

## Special Topics

## Beckham 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 6 key cities within the county (Elk City, Sayre, Erick, Texola, Carter, Sweetwater).

*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.*

No comprehensive plan was found for Elk City.

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.

Beckham County has a Hazard Mitigation Plan and an Emergency Operations Plan.

#### 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.

Within the Beckham County HMP, a risk assessment was performed and identified the typical hazards that the county typically faces:

PLACE	DAM FAILURE	DROUGHT	EARTHQUAKE	EXTREME HEAT	FLOODING	HAIL	SPECIAL EVENT	HIGH WIND	LIGHTNING	TORNADO	WILDFIRE	WINTER STORM (ICE & SNOW)	LANDSLIDE/ROCK FALL	EXPANSIVE SOIL
Oklahoma	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Beckham County 2004	X	X	X		X	X	X	X	X	X	X	X		
Beckham County 2013	X	X	X	X	X	X		X	X	X	X	X		

p. 20

After the risks are assessed, as is typical in the HMP process, they county scored their relative vulnerability to these risks:

CRITERIA	DAM FAILURE	DROUGHT	EARTHQUAKE	EXTREME HEAT	FLOODING	HAIL	HIGH WIND	LIGHTNING	TORNADO	WILDFIRE	WINTER STORM (SNOW AND ICE)
SPEED OF ONSET	131	39	147	44	106	137	75	109	147	146	74
HISTORY	52	147	37	148	108	148	145	148	146	148	146
PROBABILITY	72	148	40	148	105	145	148	148	144	145	136
SEVERITY OF IMPACT	40	103	43	113	104	107	109	110	145	140	106
VULNERABILITY	43	113	43	140	76	108	135	110	143	144	143
TOTAL	338	550	310	593	499	645	612	625	725	723	605
RANKING	10	8	11	7	9	3	5	4	1	2	6

Tornados, wildfire, and hail being the top three hazards for the county.

**Dam Failure:**

Dam failures have not occurred in any years between 1950 and 2010. Damages to personal property are estimated at \$0. (p. 24)

**Probability of future events:**

There is no history of dam failures occurring in Beckham County, jurisdictions, schools and rural water district participating in this plan and the likelihood of such an event occurring in the future is unlikely. P. 26

**Drought:**

Impacts the entire state and impacts availability of water. From the housing perspective, there are no general guidelines on location for housing or construction practices which will lessen the impacts of this cyclical event.

**Flooding**

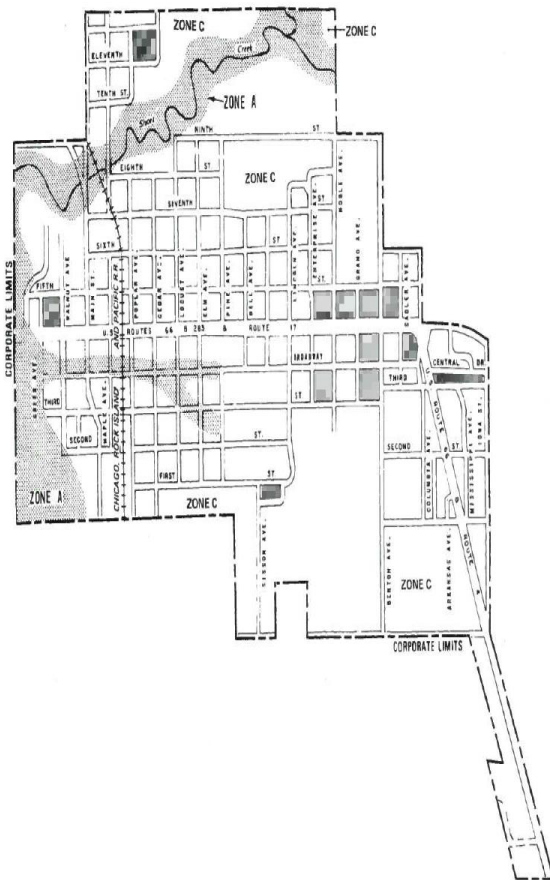
The North Fork Red River runs through the county from the southwest to the west central. In addition to this major river there are also several large streams in the county. Elk City Lake was built in 1970 for flood control. The lake covers 240 acres at an average depth of 20 feet and contains 5 dams.



While these dams have greatly reduced flooding in Beckham County, Town of Carter, City of Elk City, City of Sayre and rural water district are still subject to riverine and flash flooding. There are no schools which are participating in this plan that are subject to flooding. (P. 33)

FIRM maps (in need of updating) were included in the HMP for all the participating towns. Carter has some small area of floodprone land in the south end of the corporate limits (p. 240).

The map for Sayre is below and shows some floodprone areas near development:



City of Sayre, OK FIRM map, 1985.

Elk City map is not of a good enough quality to include here (p. 246), but shows some floodprone land near development following river.

**“Flooding**

A mitigation strategy for flooding includes participation in the (NFIP) National Flood Insurance Program. Steps to be taken by participating jurisdictions to remain in compliance or become a participant in the NFIP include:

- A. Identify all areas within a participating jurisdiction that have the potential for flooding and determine if the area is currently identified by the NFIP.
- B. Analyze and gather data pertaining to identified flood zones including; history of flooding

in the jurisdiction, repetitive loss areas, and existing FIRM maps. An analysis of the information will then be used to determine:

1. Are the existing flood zones and maps up-to-date?
2. Have areas of new development within a participating jurisdiction been evaluated, and included in the NFIP?
3. Have mitigation efforts and flood control projects remedied the hazard potential for flooding in an area? If so, has the area been reevaluated and mapped as necessary?

C. Prioritize actions to be taken by revising and updating current NFIP jurisdictions and adding jurisdictions that are not currently members. The STAPLEE criterion, as discussed in Chapter 5, allows for prioritization when including the NFIP as a mitigation project. Overflow of waterways and roadways can occur during high precipitation events within Beckham County, participating jurisdictions, schools and rural water district. The county has been able to rip/wrap several washout and erosion areas; this is an excellent way to mitigate the erosion of county roadways. The county also removes debris and has strategies in place to clear the drainage ditches along the roads. There are no repetitive loss structures in Beckham County, participating jurisdictions and rural water district." P. 57

## Tornados

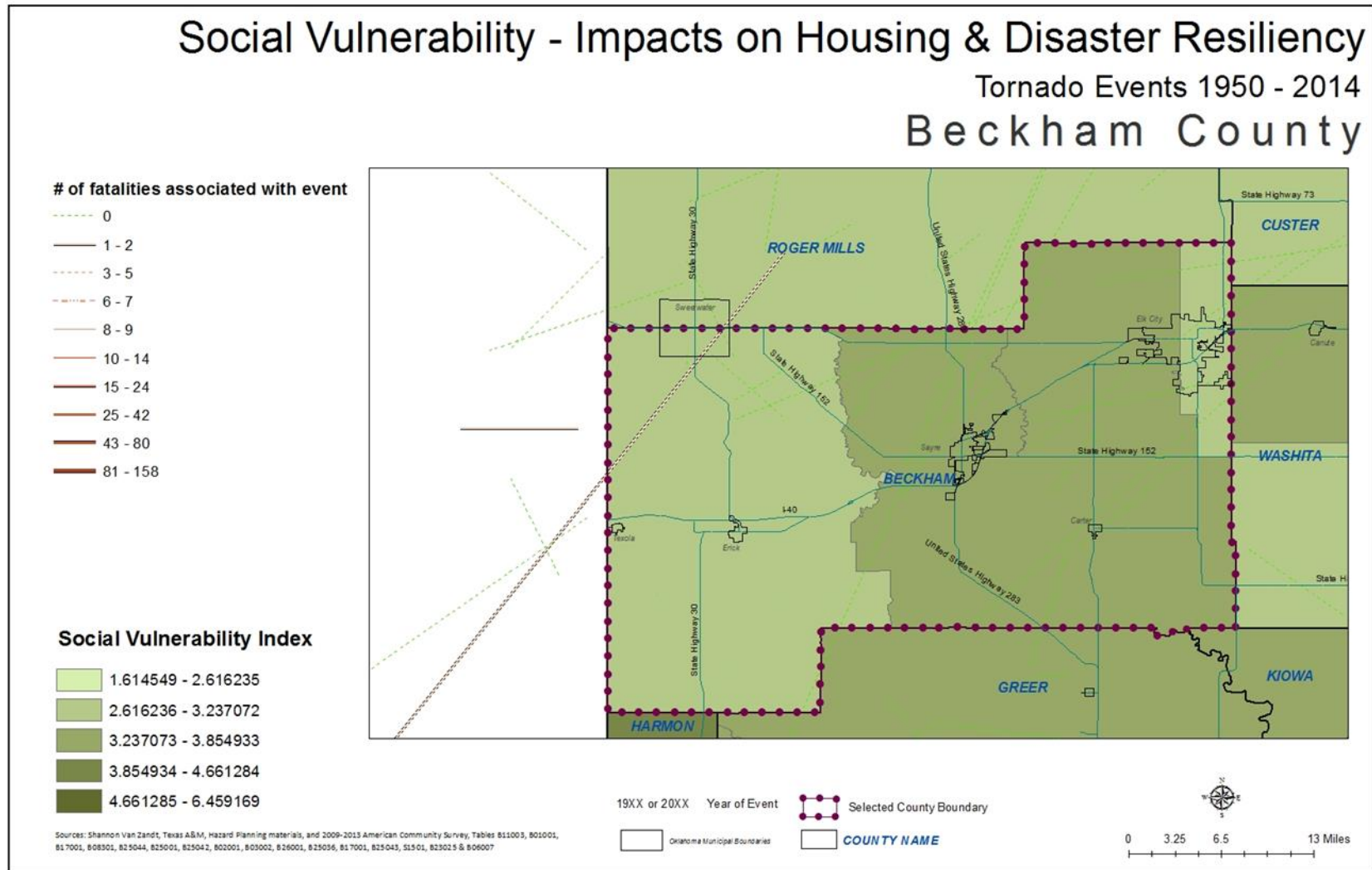
There have been 69 tornados recorded in all Beckham County, participating jurisdictions, schools and rural water district since 1950 according to the NCDC queries. There were 4 injuries and \$8.8 million dollars recorded as a result of these tornados. While none of these tornados have been in the EF5 size category or directly hit a heavily populated area in the county, they pose a threat as a major disaster. (P. 43)

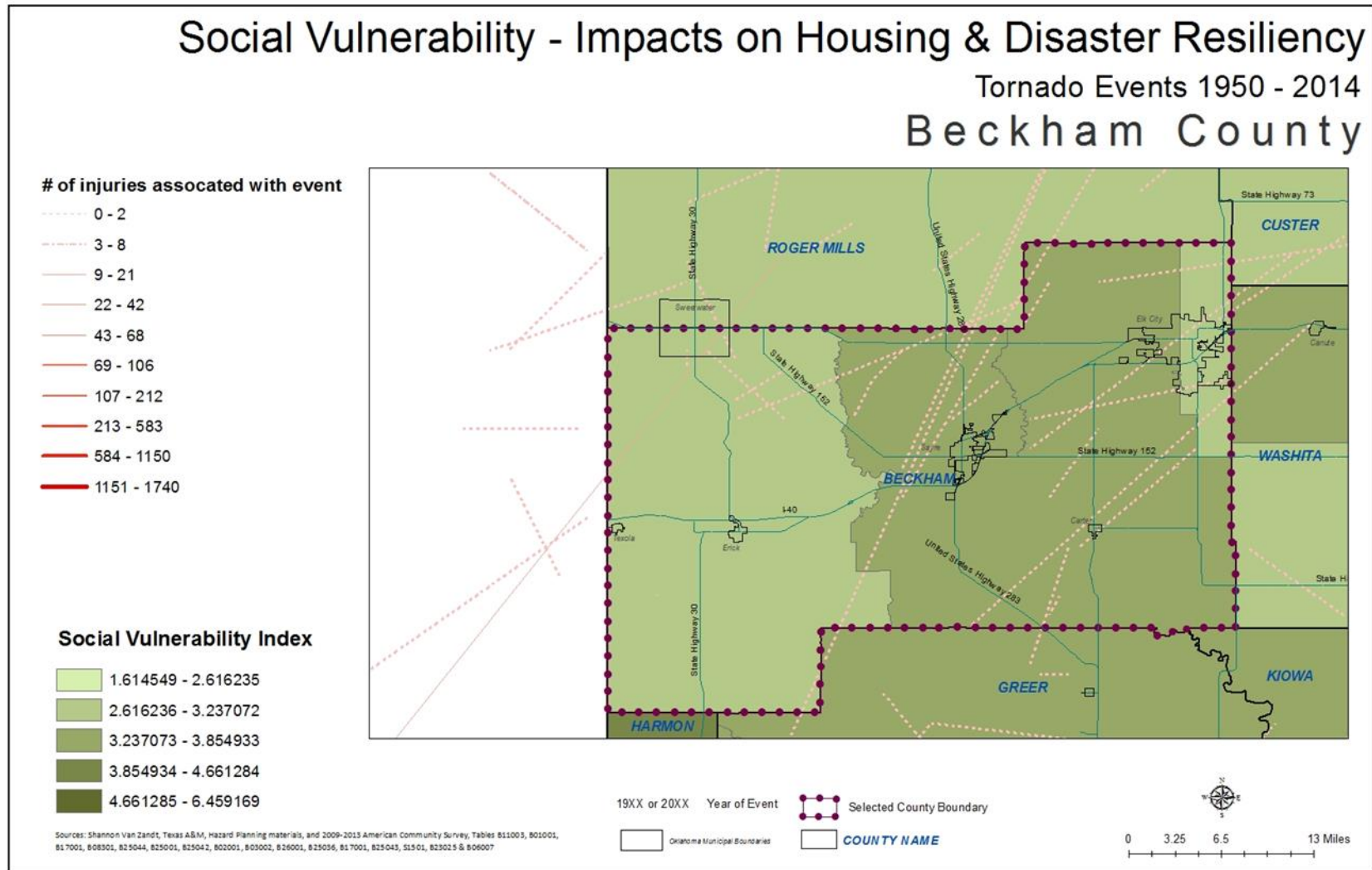
Recommended mitigation strategies included:

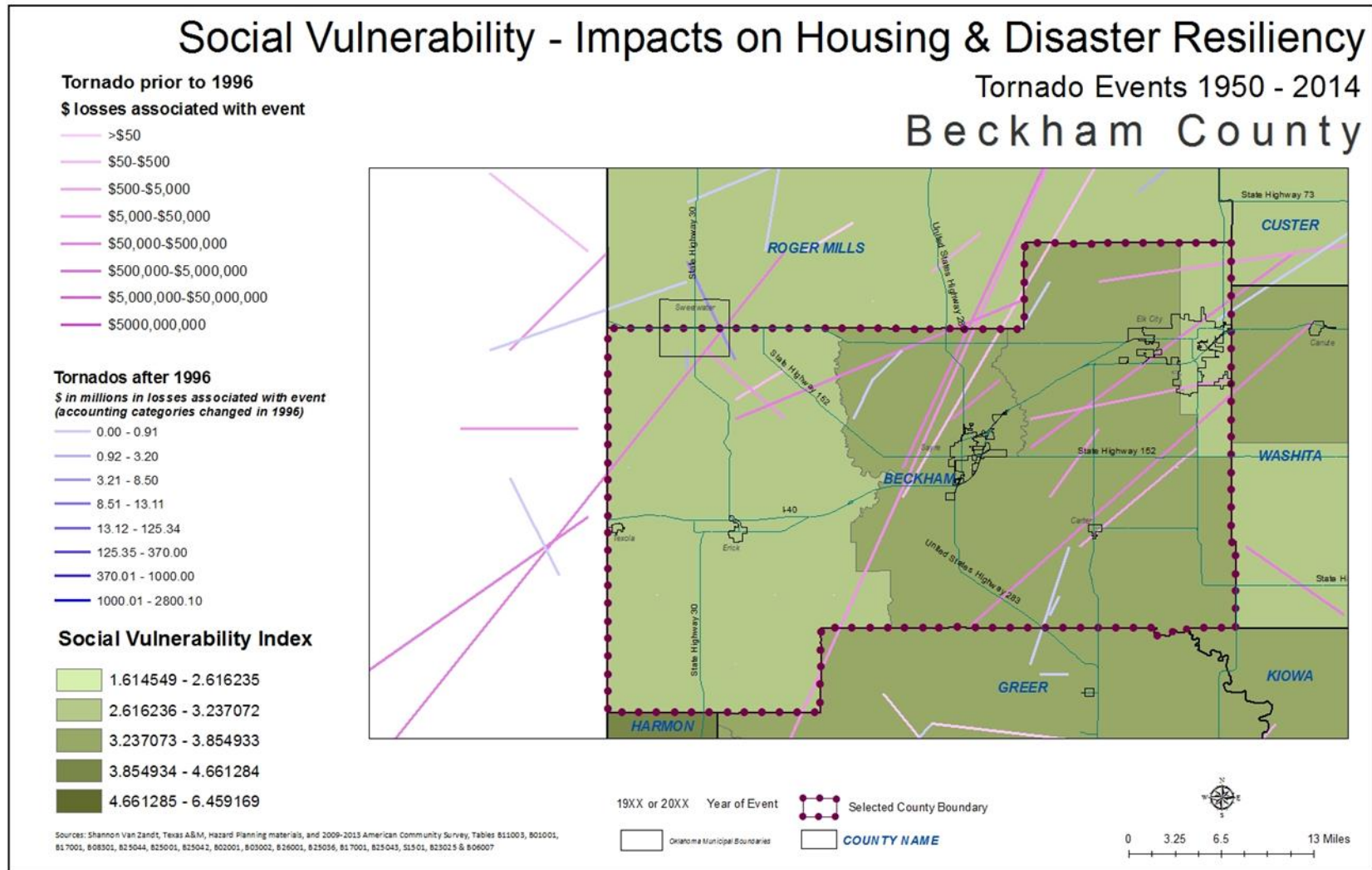
- Skywarn (Storm Spotters) are trained government employees and private citizens
- Senior fireman or policeman at the center activates storm sirens
- Storm shelters and safe rooms are effective in preventing loss of life and injuries.

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

Historic data on tornados between 1950-2014 there are 60 tornados documented. There were 22 injuries that occurred connected to these tornados, with 18 of those injuries happening in the 1955 tornado. There were 2 fatalities connected to tornadoes during this time period, all of which occurred in 1955. Property losses between 1950-1996 ranged from \$487,654.00 to \$4,876,700.00. (The accounting methods used for losses changed in 1996.) The losses estimated between 1996-2014 was \$6,300,000.00.









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

- Construct a public shelter is included in the HMP (several cities and towns have proposed constructing community shelters)

“There are some shelters available to the general public, but because 24 hour availability and handicap accessibility might be an issue, they are not advertised or included in this plan.” P. 19

Shelters listed in the Emergency Operations Plan for public use included:

Sayre

- City Of Sayre Building Basement 214 Nth 4th
- First Baptist Church Sayre, Ok. 512 N. 4th

Elk City

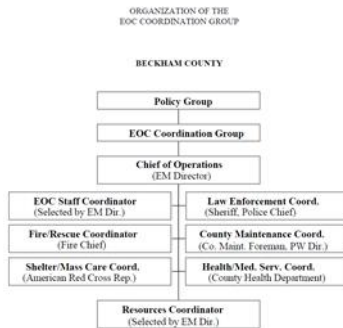
- Elk City Fire Department 303 W. 5th Elk City, Ok

Erick

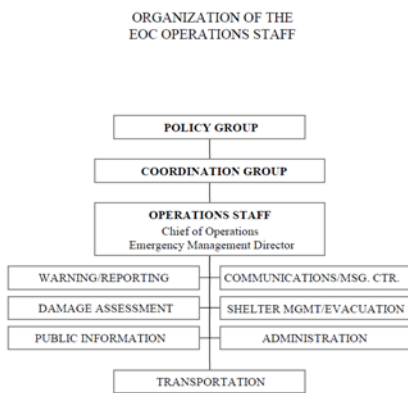
- First Baptist Church 400 S. Main Erick, Ok
- First Christian Church 223 S. Walnut Erick, Ok
- Erick School Shelter 200 S. Cedar Erick, Ok

**C.2.1.3 Public Policy and Governance to Build Disaster Resiliency**

### C.2.1.4 Local Emergency Response Agency Structure



p. 42



p. 44

### C.2.1.5 Threat & Hazard Warning System

Sirens:

Sayre – 3 sirens (EOP, p. 86)

Carter – 3 sirens

Elk City – 15 sirens

Erick – 3 sirens

Texola – 1 siren

1. From the Beckham County HMP – the following are proposed for improvements to storm preparedness: Generators for radio and warning systems.
5. Determine school shelters.
7. Educate public about storm siren
9. Identify Public storm shelters
10. Identify private storm shelters.
11. Expand warning system. (HMP, p. 60-61)

Town of Carter, in the HMP, included a project:

**“CREATE DATABASE OF CITIZENS WITH SPECIAL NEEDS**

*Project:* Create a database of citizens with special needs and relocate them to community shelters when necessary. *Lead:* Town of Carter Emergency Responders” p. 72

**LOCATE AND MAP EXISTING SHELTERS**

*Project:* Locate and map existing shelters within the city limits.

*Lead:* Town of Carter Emergency Responders p. 73

City of Erick proposed more sirens, locate private storm shelters, and a community shelter. (p.85)

City of Sayre proposed more sirens, a community shelter, signage to shelters, and GPS located private storm shelters. (p. 90).

Town of Sweetwater proposed more sirens and a community shelter (p. 100).

Merritt Schools proposed constructing a safe room and NOAA radios (p. 108).

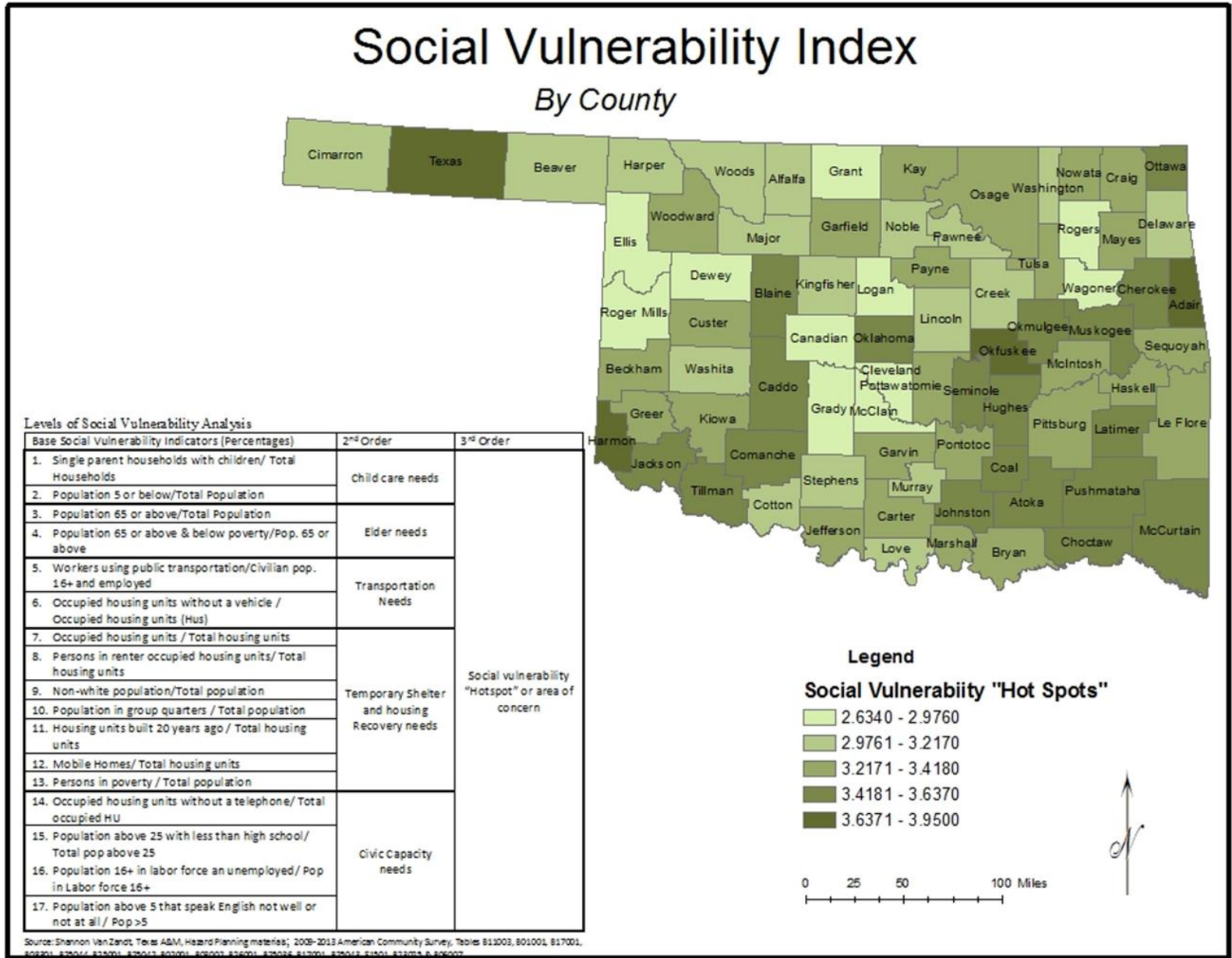
### **Social Vulnerability**

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.

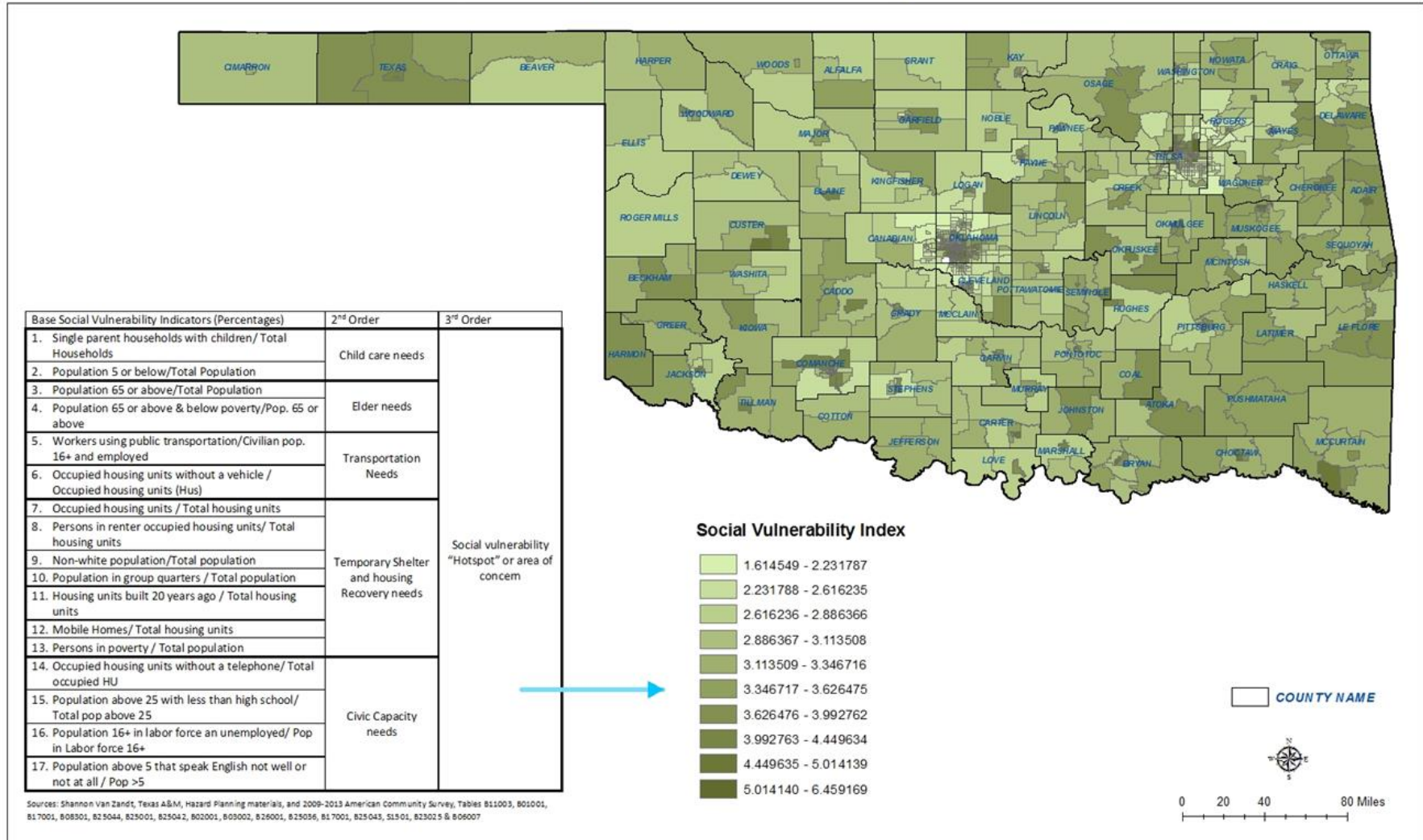
<b>Social Vulnerability Analysis - Beckham County</b>		
<b>Base Social Vulnerability Indicators (%)</b>	<b>2nd Order</b>	<b>3rd Order</b>
1.) Single Parent Households	16.04%	0.243
2.) Population Under 5	8.29%	(Child Care Needs)
3.) Population 65 or Above	12.24%	0.244
4.) Population 65 or Above Poverty Rate	12.19%	(Elder Needs)
5.) Workers Using Public Transportation	0.00%	0.04
6.) Occupied Housing Units w/o Vehicle	3.98%	(Transportation Needs)
7.) Housing Unit Occupancy Rate	80.43%	2.568 (Temporary Shelter and Housing Recovery Needs)
8.) Rental Occupancy Rate	39.06%	
9.) Non-White Population	22.17%	
10.) Population in Group Quarters	8.48%	
11.) Housing Units Built Prior to 1990	79.33%	
12.) Mobile Homes, RVs, Vans, etc.	12.26%	
13.) Poverty Rate	15.11%	
14.) Housing Units Lacking Telephones	3.26%	0.279 (Civic Capacity Needs)
15.) Age 25+ With Less Than High School Diploma	18.00%	
16.) Unemployment Rate	2.90%	
17.) Age 5+ Which Cannot Speak English Well or Not At All	3.74%	
		<b>3.375 Social Vulnerability 'Hotspot' or Area of Concern</b>

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



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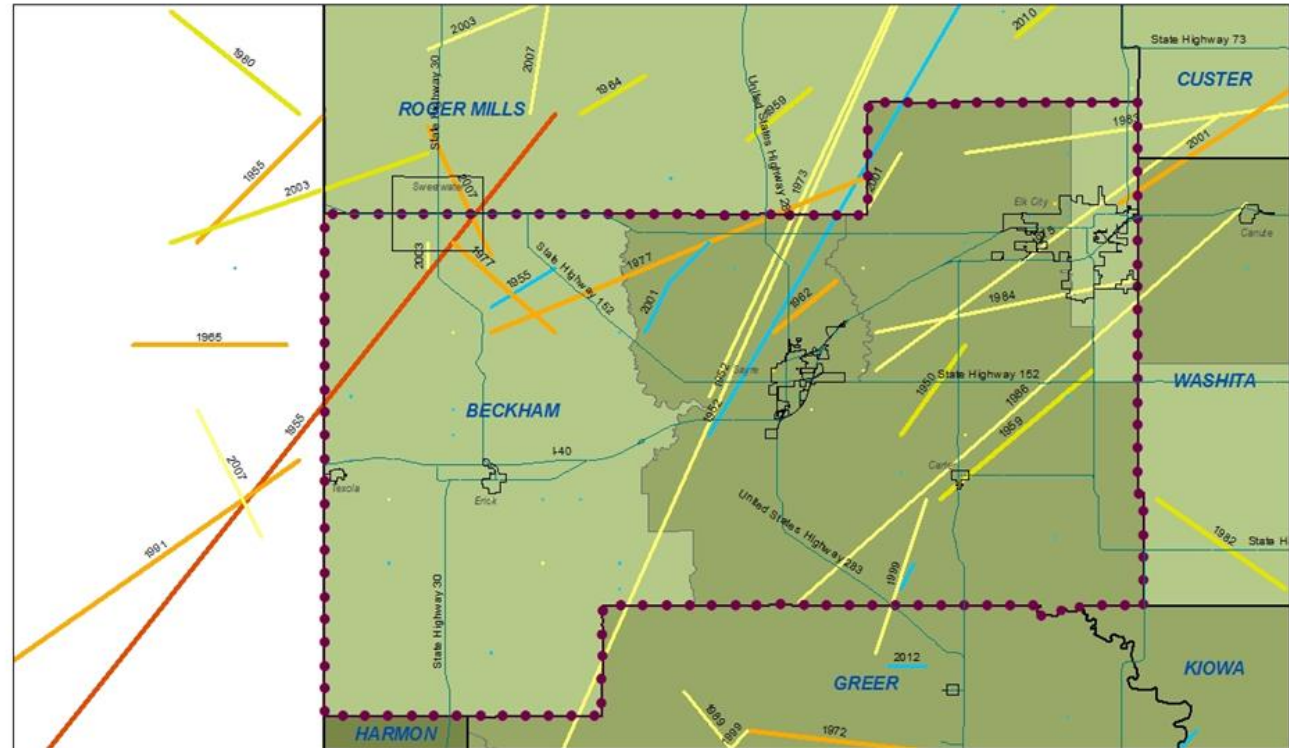
## Tornado Events 1950 - 2014

### Beckham County

#### Tornado Magnitude



#### Social Vulnerability Index



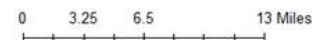
Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables 811003, 801001, 817001, 808301, 825044, 825041, 825042, 802001, 803002, 826001, 825056, 817001, 825043, 51501, 825025 & 806007

19XX or 20XX Year of Event

Selected County Boundary

Oklahoma Municipal Boundaries

COUNTY NAME



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 has similar in score per this index for social vulnerability when comparing as a county to other counties in the state. Looking at the census tract level, the Sayre and Elk City areas of the county have particularly higher scores for social vulnerability. Combine that with the tornados, as one physical hazard or event that occurs, people in these areas may have additional difficulties during an event due to transportation and family needs. Additionally recovery for socially vulnerable populations can be slow and may require additional outside assistance.

Recommendations for this county:

- Maintain the county HMP and EOP 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.