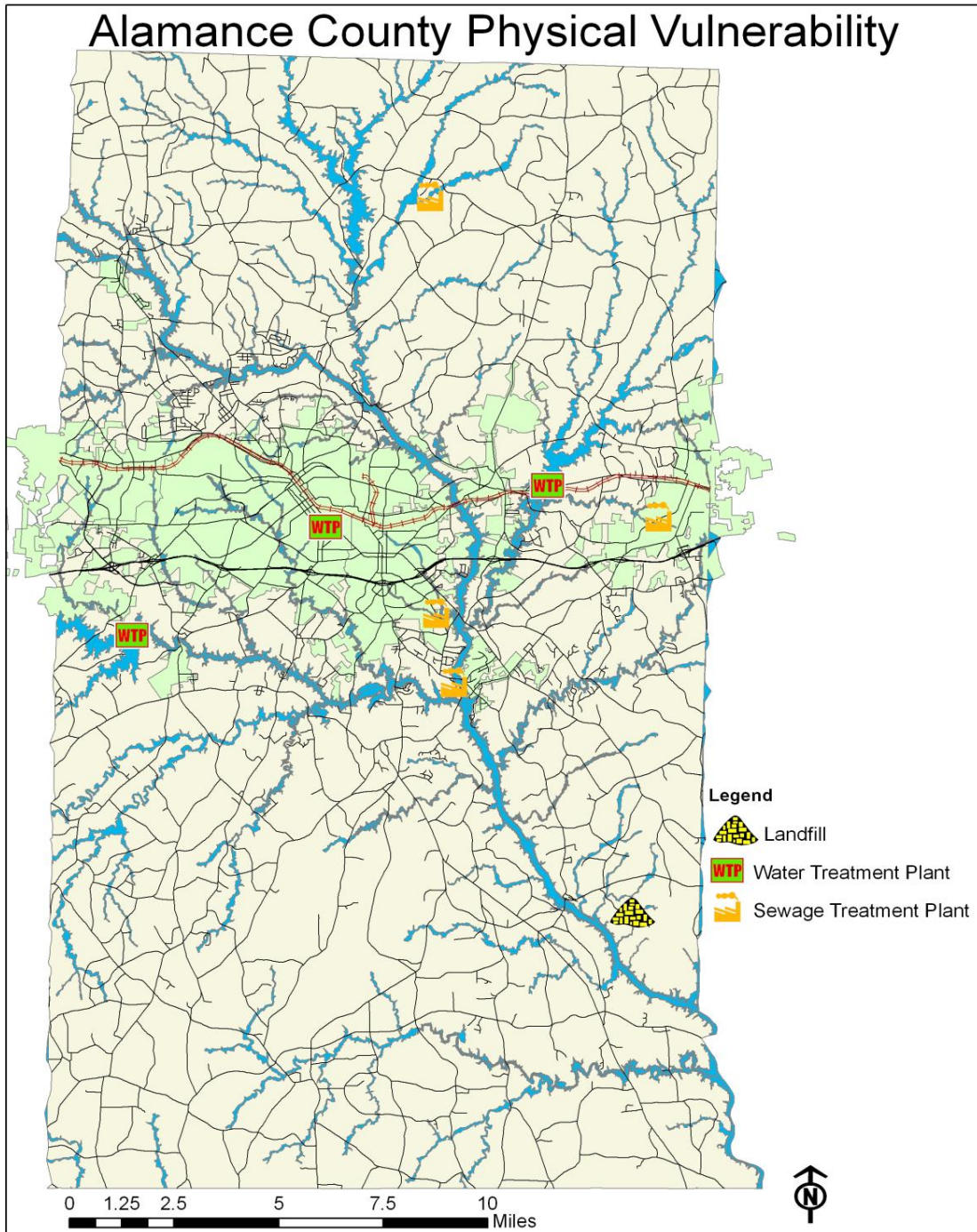
Social Vulnerability

The Alamance County Social Vulnerability Map displays all of the facilities gathered and presented in Worksheet 7: Critical Facilities Inventory (see Appendix). These sites represent buildings that house vulnerable populations that require immediate attention in the event of a natural disaster, as well as all emergency response centers that mobilize in the event of a disaster. However, this map is not comprehensive, as residentially vulnerable structures and buildings are not represented. For example, mobile home communities are especially vulnerable in the event of certain disasters but are not present on this map due to data availability. In addition, the map does not represent scattered single buildings where vulnerable individuals may be found.



Physical Vulnerability Map

The Alamance County Physical Vulnerability Map shows the critical facilities related to water treatment and waste disposal. The damage or disruption of these facilities as a result of a natural disaster could have adverse effects for the surrounding populations in Alamance County, such as the failure of a water treatment plant to provide clean water. The important facilities were taken from the "Destination 2020 Strategic Plan" planning document submitted by Alamance County Planning Department. (Destination 2020)



Interview Process and Findings

The team conducted interviews with eight key informants in order to gather information for the Alamance County vulnerability assessment. We spoke directly with professionals in various emergency management and disaster relief positions, which allowed us to assemble a big picture overview of how the county prepares for, responds to, and handles states of emergency.

We began the interview process by submitting a list of potential interview questions through the Institutional Review Board (IRB). The questions were formulated based on previous vulnerability assessments, as well as additional questions we deemed necessary in order to understand the county's overall disaster response. Once the IRB approved the interview guide, three members of the team underwent CITI (Collaborative Institutional Training Initiative) training to be properly trained and certified to conduct interviews.

The team generated a list of potential key informants and set up a time to talk with each person who responded. The interviews were mostly conducted by three team members and were audio recorded. Audio recordings were then divided and transcribed by several team members and coded for anonymity. The interview coding process allowed us to identify important trends and conclusions from interviewees' responses to incorporate in our analyses of Alamance County's emergency preparedness and response.

Key Informant Selection

A list of potential key informants was initially generated based on extensive browsing through Alamance County's official website for people in departments that would be most familiar with emergency planning and disaster response. These people were contacted either by phone or email and those who responded and agreed to participate in the assessment, were interviewed over the phone. Other potential key informants were identified through referrals during previous interviews and contacted in the same manner, by one of the three CITI certified team members.

Common or Recent Emergencies and Natural Disasters

The most common emergencies discussed were weather-related events or natural disasters, public health incidents, and transportation incidents. Alamance County experiences a wide range of severe weather-related events including severe thunderstorms, tornados, ice storms, severe heat, straight-line winds, flooding, and sometimes effects of hurricanes if they reach that far inland. Two major public health incidents that were frequently cited were the 2009 H1N1 virus outbreak (Nickens 2009) and a 2011 pertussis outbreak (Marvin 2011).

Transportation incidents, especially involving hazardous materials spills and leaks, were also frequently mentioned since two major interstates (I-40 and I-85) and a railway run straight through Alamance County. On May 13, 2010, there was a train derailment where an Amtrak-operated passenger train heading from Raleigh to Charlotte hit a tractor-trailer and derailed in Alamance County. The collision resulted in 13 injuries and no fatalities (WRAL).

Professionals typically involved in emergency response include emergency operations, law enforcement, and the fire Marshall's office. "Routine emergencies" or everyday type emergencies include fire calls, medical calls and law enforcement calls. The most recent large-scale disaster mentioned was the series of tornadoes that took place on April 16, 2011. Tornado sirens were signaled in the Elon area of Alamance County. Emergency dispatchers have received some damage reports in the area around Burch Bridge Road in the Altamahaw community (Brock 2011). There were no reports of injuries. Other mentions of recent notable disasters include a false bomb threat on Alamance County Criminal Courts building in Graham.

The last event where Alamance County residents sought shelter was in January 2001 during an ice storm where power was lost for several days and people needed shelter for warmth and electricity. Since then there have been several instances where shelters were opened in an effort to be proactive but no one came to seek shelter. In May 2000, Burlington experienced straight-line winds that caused a great deal of property damage (Harned 2000). Lastly, there was an emergency where employees at a private business got carbon monoxide poisoning from improperly ventilated forklift exhaust fumes.

Emergency Planning and Response

Emergency planning in Alamance County is a continuous cycle that requires ongoing planning meetings and a constant cycle of revisions. Many of the key informants said they would like to change the emergency planning process in order to create a more fluid and cohesive plan for the county. There is a set cycle of emergency preparedness in the county: a plan for an emergency is set, the emergency is managed, officials respond to the immediate needs of the county and then officials focus on recovery. The current local emergency planning committee (LEPC) was established in Alamance County subsequent to the 1986 Superfund Amendment and reauthorization Act (SARA) to respond to the need for communities to know more about chemical hazards and to create specific response plans for these emergencies. Alamance County's LEPC consists of representatives from industry, interested community members, government officials and individuals from specific agencies who assure that Alamance County has the planning and resource capabilities for chemical emergencies (Alamance County Government).

Anytime there is an emergency situation in Alamance County, the emergency management office will be notified by the central communications, or C-COMM, the local 911 staff. Once the office is notified, the staff will either report the event to the incident commander or make a determination about what needs the emergency responders have and whether or not they need to assist them on site. The incident command system (ICS) model can be applied in various types of emergencies. An ICS model is a systematic tool used for the command, control, and coordination of emergency response. It is "a set of personnel, policies, procedures, facilities, and equipment, integrated into a common organizational structure designed to improve emergency response operations of all types and complexities" (FEMA). The office tries to respond to the emergency using the National Institute Management System (NIMS) for a unified command: breaking the emergency down into different areas such as an operations, planning, logistics and finance sections, different functional groups, and assigning staff and personnel throughout those particular areas to make sure needs are being met.

There is no mass notification system to notify the public in Alamance County besides a special needs registry. Citywide notification is important for moving forward with and including planning for at-risk populations that needs community input in order to create a more efficient and complete plan. Currently the county relies on TV/radio/media outlets to get the message across to their citizens but there are innate problems within these outlets, such as not everyone has access to these media outlets, or these messages could only be in English, thereby excluding the non-English speaking populations. One idea for a mass notification system is a call-out, if an emergency presents itself, say a severe weather emergency, this system would automatically contact residents by phone call, text message, email and/or a social media update with details of the emergency. For people that may not have access to technology, emergency officials may go into those communities with warning sirens. However there are budgetary issues that plague emergency planning where many counties just cannot afford to overhaul the notification system due to budgetary constraints.

Emergency response is continuously being revised with details and actions of the previous response. Using emergency coordinating matrices is one method to ensure that everything that

should happen gets done, as an emergency checklist. Key informants stressed the need for further public awareness and education. There are training and drills throughout the year for emergency planning committee professionals. The committee consists of human and social services contacts, as well as county commissioners and private business representatives. One key informant suggested that more private partners should be involved in the trainings in order to ensure that everyone is included in the event of an emergency. By involving community members and citizen groups, it allows the emergency management planning committee to effectively reach more citizens and helps to fill in the gaps of not reaching at-risk populations. One key informant stated that they would like to create a notification system for emergency management employees to help ensure that all those required for the mitigation process are notified as soon as possible. This would include notifying those in the ICS by calling their cell phone or home phone, emailing or texting so that everyone is notified as fast as possible. Alamance County's Department of Social Services (DSS) has 12 shelter teams already in place, with each team consisting of a leader and 10-12 members. A system of operation has been put in place to determine when these shelter teams are needed and to ensure that they are constantly updated with their contact information so these teams can be ready to go at any time. These teams periodically go through training to make certain that they are prepared. The DSS works closely with the Red Cross to determine whether or not a site meets the Red Cross' criteria for a shelter. Depending on the weather circumstance (excluding tornadoes), the DSS usually has a few hours of advanced planning time before opening a shelter.

The Red Cross can provide emergency assistance for people displaced by natural disasters, such as a fire for instance. They can lodge affected residents in a hotel for several nights and provide them with food, water, etc. They also conduct door-to-door neighborhood assessments, looking at the aftermath of a disaster to see what has been affected and what their response needs to be.

The Alamance County Public Health department can provide mass clinics and vaccinations in the case of an outbreak. Public health emergency events tend to last longer. The department has to also consider events like nuclear, biological or chemical emergencies. For outbreaks, they look to the CDC and state communicable disease recommendations for immunizations, prophylaxis, etc. When responding to events, such as the December 2011 Pertussis outbreak, the department has to consider vaccine efficacy, when to administer vaccine boosters and who should receive care first.

At-Risk populations

Key informants emphasized the variability of vulnerable populations based on different types of disasters. Children, for example, were frequently cited throughout the interviews as a population that is vulnerable to transmission of the recent pertussis outbreak from riding school buses, being in classrooms with many other students, etc. In the case of a tornado, the vulnerable population would change to residents living in structurally vulnerable houses, such as mobile home units. People with no access to technology may be disadvantaged when notifications about any type of disaster is sent out to the community

Social Vulnerability

Low-income elderly, assisted living, disabled, and special needs patients (wheel-chair confined, people on oxygen, people who need special medications) are especially vulnerable during disasters and emergencies. The growing Hispanic community is also vulnerable. There is a special need to be able to communicate messages in Spanish, or other languages of non-English speakers in the county. Poverty-stricken citizens may not be able evacuate in a timely manner, due to lack of transportation. This may include people who do not own a car or do not have social connections to provide transportation. If an on-going disaster occurs and the governor has declared a disaster area, the Department of Social Services must go through the federal government to be issued disaster food stamps for low-income people. Individuals who live alone are also vulnerable,

especially if they are elderly and/or disabled. The DSS will contact the 55 adult care homes and go by those homes, if there is no response by telephone. In rural communities, local volunteer fire dept's often are knowledgeable about vulnerable populations in their community.

Physical Vulnerability

There are 133 mobile home parks in Alamance County. These mobile home residents are especially vulnerable in rapidly developing natural disasters, such as tornados. Alamance County is a rural-urban mix but enough of the county is rural that it's hard to get places without proper transportation.

Recommendations

Introduction

Because scheduling and communications constraints prevented the team from immersing itself fully in the specific problems of Alamance County, our recommendations are generic in nature. Because of the county's consistent focus on minimizing the impact of disasters, it was difficult to give strong and specific recommendations. Listed below is a summary of our recommendations. Pertussis and the emergency call-out system also are described in detail.

- Increase focus on pertussis as a public health hazard.
- Implement advanced emergency call out system.
- Create GIS layered maps of mobile home facilities along with flood plains, increased populations of non-English speaking residents
- Begin a public awareness campaign for disaster education so that residents will be better prepared to respond.

Pertussis

The Alamance County Health Department has investigated several cases of pertussis in Alamance County schools during January 2012. Pertussis, which is also referred to as whooping cough, is a bacterial infection that resembles the common cold (runny nose, cough, and slight fever) and leads to prolonged bursts of coughing, sometimes with a whooping sounds at the end, over a span of about two weeks. Pertussis is usually spread from an infected person through coughing and sometimes from touching a surface with pertussis bacteria on it. Many people with this infection will have a cough that lasts a number of weeks. Parents should not be overly concerned since this infection is rarely a cause of serious disease or hospitalization children or adults. The best way to prevent pertussis is to make sure that both you and your child are up to date with your vaccination (DTaP).

For additional information on pertussis, please go to the CDC website: <http://www.cdc.gov/pertussis>.

Emergency Call-Out System

Currently, Alamance County maintains only a special needs registry to contact vulnerable citizens, which is essentially a call list for individuals who choose to sign up for advanced notification and advisory direction. Aside from this special needs registry, a public official stated that there is no mass public emergency call-out system used to preemptively address emergencies and advise the general population during a disaster. There are several levels and modes of contact that need to be addressed in an effective emergency call out system. To recommend an appropriate emergency call-out system to Alamance County, we can evaluate the successes and best practices of several existing call-out systems in similar areas.

FEMA has released a mitigation best practices case study detailing an emergency call-out system implemented in Guadalupe County, TX, a county with a relatively similar population as Alamance County that is plagued by flooding issues. Guadalupe County utilizes an automated telephone notification system with two databases of phone numbers, one that consists of landline telephone numbers regularly updated by AT&T, and the other consisting of telephone numbers collected from an Emergency Call-out System Voluntary Registration form distributed to residents located in established flood hazard zones. This second database goes beyond the normal landline database by

including cable phone and cell phone numbers, since roughly 20-30% percentage of the population lack landline phones or do not use landline phones as their primary phone. Only two phone numbers per household can be registered for the sake of freeing up the lines, given that each emergency notification takes 1-2 minutes per phone call. Residents are asked to update their numbers in writing if they move out of the flood hazard zone. In addition to this automated phone system, the county has a network of 23 emergency notification sirens placed in regions of severe flooding, which also can warn residents of other hazards such as Haz-Mat incidents, or tornados or other severe weathers. It seems as though Alamance County lacks a siren system, which could be of use if residents are not actively tuning into media sources or are not near a telephone.

Another good example of an effective emergency call-out system is that of UNC's own Alert Carolina in neighboring Orange County. Though on a smaller scale compared to the entirety of Alamance County's population, Alert Carolina serves nearly 30,000 students and over 11,000 faculty and staff members. Similar to Guadalupe County's emergency call out, University students and workers are required to enter a cell phone number into the Alert Carolina database. Furthermore, Alert Carolina is driven by the ONYEN system, which is the personalized username of each university student and worker. Through the use of this ONYEN, students and workers also can specify the email address at which they wish to receive notifications. Alert Carolina sends out texts and emails in the event of an emergency situation, which is identified by emergency notification protocols that categorize the level of the emergency. In conjunction with an automated phone database, Alamance County could incorporate text and/or email notifications into an emergency call-out system. Texts and emails have the benefit of being more timely, succinct, and simpler to transmit than 1-2 minute phone calls used in the Guadalupe County example. However, any move to implement new systems using a full-scale text/email component should include consideration of the technology barrier this would present for some residents, since not all residents utilize cell phone or email technology.

Conclusion

Over the course of this semester the six undergraduate students in our capstone team have used the FEMA-funded *Community Based Vulnerability Assessment* tool developed by MDC, Inc. and UNC IE to complete a vulnerability assessment of Alamance County. To complete this task, we identified and gathered information about the socially and physically vulnerable populations of Alamance County, and determined areas of strength and weakness in Alamance County's emergency response plan.

In order to obtain information about the county's emergency preparedness and identify the vulnerable populations, half of the team members conducted key informant interviews and the other half completed the 11 worksheets in the assessment tool through online research. We were able to speak directly with professionals in emergency management and disaster relief positions in Alamance County and were able to take a comprehensive look at how the county plans, responds to, and prepares for disasters. Based on this information, we determined the most at-risk populations in Alamance County during emergencies and disasters. Of course, all populations are potentially at risk during a disaster and change based on the type of the disaster. Physical vulnerability refers to individuals that live in structurally unsound houses and critical facilities such as schools, nursing homes, day cares. The most prominent socially vulnerable populations in Alamance County include the elderly and the physically disabled. Other instances of social vulnerability in Alamance County are non-English speaker and individuals without access to transportation. Key informants also discussed what types of special precautions must be taken for these vulnerable populations in emergency response plans and disaster preparedness.

In addition, as part of our final product we completed a series of maps of the county, identifying critical facilities and certain vulnerable populations. The most common emergencies in Alamance County are natural disasters, public health incidents and transportation related disasters. The importance of communication in emergency response between different entities of the emergency response team and education of community members was emphasized by interviewees.

Our assessment would be more comprehensive had we been able to hold a community meeting in Alamance County, and spoken directly with both emergency management professionals and with community members—possibly including representatives of vulnerable populations—about their experiences with emergency response in Alamance County. Should such a meeting be possible in the future, the local input collected can be incorporated into a revised version of this report.

In light of the challenges of developing a working relationship with emergency professionals, the team became interested in how campus-community partnerships may successfully be established and maintained. To that end, the team conducted a literature review on such collaborations, to better understand what factors make a successful partnership and produce a reciprocal rather than hierarchical (university-dominant) relationship. (A fuller discussion of this literature review is provided in supplemental materials.) Challenges include assuring support from all parties, maintaining communication, and allowing partnerships to mature and build on sustained interactions and observations, rather than trying to move to action too quickly. A mutually beneficial relationship with input from both sides is best in campus-community partnerships. Strong lines of communication need to be developed and expectations of what both sides would like to achieve through the partnership should be made clear from the beginning. Although our team provided a substantial amount of information and analysis, team members believe the final product would be stronger and more useful with access to additional data and an opportunity to travel to Alamance County and meet with professionals and citizens.

References

- 2010 Census. Washington, D.C.: U.S. Census Bureau, 2009. Print.
- Alamance County Government. *Local Emergency Planning Committee*. Alamance County Health Department. 2012. Web. 18 Apr. 2012 <<http://www.alamance-nc.com/d/fire-marshall/chemical-planner/local-emergency-planning-committee-lepc.html>>.
- Alamance County Health Department. *State of the County Health Report*. Alamance County, Dec. 2010. Web. 16 Apr. 2012. <<http://www.alamance-nc.com/fileadmin/alamance/Health/docs/SOTCH%202010.pdf>>.
- Bass, Joseph. Alamance County Health Department Notice. 19 Jan. 2012. <<http://wom.abss.k12.nc.us/modules/groups/homepagefiles/cms/35277/File/Pertussis%20-%20English.pdf?sessionid=0544>>.
- Brock, Leigh. *Damage Reported as Severe Weather Rolls Through Triad*. WFMY News 2, 16 Apr. 2011. Web. 18 Apr. 2012 <<http://www.digtriad.com/news/article/171743/57/Damage-Reported-As-Severe-Weather-Rolls-Through-Triad>>.
- Destination 2020 Planning Workgroup. *Destination 2020*. 21 Apr. 2003. Alamance County Destination 2020 Strategic Plan. Alamance County.
- Federal Emergency Management Agency. *Incident Command System (ICS) Overview*. U.S. Department of Homeland Security. 2012. Web. 18 Apr. 2012 <<http://www.fema.gov/emergency/nims/IncidentCommandSystem.shtm>>.
- Federal Emergency Management Association. "Emergency Manager Finds New Use for Cable and Cell Phones." *FEMA.gov*. Federal Emergency Management Agency, 21 Sept. 2007. Web. 15 Mar. 2012. <<http://www.fema.gov/mitigationbp/bestPracticeDetail.do;jsessionid=487D1CD076598C15DCE71847EA52CAEE.WorkerPublic?mitssId=4566>>.
- Harned, Steve. *Public Information Statement*. National Weather Service. Raleigh NC: 26 May 2000. <<http://www4.ncsu.edu/~nwsfo/storage/training/mcs/mcs.html>>.
- Marvin, Amanda. *Pertussis Case Confirmed in Alamance County Elementary School*. Alamance County Health Department. 27 Dec 2011. Alamance County, NC <<http://www.alamance-nc.com/a/article/pertussis-case-confirmed-in-alamance-county-elementary-school-467//abp/158.html>>.
- MDC, Inc. *Community Based Vulnerability Assessment*. Chapel Hill: Emergency Preparedness Demonstration Project, 2009. Print.
- National Weather Service Forecast Office: *Event Summaries, Case Studies and Event Maps*. 25 Feb. 2012. 24 Mar. 2012 <<http://www.erh.noaa.gov/rah/events/>>.
- Nickens, Eric. *First Confirmed Novel H1N1 Case in Alamance County*. Alamance County Health Department. 9 June. 2011. Web. 18 Apr. 2012 <<http://www.alamance-nc.com/a/archive/2009/06/article/first-confirmed-novel-h1n1-case-in-alamance-county-163//abp/158.html>>.

UNC-CH. "About Alert Carolina." *AlertCarolina.unc.edu*. University of North Carolina, Jan. 2012. Web. 15 Mar. 2012. <<http://www.alertcarolina.unc.edu/go/doc/1395/1319331/>>.

UNC OIRA. "Permanent Full-Time/Part-Time Employees and Full-Time Equivalent by School and Division, Fall 2011." *Oira.unc.edu*. Office of Institutional Research and Assessment, 17 Jan. 2012. Web. 15 Mar. 2012. <<http://oira.unc.edu/permanent-full-time/part-time-employees-and-full-time-equivalent-by-school-and-division-fall-2007.html>>.

"Where We've Been - A History of Alamance County." *Alamance County*. Alamance County, NC, 2012. Web. 15 Feb 2012. <<http://www.alamance-nc.com/about-alamance-county/history.html>>.

WRAL. Hinchcliffe, Kelly., Johnson, Anne., Glusco, Jodi Leese., Hanrahan, Kathy,. May 13, 2011. WRAL News. Web. 18 Apr 2012 < <http://www.wral.com/news/local/story/7593803/>>.

Appendix

Worksheet 1: Taskforce Membership – Possible Future Taskforce

Source: Interviews from Alamance

Worksheet 2: Taskforce Contact Information – Possible Future Taskforce

Source: Interviews from Alamance, Online research

Worksheet 3: Community Demographics Survey

Source: Census

Worksheet 4: Inventory of Existing Information

Source: County Website

Worksheet 5: Identifying Hazards

Source: NCDC Storm Events

Worksheet 6: Ranking Hazards

Source: Wilson County Hazard Mitigation Plan

Worksheet 7: Critical Facilities Inventory

Source: School District Website, Google Maps, Interview, City of Alamance Planning Department

Worksheet 8: Current Inventory of People and Property

Source: Census 2010, CityData.com

Worksheet 9: Future Inventory of People and Property

Source: *Incomplete*

Worksheet 10: Employment Center Inventory

Source: Alamance County Chamber of Commerce, NC Community Profile

Worksheet 11: Environmental Threat Inventory

Source: *Incomplete*

Worksheet 1: Taskforce Membership

Possible Taskforce Member Affiliations and Characteristics		Represented?	
		Yes	No
Agencies	Public Safety/Emergency Management Office	X	
	Department of Health (include Office of Aging)	X	
	Department of Planning	X	
	Department of Social Services	X	
	Fire and Law Enforcement	X	
	School	X	
	State Emergency Management Agencies	X	
Community Groups	Community Development Corporations (CDCs)	X	
	Faith-based Organizations	X	
	Other Nonprofit Groups	X	
	Small Business Owners	X	
	Private Companies and Organizations	X	
Residents <i>(wait for meetings)</i>	Elderly		X
	Disabled		X
	Low Income		X
	Non-English Speakers		X
	Racial/Ethnic Minorities		X

Worksheet 2: Taskforce Contact Information [list of potentially interested stakeholders]

Name	Phone	E-mail Address	Title/Position	Affiliation
Leonard, David	(336) 227-1365	david.leonard@alamance-nc.com	Fire Marshall, Emergency Management Coordinator	Emergency Management Office
Allen, Brenda	(336) 570-4668		Executive Director	Loaves and Fishes Christian Food Ministry
Alley, Shannon	(336) 570-6367 ext 319	carl.carroll@alamance-nc.com	Environmental Health Specialist	Public Health Department
Bass, Joseph Barry	(336) 227-0101	joseph.bass@alamance-nc.com	Health Director	Public Health Department
Cox, Lillie, Ed.D.	(336) 570-6060		Superintendent	Alamance-Burlington Schools
Davis, Tod	(336) 210-0140	Tod@Carolina-RTS.com	Owner/President	Carolina Relocation and Transition Services
Farmer, Terry		pastormebane1st@aol.com	Senior Pastor	First Baptist Church
Hoell, Doug	(919) 733-3867	dhoell@ncem.org	Director	State Division of Emergency Management
Ireland, Jeremy	(336) 222-6868		Executive Director	Centro la Comunidad
Johnson, Terry S.	(336) 570-6311	terry.johnson@alamance-nc.com	Sheriff	County Sheriff's Office
Lamb, Wayne	(336) 376-3407	Contact available through website	Pastor	Chatham Friends Meeting
Lybrand, Brett		brett@stmarkschurch.org	Connections Pastor	St Marks Church
Martin, Jason, MPA	(336) 570-4053	jason.martin@alamance-nc.com	Manager	County Planning Department
York, Susan	(336) 229-3141	susan.york@alamance-nc.com	Adult Care Home Specialist/CAP	County Social Services Department
Porter, Brenda	(336) 538-8080	bporter@armc.com	Director	Alamance Eldercare, Inc.
Porterfield, Sheila	(336) 229-2986	sheila.porterfield@alamance-nc.com	Food and Nutrition Services Supervisor	County Social Services Department
Sanchiz, Juan	(336) 513-5477	jsanchiz@ci.burlington.nc.us	Latino Outreach Coordinator	Burlington Police Department
Smith, Zachary	(336) 229-3122	zsmith@ci.burlington.nc.us	Burlington, Director of Emergency Management	Burlington Police, Division Emergency Management
Stephenson, Bob	(336) 226-1331 (office phone)	rbch@bellsouth.net (general email)	Senior Pastor	Riverside Baptist Church
Wintringham, Robin	(336) 222-8191	Habitat1@netzero.net	Executive Director	Habitat for Humanity of Alamance County
Shatterly, Robbie	(336) 226-4906	shatterly@piedmontredcross.org	Emergency Services Manager	Red Cross
Wittman, Nathan	(336) 584-5411	preachernathan@gmail.com	Pastor	Fairview United Methodist Church
(No listed individuals)	(336) 228-8815	meals@alamancemow.org	(General contact information)	Meals on Wheels

Worksheet 3: Community Demographics

Group	% Alamance Co.	% NC	% USA
Physically Vulnerable:			
Elderly (65+)	14.61%	12.94%	13.04%
Single Head of House*	10.69%	10.09%	9.56%
Physically Disabled	14.05%	13.20%	11.95%
Institutionalized Persons	0.56%	1.19%	1.10%
Economically Vulnerable			
Median household income	\$44,058	\$43,326	\$50,046
Households living below poverty line	12.13%	11.96%	10.49%
Vehicle availability	7.51%	6.59%	9.08%
Culturally and Historically Vulnerable			
Non-English speaking	5.89%	4.81%	8.72%
Ethnicity:			
Hispanic	11.00%	8.39%	16.35%
Non-Hispanic	89.00%	91.61%	83.65%
Race:			
African-American	18.77%	21.48%	12.61%
American-Indian	0.67%	1.28%	9.50%
Asian-American	1.22%	2.19%	4.75%
White	71.08%	68.47%	72.41%
Two or more races	2.08%	2.16%	2.92%
Other	6.18%	4.42%	6.19%
Structurally Vulnerable			
Residents living in mobile homes	13.98%	14.00%	6.55%
Other			

* Defined as Single householders (male and female) with own children under 18 years

Worksheet 4: Existing Information

A: City of Burlington

Document	Available?	
	Yes	No
City or County Comprehensive Plans and Reports		
Comprehensive Plan	x	
Source: http://www.ci.burlington.nc.us/DocumentView.aspx?DID=2038		
Comprehensive Bicycle Plan		x
Housing Improvement Initiatives	x	
Source: http://burlingtonnc.gov/DocumentView.aspx?DID=2025		
Pedestrian Improvement Plan	x	
Source: http://www.burlingtonnc.gov/DocumentView.aspx?DID=2197		
Pedestrian Safety Action Plan		x
Safe Routes to School		x
Local or county emergency management plans		
Hazard Mitigation Plan	x	
Source: http://www.alamance-nc.com/fileadmin/alamance/Fire%20Marshal/docs/Hazard%20Mitigation%20Plan%20Final%20Draft%205-2-05.pdf		
Local Health Department reports or plans		
Strategic Plan	x	
Source: http://www.alamance-nc.com/d/health.html		
Office on Aging reports or plans		
Not available		x

Worksheet 4: Existing Information

B: Alamance County

Document	Available?	
	Yes	No
City or County Comprehensive Plans and Reports		
Comprehensive Plan	x	
<i>Source: Alamance County Destination 2020 Strategic Plan</i>		
Local or county emergency management plans		
Hazard Mitigation Plan	x	
<i>Source: Alamance County Hazard Mitigation Plan</i>		
Hurricane Preparedness	x	
<i>Source: http://www.alamance-nc.com/d/fire-marshal/emergency-management/the-storm/during-the-storm/tropical-storms-and-hurricanes/hurricane-and-tropical-storm-preparation.html</i>		
Local Health Department reports or plans		
Community Health Assessment	x	
<i>Source: http://www.alamance-nc.com/d/health/health-reports-and-statistics.html</i>		
Child Health Fatality Report		x
State of the County's Health Report	x	
<i>Source: http://www.alamance-nc.com/fileadmin/alamance/Health/docs/Alamance_final_SOTCH2008.pdf</i>		
Air Quality Flag Program	x	
<i>Source: http://www.alamance-nc.com/d/environmental-health/air-quality-and-asthma.html</i>		
Office on Aging reports or plans		
Not available		x

Worksheet 5: Identifying Hazards

Disaster	Past Occurrences	Description*
Avalanche	None	
Coastal Erosion	N/A	
Coastal Storm	N/A	
Dam Failure	None	
Drought	None	
Earthquake	None	
Expansive Soil	None	
Extreme Heat	1 (1998)	
Flood	25 (1993-2011)	Mostly flash floods
Hailstorm	66 (1970-2011)	Ranging from 0.75-2.50 in
Hurricane	4 (1996-1999)	7 deaths
Land Subsidence	None	
Severe Winter Storm	25 (1993-2010)	1993 storm was state-wide and caused \$50 million in damages and 2 deaths
Tornado	5 (1975-2011)	Caused \$1.03 million in damages
Tsunami	None	
Wildfire	None	
Windstorm	115 (1957-2011)	Ranging from 50-75 knots, caused 3 injuries and \$237K in property damage
Other		

*Data on deaths, damages, etc. are cumulative unless otherwise noted.

Worksheet 6: Ranking Hazards

Hazard or Event	Extent	Frequency	Severity	Overall Ranking
Earthquake	Entire County	Unlikely	Negligible	Low
Hurricane / Flooding	River Floodplains	Likely	Limited	Medium - High
Thunderstorms	Entire County	Highly Likely	Limited	Medium - High
Winter Storms	Entire County	Likely	Negligible	Medium
Wild Fires	Substantial Area	Likely	Negligible	Medium - Low
Tornado	Entire County	Possible	Limited	Medium
Drought	Entire County	Possible	Negligible	Low

Worksheet 7: Critical Facilities Inventory

Facility Type	Name of Facility	Address	Phone
College	Elon University	2700 Campus Box Elon, NC 27244	(800) 334-8448
	Alamance Community College	1247 Jimmie Kerr Road Graham, NC 27253	(336) 578-2002
Public School	Hugh M Cummings	2200 North Mebane St. Burlington, NC 27217	(336) 570-6100
	Broadview Middle	2229 Broadview Dr. Burlington, NC 27217	(336) 570-6195
	R. Homer Andrews Elementary	2630 Buckingham Road Burlington, NC 27217	(336) 570-6170
	Eastlawn Elementary	502 No. Graham Hopedale Road Burlington, NC 27217	(336) 570-6180
	Harvey R. Newlin Elementary	316 Carden St. Burlington NC 27215	(336) 570-6125
	Eastern Alamance High	4040 Mebane Rogers Road Mebane, NC 27302	(919) 563-5991
	Hawfields Middle	1951 NC 119 South Mebane, NC 27302	(919) 563-5303
	Woodlawn Middle	3970 Mebane Rogers Road. Mebane, NC 27302	(919) 563 3222
	Audrey W. Garrett Elementary	3224 Old Hillsborough Road Mebane, NC 27302	(919) 563-2088
	Pleasant Grove Elementary	2847 Pleasant Grove Union School Road Burlington NC 27217	(336) 421-3701
	South Mebane Elementary	600 South Third St. Mebane, NC 27302	(919) 563-6905
	E. M. Yoder Elementary	301 North Charles St. Mebane, NC 27302	(919) 563-3722
	Graham High	903 Trollinger Rd, Graham NC 27253	(336) 570-6440

	Graham Middle	331 East Pint St. Graham, NC 27253	(336) 570-6460
	Haw River Elementary	701 East Main St. Haw River, NC 27258	(336) 578-0177
	North Graham Elementary	1025 Trollinger Road Graham, NC 27253	(336) 578-2272
	South Graham Elementary	320 Ivey Road Graham, NC 27253	(336) 570-6520
	Southern Alamance High	631 Southern HS Road Graham, NC 27253	(336) 570-6400
	Southern Middle	771 Southern High School Road Graham, NC 27253	(336) 570-6500
	Alexander Wilson Elementary	2518 NC 54, Graham, NC 27253	(336) 578-1366
	E. M. Holt Elementary	4751 S. NC 62 Hwy Burlington, NC 27215	(336) 570-6420
	B. E. Jordan Elementary	5827 Church Road Graham, NC 27253	(336) 376-3673
	Sylvan Elementary	7718 Sylvan Road Snow Camp, NC 27349	(336) 376-3350
	Western Alamance High	1731 North NC 87 Elon, NC 27244	(336) 538-6014
	Western Middle	2100 Eldon Dr. Elon, NC 27244	(336) 538-6010
	Altamahaw-Ossipee Elementary	2832 North NC 87 Elon, NC 27244	(336) 538-6030
	Elon Elementary	510 East Haggard Ave. Elon, NC 27244	(336) 538-6000
	Walter M. Williams High	1307 South Church St. Burlington, NC 27215	(336) 570-6161
	Turrentine Middle	1710 Edgewood Ave. Burlington, NC 27215	(336) 570-6150
	Grove Park Elementary	141 Trail One Burlington, NC 27215	(336) 570-6115
	Hillcrest Elementary	1714 West Davis St. Burlington, NC 27215	(336) 570-6120
	Marvin B. Smith Elementary	2235 Delaney Dr., Burlington, NC 27215	(336) 570-6140
Other Schools	Sellars-Gunn Education Center	612 Apple Street Burlington, NC 27217	(336) 570-6130
	Alamance-Burlington Middle College	1247 Jimmie Kerr Road Graham, NC 27253-8597	(336) 506-4001
	Highland Elementary School	3720 Bonnar Bridge Road Burlington, NC 27215	(336) 538-8700
Private Schools	Blessed Sacrament Catholic School	515 Hillcrest Avenue Burlington, NC 27215-3841	(336) 570-0019
	Alamance Christian School	1336 Townbranch Road Graham, NC 27253-2606	(336) 578-0318

	Bible Wesleyan Christian School	106 Moores Chapel Cemetery Road Graham, NC 27253	(336) 376-3913
	Bradford Academy	S 3rd Street Ext Mebane, NC 27302	(336) 263-1262
	Excel Christian Academy	734 Apple Street Burlington, NC 27217	(336) 229-1982
	The Elon School	201 South Okelley Ave, Elon, NC 27244	(336) 584-0091
	Friendship Christian School	2541 Elon Ossipee Rd, Elon, NC 27244-8100	(336) 584-4476
	Burlington Christian Academy	621 East 6th St, Burlington, NC 27215	(336) 227-0288
	Burlington Day School	1615 Greenwood Ter Burlington, NC 27215	(336) 228-0296
	Haw River Christian School	151 North Wilkins Rd, Haw River, NC 27302	(336) 578-0678
Hospital(s)	Alamance Regional Medical Center	1240 Huffman Mill Road Burlington, NC 27215	(336) 538-7000
EMS	Alamance County EMS (Graham)	296 East Crescent Square Drive Graham, NC 27253	(336) 570-6796
	Alamance County EMS (Burlington)	4657 Bellemont Mount Hermon Rd Burlington, NC 27215	(336) 513-5589
Police Station(s)	Burlington Police Administration	267 West Front Street Burlington, NC 27215	(336) 229-3540
	Graham Police Department	216 South Maple Street Graham, NC 27253	(336) 570-6715
	Haw River Police Department	105 Stone Street Haw River, NC 27258-9758	(336) 578-4141
	Town of Elon Police Department	104 South Williamson Ave Elon, NC 27244	(336) 584-1301
	Mebane Police Department	116 West Center St Mebane, NC 27302	(919) 563-9031
Fire Station(s)	Altamahaw-Ossipee	2806 Old NC Hwy 87 Elon, NC 27244-9740	(336) 584-0526
	EM Holt	2172 Bellemont-Alamance Road, Burlington NC 27215	(336) 226-0617
	Eli Whitney	7618 NC 87 S Graham, NC 27253	(336) 376-9078
	Elon	219 South Williamson Avenue Elon, NC 27244	(336) 584-9190
	Faucette	2164 Carolina Road Burlington, NC 27217	(336) 226-4042
	Graham	201 South Main Street Graham, NC 27253	(336) 570-6707
	Haw River	403 East Main Street Haw River, NC 27258	(336) 578-1355
	Mebane	405 N First St Mebane, NC 27302	(919) 563-5718

	North Central Alamance	595 Altamahaw Union Ridge Road Burlington, NC 27217	(336) 421-9576
	North Eastern Alamance (Pleasant Grove)	3847 North NC Highway 49 Burlington, NC 27217	(336) 578-3136
	Snow Camp	6457 Bass Mountain Road Snow Camp, NC 27349	(336) 376-9774
	Swepsonville	2736 Swepsonville Rd Graham, NC 27253	(336) 578-1500
Nursing Home(s)	Cedar Ridge	2680 S. Mebane St. Burlington, NC 27215	(336) 229-2002
	Alamance Health Care Center	1987 Hilton Road Burlington, NC 27215	(336) 226-0848
	Liberty Commons	791 Boone Station Rd Burlington, NC 27215	(336) 586-9850
	Presbyterian Home of Hawfields	2502 S. NC 119 Mebane, NC 27302	(336) 578-4701
	Rehabilitation & Health Care Center of Alamance	779 Woody Drive Graham, NC 27253	(336) 228-8394
	Edgewood Place at Village at Brookwood	AR Medical Center, 1815 Edgewood Ave Burlington, NC 27215	(336) 570-8400
	Twin Lakes Center	100 Wade Coble Drive Burlington, NC 27215	(336) 538-1400
	Twin Lakes Community Memory Care	100 Wade Coble Drive Burlington, NC 27215	(336) 585-2400
	White Oak Manor	323 Baldwin Road Burlington, NC 27217	(336) 229-5571
Adult Care Homes	A Vision Come True	220 Hatch Street Burlington, NC 27217	(336) 227-4960
	Blakey Hall	501 Blakey Hall Lane Elon, NC 27244	(336) 506-2300
	Burlington Care Center	2201 Burch Bridge Road Burlington, NC 27215	(336) 222-1077
	Burlington Manor	3615 S. Mebane Street Burlington, NC 27215	(336) 584-9066
	Clare Bridge	3619 S. Mebane Street Burlington, NC 27215	(336) 538-0367
	Elon Village Homes	715 E. Haggard Avenue, P. O. Box 245, Elon, NC 27244	(336) 584-7930
	Golden Years Assisted Living	209 E. Sixth Street Burlington, NC 27215	(336) 222-9131
	Golden Years Assisted Living II	205-B E. Sixth Street Burlington, NC 27215	(336) 229-5165
	Homeplace of Burlington	118 Alamance Road Burlington, NC 27215	(336) 227-2328
	The Oaks of Burlington	1670 Westbrook Avenue Burlington, NC 27215	(336) 584-3070
	Pleasant Grove Retirement Home	4516 Hwy. 49 North Burlington, NC 27217	(336) 578-0441

	Southern Seasons Retirement Home	625 Lane Street Burlington, NC 27217	(336) 229-9900
	Springview - Brock Building	1032-C N. Mebane Street, PO Box 2175, Burlington, NC 27216	(336) 227-3808
	Springview - Crouse Building	613 W. Whitsett St., Graham, NC 27253, Burlington, NC 27216	(336) 222-6999
	Springview - Ross Building	1032-B N. Mebane Street, PO Box 2175, Burlington, NC 27216	(336) 227-4417
	Springview-Stewart Bldg, Beverly/Brent Howerton	611 W. Whitsett St., Graham PO Box 2175, Burlington, NC 27216	(336) 222-1888
Group Homes/ ICF-MR	Alamance County ICF-MR #1	710 Townbranch Road Graham, NC 27253	(336) 227-1011
	Alamance County ICF-MR #2	304 Rosemont Street Gibsonville, NC 27249	(336) 227-1011
	Alamance County ICF-MR #3	108 Laramie Drive Mebane, NC 27302	(336) 227-1011
	Alamance County ICF-MR #4	500 Veterans Drive Elon, NC 27244	(336) 227-1011
	Poplar Street Group Home	328 Poplar Street Graham, NC 27253	(336) 227-1011

Day Care Centers

NAME	ADDRESS	PHONE
A Mother's Touch	518 Hatch St Burlington, NC 27217	(336) 227-5628
Abundantly Blessed Childcare	5569 Byrd Road Burlington, NC 27217	(336) 421-1887
Alamance Christian School Day Care	1336 Townbranch Road Graham, NC 27253	(336) 578-0318
Alamance Developmental Center	919 Stokes St Burlington, NC 27217	(336) 513-4250
Alexander Wilson Elementary Pre-K	2518 NC 54 Graham, NC 27253	(336) 578-1366
Altamahaw Baptist Day Care	3445 Altamahaw Church St Elon, NC 27244	(336) 584-5949
Andrews Elementary Pre-K	2630 Buckingham Road Burlington, NC 27217	(336) 570-6170
Andrews Memorial Readiness School II	303 W Elm St Graham, NC 27253	(336) 226-5201
Angel Garden Learning Center	2456 Altamahaw Union Ridge Road Burlington, NC 27217	(336) 524-0250
Annie's Blessed Children's Daycare	1875 North Hwy 62 Burlington, NC 27217	(336) 513-0072
Ant Bee's Tender Kare	2539 Hyde St Burlington, NC 27217	(336) 437-3571

ARMC Family Enrichment Center	981 Kirkpatrick Rd Burlington, NC 27217	(336) 586-9767
Beautiful Babies Day Care	629 South 8th St Mebane, NC 27302	(919) 563-9888
Beautiful Beginnings	431 Fernway Dr Burlington, NC 27217	(336) 226-5964
Beginning Vision Child Development Center	145 Huffine St Gibsonville, NC 27249	(336) 449-4070
Blessed Sacrament School	515 Hillcrest Ave Burlington, NC 27217	(336) 570-0019
Boys-N-Girls Learning Center, Inc.	520 Tucker St Burlington, NC 27215	(336) 226-7200
C.C.'s Learning Express Family Child Care	1827 North Cosby Ct Burlington, NC 27217	(336) 260-6008
Child Development Center First Presbyterian Church	508 W Davis St Burlington, NC 27215	(336) 226-7055
Childcare Network #78	827 S Sellers Mill Road Burlington, NC 27217	(336) 226-7361
Children's House Montessori School	3750 Alamance Road Burlington, NC 27215	(336) 228-0908
Creative Child Care 2	2257 NC 87 S Graham, NC 27253	(336) 226-6209
Creative Childcare	3216 NC Hwy 54 E Graham, NC 27253	(336) 578-7343
Creative Day School	1010 S Williamson Ave Elon, NC 27244	(336) 584-5678
D. Ivey Child Care	205 Stage Coach Road Mebane, NC 27302	(919) 563-6046
Demonstration Development Day Care of Alamance	1247 Jimmy Kerr Road Graham, NC 27253	(336) 506-4123
Eastlawn Elementary Pre-K	502 N Graham Hopedale Road Burlington, NC 27217	(336) 570-6180
Elon Elementary Pre-K	510 E Haggard Ave Elon, NC 27244	(336) 538-6000
EM Yoder Elementary Pre-K	301 N Charles St Burlington, NC 27302	(919) 563-3722
Emmanuel Christian Preschool	2331 Lavista Dr Burlington, NC 27215	(336) 228-8254
Enzer T. Perry Small Day Care Home	416 Boundary St Haw River, NC 27258	(336) 578-2593
Excel Christian Academy	734 Apple St Burlington, NC 27217	(336) 226-8526
F.A.C.B. Child Development Center	639 South 8th St Mebane, NC 27302	(919) 563-5571
First Baptist Child Development Center	400 South Broad St Burlington, NC 27215	(336) 228-6692
Front Street United Methodist Preschool/Afterschool	136 S Fisher St Burlington, NC 27216	(336) 227-6263
God's Favor Before and After School	106 Albany St	(336) 227-7798

Care	Graham, NC 27253	
Gospel Tabernacle Day Care	421 Fulton St Burlington, NC 27217	(336) 226-5748
Grace Baldwin's Day Care Home	304 Oakgrove Dr Graham, NC 27253	(336) 229-7003
Graham Head Start	620 Ray St Graham, NC 27253	(336) 629-5141
Grove Park Elementary Pre-K	141 Trail One Burlington, NC 27215	(336) 570-6115
Harvey Newlin Elementary Pre-K	316 Carden St Burlington, NC 27215	(336) 570-6125
Haw River Day Care	601 S Main St Haw River, NC 27258	(336) 578-0827
Haw River Elementary Pre-K	701 E Main St Haw River, NC 27258	(336) 518-0177
Hawfields Presbyterian Child Care & Development Center, Inc.	2115 S NC 119 Mebane, NC 27302	(336) 578-3732
Head Start Junction	421 Alamance Road Burlington, NC 27215	(336) 436-0202
Hillcrest Elementary Pre-K	1714 West Davis St Burlington, NC 27215	(336) 570-6120
Imaginations	2120 Jimmie Kerr Road Haw River, NC 27258	(336) 578-0888
Jane's Day Care	3626 Boywood Road Graham, NC 27253	(336) 226-5387
Janice Scarborough Head Start	615 Gunn St Burlington, NC 27217	(336) 629-5141
Jeanette Beaudet Day Care Home	2202 Sterling Ct Burlington, NC 27215	(336) 584-9423
Just Like Home	4173 L Lawrence Trail Graham, NC 27253	(336) 376-6661
Kiddie Kare II Day Care	914 S 5th St Mebane, NC 27302	(919) 563-3377
Kiz-N-Progress 2	807 E Main St Haw River, NC 27258	(336) 578-0881
Kidz-N-Progress	202 Giles St Mebane, NC 27302	(919) 563-5439
Lamplight Loving Care	1417 West Webb Ave Burlington, NC 27217	(336) 570-9801
Lawson's Preschool 2	810 N Main St Graham, NC 27253	(336) 570-3132
Lawson's Preschool	612 E Elm St Graham, NC 27253	(336) 227-2428
Life's Journey Child Development Center	2121 Edgewood Ave Burlington, NC 27215	(336) 538-0224
Like My Own	1935 Lewis Dr Burlington, NC 27216	(336) 228-0298
Like My Own Day Care #2	1139 Chapel Hill Road Burlington, NC 27215	(336) 221-8111

Lil' Scholarz	2916 McKinney St Burlington, NC 27217	(336) 226-8729
Linda's Childcare Home	214 Howard St Burlington, NC 27217	(336) 228-6690
Little Delights Educare	603 North Graham Hopedale Rd, Burlington, NC 27217	(336) 221-9970
Little Thinkers	2485 Moran St Burlington, NC 27215	(336) 227-9131
Lots of Luv	808 Oakley St Graham, NC 27253	(336) 229-0611
Love Afterschool	947 South 5th St Mebane, NC 27302	(919) 304-1138
Love Fellowship Child Development Center	2228 Carter Road Burlington, NC 27217	(336) 578-6002
Love-A-Lot Day Care & Preschool, Inc.	721 N Fisher St Burlington, NC 27217	(336) 228-8157
Loving Memories Day Care	806 North Ave Burlington, NC 27217	(336) 229-0962
Lynn's Day Care	1146 Jackson St Burlington, NC 27217	(336) 227-7326
Marvin B Smith Elementary Pre-K	2235 Delaney Dr Burlington, NC 27215	(336) 570-6140
Mary's Creative Play Preschool	823 Lakeside Ave Burlington, NC 27217	(336) 228-1908
Mickey/Minnie Day Care	2409 Hyde St Burlington, NC 27217	(336) 570-0715
Ms. Kitty's Building Blocks	411 Tillman St Burlington, NC 27217	(336) 222-6080
Mums Weekday School	200 S 4th St Mebane, NC 27302	(919) 563-5600
Myra's Tender Loving Care Nursery & Preschool	154 Bland Blvd Burlington, NC 27217	(336) 226-2880
New Covenant Day Care Center	714 Sharpe Road Burlington, NC 27215	(336) 226-1921
Noah's Ark Academy Child Dev. Center	3564 Hwy 119 N Mebane, NC 27302	(336) 263-4998
North Graham Elementary Pre-K	1025 Trollinger Road Graham, NC 27253	(336) 578-2272
Patricia Filyaw Day Care Home	706 Trail 2 Burlington, NC 27215	(336) 229-1981
Patty Cakes Home Child Care	2443 Michelle Dr Burlington, NC 27217	(336) 578-2906
Pleasant Grove Elementary Pre-K	2847 Pleasant Grove School Road Burlington, NC 27217	(336) 421-3701
Positive Day School	229 N Graham-Hopedale Road Burlington, NC 27217	(336) 222-6066
Precious Gift	509 S Sellars Mill Road Burlington, NC 27217	(336) 222-1787
Precious Lil Tots Day Care	309 Peele St	(336) 226-2503

	Burlington, NC 27215	
Shelby's In-Home Day Care	1458 Knollwood Dr Burlington, NC 27217	(336) 222-8353
Sonya's Kidz Depot	2206 Swepsonville Road Graham, NC 27253	(336) 227-2525
South Graham Elementary Preschool	320 Ivey Road Graham, NC 27253	(336) 570-6520
South Mebane Elementary Pre-K	600 S Third St Mebane, NC 27302	(919) 563-4616
Step by Step Child Care	4811 Pagetown Road Burlington, NC 27217	(336) 584-5850
Stephanie's DCD, Inc.	2347 S Hwy 119 Mebane, NC 27302	(336) 578-5015
Sugarbabies	3344 Golden Oaks Road Graham, NC 27253	(919) 210-1721
Sylvan Elementary Pre-K	7718 Sylvan School Road Snow Camp, NC 27349	(336) 376-3350
Temple Christian Preschool	2224 Anthony Road Burlington, NC 27215	(336) 226-0254
Teresa's Playful Babies	506 Trail 1 Burlington, NC 27215	(336) 350-3818
Terri's Lil' Tots	1883 NC Highway 62 N Burlington, NC 27217	(336) 227-6082
The Growing Years Learning Center	3804 Bonnar Bridge Pkwy Burlington, NC 27220	(336) 261-0651
Wee Care Child Development Center	302 Trail 4 Burlington, NC 27215	(336) 229-0704

Worksheet 8: Current Inventory of People and Property

	# Buildings	Average Value (\$)
Single detached	42,825	\$174,409/unit
Single attached	1,437	\$174,295/unit
Multi-family	13,090	\$65,135-482,914*
Mobile homes	9,320	\$67,062/unit
Other		

*Average range, depending on number of units in structure

Worksheet 9: Future Inventory of People and Property

	# Buildings	# People	Value (\$)
Single detached			
Single attached			
Multi-family			
Mobile homes			
Other			

Worksheet 10: Employment Center Inventory

Employer/Employment Center	Address	Number of Employees
Laboratory Corp of America	128 Maple Ave Burlington NC 27215-5847	3,300
Alamance-Burlington School System	1712 Vaughn Road Burlington NC 27217-2916 (336) 570-6060	3,260
Alamance Regional Medical Center	1240 Huffman Mill Road Burlington, NC 27215-8700 (336) 538-7000	2,300
Elon University	100 Campus Drive Elon, NC 27244	1,290
Alamance County	124 West Elm Street Graham, NC (336) 228-1312	1,100
Wal-Mart Stores Inc.	3 locations	1,100
City of Burlington	425 S Lexington Ave Burlington, NC 27215	875
Alamance Community College	1247 Jimmie Kerr Road Graham, NC 27253-8597	600

Worksheet 11: Environmental Threat Inventory [to be completed when data are available]

Facility Name	Street Address	City	County	State	Zip	Filing Year