Special Topics

Comanche County Disaster Resiliency Assessment

The purpose of this section is to assess at the county level key components of disaster resiliency. Housing location and quality as well as planning activities can help reduce impacts from disaster events and allow for faster recovery. Disasters can include tornadoes, extreme weather, high winds, as well as man-made events. These events may largely be inevitable, but the ability to reduce damage and casualties as well recovery can be improved with good planning.

C.0 Comprehensive Plans & Hazard Mitigation Plans

The main city in Comanche County is Lawton, OK. There are two smaller cities in Comanche County including the City of Cache and the City of Elgin.

Lawton had a population of 96,867 in 2010 Census and it has a comprehensive plan. Cache had a population of 2,796, and Elgin had a population of 2,156 in the 2010 Census. Several towns exist within the county that are too small to warrant creation of a comprehensive plan. Overall, the county population was 124,098 in the 2010 Census. Of these smaller communities, the towns are Fletcher (1,177), Sterling (793), Medicine Park (382), Geronimo (1,268), Indiahoma (344), Faxon (136). Unincorporated areas are Meers, Bethel and Pumpkin Center.

The other key plan for a city to manage, mitigate and plan for recovery related to disasters is a **Hazard Mitigation Plan** (HMP). Often in low density counties, the Hazard Mitigation Plan is done at the county level, though some cities may augment the county plan with a city plan. The Comanche County Hazard Mitigation Plan was adopted August 11th, 2003 and is intended to be reviewed and revised on a five-year cycle. The formal adoption of the Resolution by local jurisdictions was approved on October 8th, 2008. The Comanche County HMP is focused on the unincorporated areas of the County. Should municipalities within the county desire to be included with the county HMP, they may request to be included and must provide the appropriate information. Indian tribes, as sovereign nations, are also not included in this HMP. Additionally, the Comanche County Conservation District and the USDA-Natural Resources Conservation Service have a joint Natural Resource Long Range Plan.

The City of Lawton's updated HMP was approved September 11th, 2012 and is on a five-year cycle for updating.

The Conservation District in Comanche County has a Long Range Plan that addresses drought, flood protection and other natural resources. This information was used in the Comanche County HMP.

C.2.1.1. Historical Data on Natural Disasters and Other Hazards

Data on historical damages and casualties is typically collected as part of a **Hazard Mitigation Plan** preparation to determine the appropriate planning measures and actions to take before and after an event.

The HMP for Comanche County identifies four Hazard Mitigation Goals that are as follows:

Goal 1. Protection from loss of lie and personal injury.

Goal 2. Protection of critical facilities and infrastructure.
Goal 3. Protection of personal property and reduction of economic injury due to hazards.
Goal 4. Minimize the costs of disaster response.

For each of the specific actions identified within the HMP, a lead agency (and in some instances, a specific position is called out) is designated to accomplish each item. The identified actions within each hazard area are as follows:

Action Item #	Lead/Responsible Department	Mitigation Strategy	Priority/ Rank
1	Comanche County Emergency Manager	Educate the public about various dangers associated with natural hazards.	1
DF 1	Comanche County Emergency Management	Identify vulnerable structures, or potentially vulnerable new structures, susceptible to flooding form dam failures.	13
DF 2	Comanche County Emergency Management	Provide dam monitoring equipment	13
DR 1	Conservation District – USDA / NRCS	Drill additional water wells ensuring that an adequate water supply is available.	15
DR 2	Comanche County	Build reservoirs to contain rain and runoff water for agricultural uses.	14
EQ 1	Comanche County Emergency Manager	Develop detailed fault maps of Comanche County to determine areas most likely to be affected by earthquakes.	8
EQ 2	Comanche County, Cotton Electric Coop.	Work with Utility companies to retrofit commercial power facilities, or address specific needs of new infrastructure to be more earthquake resistant.	8
EH 1	Comanche County Memorial Hospital	Provide cooling stations to allow citizens to come in out of the heat to cool down.	7
EH 2	Comanche County Emergency Manager	Installing Protective Film on windows in all county windows to reduce heat gain.	9
F 1	Comanche County Flood Plain Manager	Elevate those structures in the floodplain that are thought to be at risk of receiving damage or being destroyed from a flooding event.	15
F 2	Comanche County Flood Plain Manager	Update and provide continual administration to insure NFIP compliance is maintained.	12
F 3	Comanche County Flood Plain Manager	Raise the roadbed and construct new bridges and approaches along three county road segments that are impassable during floods.	16
HS 1	Comanche County Emergency Manager	Public Education – Promote the use of hail resistant shingles and building materials for retrofit or new construction to the public using brochures and the media.	12
HS 2	Comanche County	Provide new shelters for county owned vehicles to	

	Emergency Manager	protect from hail damage.	
HS 3	Comanche County Emergency Manager	Install Protective Film on windows in all county buildings.	9
L 1	Comanche County Emergency Management	Purchase Lightning Prediction Systems for Comanche County Critical Facilities.	8
L 2	Comanche County Emergency Management	Install lightning protection and suppression systems protecting radios and other essential equipment at existing and new critical facilities throughout the county.	12
T-HW 1	Comanche County Emergency Management	Develop emergency operation plan to implement mitigation, response and recovery phases of an event. This plan would reduce the loss of life and lower property damage.	4
T-HW 2	Comanche County Emergency Management	Educate the public in the benefits of installing residential and commercial storm shelters and safe rooms.	3
T-HW 3	Comanche County Emergency Management	Obtain mobile communications equipment for spotters and Emergency Response Teams.	5
T-HW 4	Comanche County Emergency Management	Purchase and install NOAA Weather Radio receivers in schools, hospitals, nursing homes and other public facilities.	3
T-HW 5	Comanche County Emergency Management	Install 20 new residential and commercial storm shelters to reduce the loss of life.	15
T-HW 6	Comanche County Emergency Manager	Promote the benefits of Tie Downs to secure existing and future mobile homes and other mobile structures helping reduce damage from high winds or tornadoes.	6
T-HW 8	Comanche County Emergency Management	Review the Comanche County Severe Weather Response Plan and Warning System on an annual basis.	
WF 1	Comanche County Emergency Manager	Purchase of two tanker fire trucks to protect Comanche County from wildfires.	
WF 2	Comanche County Emergency Manager	Provide dry hydrants for wildfire protection.	
WF 3	Comanche County Emergency Manager	Implement the Fire Wise program to provide wildfire protection by making the public aware of the need for defensible space.	
WS 1	Comanche County Emergency Manager	Purchase and install generators to power critical facilities in Comanche County such as the Comanche County Court House, County Barns, rural water districts, sewer systems, public shelters, nursing	

		homes, etc.	
WS 2	Comanche County Emergency Management	Work with Comanche County 911 database, senior citizens, and the public in creating a database of citizens with special needs who may be adversely affected by extreme cold events. The database would include a map showing the location of at risk residents with contact information so their welfare can be verified.	

For this county the Hazard Mitigation Plan contains the following historic data on disasters and damages in the county:

Dam Failure Risk
There are 14 dams in Comanche County. Seven are designated as "high hazard" by the Oklahoma Water Resources Board meaning there are no occupied dwellings immediately downstream. There is no history of failure of the dams in Comanche County.

Drought
12 drought events were reported in **Comanche County, Oklahoma** HMP for the reporting period of **01/01/1950** to **010/31/2006** that resulted in 4 injuries, $31.695M in property damage and $557.340M in crop damage**.**

Earthquake
All of **Comanche County, Oklahoma** is equally susceptible to earthquake. Earthquake is not limited to certain areas of the County or certain communities. Comanche County has numerous pipelines, producing oil and gas wells and large buildings that are not constructed to earthquake codes. This creates the possibility of a major catastrophe in the event of a major earthquake.

Earthquakes centered within Comanche County are rare. The few events that have been recorded are largely unfelt and are seismically rated at or below a level 2. Records maintained by the Oklahoma Geological Survey and dating back to 1897 indicate that nine occurrences of seismic activity have been recorded in Comanche County. On April 9, 1952, a large earthquake centered near El Reno (in Canadian County) affected most of Oklahoma and extending as far north as Iowa.

Expansive Soils
Expansive soils in **Comanche County, Oklahoma** have shale as the parent material and are found in the upland western two thirds the County. The expansive soil area amounts to about 20% of the County.

Extensive damage from expansive soils can occur to highways and streets. Homes, buildings and other structures can have damage resulting in sticking doors, uneven floors and cracks in the foundation, floors, walls, and ceilings. Since this hazard develops gradually and seldom presents a threat to life, problems may not be recognized as being related to expansive soils or may be considered only nuisances and therefore never reported. **No records of specific incidences of structure loss due to expansive soils in Comanche County were found**.

Extreme Heat

Extreme Heat events are regional in nature. The entire County is equally affected by extreme heat. **7 TEMPERATURE EXTREMES** event(s) were reported in **Comanche County, Oklahoma** between **01/01/1950** and **03/31/2007**. Excessive heat on 7/4/2001 resulted in 8 deaths. From Heat event 7/16/2006 (not Extreme Heat event), 10 deaths, 100 injuries were reported. And on 8/1/2006 8 deaths and $10,000 in property damage occurred related to Heat event. These events are recorded for Oklahoma and are not county specific. $10,000 in property damage was also reported.

In Comanche County young children, elderly people and those who are sick or overweight are more likely to become victims to extreme heat. Other conditions that can limit the ability to regulate temperature include fever, dehydration, heart disease, mental illness, poor circulation, sunburn, prescription drug use and alcohol use. Another segment of the population at risk is those whose jobs consist of strenuous labor outside. Livestock and crops can also become stressed, decreasing in quality or in production during times of extreme heat.

Extreme high temperatures can cause water shortages, increase fire danger, and prompt excessive demands for energy. Another secondary hazard is air pollution in summer months resulting from consistent high temperatures and reduced airflows.

Flood

There are two types of floods, both which can occur in Comanche County. First, flash floods, which result from localized heavy rain falls. Second, riverine floods occur after extended periods of rain over several days or weeks. Riverine floods generally can be forecast in advance, and proper precautions taken to save lives and mitigate some though certainly not all, property losses.

Comanche County, Oklahoma experienced 20 floods from **01/01/1993** to **03/07/2007** that resulted in $20,000 in property damage from flash floods. No injuries or deaths were reported.

Hailstorm

Due to Oklahoma's rapidly changing climate, large-scale hailstorms are especially prevalent. All parts of Delaware County are equally vulnerable to hailstorms. **111 HAIL** large event(s) were reported in **Comanche County, Oklahoma** between **05/24/1957** and **04/24/2006 with hail size of at least 1.5 inch(es) and 413 HAIL** events between **01/01/1957** and 1**0/31/2006 with hail size of at least 0.5 inches.**

Since most hail losses are insured or go unreported, no loss figures are estimated for those events. Crops are especially vulnerable to hail damage.

Lightning

Comanche County, Oklahoma reported **28 lightning** events from 0**1/01/1950** to **03/31/2007** that resulted in **32 injuries** and $915,000 in property damage.

July 23, 1994, 9:35 a.m. – Lightning damaged computers and telephone lines at Fort sill. Damage was estimated at $5,000.

May 3, 1995, 3:30 a.m. – Lightning struck a stone tower at the Wichita Mountain Wildlife Refuge. The strike blew the battlement apart and set fire to the roof beams. Damage was estimated at $5,000.

July 16, 1995, 9:15 p.m. – Lightning struck the support pole of a tent on Fort Sill Army Base, injuring all 26 occupants. Most injuries were cuts and bruises from the collapse of the tent.

September 12, 1995, 10:00 p.m. – Lightning struck an apartment building in Lawton, igniting and damaging the roof. Damage was estimated at $50,000.

June 16, 1996, 8:00 p.m. – Lightning struck the side of an apartment building in Lawton, broke a two-foot hole in the wall. Damage was estimated at $500.

June 11, 1998, 12:30 a.m. – Lightning and set fire to two buildings at an old amusement park in Cache. Damage was estimated at $25,000.

August 10, 1998, 5:33 p.m. – Lightning truck two oil tanks three miles east of Sterling setting them ablaze. Damage was estimated at $10,000.

October 22, 2000, 5:**15 p.m.** – Lightning struck an insulator in Lawton causing a power outage to 1,100 homes. Damage was estimated at $13,000.

Lightning struck an air conditional unit causing some curtains to catch fire. Significant fire and smoke damage occurred to the master bedroom. Damage was estimated at $13,000.

January 16, 2001, 9:00 a.m. – Lightning struck the ground near a group of 34 soldiers training at the East Range at Fort Sill, sending five of them to the hospital for treatment.

Severe Winter Storms

All parts of Comanche County are susceptible to severe winter storms. Comanche County has not experienced loss of life or significant impacts to crops due to severe winter storms. The county has experienced property and economic damage. Fortunately, Comanche County is not affected by blizzard as often as other parts of the state. During times of more than average accumulation structures can collapse due to the added weight of snow and ice. Ice dams can cause additional roof damage.

Over the past 57 years (1950 - 2007), the National Climatic Data Center has recorded that Comanche County has experienced 22 significant winter storm events. Some examples of past winter storm events in Comanche County include the following:

January 5-7, 1988 - Significant snowfall amounts were reported across Oklahoma. The storm totals exceeded six inches over virtually the entire state, except a few areas near the Red River and the far western Oklahoma Panhandle.

November 24, 1996 - Ice accumulated up to 1/2 inch thick mainly southeast of a line from Shawnee in Pottawatomie to Chickasha, in Grady County to Frederick in Tillman County. Power was out to a large portion of the area due to icing of power lines and tree limbs. It took as long as three days to restore power to some customers.

December 20, 1998 - Light-freezing rain produced a thin layer of ice on most roads. Across the entire state, there were 13 fatal traffic accidents and 100 injury-related traffic accidents.

January 30, 2002 - Ice accumulations of one to two inches. The worst damage occurred in a 60-mile wide band, extending from near Ponca City, in Kay County southwestward toward Lawton in Comanche County and Hobart in Kiowa County. Dozens of towns were left completely without power

for days, with some residents without power for weeks. The damage was catastrophic in places, with thousands of utility poles, along with thousands of trees, were brought down by the weight of the ice

December 4, 2002 – A winter storm affected the northwest half of Oklahoma during the afternoon and evening of the 3rd and early morning of the 4th. The precipitation started as freezing rain and sleet across portions of west central and northwest Oklahoma, including Harper, Ellis, Woodward, woods, alfalfa, and major Counties, and then quickly changed to snow. Total accumulations were between four and eight inches. The highest totals were nine inches in Arnett (Ellis County), eight inches in Mutual (Woodward County) and eight inches in Buffalo (Harper County). Southeast of this area, a mixture of freezing rain, sleet, and snow fell, with ice accumulations ranging from a trace to one half inch, and snow accumulation between two and three inches. The greatest amount of ice fell from about Stillwater (Payne County), southwestward to about Guthrie (Logan County), Bethany (Oklahoma County), Weatherford (Custer County), and Elk City (Beckham County). Nearly 50,000 residences were without power during the peak of the winter storm.

Ice and Snow Events

22 SNOW & ICE events were reported in **Comanche County, Oklahoma** between **01/01/1993** and **03/31/2007** that resulted in 28 deaths, 103 injuries, and $10,000 in property damage.

Temperature Extremes

7 TEMPERATURE EXTREMES were reported in **Comanche County, Oklahoma** between **01/01/1994** and **03/31/2007**.

January 18, 1996 – Extreme cold resulted in 2 deaths.
July 22, 1998 – Excessive heat resulted in 3 injuries.
July 16, 2006 – A high heat event resulted in 10 deaths and 100 injuries.
August 1, 2006 – Heat caused 8 deaths and $10,000 in property damage.

Tornado & Wind

Tornadoes and high winds are combined in profile because of similarities in potential damage and mitigation measures. All of Comanche County is equally susceptible to tornado and high wind damages. Due to the County wide probability every structure has equal probability to be struck by a tornado or high wind. According to NOAA data, this area of the United States is the most tornado prone in the county. The area has a reported concentration of more than 11 tornadoes per 1,000 square miles.

47 Significant TORNADO(s) (F2 or intensity of greater) were reported in **Comanche County, Oklahoma** between **01/01/1950** and **03/31/2007**.resluting in **3 deaths**, **111 injuries**, and $31.949 million in property damage.

April 10, 1979 – Red River Valley Tornados – The thunderstorm system that produced the Vernon tornado crossed the Red River and left a 50-mile-long skipping track of tornado damage through Oklahoma. Just after 5:00 p.m., another tornado (F4) spawned by the same thunderstorm system crashed into Lawton. Lawton officials sounded the siren system to warm the people of the approaching storm. As a result of the early warning, the casualty list of three dead and 109 injured

was relatively small despite the destruction of several hundred homes and businesses. Damage was estimated at $25 million.

May 25, 1997 – A tornado was reported by spotters just north of Fletcher near the Caddo/Comanche County line.

October 4, 1998 – A tornado was seen by an Oklahoma Highway Patrol Officer five miles north of Medicine Park in Comanche County touching down briefly in an open field with no known damage.

May 3, 1999 – 14 tornadoes reported in a seven-hour period.

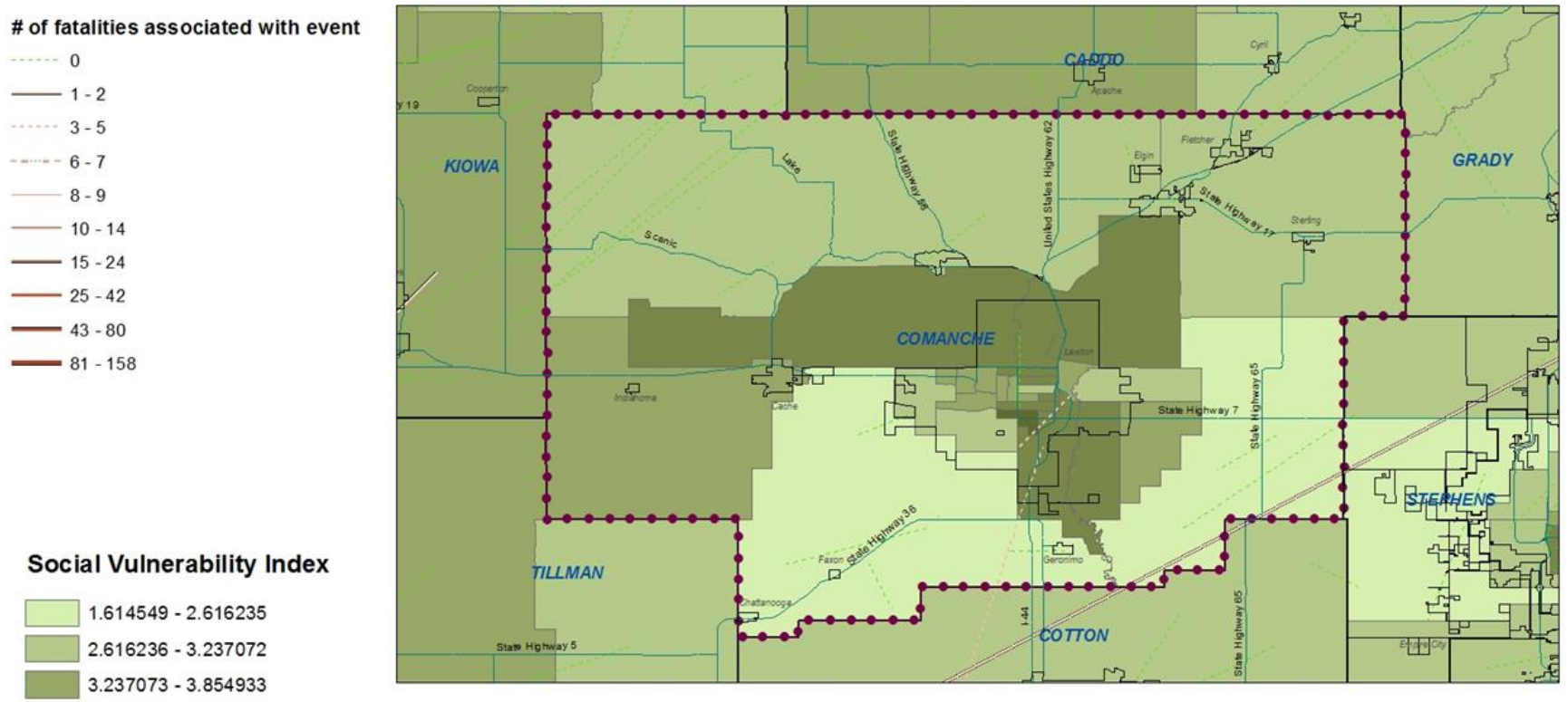
- Beginning north of fort sill in Comanche County, the tornadoes traveled across Comanche, Caddo, Grady, and McClain Counties into the Oklahoma City metropolitan area and beyond. The first tornado of the outbreak touched down on US 62, two miles north of Interstate 44 in Comanche County at 3:51 p.m.
- The second tornado formed approximately three miles west of Elgin in Comanche County. No damage was observed.
- The third tornado touched down in a rural area three miles east of Apache in Caddo County. As the tornado moved northward to near Anadarko in Caddo County, one house was destroyed near the community of Stecker in Caddo County, with is roof ripped off and several walls knocked down. Three persons inside the house were injured. Damage was estimated at $50,000.
- The fourth tornado was seen three miles northwest of Cyril in Caddo County just west of SH 8. No damage was reported.
- The fifth tornado formed two miles south of Anadarko in Caddo County. No damage was reported.
- The sixth tornado developed about three miles north-northeast of Cement near the Caddo/Grady County border, and quickly intensified to a strong tornado with associated damage rated at the high end of the F3 scale. Damage was estimated at $75,000.
- The most notable tornado was rated F5 and formed over Grady into the Oklahoma metropolitan area after 6 p.m. Bridgecreek (Grady County), Oklahoma City (Oklahoma County), Moore (Oklahoma County), Del City (Oklahoma County), and Midwest City (Oklahoma County) suffered tremendous damage.

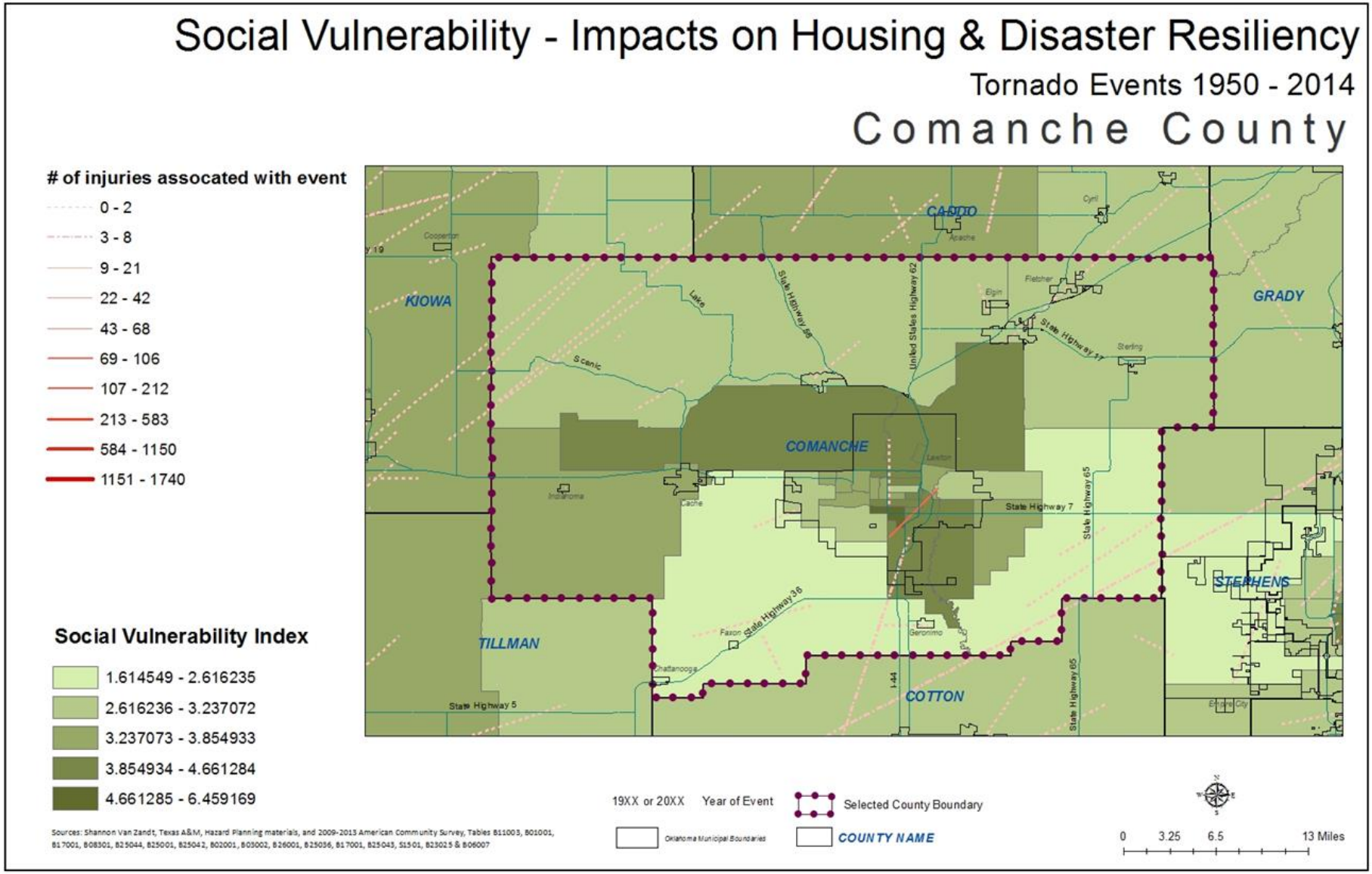
For all the county profiles for this study we are providing maps of the historic tornados mapped over the developed social vulnerability index. This is in addition to the data prepared and summarized from the HMP in this section.

Social Vulnerability - Impacts on Housing & Disaster Resiliency

Tornado Events 1950 - 2014

Comanche County

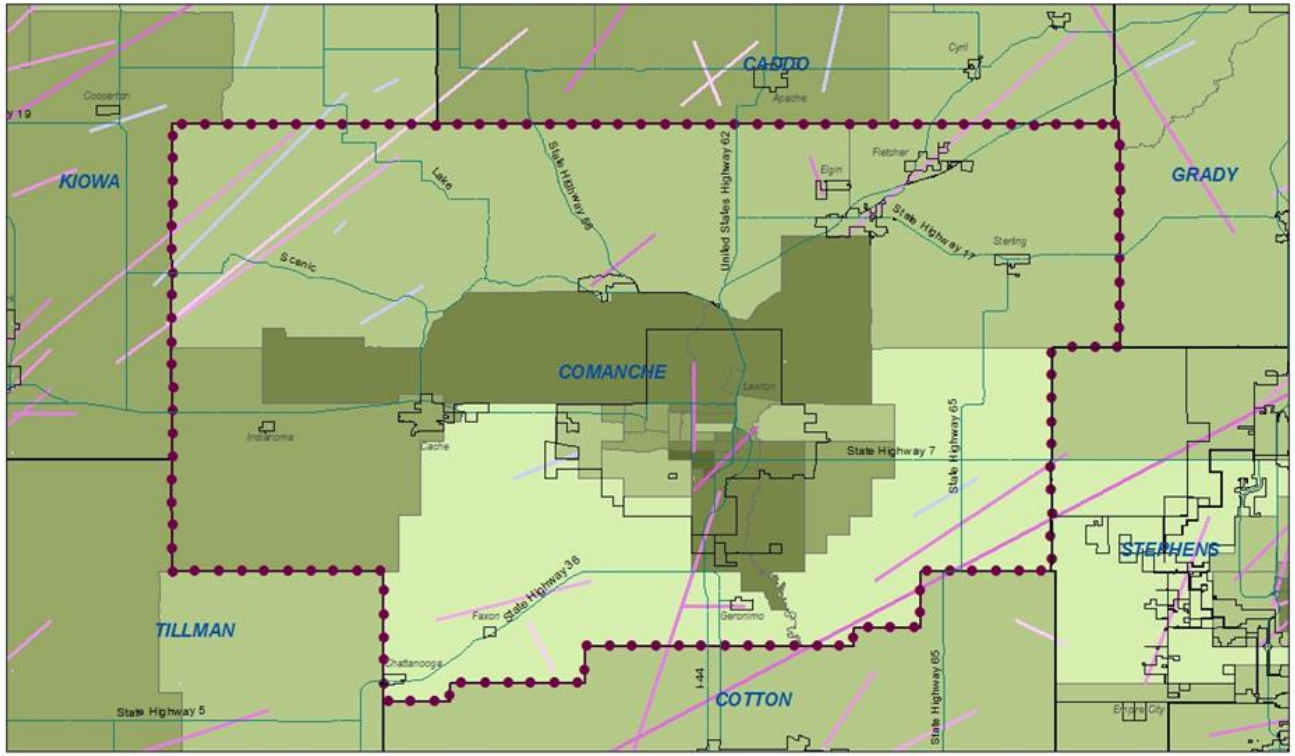



Social Vulnerability - Impacts on Housing & Disaster Resiliency
Tornado Events 1950 - 2014
Comanche County
# of injuries assocated with event
0 - 2
3 - 8
9 - 21
22 - 42
43 - 68
69 - 106
107 - 212
213 - 583
584 - 1150
1151 - 1740
Social Vulnerability Index
1.614549 - 2.616235
2.616236 - 3.237072
3.237073 - 3.854933
3.854934 - 4.661284
4.661285 - 6.459169
KIOWA
CADDO
GRADY
COMANCHE
TILLMAN
COTTON
STEPHENS
Lake
Scenic
Cache
Lawton
Elgin
Fletcher
Sterling
Cyril
Apache
Cooperton
Geronimo
Chattanooga
Faxon
State Highway 36
State Highway 65
State Highway 7
State Highway 5
United States Highway 62
I-44
19XX or 20XX Year of Event
Selected County Boundary
Oklahoma Municipal Boundaries
COUNTY NAME
0 3.25 6.5 13 Miles
Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables B11003, B01001, B17001, B08301, B25044, B25001, B25042, B02001, B03002, B26001, B25036, B17001, B25043, S1501, B23025 & B06007

Social Vulnerability - Impacts on Housing & Disaster Resiliency

Tornado Events 1950 - 2014

Comanche County



Tornado prior to 1996

$ losses associated with event

- >$50
- $50-$500
- $500-$5,000
- $5,000-$50,000
- $50,000-$500,000
- $500,000-$5,000,000
- $5,000,000-$50,000,000
- $5000,000,000

Tornados after 1996

$ in millions in losses associated with event (accounting categories changed in 1996)

- 0.00 - 0.91
- 0.92 - 3.20
- 3.21 - 8.50
- 8.51 - 13.11
- 13.12 - 125.34
- 125.35 - 370.00
- 370.01 - 1000.00
- 1000.01 - 2800.10

Social Vulnerability Index

- 1.614549 - 2.616235
- 2.616236 - 3.237072
- 3.237073 - 3.854933
- 3.854934 - 4.661284
- 4.661285 - 6.459169

19XX or 20XX Year of Event

Selected County Boundary

Oklahoma Municipal Boundaries

COUNTY NAME

0 3.25 6.5 13 Miles

Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables B11003, B01001, B17001, B08301, B25044, B25001, B25042, B02001, B03002, B26001, B25036, B17001, B25043, S1501, B23025 & B06007

High Wind Events
292 HIGH WINDS event(s) were reported in **Comanche County**, Oklahoma between **01/01/1950** and **03/31/2007** resulting in **1 death**, **12 injuries**, and **$33.184 million** in property damage.

The probability of a tornado or high wind even occurring in Comanche County is highly likely.

Wild and Forest Fires
1 WILD & FOREST FIRE was reported in the **Comanche County, Oklahoma** HMP during the reporting period of **01/01/1950** to **10/31/2006** that resulted in $200,000 in property damage. No deaths or injuries were reported.

C.2.1.2; C.2.1.6; C.2.1.7;C.2.1.8 Shelters from Disaster Event

Most jurisdictions have elected to not have public shelters in order to discourage people from leaving safe places and ultimately be caught on the road trying to reach a public shelter.

Of the mitigation strategies or "Action Items" identified, the following items pertain to storm shelters.

Action Item #T-HW 2. Educate the public in the benefits of installing residential and commercial storm shelters and safe rooms.

Action Item #T-HW 5. Install 20 new residential and commercial storm shelters to reduce the loss of life.

Action Item #WS 2. Work with Comanche County 911 database, senior citizens, and the public in creating a database of citizens with special needs who may be adversely affected by extreme cold events. The database would include a map showing the location of at risk residents with contact information so their welfare can be verified.

The HMP shows the rating system used to prioritize the above Action Items. The scoring resulted in education about storm shelters (**Action Item #T-HW 2**) as the third most important item. Of particular interest is **Action Item #WS 2** that calls for creating a database of citizens with special needs and mapping the location of at risk residents with contact information so their welfare can be verified. Such a database could also be used to map the locations of storm shelters so that emergency personnel can check those locations after a tornado or high wind event to verify the welfare of residents. This item was ranked in the eleventh ranking group in priority.

C.2.1.3 Public Policy and Governance to Build Disaster Resiliency

The State of Oklahoma has not granted to counties broad regulatory powers to enact and enforce building codes, building inspections, subdivision regulations and growth management initiatives. Comanche County does have power to regulate all platting of land, all construction of dwelling units or commercial or industrial structures and all future development within a delineated floodplain area, except land held in trust by the United States for Native Americans.

C.2.1.4 Local Emergency Response Agency Structure

The Hazard Mitigation Plan prioritized mitigation actions and addressed how the actions will be implemented and administered, including the responsible department, existing and potential resources and timeframe to complete each action.

C.2.1.5 Threat & Hazard Warning Systems

The identified Threat & Hazard Warning Systems for Comanche County include:

- ☐ Sirens
- ☐ Phone notification
- ☐ Emergency Broadcast System
- ☐ Other

The City of Lawton and Comanche County have implanted an emergency notification system through the phone. CodeRED employs intranet mapping capable of geographic targeting of calls, couple with a telephone calling system capable of delivering a pre-recorded message directly to homes and businesses at the rate of up to 60,000 calls per hour.

The City of Lawton HMP includes numerous mitigation measures regarding strengthening public storm shelters, continuing their Safe Room Rebate Program, evaluating and constructing school safe rooms, and constructing safe rooms for first responders. With the city's 2012 HMP update, the Steering Committee and the City GIS Department planned for mapping critical structures in the city including hazmat storage facilities, dialysis facilities, day care centers, storm shelters, and nursing homes. It appears that the storm shelters mentioned are six shelters that may be located in schools. Recommend the system be updated to include locations of private storm shelters as well.

Social Vulnerability

Based on the research work done by the Texas A&M University Hazard Reduction and Recovery Center, an added component is being included in this section. Social vulnerability can place households at a further disadvantage during and after a disaster. This analysis is assessing for the county the levels of social vulnerability based on demographic indicators to highlight 'hotspots' or counties that have higher social vulnerability. That combined with Hazard Mitigation Plans – or lack thereof – can highlight places where additional work is needed to reduce impacts on households.

Social Vulnerability Analysis - Comanche County

Base Social Vulnerability Indicators (%)		2nd Order	3rd Order
1.) Single Parent Households	20.63%	0.282 (Child Care Needs)	**3.569 Social Vulnerability 'Hotspot' or Area of Concern**
2.) Population Under 5	7.62%		
3.) Population 65 or Above	10.44%	0.193 (Elder Needs)	
4.) Population 65 or Above & Below Poverty Rate	8.88%		
5.) Workers Using Public Transportation	0.78%	0.078 (Transportation Needs)	
6.) Occupied Housing Units w/o Vehicle	7.02%		
7.) Housing Unit Occupancy Rate	86.82%	2.771 (Temporary Shelter and Housing Recovery Needs)	
8.) Rental Occupancy Rate	43.40%		
9.) Non-White Population	41.50%		
10.) Population in Group Quarters	7.84%		
11.) Housing Units Built Prior to 1990	74.86%		
12.) Mobile Homes, RVs, Vans, etc.	5.31%		
13.) Poverty Rate	17.35%		
14.) Housing Units Lacking Telephones	2.35%	0.244 (Civic Capacity Needs)	
15.) Age 25+ With Less Than High School Diploma	11.00%		
16.) Unemployment Rate	8.06%		
17.) Age 5+ Which Cannot Speak English Well or Not At All	2.99%		

Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables B11003, B01001, B17001, B08301, B25044, B25001, B25042, B02001, B03002, B26001, B25036, B17001, B25043, S1501, B23025 & B06007

Social Vulnerability Index

By County

Levels of Social Vulnerability Analysis

Base Social Vulnerability Indicators (Percentages)	2nd Order	3rd Order
1. Single parent households with children/ Total Households	Child care needs	Social vulnerability "Hotspot" or area of concern
2. Population 5 or below/Total Population		
3. Population 65 or above/Total Population	Elder needs	
4. Population 65 or above & below poverty/Pop. 65 or above		
5. Workers using public transportation/Civilian pop. 16+ and employed	Transportation Needs	
6. Occupied housing units without a vehicle / Occupied housing units (Hus)		
7. Occupied housing units / Total housing units	Temporary Shelter and housing Recovery needs	
8. Persons in renter occupied housing units/ Total housing units		
9. Non-white population/Total population		
10. Population in group quarters / Total population		
11. Housing units built 20 years ago / Total housing units		
12. Mobile Homes/ Total housing units		
13. Persons in poverty / Total population		
14. Occupied housing units without a telephone/ Total occupied HU	Civic Capacity needs	
15. Population above 25 with less than high school/ Total pop above 25		
16. Population 16+ in labor force an unemployed/ Pop in Labor force 16+		
17. Population above 5 that speak English not well or not at all / Pop >5		

Source: Shannon VanZandt, Texas A&M, Hazard Planning materials; 2009-2013 American Community Survey, Tables B11003, B01001, B17001,

Legend

Social Vulnerabiity "Hot Spots"

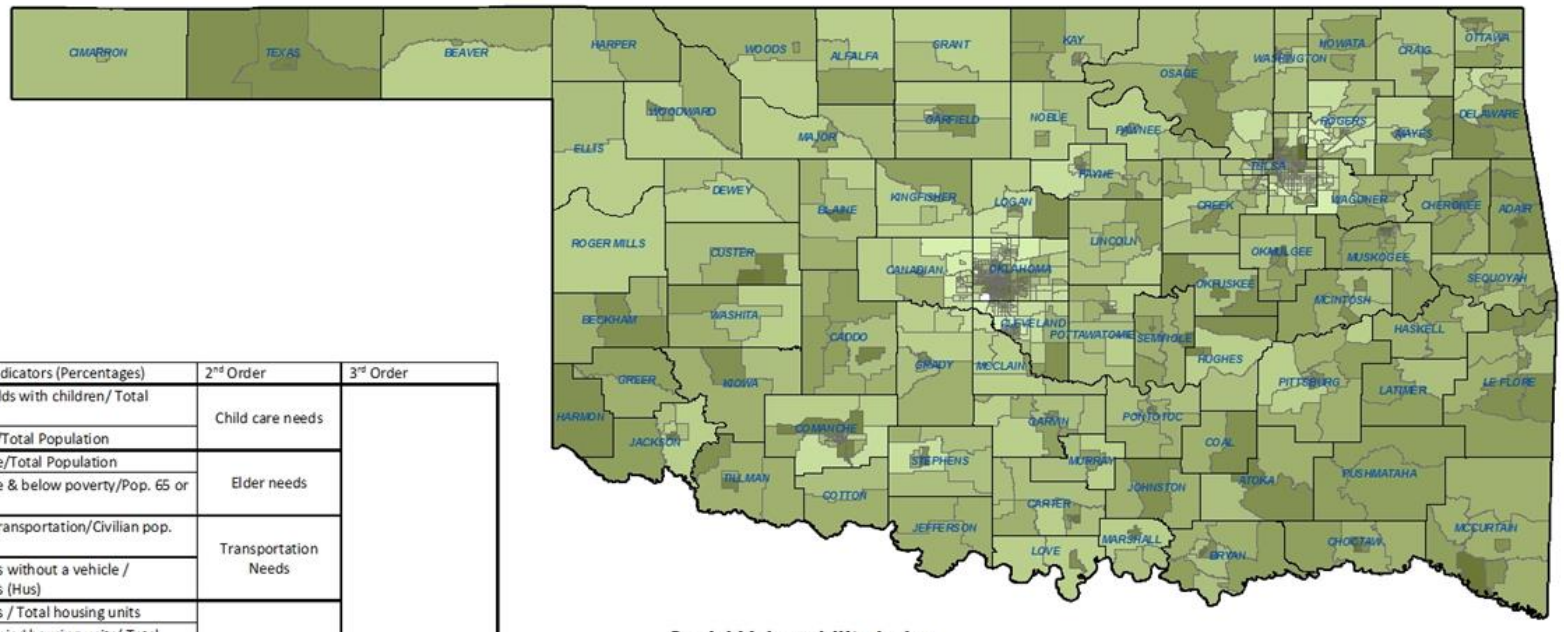
- 2.6340 - 2.9760
- 2.9761 - 3.2170
- 3.2171 - 3.4180
- 3.4181 - 3.6370
- 3.6371 - 3.9500

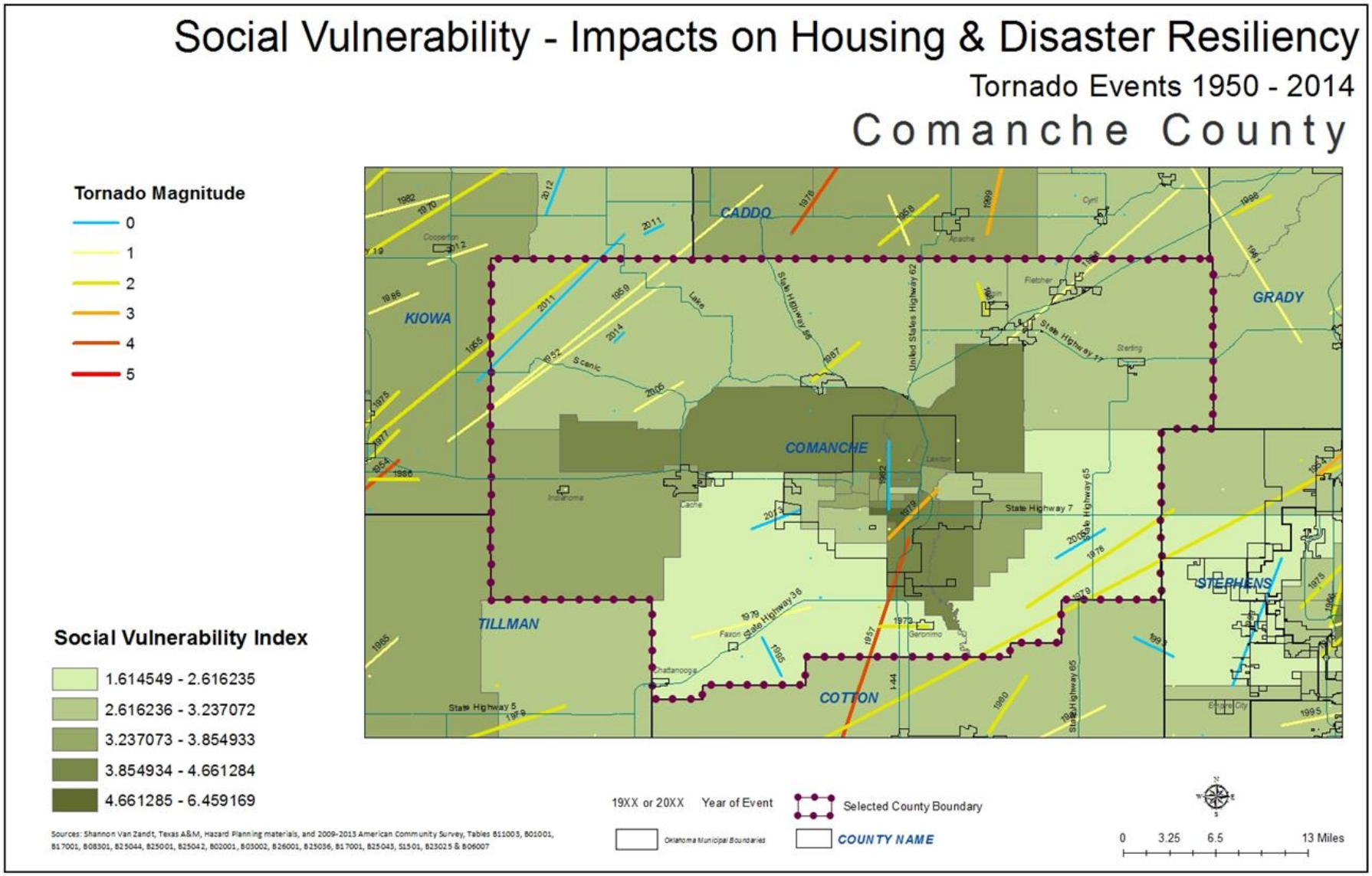
0 25 50 100 Miles

Social Vulnerability - Impacts on Housing & Disaster Resiliency

Base Social Vulnerability Indicators (Percentages)	2nd Order	3rd Order
1. Single parent households with children/ Total Households	Child care needs	Social vulnerability "Hotspot" or area of concern
2. Population 5 or below/Total Population		
3. Population 65 or above/Total Population	Elder needs	
4. Population 65 or above & below poverty/Pop. 65 or above		
5. Workers using public transportation/Civilian pop. 16+ and employed	Transportation Needs	
6. Occupied housing units without a vehicle / Occupied housing units (Hus)		
7. Occupied housing units / Total housing units	Temporary Shelter and housing Recovery needs	
8. Persons in renter occupied housing units/ Total housing units		
9. Non-white population/Total population		
10. Population in group quarters / Total population		
11. Housing units built 20 years ago / Total housing units		
12. Mobile Homes/ Total housing units		
13. Persons in poverty / Total population		
14. Occupied housing units without a telephone/ Total occupied HU	Civic Capacity needs	
15. Population above 25 with less than high school/ Total pop above 25		
16. Population 16+ in labor force an unemployed/ Pop in Labor force 16+		
17. Population above 5 that speak English not well or not at all / Pop >5		

Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables B11003, B01001, B17001, B08301, B25044, B25001, B25042, B02001, B03002, B26001, B25036, B17001, B25043, S1501, B23025 & B06007




Social Vulnerability - Impacts on Housing & Disaster Resiliency
Tornado Events 1950 - 2014
Comanche County
Tornado Magnitude
0
1
2
3
4
5
CADDO
KIOWA
GRADY
COMANCHE
TILLMAN
COTTON
STEPHENS
Lake
Scenic
State Highway 58
United States Highway 62
State Highway 17
State Highway 7
State Highway 65
State Highway 36
State Highway 5
I-44
Social Vulnerability Index
1.614549 - 2.616235
2.616236 - 3.237072
3.237073 - 3.854933
3.854934 - 4.661284
4.661285 - 6.459169
19XX or 20XX Year of Event
Selected County Boundary
Oklahoma Municipal Boundaries
COUNTY NAME
0 3.25 6.5 13 Miles
Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables B11003, B01001, B17001, B08301, B25044, B25001, B25042, B02001, B03002, B26001, B25036, B17001, B25043, S1501, B23025 & B06007

Social vulnerability combined with the devastating impacts of a natural or man-made disaster can compound a household's ability to recover and in fact can place those individuals at an even great gap or disadvantage prior to the event (Shannon Van Zandt, Texas A&M, Hazard Planning)

This county falls above average per this index for social vulnerability when comparing as a county to other counties in the state. The area most vulnerable by census tract is in the central portion of the county, Lawton area. This is the heavily populated portion of the county. The social vulnerability assessment is intended to focus attention to those that may have additional difficulties during an event as well as part of recovery.

Recommendations for this county:

- Continue to update and maintain the county HMP and include attention to areas within the county that in addition to physical vulnerability may have compounding social vulnerability factors.
- Efforts to strengthen building codes related to tornadoes and natural disasters should be considered.
- Planning for shelters from disaster events for multifamily, HUD and LIHTC units, in addition to all housing in the community should be incorporated with any effort to increase housing.
- Elevating the priority of creating a database and map of storm shelter locations.