

Special Topics

Stephens 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.

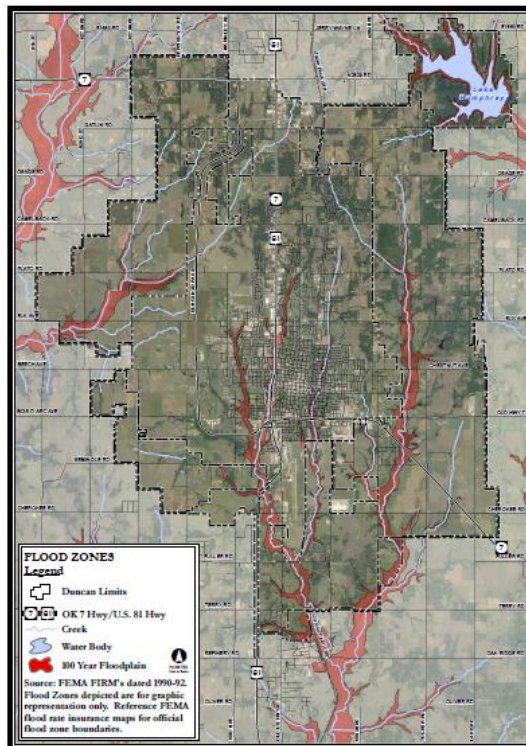
C.0 Comprehensive Plans & Hazard Mitigation Plans

There are 15 key cities within the county: Alma, Bray, Central High, Comanche, Corum, Duncan, Elk Plaza, Empire City, Lake Humphreys, Loco, Marlow, Meridian, Santa Fe, Sunray, and Velma.

Comprehensive plans are the guiding documents for cities of various sizes to address key aspects of their community from land use, transportation, environment, housing, and economic development.

Of the 15 cities, one has a comprehensive plan that has been adopted: Duncan. Of these plans the following plans contain language in the plan that addresses land use decisions that reduce placing housing and businesses within historical areas of risk (e.g. flooding) and other supporting actions to increase disaster resiliency.

Duncan



Page 18:

Page 16: Future development should take into account this minor tributary and provide for appropriate setbacks and open space. Evaluation of future commercial development should be conducted to ensure no additional runoff causing additional downstream flooding occurs. The

community should develop a community wide stormwater management plan to reduce the flooding in the community and to minimize future expansion of the floodplain.

Based on the review of the existing and available comprehensive plans for the area, it is recommended that any future comprehensive planning work done include coordination and goals to address disaster resiliency.

The other key plan for a city to manage, mitigate and plan for recovery related to disasters is a **Hazard Mitigation Plan** (or Emergency Management Plan). Often 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.

Stephens County does not have a Hazard Mitigation Plan. There is no plan in place, no emergency manager was able to be identified and contacted. No staff person at county or city level was able to provide any information on how the county planned to address a disaster event.

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.

Flooding

All parts of the county may be subject to flash flooding, freeze-thaw flooding and extreme precipitation that can cause flooding, unrelated to the streams and rivers. Below are images taken from the FEMA National Flood Hazard Layer maps displaying floodplains in each of the key towns:

Central High

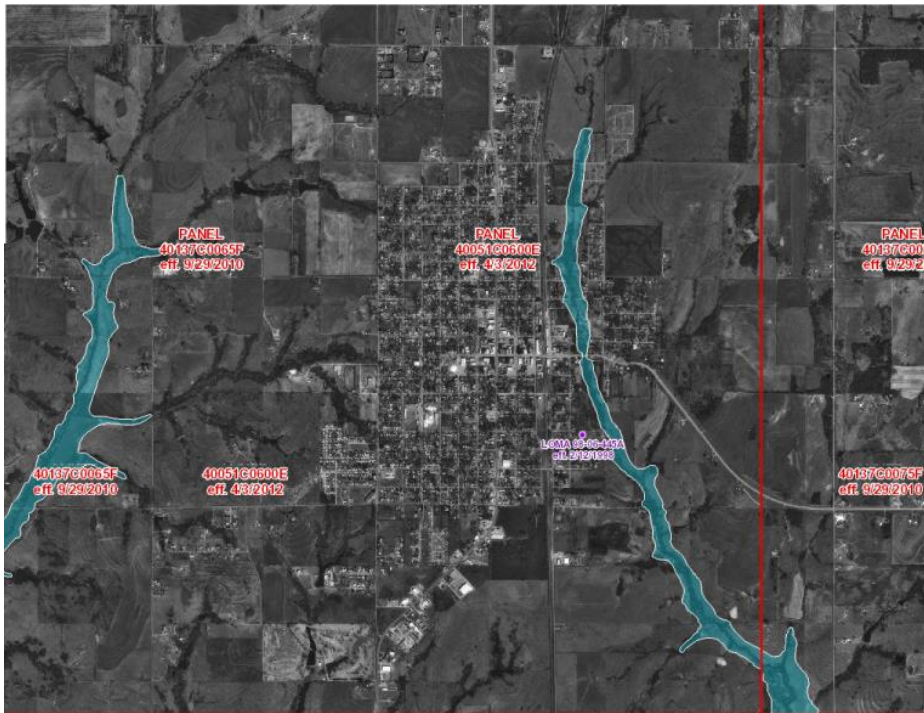


Flood Hazard Zones

■ 1% Annual Chance Flood Hazard

FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

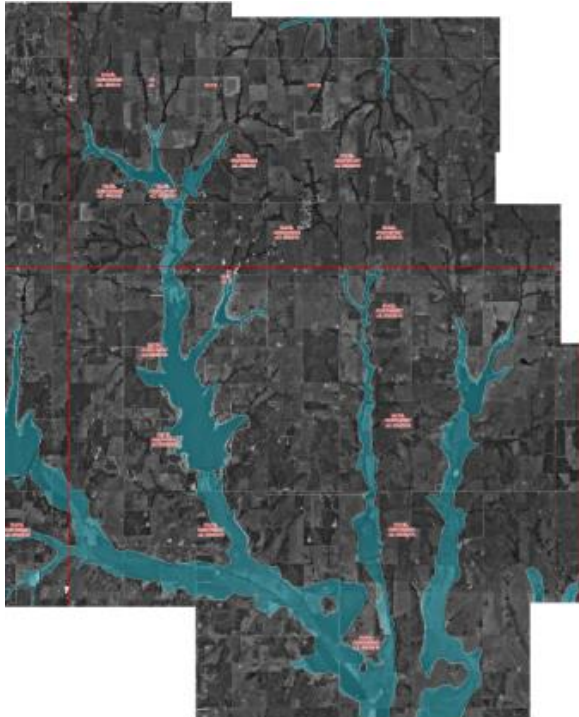
Marlow



Flood Hazard Zones
■ 1% Annual Chance Flood Hazard

FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Bray



Flood Hazard Zones
■ 1% Annual Chance Flood Hazard

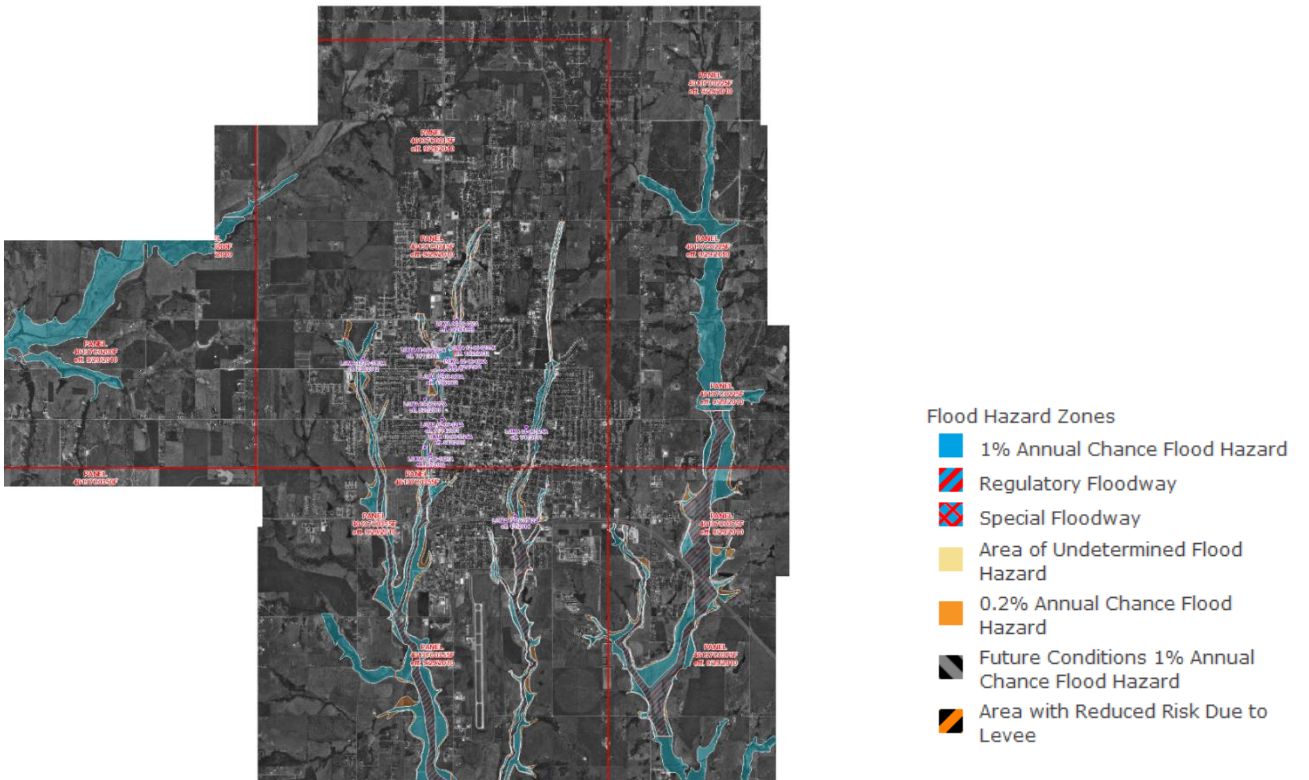
FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Lake Humphreys



FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Duncan



FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Velma



FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Alma



FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Empire City



Flood Hazard Zones
■ 1% Annual Chance Flood Hazard

FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Meridian



Flood Hazard Zones
■ 1% Annual Chance Flood Hazard
▨ Regulatory Floodway
▨ Special Floodway
■ Area of Undetermined Flood Hazard
■ 0.2% Annual Chance Flood Hazard
■ Future Conditions 1% Annual Chance Flood Hazard
▨ Area with Reduced Risk Due to Levee

FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>



Sunray



Flood Hazard Zones
■ 1% Annual Chance Flood Hazard

FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Santa Fe



Flood Hazard Zones
■ 1% Annual Chance Flood Hazard

FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

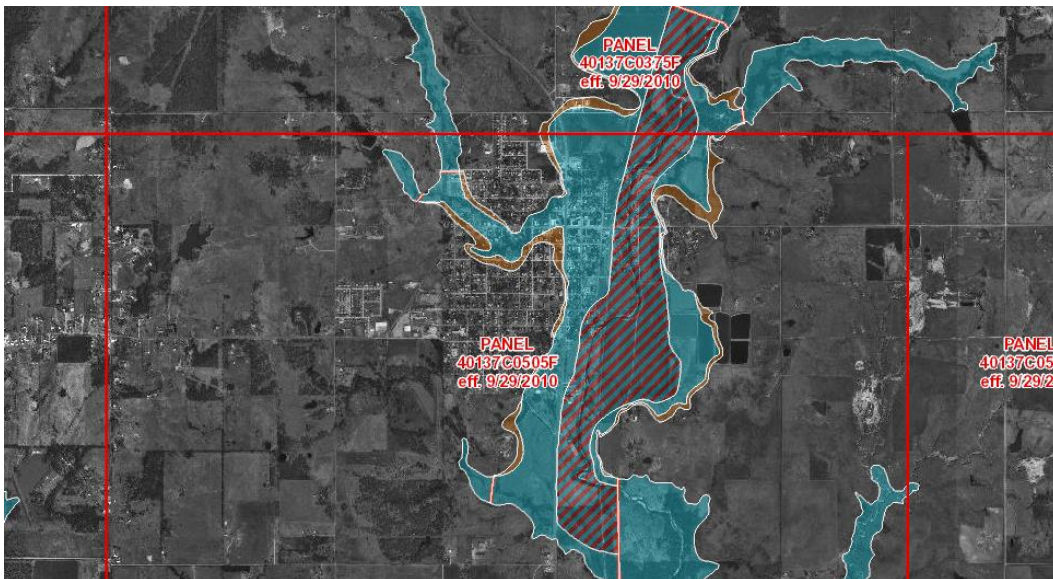
Corum



Flood Hazard Zones
■ 1% Annual Chance Flood Hazard

FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Comanche



Flood Hazard Zones
■ 1% Annual Chance Flood Hazard
■ Regulatory Floodway
■ Special Floodway
■ Area of Undetermined Flood Hazard
■ 0.2% Annual Chance Flood Hazard
■ Future Conditions 1% Annual Chance Flood Hazard
■ Area with Reduced Risk Due to Levee

FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Loco



FEMA's National Flood Hazard Layer <http://fema.maps.arcgis.com/>

Elk Plaza – neither Google Maps nor the FEMA National Flood Hazard Layer could find this unincorporated community.

NOAA data shows the following historic data on disaster events for the county:

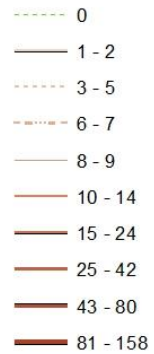
Historic data on tornados between 1951-2014 there are 61 tornados documented. There were 27 injuries that occurred connected to these tornados, with 4 of those injuries happening in the March 19th, 1973 tornado and another 4 occurring on the February 22nd, 1975 tornado. There were 2 fatalities connected to tornadoes during this time period, one occurring on the May 5th, 1977 tornado and the other on April 10th, 1979. Property losses between 1961-1996 ranged from \$1,554,700 to \$15,547,200. Accounting for losses estimated changed in 1996. The losses estimated between 1996-2014 was \$110,000.

Social Vulnerability - Impacts on Housing & Disaster Resiliency

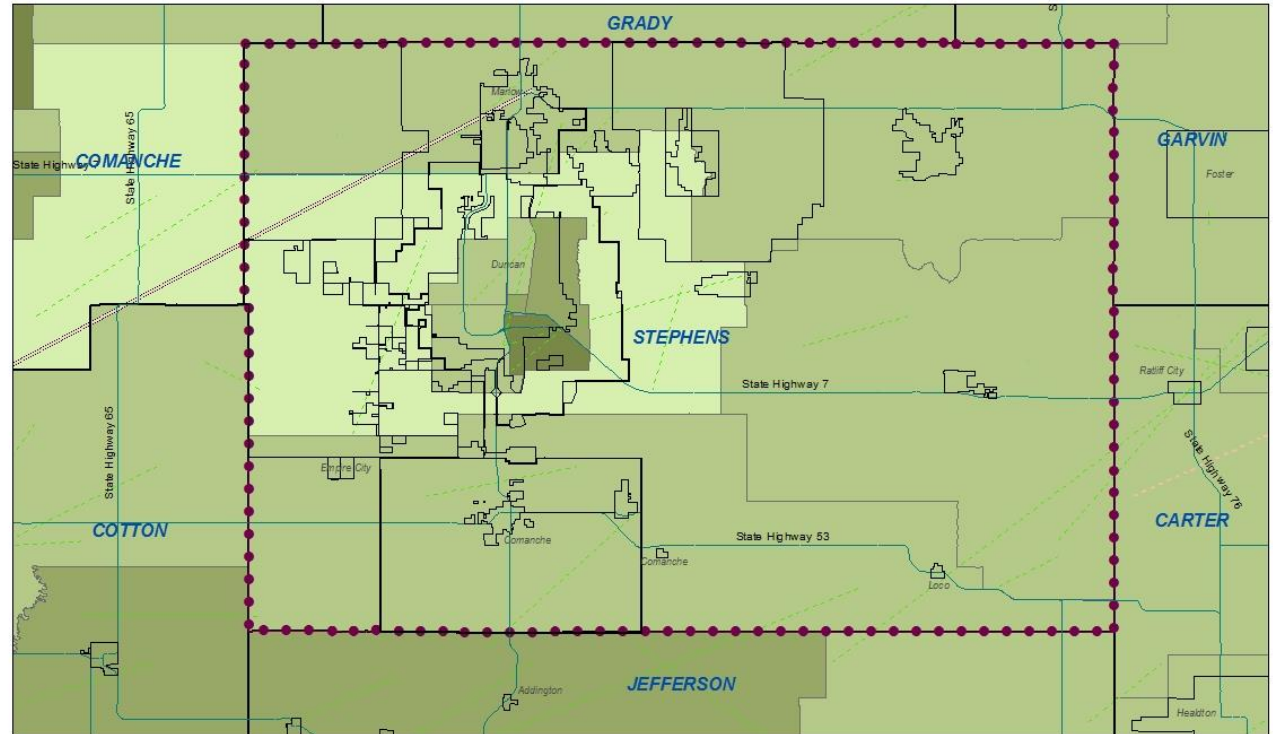
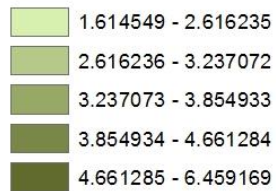
Tornado Events 1950 - 2014

Stephens County

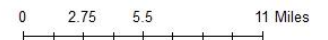
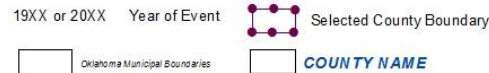
of fatalities associated with event



Social Vulnerability Index



Sources: Shanno 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

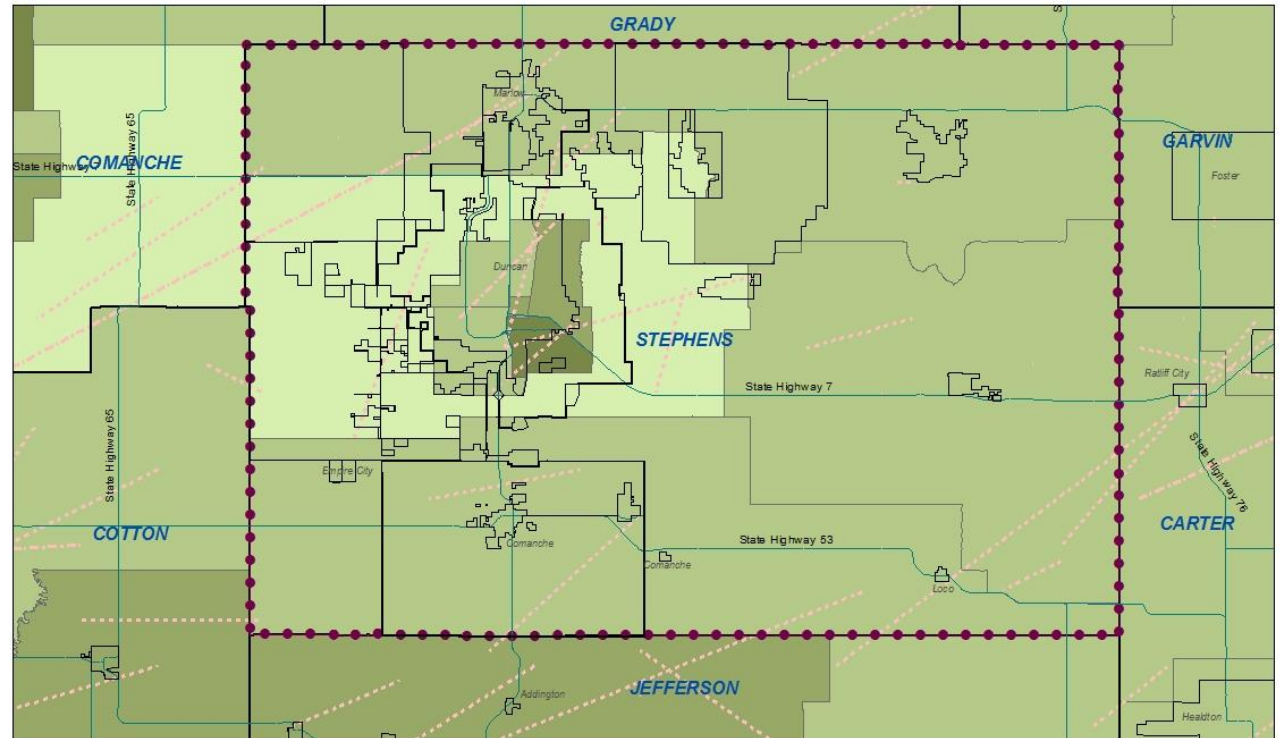
Stephens County

of injuries associated with event

- 0 - 2
- 3 - 8
- 9 - 21
- 22 - 42
- 43 - 68
- 69 - 106
- 107 - 212
- 213 - 583
- 584 - 1150
- 1151 - 1740

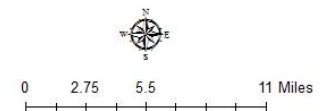
Social Vulnerability Index

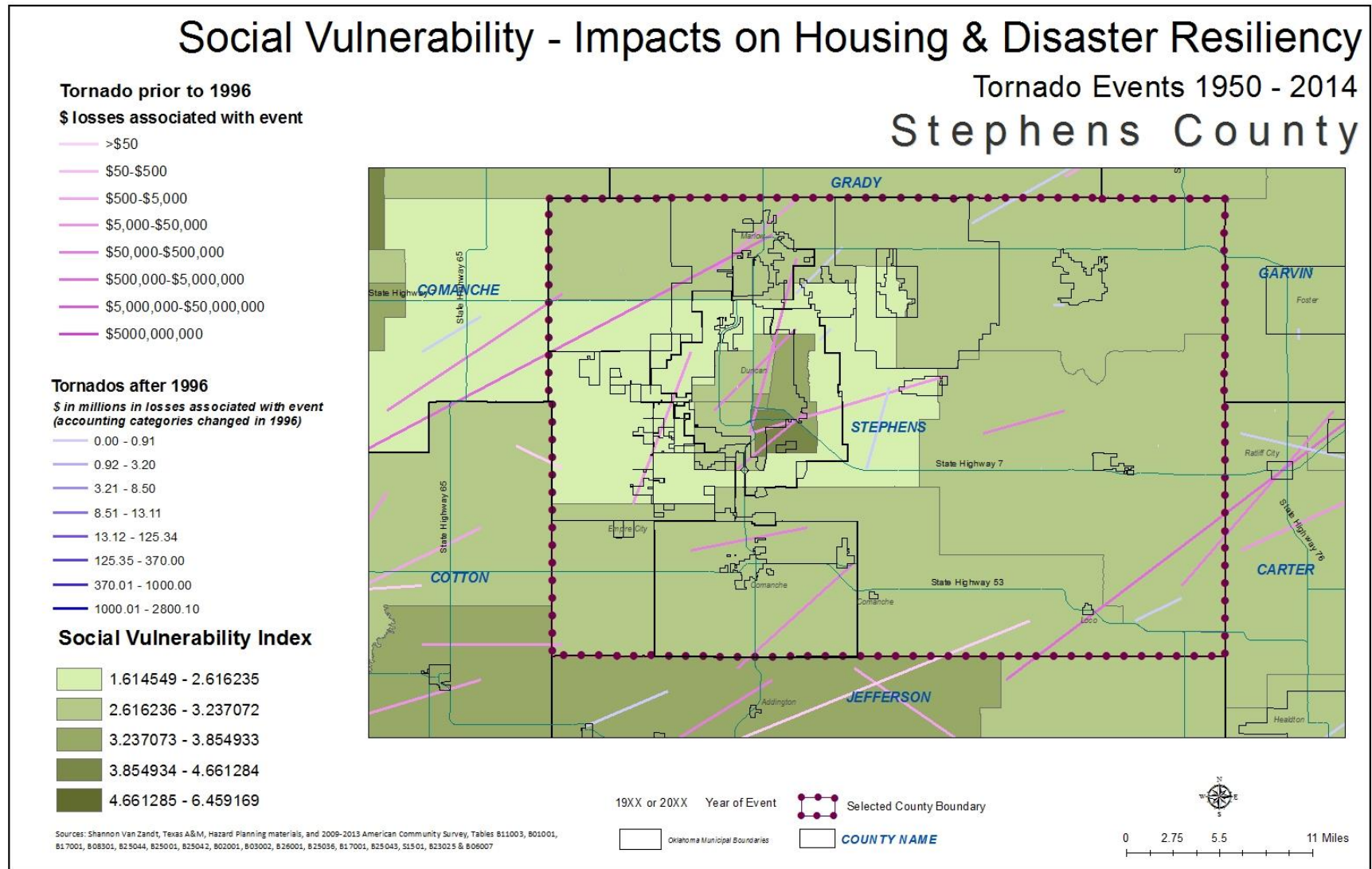
- 1.614549 - 2.616235
- 2.616236 - 3.237072
- 3.237073 - 3.854933
- 3.854934 - 4.661284
- 4.661285 - 6.459169



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

19XX or 20XX Year of Event
 [Symbol] Selected County Boundary
 [Symbol] Oklahoma Municipal Boundaries
 [Symbol] COUNTY NAME





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

Stephens County storm shelter registration: <http://www.stephenscount yok.com/emergency-management/item/128-registering-your-storm-shelter>

Duncan is the only town that mentions public storm shelters. The town discussed installing a public shelters in 2011. Duncan's Community Development Director at the time was quoted to say, "...we don't really have a listing of any that I'm aware of. I'm not sure where people would go honestly, if they didn't have access to a private shelter." http://www.duncanbanner.com/news/city-pursues-public-storm-shelters/article_7e84e108-3686-5752-8dd3-3d992e4dd2b0.html

More recently, the town has hopes of setting up to seven shelters in the school system. Mark Twain Elementary and Irving Elementary had theirs delivered in June 2015 and Plato Elementary was planning to get theirs soon after the article was written. The shelters are FEMA rated to withstand an EF5 tornado. <http://www.ksw.com/story/29420548/duncan-public-schools-gets-tornado-shelters>

C.2.1.3 Public Policy and Governance to Build Disaster Resiliency

Information not available.

C.2.1.4 Local Emergency Response Agency Structure

Information not available.

C.2.1.5 Threat & Hazard Warning Systems

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

- Sirens
- Blackboard Emergency Notifications System: <https://stephenscounty.bbcportal.com/>

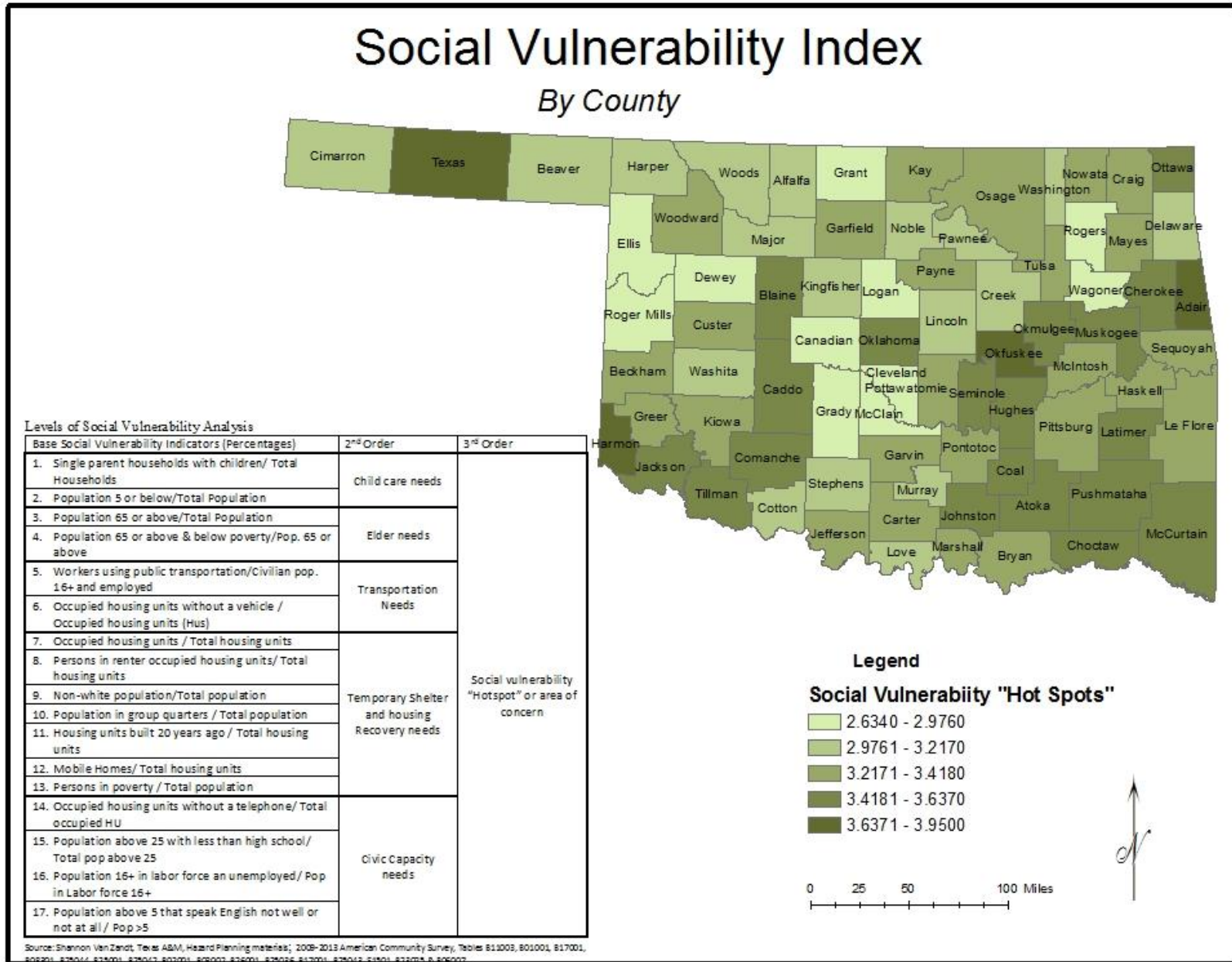
Social Vulnerability

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 - Stephens County

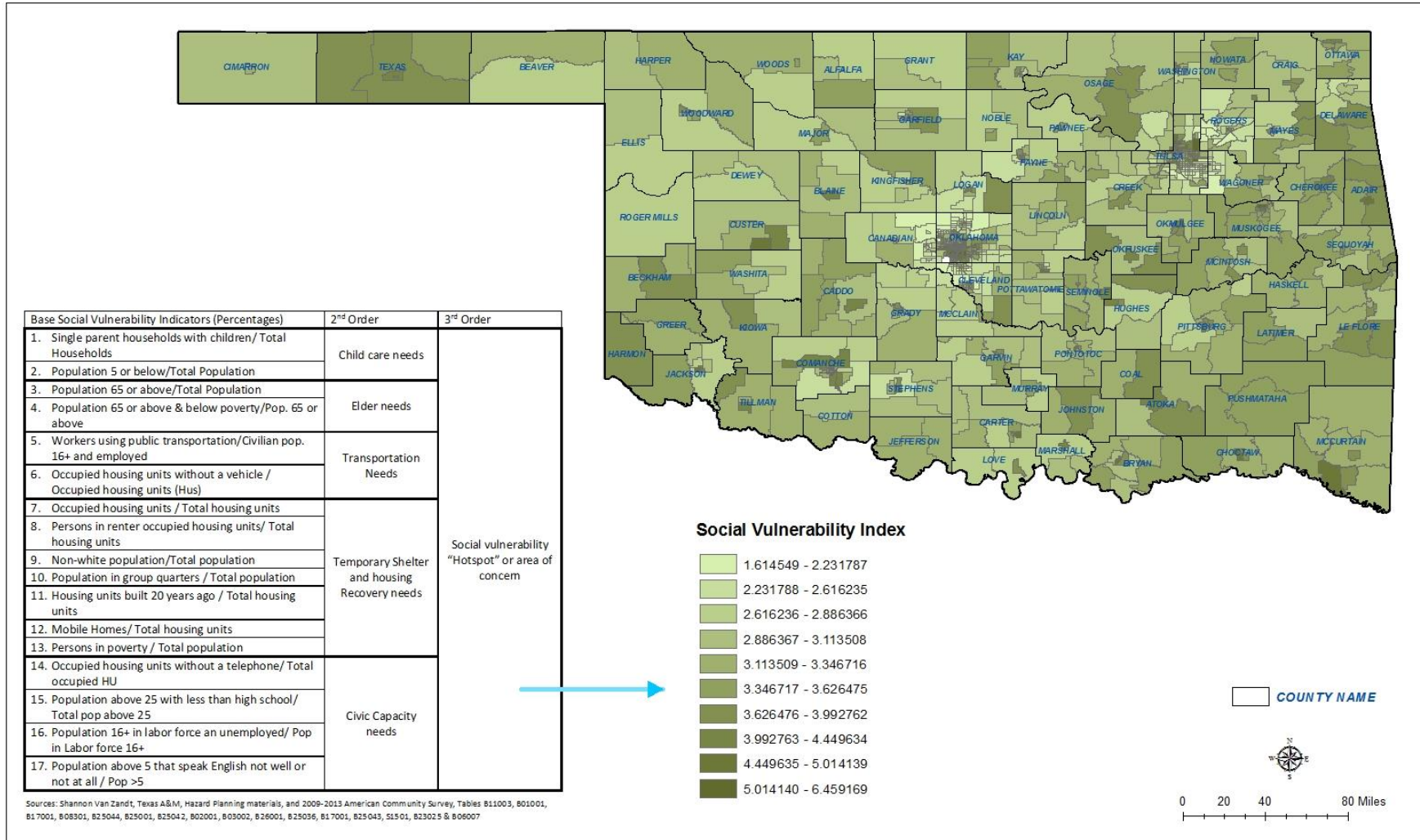
Base Social Vulnerability Indicators (%)		2nd Order	3rd Order
1.) Single Parent Households	10.81%	0.172	3.161 Social Vulnerability 'Hotspot' or Area of Concern
2.) Population Under 5	6.39%	(Child Care Needs)	
3.) Population 65 or Above	17.47%	0.276	
4.) Population 65 or Above & Below Poverty Rate	10.18%	(Elder Needs)	
5.) Workers Using Public Transportation	0.57%	0.058	
6.) Occupied Housing Units w/o Vehicle	5.27%	(Transportation Needs)	
7.) Housing Unit Occupancy Rate	85.78%		
8.) Rental Occupancy Rate	29.19%		
9.) Non-White Population	17.94%	2.392	
10.) Population in Group Quarters	1.25%	(Temporary Shelter and Housing Recovery Needs)	
11.) Housing Units Built Prior to 1990	82.12%		
12.) Mobile Homes, RVs, Vans, etc.	8.27%		
13.) Poverty Rate	14.64%		
14.) Housing Units Lacking Telephones	2.36%		
15.) Age 25+ With Less Than High School Diploma	14.50%	0.262	
16.) Unemployment Rate	7.86%	(Civic Capacity Needs)	
17.) Age 5+ Which Cannot Speak English Well or Not At All	1.48%		

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



Source: Shannon Van Zandt, Texas A&M, Hazard Planning Institute; 2009-2013 American Community Survey, Tables B11009, B01001, B17001, B02001, B23014, B23042, B23043, B03001, B05003, B26001, B25025, B17001, B29013, B18011, B22005, B26002

Social Vulnerability - Impacts on Housing & Disaster Resiliency



Social Vulnerability - Impacts on Housing & Disaster Resiliency

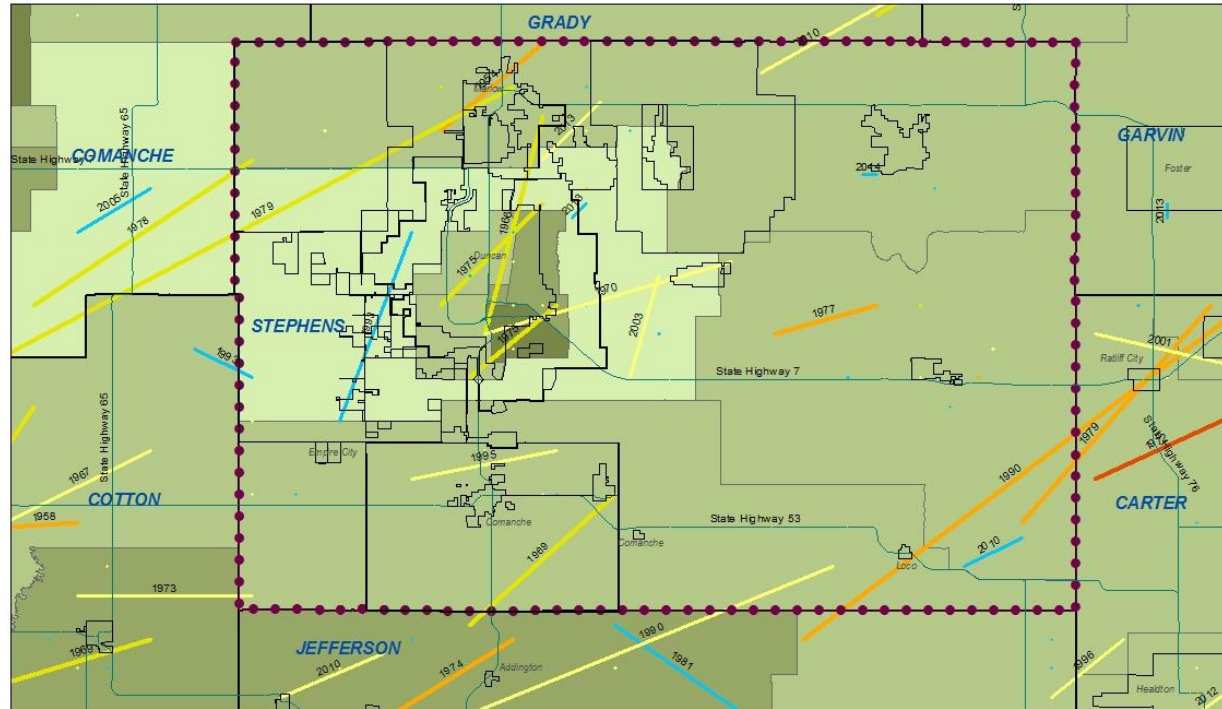
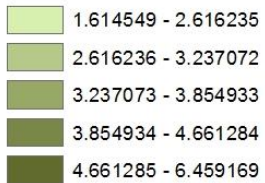
Tornado Events 1950 - 2014

Stephens County

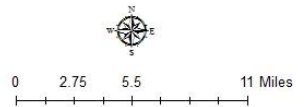
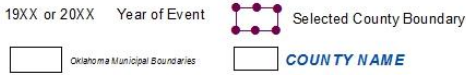
Tornado Magnitude



Social Vulnerability Index



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, S15 01, 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 greater gap or disadvantage prior to the event (Shannon Van Zandt, Texas A&M, Hazard Planning).

This county falls below the state score per this index for social vulnerability when comparing as a county to other counties in the state. The Duncan area census tracts within the county have some increased social vulnerability scores.

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.