Appendices Contents

Appendix 1 – Additional Hazus Data

1.1 – Potential Losses by HAZUS Simulation

Included in the risk assessment are comprehensive simulations conducted in FEMA's HAZUS-MH 4.0 To properly display Tennessee's risk to earthquakes this plan conducted 2 earthquake simulations and 4 riverine flood simulations.

The first simulation model is in accordance the USGS's NMSZ prediction detailed in Section 3.3EQ (50% chance in the next 50 years). A historic epicenter was chosen from the 1811/1812 earthquakes at the coordinates: 36.300000, -89.600000. An average depth of 6 kilometers was chosen based on historical earthquake patterns around this epicenter. Per the USGS's prediction, the simulation models an earthquake of magnitude 6.5.

The second simulation model is based on the largely unknown and studied risk in East Tennessee. A historical epicenter was chosen based on the largest recorded earthquake in the area. Its coordinates are: 34.695232, -82.969903. The historic depth of 3 kilometers was chosen based on the previous occurrence. Selecting a magnitude was difficult as the greatest in the area was a 4.6 and there is little seismological research for the area. A 6.0 magnitude earthquake was selected as it is a reasonable increase from 4.6, but does not make claim that there is a catastrophic risk in the area.

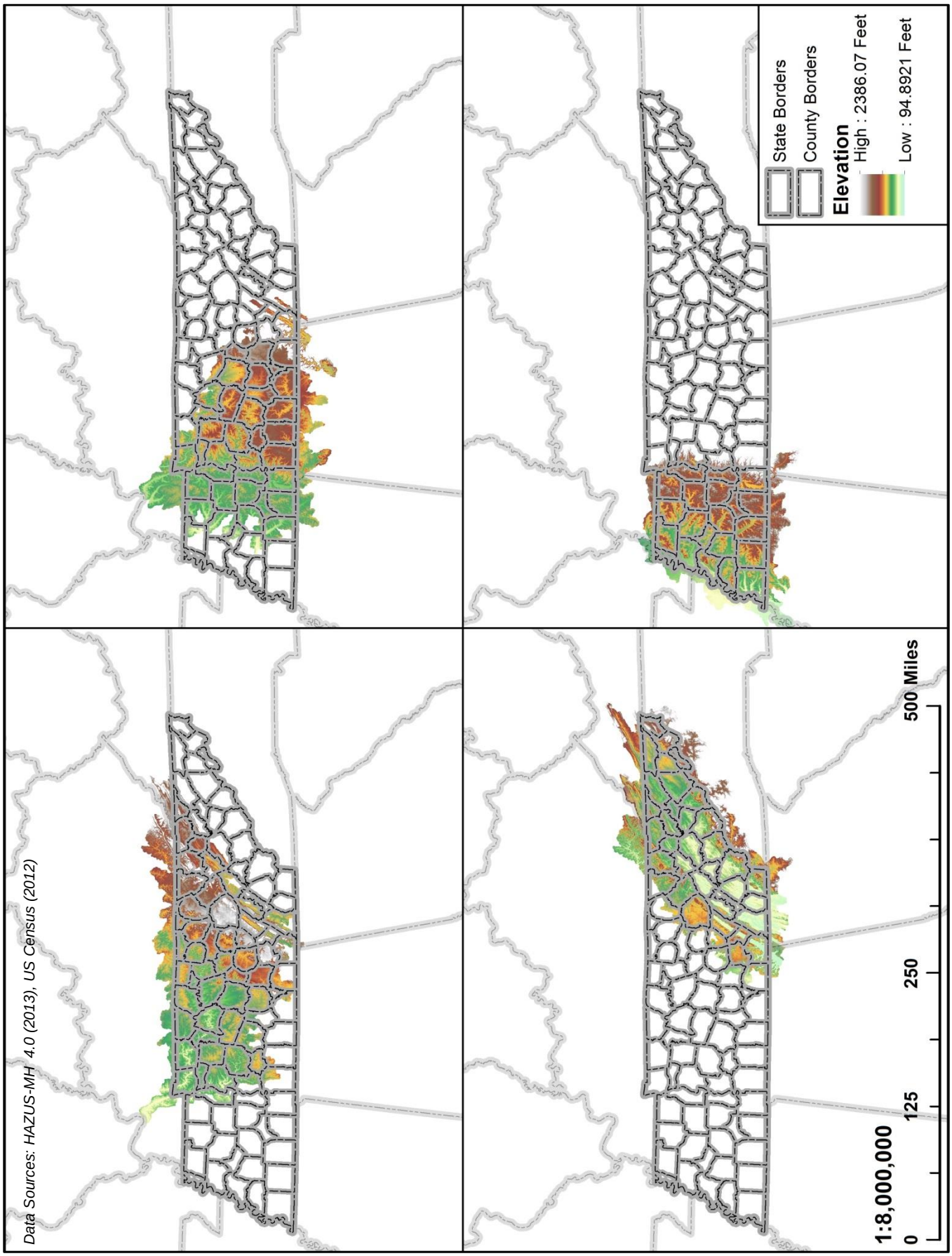
Both earthquake simulation models incorporated a NEHRP soil classification dataset and a soil liquefaction dataset. These datasets enhanced the accuracy of the simulation models.

The third through sixth simulation models utilize the USGS's National Elevation Database (at 1 arc second) as the baseline for determining stream basins, hydrology, and drainage. As it is unlikely multiple major river sheds will flood at the same time, 1 HAZUS model, calculating flood impacts simultaneously across the state did not make the most sense. Instead, 4 models were developed, each representing 1 of Tennessee's major river basins: the Cumberland, the lower Tennessee, the Mississippi, and the upper Tennessee River. Map 128 on the following page displays the river basin study regions.

A 50 square mile stream drainage setting was used to calculate each models hydrology functions. Increasing the accuracy of the stream drainage setting was not appropriate for modeling at such a large scale. None of the 4 models contains any failed hydrological reaches. Each scenario models the effects of a 500 year flood.

The following sub sections depict the simulation models' casualty estimates, debris generation, economic losses, shelter requirements, and structural damage. Maps have been included to display flood boundaries, epicenters, shake contours, and economic losses.

Map 1 – HAZUS Flood Model Study Regions



1.1.1 – HAZUS Model 1 – Earthquake – New Madrid Seismic Zone

Table 1 – HAZUS Earthquake Model 1, Casualty Report				
County	Casualties by Incident Time			Average Casualties
	2:00 AM (Nighttime)	2:00 PM (Workday)	5:00 PM (Traffic)	
Anderson	0	0	0	0
Bedford	0	0	0	0
Benton	1	1	1	1
Bledsoe	0	0	0	0
Blount	0	0	0	0
Bradley	0	0	0	0
Campbell	0	0	0	0
Cannon	0	0	0	0
Carroll	6	5	5	5
Carter	0	0	0	0
Cheatham	0	0	0	0
Chester	3	2	2	2
Claiborne	0	0	0	0
Clay	0	0	0	0
Cocke	0	0	0	0
Coffee	0	0	0	0
Crockett	6	5	4	5
Cumberland	0	0	0	0
Davidson	1	1	1	1
Decatur	1	1	1	1
DeKalb	0	0	0	0
Dickson	0	0	0	0
Dyer	57	123	88	89
Fayette	7	6	6	6
Fentress	0	0	0	0
Franklin	0	0	0	0
Gibson	16	15	13	15
Giles	0	0	0	0
Grainger	0	0	0	0
Greene	0	0	0	0
Grundy	0	0	0	0
Hamblen	0	0	0	0
Hamilton	0	0	0	0
Hancock	0	0	0	0
Hardeman	7	7	5	6
Hardin	3	2	2	2
Hawkins	0	0	0	0
Haywood	7	6	6	6
Henderson	4	3	3	3
Henry	6	6	5	6
Hickman	0	0	0	0
Houston	0	0	0	0

County	Casualties by Incident Time			Average Casualties
	2:00 AM (Nighttime)	2:00 PM (Workday)	5:00 PM (Traffic)	
Humphreys	1	1	1	1
Jackson	0	0	0	0
Jefferson	0	0	0	0
Johnson	0	0	0	0
Knox	0	0	0	0
Lake	139	144	116	133
Lauderdale	13	11	10	11
Lawrence	0	0	0	0
Lewis	0	0	0	0
Lincoln	0	0	0	0
Loudon	0	0	0	0
Macon	0	0	0	0
Madison	25	33	26	28
Marion	0	0	0	0
Marshall	0	0	0	0
Maury	0	0	0	0
McMinn	0	0	0	0
McNairy	2	2	2	2
Meigs	0	0	0	0
Monroe	0	0	0	0
Montgomery	0	0	0	0
Moore	0	0	0	0
Morgan	0	0	0	0
Obion	25	26	22	24
Overton	0	0	0	0
Perry	1	1	0	1
Pickett	0	0	0	0
Polk	0	0	0	0
Putnam	0	0	0	0
Rhea	0	0	0	0
Roane	0	0	0	0
Robertson	0	0	0	0
Rutherford	0	0	0	0
Scott	0	0	0	0
Sequatchie	0	0	0	0
Sevier	0	0	0	0
Shelby	127	168	133	143
Smith	0	0	0	0
Stewart	1	0	0	0
Sullivan	0	0	0	0
Sumner	0	0	0	0
Tipton	10	8	8	9
Trousdale	0	0	0	0
Unicoi	0	0	0	0
Union	0	0	0	0
Van Buren	0	0	0	0

County	Casualties by Incident Time			Average Casualties
	2:00 AM (Nighttime)	2:00 PM (Workday)	5:00 PM (Traffic)	
Warren	0	0	0	0
Washington	0	0	0	0
Wayne	0	0	0	0
Weakley	12	10	10	11
White	0	0	0	0
Williamson	0	0	0	0
Wilson	0	0	0	0
Total =	**481**	**587**	**470**	**513**

Table 2 – HAZUS Model 1, Debris & Shelter Report

County	Brick, Wood & Others (Tons)	Concrete & Steel (Tons)	Total Debris (Tons)	Displaced Households	People Requiring Short Term Shelter
Anderson	0	0	0	0	0
Bedford	0	0	0	0	0
Benton	1,290	480	1,770	1	0
Bledsoe	0	0	0	0	0
Blount	0	0	0	0	0
Bradley	0	0	0	0	0
Campbell	0	0	0	0	0
Cannon	0	0	0	0	0
Carroll	5,390	2,730	8,120	6	4
Carter	0	0	0	0	0
Cheatham	0	0	0	0	0
Chester	2,270	1,090	3,360	3	2
Claiborne	0	0	0	0	0
Clay	0	0	0	0	0
Cocke	0	0	0	0	0
Coffee	0	0	0	0	0
Crockett	4,130	2,530	6,660	5	4
Cumberland	0	0	0	0	0
Davidson	1,110	390	1,500	2	2
Decatur	790	300	1,090	0	0
Dekalb	0	0	0	0	0
Dickson	0	0	0	0	0
Dyer	47,120	85,400	132,510	122	87
Fayette	6,370	3,760	10,130	6	5
Fentress	0	0	0	0	0
Franklin	0	0	0	0	0
Gibson	14,780	10,540	25,320	23	16
Giles	0	0	0	0	0
Grainger	0	0	0	0	0
Greene	0	0	0	0	0
Grundy	0	0	0	0	0
Hamblen	0	0	0	0	0

County	Brick, Wood & Others (Tons)	Concrete & Steel (Tons)	Total Debris (Tons)	Displaced Households	People Requiring Short Term Shelter
Hamilton	0	0	0	0	0
Hancock	0	0	0	0	0
Hardeman	4,810	2,460	7,270	5	5
Hardin	2,710	1,150	3,860	2	1
Hawkins	0	0	0	0	0
Haywood	5,430	3,710	9,140	11	10
Henderson	3,530	1,630	5,170	3	2
Henry	5,890	3,010	8,890	7	5
Hickman	80	30	110	0	0
Houston	270	90	350	0	0
Humphreys	1,000	370	1,380	1	0
Jackson	0	0	0	0	0
Jefferson	0	0	0	0	0
Johnson	0	0	0	0	0
Knox	0	0	0	0	0
Lake	30,900	40,170	71,060	280	283
Lauderdale	9,090	7,670	16,760	15	12
Lawrence	0	0	0	0	0
Lewis	0	0	0	0	0
Lincoln	0	0	0	0	0
Loudon	0	0	0	0	0
McMinn	0	0	0	0	0
McNairy	2,590	1,140	3,730	1	1
Macon	0	0	0	0	0
Madison	24,630	14,760	39,390	50	39
Marion	0	0	0	0	0
Marshall	0	0	0	0	0
Maury	0	0	0	0	0
Meigs	0	0	0	0	0
Monroe	0	0	0	0	0
Montgomery	280	100	370	0	0
Moore	0	0	0	0	0
Morgan	0	0	0	0	0
Obion	17,850	14,610	32,460	31	22
Overton	0	0	0	0	0
Perry	610	240	850	0	0
Pickett	0	0	0	0	0
Polk	0	0	0	0	0
Putnam	0	0	0	0	0
Rhea	0	0	0	0	0
Roane	0	0	0	0	0
Robertson	0	0	0	0	0
Rutherford	0	0	0	0	0
Scott	0	0	0	0	0
Sequatchie	0	0	0	0	0
Sevier	0	0	0	0	0

County	Brick, Wood & Others (Tons)	Concrete & Steel (Tons)	Total Debris (Tons)	Displaced Households	People Requiring Short Term Shelter
Shelby	144,590	65,370	209,950	268	208
Smith	0	0	0	0	0
Stewart	500	160	660	0	0
Sullivan	0	0	0	0	0
Sumner	0	0	0	0	0
Tipton	8,690	4,030	12,730	8	7
Trousdale	0	0	0	0	0
Unicoi	0	0	0	0	0
Union	0	0	0	0	0
Van Buren	0	0	0	0	0
Warren	0	0	0	0	0
Washington	0	0	0	0	0
Wayne	90	30	120	0	0
Weakley	9,160	5,550	14,700	19	15
White	0	0	0	0	0
Williamson	220	70	290	0	0
Wilson	0	0	0	0	0
Total =	**356,170**	**273,570**	**629,700**	**869**	**730**

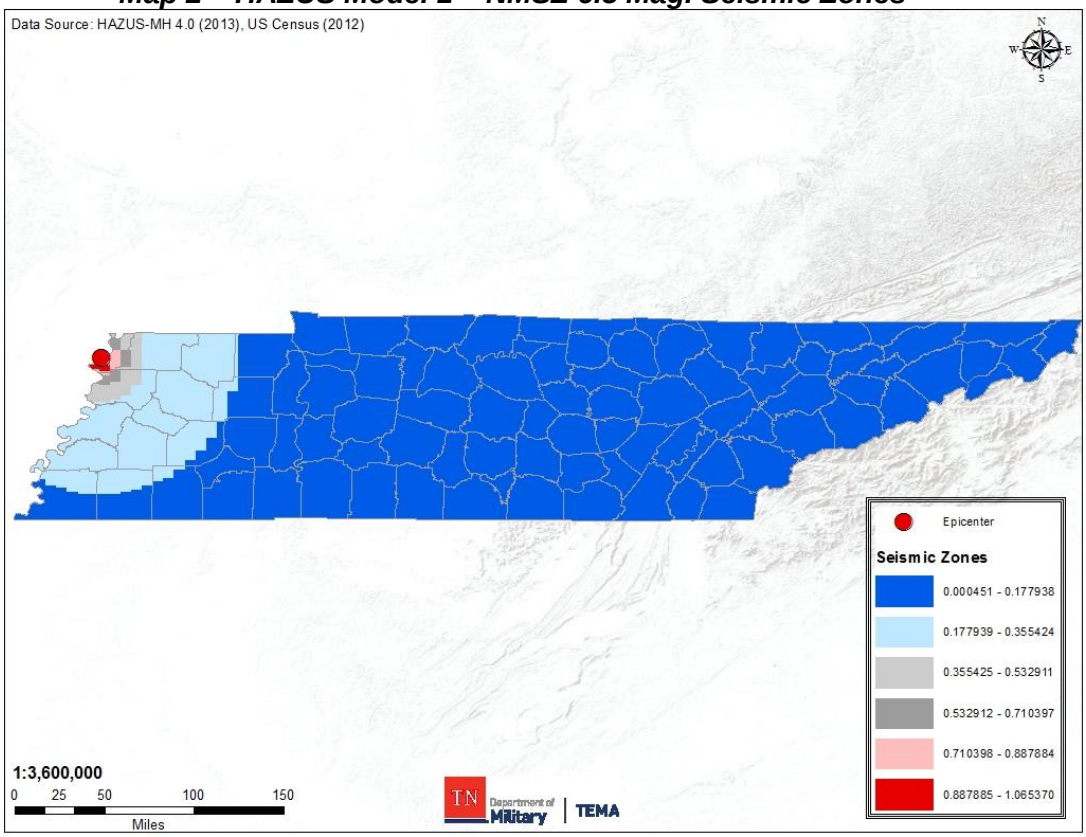
Table 3 – HAZUS Model 1, Economic Loss Report

County	Capital Stock Losses					Income Losses	Total
	Structural	Infrastructure	Contents	Inventory	Ratio		
Anderson	$0	$0	$0	$0	0.00%	$0	$0
Bedford	$0	$0	$0	$0	0.00%	$0	$0
Benton	$573,910	$1,092,690	$189,100	$9,210	0.18%	$936,090	$2,800,990
Bledsoe	$0	$0	$0	$0	0.00%	$0	$0
Blount	$0	$0	$0	$0	0.00%	$0	$0
Bradley	$0	$0	$0	$0	0.00%	$0	$0
Campbell	$0	$0	$0	$0	0.00%	$0	$0
Cannon	$0	$0	$0	$0	0.00%	$0	$0
Carroll	$2,555,150	$5,960,310	$1,620,430	$80,720	0.55%	$4,553,680	$14,770,290
Carter	$0	$0	$0	$0	0.00%	$0	$0
Cheatham	$0	$0	$0	$0	0.00%	$0	$0
Chester	$1,136,880	$2,566,940	$606,830	$27,040	0.44%	$1,864,320	$6,202,010
Claiborne	$0	$0	$0	$0	0.00%	$0	$0
Clay	$0	$0	$0	$0	0.00%	$0	$0
Cocke	$0	$0	$0	$0	0.00%	$0	$0
Coffee	$0	$0	$0	$0	0.00%	$0	$0
Crockett	$2,345,830	$6,017,500	$1,967,480	$93,410	1.03%	$3,509,200	$13,933,410
Cumberland	$0	$0	$0	$0	0.00%	$0	$0
Davidson	$501,270	$772,140	$91,100	$4,040	0.00%	$898,940	$2,267,500
Decatur	$339,860	$619,610	$99,830	$6,760	0.14%	$583,500	$1,649,550
Dekalb	$0	$0	$0	$0	0.00%	$0	$0
Dickson	$0	$0	$0	$0	0.00%	$0	$0

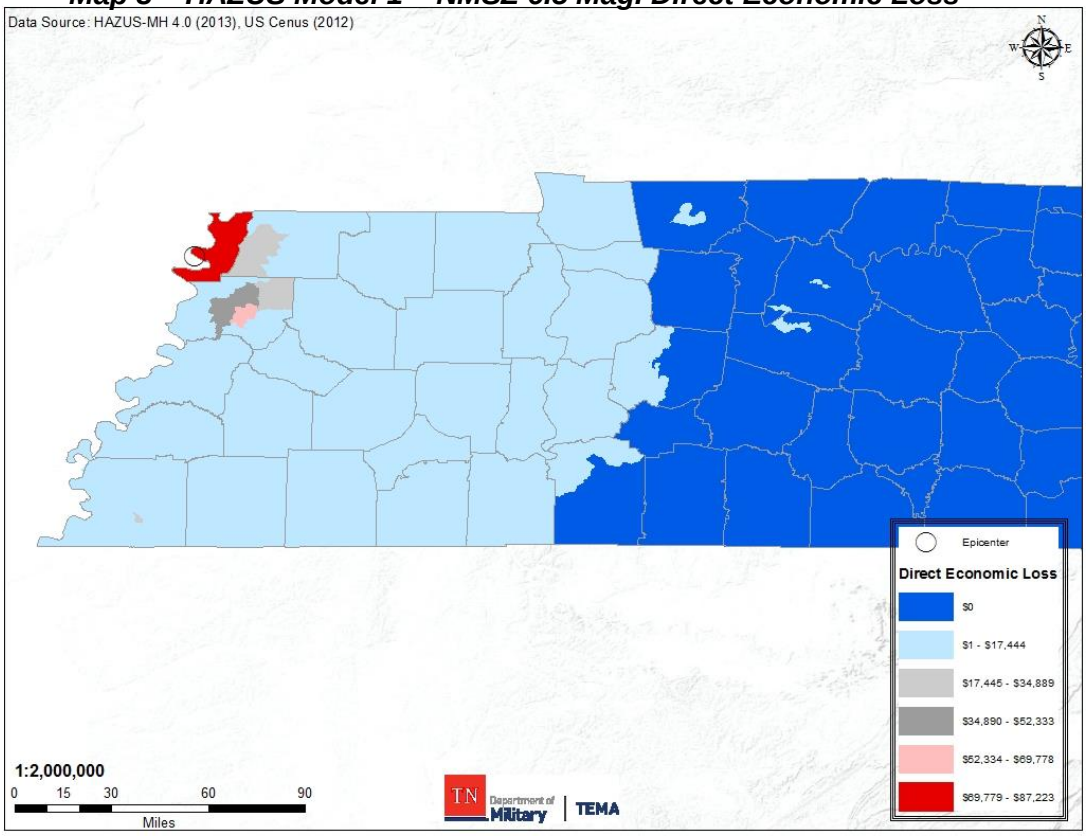
County	Capital Stock Losses					Income Losses	Total
	Structural	Infrastructure	Contents	Inventory	Ratio		
Dyer	$40,624,340	$120,221,770	$51,766,280	$4,163,640	5.97%	$77,682,000	$294,458,020
Fayette	$3,856,460	$8,868,160	$2,701,670	$159,740	0.62%	$5,278,030	$20,864,050
Fentress	$0	$0	$0	$0	0.00%	$0	$0
Franklin	$0	$0	$0	$0	0.00%	$0	$0
Gibson	$8,021,350	$20,089,440	$7,091,760	$542,870	0.89%	$14,881,260	$50,626,670
Giles	$0	$0	$0	$0	0.00%	$0	$0
Grainger	$0	$0	$0	$0	0.00%	$0	$0
Greene	$0	$0	$0	$0	0.00%	$0	$0
Grundy	$0	$0	$0	$0	0.00%	$0	$0
Hamblen	$0	$0	$0	$0	0.00%	$0	$0
Hamilton	$0	$0	$0	$0	0.00%	$0	$0
Hancock	$0	$0	$0	$0	0.00%	$0	$0
Hardeman	$2,447,790	$5,553,370	$1,453,080	$56,570	0.58%	$4,262,470	$13,773,290
Hardin	$1,193,450	$2,353,900	$487,240	$27,070	0.24%	$2,291,940	$6,353,600
Hawkins	$0	$0	$0	$0	0.00%	$0	$0
Haywood	$2,805,910	$7,042,650	$2,502,080	$179,900	0.91%	$4,883,390	$17,413,910
Henderson	$1,610,540	$3,334,760	$770,070	$49,040	0.34%	$2,746,530	$8,510,950
Henry	$2,878,490	$6,391,520	$1,711,070	$89,280	0.48%	$5,731,620	$16,801,990
Hickman	$36,270	$55,810	$4,990	$190	0.01%	$50,690	$147,940
Houston	$117,400	$205,580	$21,890	$1,020	0.08%	$170,290	$516,190
Humphreys	$482,400	$933,290	$162,330	$11,390	0.12%	$741,780	$2,331,180
Jackson	$0	$0	$0	$0	0.00%	$0	$0
Jefferson	$0	$0	$0	$0	0.00%	$0	$0
Johnson	$0	$0	$0	$0	0.00%	$0	$0
Knox	$0	$0	$0	$0	0.00%	$0	$0
Lake	$21,318,310	$78,879,060	$26,927,200	$819,600	28.67%	$33,548,590	$161,492,760
Lauderdale	$5,244,450	$16,878,860	$6,590,700	$472,700	1.66%	$9,013,410	$38,200,120
Lawrence	$0	$0	$0	$0	0.00%	$0	$0
Lewis	$0	$0	$0	$0	0.00%	$0	$0
Lincoln	$0	$0	$0	$0	0.00%	$0	$0
Loudon	$0	$0	$0	$0	0.00%	$0	$0
Macon	$0	$0	$0	$0	0.00%	$0	$0
Madison	$13,419,410	$32,975,160	$10,349,210	$567,050	0.69%	$26,299,090	$83,609,930
Marion	$0	$0	$0	$0	0.00%	$0	$0
Marshall	$0	$0	$0	$0	0.00%	$0	$0
Maury	$0	$0	$0	$0	0.00%	$0	$0
McMinn	$0	$0	$0	$0	0.00%	$0	$0
McNairy	$1,141,360	$2,196,490	$482,190	$31,260	0.22%	$1,918,280	$5,769,580
Meigs	$0	$0	$0	$0	0.00%	$0	$0
Monroe	$0	$0	$0	$0	0.00%	$0	$0
Montgomery	$137,630	$236,550	$36,610	$410	0.00%	$227,350	$638,560
Moore	$0	$0	$0	$0	0.00%	$0	$0
Morgan	$0	$0	$0	$0	0.00%	$0	$0
Obion	$10,592,410	$33,758,460	$12,775,890	$542,620	2.09%	$19,593,790	$77,263,170
Overton	$0	$0	$0	$0	0.00%	$0	$0
Perry	$278,160	$519,050	$88,700	$3,070	0.19%	$425,450	$1,314,440

County	Capital Stock Losses					Income Losses	Total
	Structural	Infrastructure	Contents	Inventory	Ratio		
Pickett	$0	$0	$0	$0	0.00%	$0	$0
Polk	$0	$0	$0	$0	0.00%	$0	$0
Putnam	$0	$0	$0	$0	0.00%	$0	$0
Rhea	$0	$0	$0	$0	0.00%	$0	$0
Roane	$0	$0	$0	$0	0.00%	$0	$0
Robertson	$0	$0	$0	$0	0.00%	$0	$0
Rutherford	$0	$0	$0	$0	0.00%	$0	$0
Scott	$0	$0	$0	$0	0.00%	$0	$0
Sequatchie	$0	$0	$0	$0	0.00%	$0	$0
Sevier	$0	$0	$0	$0	0.00%	$0	$0
Shelby	$76,045,280	$235,048,620	$69,726,630	$2,481,550	0.44%	$135,349,200	$518,651,290
Smith	$0	$0	$0	$0	0.00%	$0	$0
Stewart	$235,440	$419,200	$49,680	$2,080	0.08%	$325,160	$1,031,560
Sullivan	$0	$0	$0	$0	0.00%	$0	$0
Sumner	$0	$0	$0	$0	0.00%	$0	$0
Tipton	$4,606,330	$15,402,370	$4,943,720	$214,190	0.67%	$6,868,300	$32,034,920
Trousdale	$0	$0	$0	$0	0.00%	$0	$0
Unicoi	$0	$0	$0	$0	0.00%	$0	$0
Union	$0	$0	$0	$0	0.00%	$0	$0
Van Buren	$0	$0	$0	$0	0.00%	$0	$0
Warren	$0	$0	$0	$0	0.00%	$0	$0
Washington	$0	$0	$0	$0	0.00%	$0	$0
Wayne	$36,400	$56,670	$5,540	$160	0.01%	$71,430	$170,200
Weakley	$4,535,850	$11,630,630	$3,631,810	$193,900	0.87%	$8,055,690	$28,047,880
White	$0	$0	$0	$0	0.00%	$0	$0
Williamson	$125,620	$214,750	$22,700	$590	0.00%	$189,240	$552,900
Wilson	$0	$0	$0	$0	0.00%	$0	$0
Total =	**$209,243,950**	**$620,295,310**	**$208,877,810**	**$10,831,070**	**-**	**$372,950,710**	**$1,422,198,850**

Map 2 – HAZUS Model 1 – NMSZ 6.5 Mag. Seismic Zones



Map 3 – HAZUS Model 1 – NMSZ 6.5 Mag. Direct Economic Loss



1.1.2 – HAZUS Model 2 – Earthquake – East Tennessee

Table 4 – HAZUS Model 2, Casualty Report				
County	Casualties by Incident Time			Average Casualties
	2:00 AM (Nighttime)	2:00 PM (Workday)	5:00 PM (Traffic)	
Anderson	52	77	59	63
Bedford	0	0	0	0
Benton	0	0	0	0
Bledsoe	0	0	0	0
Blount	101	137	112	117
Bradley	3	3	3	3
Campbell	9	7	6	7
Cannon	0	0	0	0
Carroll	0	0	0	0
Carter	1	1	1	1
Cheatham	0	0	0	0
Chester	0	0	0	0
Claiborne	2	2	2	2
Clay	0	0	0	0
Cocke	2	2	1	2
Coffee	0	0	0	0
Crockett	0	0	0	0
Cumberland	2	2	2	2
Davidson	0	0	0	0
Decatur	0	0	0	0
DeKalb	1	0	0	0
Dickson	0	0	0	0
Dyer	0	0	0	0
Fayette	0	0	0	0
Fentress	1	1	0	1
Franklin	0	0	0	0
Gibson	0	0	0	0
Giles	0	0	0	0
Grainger	4	3	3	3
Greene	2	2	2	2
Grundy	0	0	0	0
Hamblen	4	4	3	4
Hamilton	7	10	8	8
Hancock	0	0	0	0
Hardeman	0	0	0	0
Hardin	0	0	0	0
Hawkins	2	1	1	1
Haywood	0	0	0	0
Henderson	0	0	0	0
Henry	0	0	0	0
Hickman	0	0	0	0
Houston	0	0	0	0

County	Casualties by Incident Time			Average Casualties
	2:00 AM (Nighttime)	2:00 PM (Workday)	5:00 PM (Traffic)	
Humphreys	0	0	0	0
Jackson	0	0	0	0
Jefferson	11	9	9	10
Johnson	0	0	0	0
Knox	3,285	5,877	4,465	4,542
Lake	0	0	0	0
Lauderdale	0	0	0	0
Lawrence	0	0	0	0
Lewis	0	0	0	0
Lincoln	0	0	0	0
Loudon	10	10	8	9
Macon	0	0	0	0
Madison	0	0	0	0
Marion	0	0	0	0
Marshall	0	0	0	0
Maury	0	0	0	0
McMinn	2	2	2	2
McNairy	0	0	0	0
Meigs	1	0	0	0
Monroe	3	3	2	3
Montgomery	0	0	0	0
Moore	0	0	0	0
Morgan	2	1	1	1
Obion	0	0	0	0
Overton	1	0	0	0
Perry	0	0	0	0
Pickett	0	0	0	0
Polk	1	0	0	0
Putnam	2	2	2	2
Rhea	1	1	1	1
Roane	7	6	5	6
Robertson	0	0	0	0
Rutherford	0	0	0	0
Scott	1	1	1	1
Sequatchie	0	0	0	0
Sevier	28	27	24	26
Shelby	0	0	0	0
Smith	0	0	0	0
Stewart	0	0	0	0
Sullivan	3	3	3	3
Sumner	0	0	0	0
Tipton	0	0	0	0
Trousdale	0	0	0	0
Unicoi	0	1	1	1
Union	7	4	4	5

County	Casualties by Incident Time			Average Casualties
	2:00 AM (Nighttime)	2:00 PM (Workday)	5:00 PM (Traffic)	
Van Buren	0	0	0	0
Warren	0	0	0	0
Washington	3	3	3	3
Wayne	0	0	0	0
Weakley	0	0	0	0
White	1	1	0	1
Williamson	0	0	0	0
Wilson	0	0	0	0
Total =	**3,562**	**6,203**	**4,734**	**4,833**

Table 5 – HAZUS Model 2, Debris & Shelter Report

County	Brick, Wood & Others (Tons)	Concrete & Steel (Tons)	Total Debris (Tons)	Displaced Households	People Requiring Short Term Shelter
Anderson	40,880	37,010	77,890	88	55
Bedford	0	0	0	0	0
Benton	0	0	0	0	0
Bledsoe	350	110	450	0	0
Blount	70,890	66,390	137,280	199	124
Bradley	3,470	1,210	4,680	4	3
Campbell	7,010	4,290	11,300	8	6
Cannon	0	0	0	0	0
Carroll	0	0	0	0	0
Carter	1,000	290	1,300	1	1
Cheatham	0	0	0	0	0
Chester	0	0	0	0	0
Claiborne	2,040	850	2,890	1	1
Clay	140	40	180	0	0
Cocke	1,950	760	2,710	2	1
Coffee	0	0	0	0	0
Crockett	0	0	0	0	0
Cumberland	2,060	750	2,810	1	1
Davidson	0	0	0	0	0
Decatur	0	0	0	0	0
Dekalb	620	240	860	0	0
Dickson	0	0	0	0	0
Dyer	0	0	0	0	0
Fayette	0	0	0	0	0
Fentress	580	190	770	0	0
Franklin	290	100	390	0	0
Gibson	0	0	0	0	0
Giles	0	0	0	0	0
Grainger	2,600	1,180	3,780	2	1
Greene	2,720	1,130	3,850	2	1
Grundy	60	10	70	0	0

County	Brick, Wood & Others (Tons)	Concrete & Steel (Tons)	Total Debris (Tons)	Displaced Households	People Requiring Short Term Shelter
Hamblen	4,840	2,330	7,170	6	4
Hamilton	11,190	3,960	15,150	13	9
Hancock	240	70	300	0	0
Hardeman	0	0	0	0	0
Hardin	0	0	0	0	0
Hawkins	1,860	630	2,490	2	1
Haywood	0	0	0	0	0
Henderson	0	0	0	0	0
Henry	0	0	0	0	0
Hickman	0	0	0	0	0
Houston	0	0	0	0	0
Humphreys	0	0	0	0	0
Jackson	230	70	300	70	300
Jefferson	8,690	5,440	14,130	5,440	14,130
Johnson	0	0	0	0	0
Knox	1,380,040	1,755,070	3,135,110	1,755,070	3,135,110
Lake	0	0	0	0	0
Lauderdale	0	0	0	0	0
Lawrence	0	0	0	0	0
Lewis	0	0	0	0	0
Lincoln	0	0	0	0	0
Loudon	9,350	5,070	14,420	5,070	14,420
McMinn	2,490	980	3,470	980	3,470
McNairy	0	0	0	0	0
Macon	0	0	0	0	0
Madison	0	0	0	0	0
Marion	160	40	200	40	200
Marshall	0	0	0	0	0
Maury	0	0	0	0	0
Meigs	390	120	520	120	520
Monroe	2,720	1,230	3,960	1,230	3,960
Montgomery	0	0	0	0	0
Moore	0	0	0	0	0
Morgan	1,400	560	1,960	560	1,960
Obion	0	0	0	0	0
Overton	610	200	810	200	810
Perry	0	0	0	0	0
Pickett	200	60	270	60	270
Polk	480	140	620	140	620
Putnam	2,070	750	2,830	750	2,830
Rhea	1,110	390	1,500	390	1,500
Roane	6,310	2,440	8,750	2,440	8,750
Robertson	0	0	0	0	0
Rutherford	0	0	0	0	0
Scott	1,000	390	1,400	390	1,400
Sequatchie	270	80	350	80	350

County	Brick, Wood & Others (Tons)	Concrete & Steel (Tons)	Total Debris (Tons)	Displaced Households	People Requiring Short Term Shelter
Sevier	22,570	12,500	35,080	12,500	35,080
Shelby	0	0	0	0	0
Smith	230	90	320	90	320
Stewart	0	0	0	0	0
Sullivan	3,540	1,140	4,680	1,140	4,680
Sumner	0	0	0	0	0
Tipton	0	0	0	0	0
Trousdale	0	0	0	0	0
Unicoi	440	140	580	140	580
Union	4,020	2,150	6,170	2,150	6,170
Van Buren	120	40	160	40	160
Warren	610	220	840	220	840
Washington	3,770	1,270	5,050	1,270	5,050
Wayne	0	0	0	0	0
Weakley	0	0	0	0	0
White	690	240	930	240	930
Williamson	0	0	0	0	0
Wilson	0	0	0	0	0
Total =	**1,567,420**	**1,875,350**	**3,442,840**	**1,791,061**	**3,244,563**

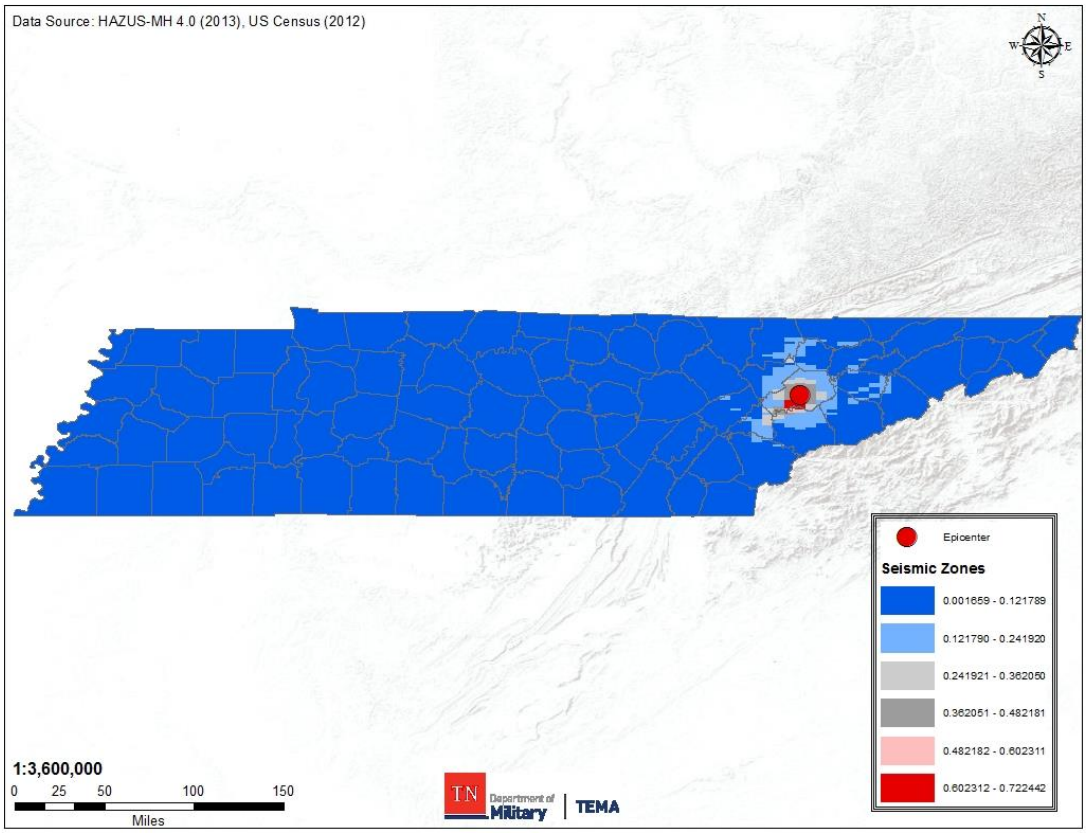
Table 6 – HAZUS Model 2, Economic Loss Report

County	Capital Stock Losses					Income Losses	Total
	Structural	Infrastructure	Contents	Inventory	Ratio		
Anderson	$25,110,580	$78,244,920	$32,865,850	$1,960,660	2.06%	$51,258,110	$189,440,110
Bedford	$0	$0	$0	$0	0.00%	$0	$0
Benton	$0	$0	$0	$0	0.00%	$0	$0
Bledsoe	$136,810	$232,680	$28,440	$1,260	0.07%	$201,300	$600,480
Blount	$42,858,780	$135,510,850	$55,854,920	$2,585,300	2.62%	$90,229,650	$327,039,500
Bradley	$1,363,030	$2,339,900	$350,830	$17,970	0.07%	$2,420,820	$6,492,550
Campbell	$3,424,990	$9,135,530	$3,139,280	$238,040	0.64%	$6,053,160	$21,991,010
Cannon	$0	$0	$0	$0	0.00%	$0	$0
Carroll	$0	$0	$0	$0	0.00%	$0	$0
Carter	$347,280	$552,210	$54,420	$2,250	0.04%	$649,060	$1,605,210
Cheatham	$0	$0	$0	$0	0.00%	$0	$0
Chester	$0	$0	$0	$0	0.00%	$0	$0
Claiborne	$796,140	$1,604,650	$403,560	$25,570	0.18%	$1,406,180	$4,236,090
Clay	$53,910	$85,940	$8,690	$270	0.04%	$106,480	$255,290
Cocke	$769,050	$1,497,010	$361,230	$25,830	0.14%	$1,532,300	$4,185,420
Coffee	$0	$0	$0	$0	0.00%	$0	$0
Crockett	$0	$0	$0	$0	0.00%	$0	$0
Cumberland	$842,940	$1,519,930	$267,990	$16,020	0.09%	$1,656,190	$4,303,080
Davidson	$0	$0	$0	$0	0.00%	$0	$0
Decatur	$0	$0	$0	$0	0.00%	$0	$0
Dekalb	$257,780	$430,080	$67,440	$4,050	0.06%	$390,850	$1,150,200

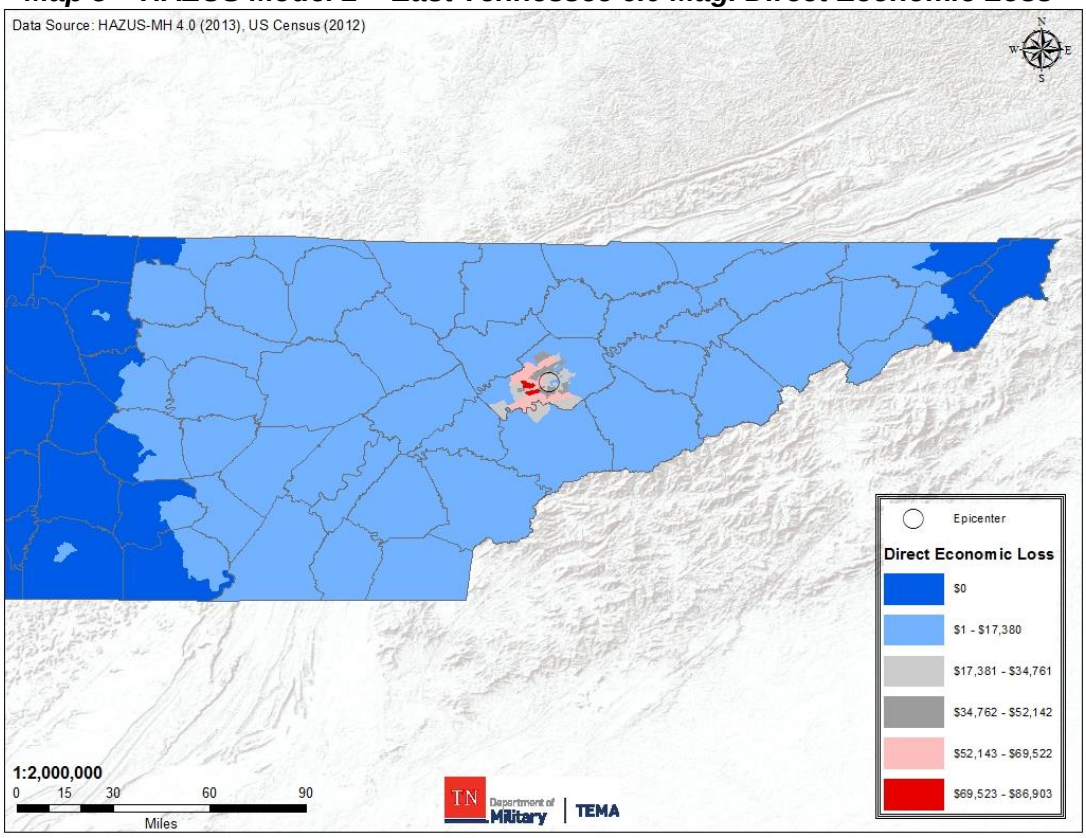
County	Capital Stock Losses					Income Losses	Total
	Structural	Infrastructure	Contents	Inventory	Ratio		
Dickson	$0	$0	$0	$0	0.00%	$0	$0
Dyer	$0	$0	$0	$0	0.00%	$0	$0
Fayette	$0	$0	$0	$0	0.00%	$0	$0
Fentress	$218,950	$391,420	$61,420	$2,400	0.09%	$431,280	$1,105,460
Franklin	$114,640	$168,600	$22,570	$1,290	0.01%	$208,270	$515,370
Gibson	$0	$0	$0	$0	0.00%	$0	$0
Giles	$0	$0	$0	$0	0.00%	$0	$0
Grainger	$1,208,250	$3,047,810	$884,690	$65,430	0.46%	$1,697,270	$6,903,440
Greene	$1,134,970	$1,916,400	$348,570	$30,220	0.08%	$2,048,270	$5,478,430
Grundy	$22,900	$37,910	$2,720	$60	0.01%	$26,960	$90,560
Hamblen	$2,083,310	$4,496,740	$1,359,210	$138,910	0.18%	$3,959,560	$12,037,740
Hamilton	$4,571,230	$7,311,210	$922,410	$46,720	0.05%	$9,220,820	$22,072,380
Hancock	$86,410	$171,980	$27,010	$560	0.09%	$143,460	$429,430
Hardeman	$0	$0	$0	$0	0.00%	$0	$0
Hardin	$0	$0	$0	$0	0.00%	$0	$0
Hawkins	$736,290	$1,306,030	$202,820	$12,550	0.08%	$1,177,520	$3,435,190
Haywood	$0	$0	$0	$0	0.00%	$0	$0
Henderson	$0	$0	$0	$0	0.00%	$0	$0
Henry	$0	$0	$0	$0	0.00%	$0	$0
Hickman	$0	$0	$0	$0	0.00%	$0	$0
Houston	$0	$0	$0	$0	0.00%	$0	$0
Humphreys	$0	$0	$0	$0	0.00%	$0	$0
Jackson	$86,310	$134,680	$12,800	$700	0.05%	$137,110	$371,600
Jefferson	$4,503,620	$12,592,250	$4,404,390	$280,510	0.70%	$7,987,690	$29,768,470
Johnson	$0	$0	$0	$0	0.00%	$0	$0
Knox	$929,070,200	$3,508,001,380	$1,461,633,960	$56,627,900	15.40%	$1,860,075,120	$7,815,408,570
Lake	$0	$0	$0	$0	0.00%	$0	$0
Lauderdale	$0	$0	$0	$0	0.00%	$0	$0
Lawrence	$0	$0	$0	$0	0.00%	$0	$0
Lewis	$0	$0	$0	$0	0.00%	$0	$0
Lincoln	$0	$0	$0	$0	0.00%	$0	$0
Loudon	$4,902,460	$14,425,860	$5,302,770	$248,390	0.72%	$10,332,670	$35,212,130
Macon	$0	$0	$0	$0	0.00%	$0	$0
Madison	$0	$0	$0	$0	0.00%	$0	$0
Marion	$62,660	$101,360	$7,640	$160	0.01%	$86,710	$258,520
Marshall	$0	$0	$0	$0	0.00%	$0	$0
Maury	$0	$0	$0	$0	0.00%	$0	$0
McMinn	$1,018,850	$1,875,820	$385,080	$27,980	0.10%	$1,856,550	$5,164,270
McNairy	$0	$0	$0	$0	0.00%	$0	$0
Meigs	$155,910	$291,180	$41,870	$1,680	0.10%	$245,840	$736,480
Monroe	$1,165,110	$2,484,520	$712,410	$66,070	0.19%	$2,246,430	$6,674,550
Montgomery	$0	$0	$0	$0	0.00%	$0	$0
Moore	$0	$0	$0	$0	0.00%	$0	$0
Morgan	$601,710	$1,427,430	$397,320	$19,610	0.25%	$969,350	$3,415,420
Obion	$0	$0	$0	$0	0.00%	$0	$0
Overton	$225,970	$366,630	$47,340	$2,720	0.06%	$419,830	$1,062,500

County	Capital Stock Losses					Income Losses	Total
	Structural	Infrastructure	Contents	Inventory	Ratio		
Perry	$0	$0	$0	$0	0.00%	$0	$0
Pickett	$74,260	$125,490	$16,640	$780	0.07%	$120,670	$337,840
Polk	$186,730	$331,180	$42,310	$1,470	0.07%	$341,750	$903,460
Putnam	$759,180	$1,168,360	$153,110	$9,630	0.05%	$1,638,770	$3,729,060
Rhea	$446,220	$809,880	$129,630	$6,400	0.08%	$787,310	$2,179,460
Roane	$2,971,810	$7,965,670	$2,336,320	$53,180	0.36%	$5,229,320	$18,556,300
Robertson	$0	$0	$0	$0	0.00%	$0	$0
Rutherford	$0	$0	$0	$0	0.00%	$0	$0
Scott	$392,860	$735,690	$158,340	$11,500	0.13%	$732,260	$2,030,640
Sequatchie	$110,700	$173,300	$17,380	$760	0.05%	$166,990	$469,140
Sevier	$11,144,480	$34,506,970	$12,516,300	$441,670	0.81%	$25,297,660	$83,907,070
Shelby	$0	$0	$0	$0	0.00%	$0	$0
Smith	$96,050	$150,020	$26,770	$1,010	0.02%	$193,670	$467,520
Stewart	$0	$0	$0	$0	0.00%	$0	$0
Sullivan	$1,352,790	$2,143,440	$257,460	$12,550	0.04%	$2,696,560	$6,462,800
Sumner	$0	$0	$0	$0	0.00%	$0	$0
Tipton	$0	$0	$0	$0	0.00%	$0	$0
Trousdale	$0	$0	$0	$0	0.00%	$0	$0
Unicoi	$161,000	$268,270	$29,620	$1,410	0.05%	$296,940	$757,250
Union	$1,956,850	$5,622,550	$1,876,380	$95,340	0.97%	$3,194,820	$12,745,930
Van Buren	$48,160	$77,390	$8,000	$590	0.05%	$68,160	$202,320
Warren	$246,550	$338,310	$38,460	$2,110	0.02%	$517,880	$1,143,310
Washington	$1,421,100	$2,333,060	$297,940	$14,320	0.05%	$2,959,110	$7,025,520
Wayne	$0	$0	$0	$0	0.00%	$0	$0
Weakley	$0	$0	$0	$0	0.00%	$0	$0
White	$273,700	$425,420	$53,820	$2,820	0.06%	$464,120	$1,219,870
Williamson	$0	$0	$0	$0	0.00%	$0	$0
Wilson	$0	$0	$0	$0	0.00%	$0	$0
Total =	**$1,049,573,480**	**$3,848,877,910**	**$1,588,138,130**	**$63,106,620**	**-**	**$2,103,880,800**	**$8,653,576,940**

Map 4 – HAZUS Model 2 – East Tennessee 6.0 Mag. Seismic Zones



Map 5 – HAZUS Model 2 – East Tennessee 6.0 Mag. Direct Economic Loss

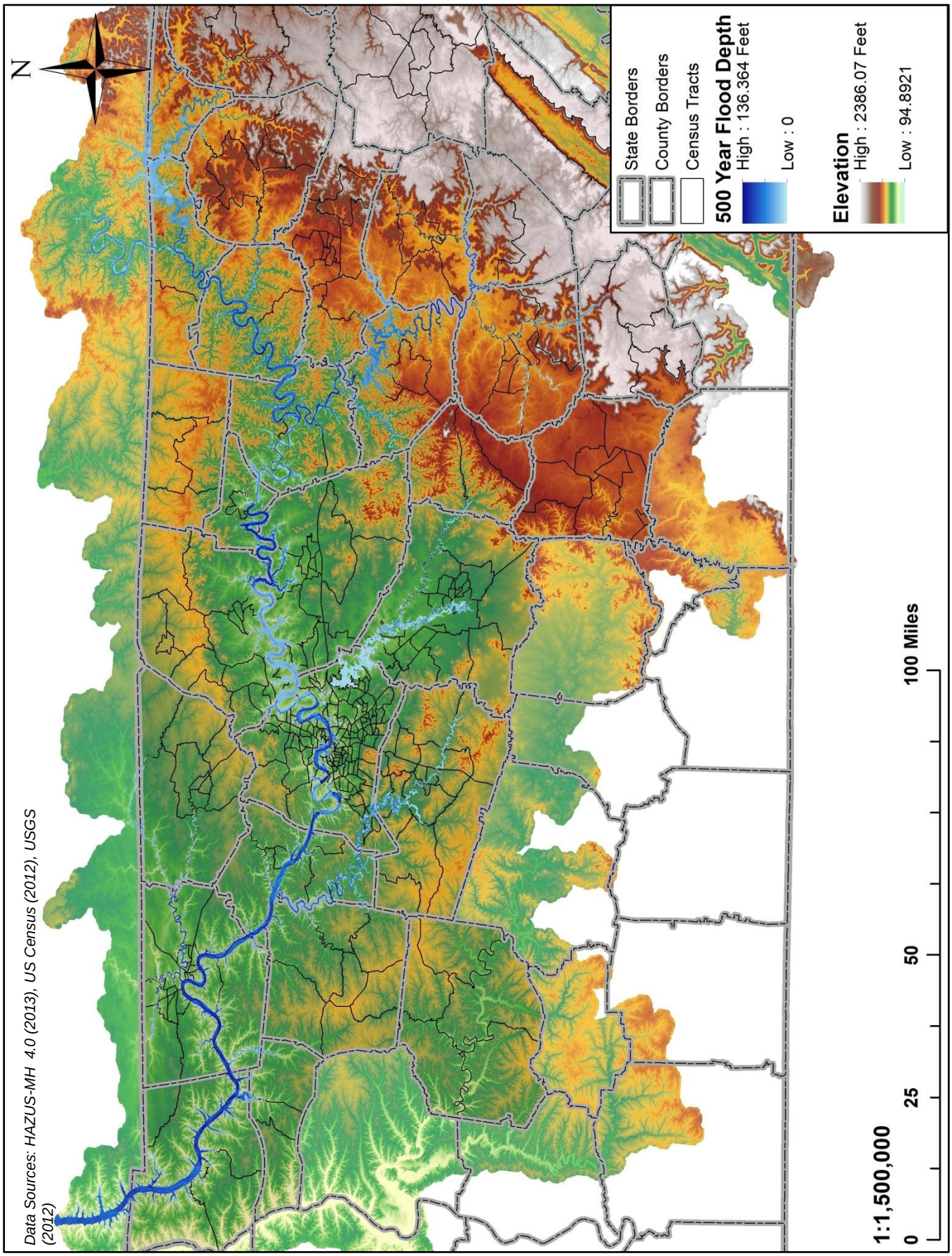


1.1.3 – HAZUS Model 3 – Flood – Cumberland River Basin

Table 7 – HAZUS Model 3, Debris & Shelter Report						
County	**Finishes (Tons)**	**Structures (Tons)**	**Foundations (Tons)**	**Total Debris (Tons)**	**Displaced People**	**People Requiring Short Term Shelter**
Bledsoe	0	0	0	0	0	0
Cannon	85	113	103	302	36	5
Cheatham	9,053	27,540	22,238	58,831	3,829	2,780
Clay	3,371	9,157	7,676	20,204	917	617
Cumberland	12	20	22	54	4	0
Davidson	133,304	488,264	369,156	990,724	37,608	34,598
Dekalb	2,052	4,216	3,894	10,161	666	193
Dickson	598	1,312	1,320	3,229	245	102
Fentress	209	471	467	1,147	46	1
Grundy	337	1,855	1,301	3,493	54	7
Houston	102	158	158	418	29	1
Jackson	2,129	5,621	4,986	12,736	850	385
Montgomery	16,272	43,050	36,130	95,451	6,914	5,511
Overton	143	295	301	739	35	0
Pickett	706	1,454	1,395	3,556	131	6
Putnam	303	666	637	1,606	78	8
Robertson	344	798	623	1,765	161	16
Rutherford	5,454	8,871	7,041	21,366	4,881	4,087
Smith	4,382	13,297	10,273	27,952	1,505	639
Stewart	4,835	12,429	10,491	27,754	1,031	307
Sumner	6,390	6,094	5,105	17,588	3,605	2,710
Trousdale	1,364	2,592	2,799	6,755	468	259
Van Buren	435	731	777	1,943	101	9
Warren	2,208	5,251	4,574	12,032	898	430
White	1,462	3,222	3,058	7,742	368	103
Williamson	5,945	7,715	6,764	20,424	4,060	3,417
Wilson	3,713	5,985	5,477	15,175	2,176	1,326
Total =	**205,206**	**651,177**	**506,765**	**1,363,148**	**70,696**	**57,517**

Table 8 – HAZUS Model 3, Economic Loss Report						
County	Capital Stock Losses				Income Losses	Total
	Structural	Contents	Inventory	Ratio		
Bledsoe	$0	$0	$0	0.00%	$0	$0
Clay	$27,093,000	$23,779,000	$753,000	13.30%	$269,000	$51,894,000
Grundy	$3,945,000	$4,812,000	$256,000	31.00%	$317,000	$9,330,000
Van Buren	$2,110,000	$1,265,000	$10,000	5.80%	$5,000	$3,390,000
Sumner	$93,396,000	$90,296,000	$2,043,000	4.60%	$590,000	$186,325,000
Dickson	$7,675,000	$5,038,000	$120,000	6.20%	$55,000	$12,888,000
Overton	$709,000	$405,000	$1,000	1.90%	$0	$1,115,000
Dekalb	$19,617,000	$15,150,000	$385,000	5.00%	$55,000	$35,207,000
Jackson	$26,090,000	$28,404,000	$2,316,000	10.00%	$258,000	$57,068,000
Trousdale	$16,358,000	$11,056,000	$322,000	12.10%	$74,000	$27,810,000
Cumberland	$61,000	$30,000	$0	2.50%	$0	$91,000
Putnam	$1,562,000	$1,022,000	$16,000	2.30%	$8,000	$2,608,000
Cheatham	$167,189,000	$150,559,000	$8,878,000	14.60%	$808,000	$327,434,000
Cannon	$791,000	$545,000	$12,000	2.70%	$0	$1,348,000
Rutherford	$153,427,000	$210,873,000	$14,616,000	5.90%	$2,717,000	$381,633,000
Wilson	$67,974,000	$52,303,000	$1,038,000	6.40%	$223,000	$121,538,000
Davidson	$2,061,226,000	$2,308,531,000	$124,677,000	20.40%	$26,165,000	$4,520,599,000
Smith	$66,045,000	$75,085,000	$6,001,000	10.90%	$661,000	$147,792,000
Fentress	$1,147,000	$767,000	$11,000	2.70%	$1,000	$1,926,000
Montgomery	$276,380,000	$214,471,000	$3,807,000	11.70%	$1,656,000	$496,314,000
Pickett	$4,132,000	$3,365,000	$146,000	2.80%	$2,000	$7,645,000
Robertson	$4,764,000	$3,779,000	$101,000	3.40%	$1,000	$8,645,000
Warren	$24,462,000	$21,049,000	$832,000	6.60%	$77,000	$46,420,000
Stewart	$44,660,000	$41,489,000	$3,172,000	9.10%	$158,000	$89,479,000
Houston	$617,000	$399,000	$1,000	1.80%	$0	$1,017,000
White	$10,561,000	$8,459,000	$128,000	5.20%	$29,000	$19,177,000
Williamson	$138,310,000	$105,768,000	$1,472,000	7.00%	$583,000	$246,133,000
Total =	**$3,220,301,000**	**$3,378,699,000**	**$171,114,000**	-	**$34,712,000**	**$6,804,826,000**

Table 9 – HAZUS Model 3, Aggregate Losses					
Building Losses	**Residential**	**Commercial**	**Industrial**	**Other**	**Total**
Building	$1,773,420,000	$984,280,000	$291,370,000	$171,240,000	$3,220,310,000
Content	$1,013,360,000	$1,417,980,000	$651,220,000	$296,130,000	$3,378,690,000
Inventory	$0	$40,510,000	$128,100,000	$2,510,000	$171,120,000
Subtotal =	$2,786,780,000	$2,442,770,000	$1,070,690,000	$469,880,000	$6,770,120,000
Business Losses					
Income	$300,000	$8,770,000	$120,000	$740,000	$9,930,000
Relocation	$2,030,000	$2,240,000	$150,000	$380,000	$4,800,000
Rental Income	$960,000	$1,510,000	$30,000	$50,000	$2,550,000
Wages	$760,000	$8,350,000	$170,000	$8,160,000	$17,440,000
Subtotal =	$4,050,000	$20,870,000	$470,000	$9,330,000	$34,720,000
Total =	**$2,790,830,000**	**$2,463,640,000**	**$1,071,160,000**	**$479,210,000**	**$6,804,840,000**



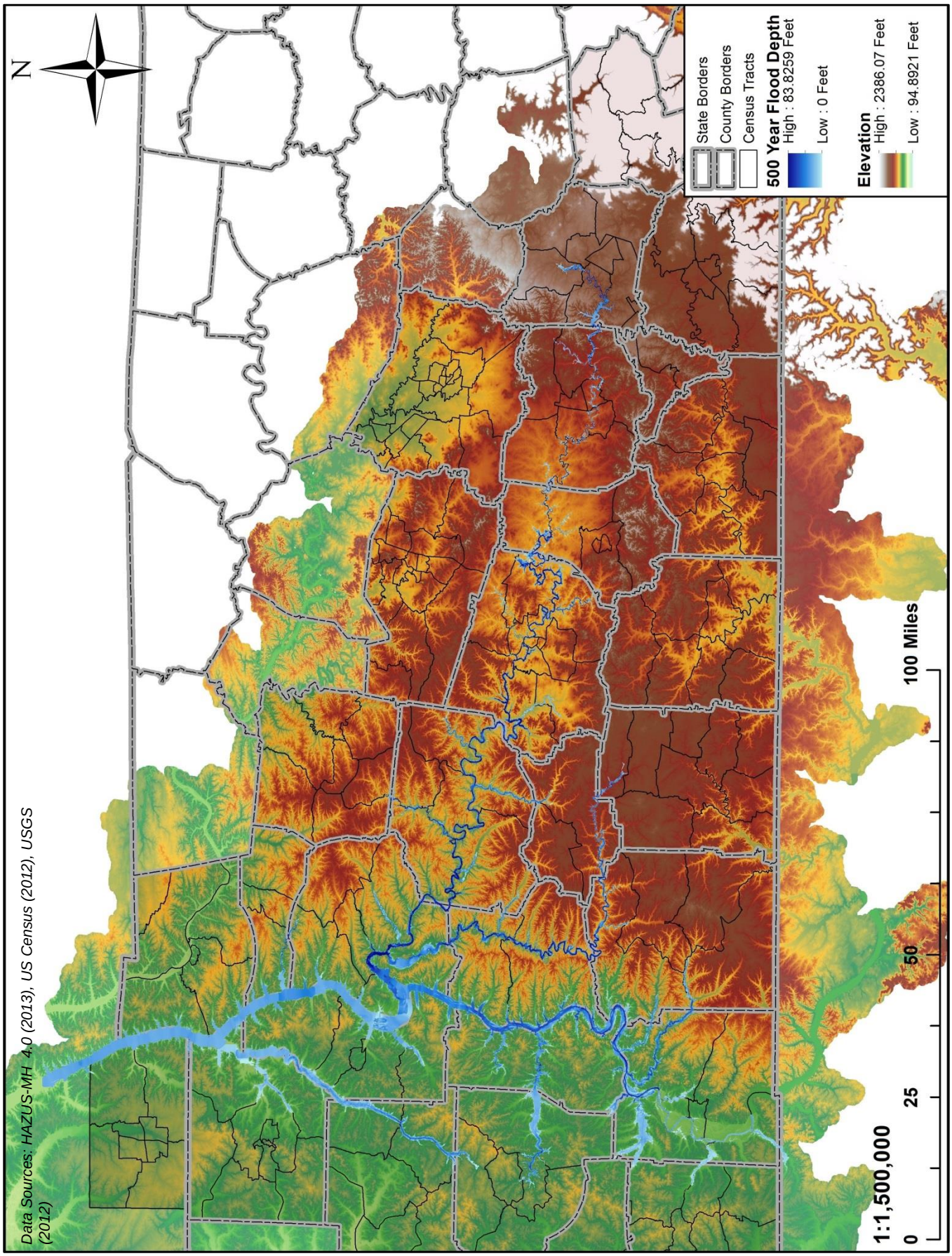
Map 6 – HAZUS Model 3 – Cumberland River Basin, 500 Year Flood

1.1.4 – HAZUS Model 4 – Flood – Lower Tennessee River Basin

Table 10 – HAZUS Model 4, Debris & Shelter Report						
County	**Finishes (Tons)**	**Structures (Tons)**	**Foundations (Tons)**	**Total Debris (Tons)**	**Displaced People**	**People Requiring Short Term Shelter**
Bedford	5,849	11,220	9,986	27,054	1,026	571
Benton	2,550	2,091	2,499	7,141	289	56
Carroll	1,124	1,700	1,649	4,474	211	55
Chester	3,406	6,139	5,898	15,442	0	0
Coffee	5,367	9,119	9,003	23,489	588	381
Decatur	6	10	9	26	612	168
Dickson	3,535	4,159	4,284	11,978	1	0
Hardin	1,884	2,160	2,248	6,293	688	183
Henderson	620	385	536	1,541	453	86
Henry	3,410	10,537	7,507	21,454	141	11
Hickman	1,056	1,411	1,632	4,099	707	231
Houston	3,902	6,223	6,246	16,371	52	2
Humphreys	223	388	381	992	472	146
Lawrence	1,209	2,277	2,260	5,747	32	0
Lewis	590	1,057	1,036	2,683	143	15
Marshall	8,621	21,237	17,515	47,373	319	55
Maury	121	62	86	269	1,884	955
McNairy	8,144	22,335	20,327	50,806	37	2
Perry	501	339	445	1,285	771	119
Stewart	1,135	1,751	1,783	4,669	22	1
Wayne	53,251	104,601	95,332	253,184	216	17
Total =	**106,503**	**209,202**	**190,663**	**506,368**	**8,664**	**3,054**

Table 11 – HAZUS Model 4, Economic Loss Report						
County	Capital Stock Losses				Income Losses	Total
	Structural	Contents	Inventory	Ratio		
Bedford	$26,534,000	$32,584,000	$2,206,000	6.40%	$146,000	$61,470,000
Benton	$7,062,000	$5,549,000	$220,000	4.10%	$18,000	$12,849,000
Carroll	$3,292,000	$2,510,000	$18,000	6.80%	$4,000	$5,824,000
Chester	$0	$0	$0	0.00%	$0	$0
Coffee	$14,826,000	$10,985,000	$148,000	5.90%	$63,000	$26,022,000
Decatur	$26,606,000	$17,296,000	$260,000	13.40%	$49,000	$44,211,000
Dickson	$44,000	$31,000	$0	0.90%	$0	$75,000
Hardin	$13,895,000	$13,025,000	$477,000	5.30%	$60,000	$27,457,000
Henderson	$10,621,000	$16,301,000	$1,772,000	3.90%	$71,000	$28,765,000
Henry	$2,264,000	$1,838,000	$7,000	1.40%	$3,000	$4,112,000
Hickman	$24,542,000	$22,817,000	$652,000	9.20%	$190,000	$48,201,000
Houston	$2,586,000	$1,406,000	$0	9.20%	$5,000	$3,997,000
Humphreys	$13,630,000	$10,823,000	$462,000	5.40%	$43,000	$24,958,000
Lawrence	$593,000	$376,000	$8,000	3.20%	$0	$977,000
Lewis	$3,687,000	$2,379,000	$31,000	7.10%	$3,000	$6,100,000
Marshall	$7,873,000	$6,050,000	$143,000	5.20%	$17,000	$14,083,000
Maury	$64,975,000	$63,139,000	$1,916,000	8.10%	$572,000	$130,602,000
McNairy	$305,000	$373,000	$19,000	1.20%	$0	$697,000
Perry	$28,179,000	$23,975,000	$718,000	10.60%	$170,000	$53,042,000
Stewart	$1,236,000	$764,000	$10,000	4.10%	$0	$2,010,000
Wayne	$3,708,000	$3,345,000	$155,000	4.30%	$13,000	$7,221,000
Total =	**$256,458,000**	**$235,566,000**	**$9,222,000**	-	**$1,427,000**	**$502,673,001**

Table 12 – HAZUS Model 4, Aggregate Losses					
Building Losses	**Residential**	**Commercial**	**Industrial**	**Other**	**Total**
Building	$189,640,000	$43,570,000	$13,180,000	$10,570,000	$256,960,000
Content	$106,670,000	$77,980,000	$28,440,000	$22,820,000	$235,910,000
Inventory	$0	$2,690,000	$6,010,000	$520,000	$9,220,000
Subtotal =	$296,310,000	$124,240,000	$47,630,000	$33,910,000	$502,090,000
Business Losses					
Income	$10,000	$300,000	$0	$30,000	$340,000
Relocation	$100,000	$70,000	$0	$10,000	$180,000
Rental Income	$20,000	$40,000	$0	$0	$60,000
Wages	$30,000	$380,000	$10,000	$420,000	$840,000
Subtotal =	$170,000	$790,000	$10,000	$460,000	$1,430,000
Total =	**$296,480,000**	**$125,030,000**	**$47,640,000**	**$34,370,000**	**$503,520,000**



Map 7 – HAZUS Model 4 – Lower Tennessee River Basin, 500 Year Flood

1.1.5 – HAZUS Model 5 – Flood – Mississippi River Basin

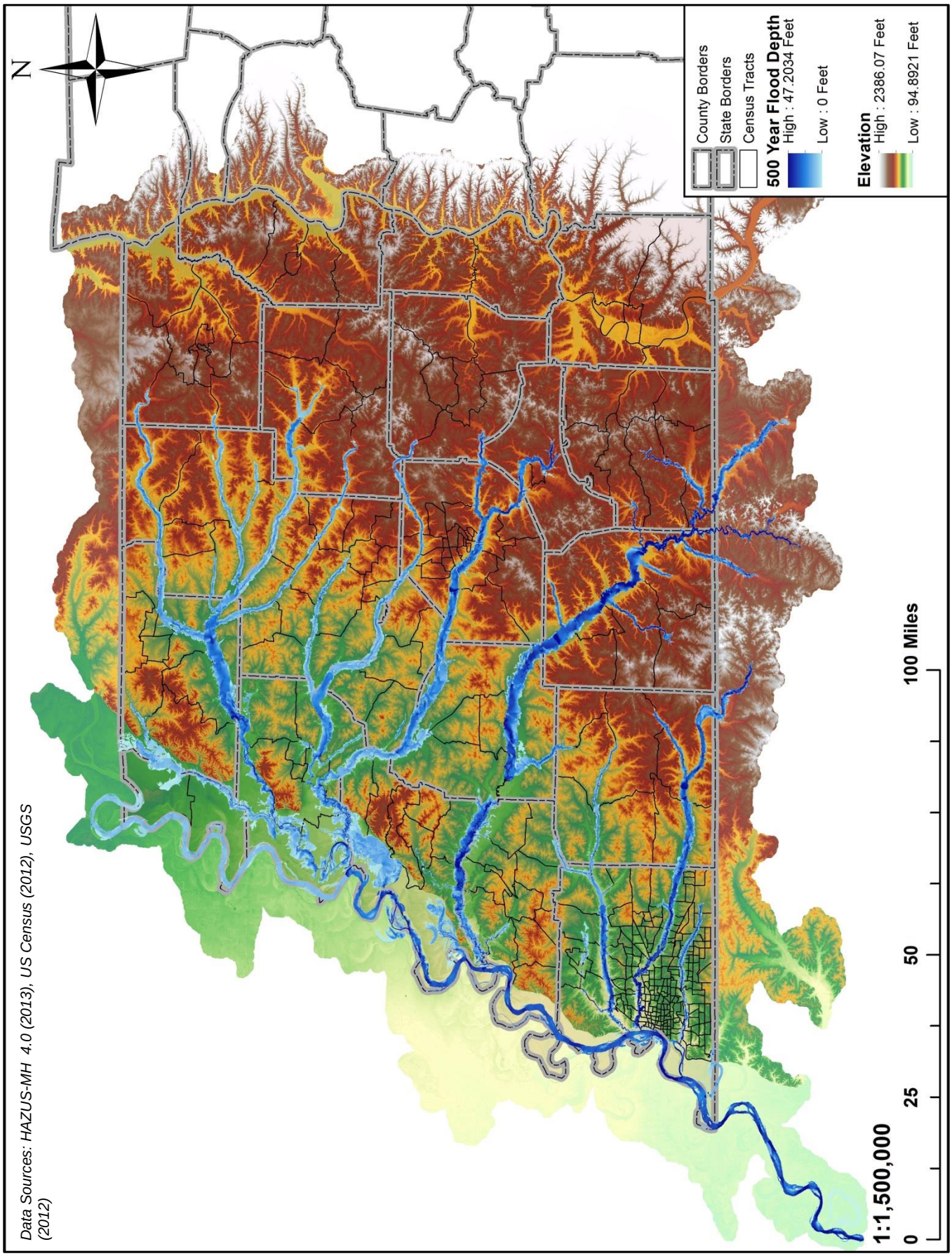
Table 13 – HAZUS Model 5, Debris & Shelter Report						
County	**Finishes (Tons)**	**Structures (Tons)**	**Foundations (Tons)**	**Total Debris (Tons)**	**Displaced People**	**People Requiring Short Term Shelter**
Carroll	865.95	203.32	332.59	1401.86	469	149
Chester	620.54	341.84	387.04	1349.42	342	115
Crockett	956.84	192.51	282.82	1432.18	405	240
Dyer	1963.5	750.6	966.3	3680.4	1,238	773
Fayette	1083.51	582.22	565.53	2231.27	851	404
Gibson	1255.91	272.14	440.79	1968.84	812	279
Hardeman	2859.36	3554.08	3426.07	9839.5	867	322
Haywood	946.42	575.23	585.26	2106.91	501	182
Henderson	133.32	83.98	116.12	333.43	82	9
Henry	70.76	27.22	46.32	144.3	36	0
Lake	61.94	10.73	15.37	88.03	91	11
Lauderdale	813.03	582.22	718.44	2113.69	418	101
Madison	2408.05	999.99	1045.34	4453.37	1,132	651
McNairy	1674.96	3093.95	2198.56	6967.47	420	127
Obion	1411.31	307.63	525.17	2244.11	730	284
Shelby	47788.93	53766.13	40781.43	142336.49	38,262	35,953
Tipton	834.52	1385.89	1280.48	3500.89	395	183
Weakley	998.64	258.61	445.05	1702.3	608	129
Total =	**66,747**	**66,988**	**54,159**	**187,894**	**47,659**	**39,912**

Table 14 – HAZUS Model 5, Economic Loss Report

County	Capital Stock Losses				Income Losses	Total
	Structural	Contents	Inventory	Ratio		
Carroll	$5,473,000	$7,406,000	$200,000	4.30%	$36,000	$13,115,000
Chester	$5,535,000	$7,054,000	$313,000	5.50%	$30,000	$12,932,000
Crockett	$5,467,000	$5,056,000	$243,000	7.60%	$9,000	$10,775,000
Dyer	$16,678,000	$20,048,000	$909,000	5.60%	$291,000	$37,926,000
Fayette	$17,417,000	$21,748,000	$1,211,000	5.00%	$149,000	$40,525,000
Gibson	$9,305,000	$11,842,000	$620,000	5.20%	$87,000	$21,854,000
Hardeman	$21,285,000	$28,266,000	$1,758,000	8.80%	$165,000	$51,474,000
Haywood	$7,084,000	$6,325,000	$300,000	10.30%	$8,000	$13,717,000
Henderson	$1,031,000	$1,025,000	$2,000	4.50%	$5,000	$2,063,000
Henry	$402,000	$380,000	$15,000	3.20%	$0	$797,000
Lake	$303,000	$217,000	$2,000	0.90%	$0	$522,000
Lauderdale	$6,377,000	$6,360,000	$147,000	5.70%	$412,000	$13,296,000
Madison	$34,199,000	$57,632,000	$5,304,000	7.00%	$471,000	$97,606,000
McNairy	$19,367,000	$38,735,000	$2,401,000	7.70%	$361,000	$60,864,000
Obion	$8,351,000	$11,517,000	$419,000	3.90%	$72,000	$20,359,000
Shelby	$868,522,000	$1,148,286,000	$39,624,000	10.10%	$14,421,000	$2,070,853,000
Tipton	$8,607,000	$10,353,000	$1,487,000	5.80%	$5,000	$20,452,000
Weakley	$5,656,000	$6,075,000	$227,000	4.60%	$23,000	$11,981,000
Total =	**$1,041,059,000**	**$1,388,325,000**	**$55,182,000**	-	**$16,545,000**	**$2,501,111,000**

Table 15 – HAZUS Model 5, Aggregate Losses

Building Losses	Residential	Commercial	Industrial	Other	Total
Building	$645,360,000	$304,350,000	$60,820,000	$30,520,000	$1,041,050,000
Content	$403,450,000	$723,690,000	$138,110,000	$123,080,000	$1,388,330,000
Inventory	$0	$24,980,000	$27,420,000	$2,780,000	$55,180,000
Subtotal =	$1,048,810,000	$1,053,020,000	$226,350,000	$156,380,000	$2,484,560,000
Business Losses					
Income	$100,000	$3,870,000	$20,000	$260,000	$4,250,000
Relocation	$1,070,000	$1,390,000	$20,000	$110,000	$2,590,000
Rental Income	$440,000	$680,000	$0	$10,000	$1,130,000
Wages	$270,000	$5,400,000	$30,000	$2,890,000	$8,580,000
Subtotal =	$1,880,000	$11,340,000	$70,000	$3,270,000	$16,550,000
Total =	**$1,050,690,000**	**$1,064,360,000**	**$226,420,000**	**$159,650,000**	**$2,501,110,000**



Map 8 – HAZUS Model 5 – Mississippi River Basin, 500 Year Flood

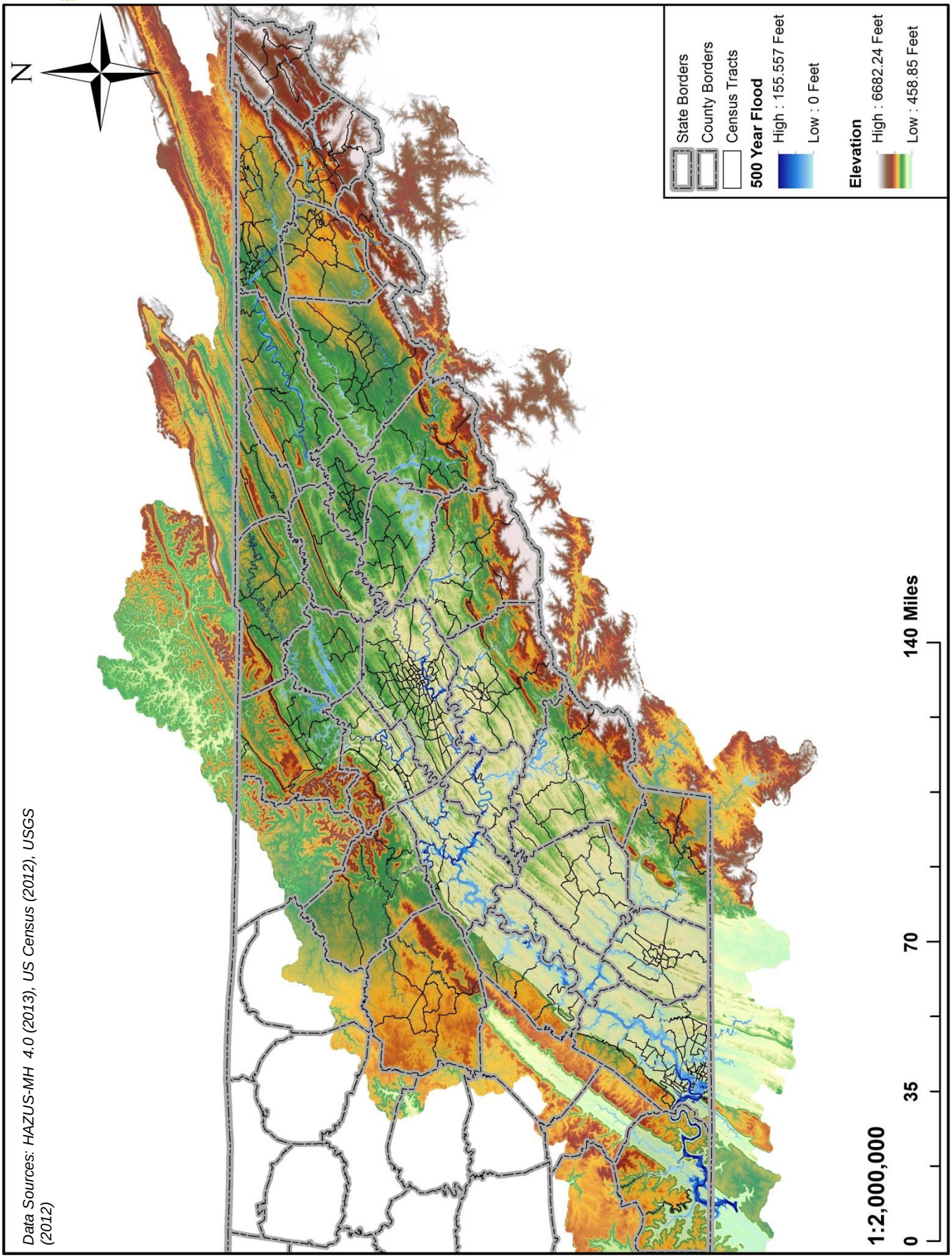
1.1.6 – HAZUS Model 6 – Flood – Upper Tennessee River Basin

Table 16 – HAZUS Model 6, Debris & Shelter Report						
County	**Finishes (Tons)**	**Structures (Tons)**	**Foundations (Tons)**	**Total Debris (Tons)**	**Displaced People**	**People Requiring Short Term Shelter**
Anderson	12,246	43,317	34,682	90,246	4,524	3,360
Blount	16,732	38,936	31,677	87,345	3,340	1,675
Bradley	3,898	5,656	5,217	14,770	1,738	1,080
Campbell	438	429	449	1,316	223	20
Carter	11,788	25,795	21,270	58,852	4,298	3,214
Claiborne	815	2,686	2,311	5,812	406	132
Cocke	3,668	13,701	10,742	28,111	1,278	690
Cumberland	216	526	492	1,234	85	10
Grainger	111	186	189	486	36	1
Greene	1,265	2,132	2,102	5,500	750	123
Hamblen	247	224	228	698	107	24
Hamilton	125,792	447,062	354,776	927,630	28,197	23,783
Hancock	136	255	265	656	40	4
Hawkins	4,513	10,474	9,868	24,855	1,661	931
Jefferson	885	578	692	2,155	399	68
Johnson	234	317	318	869	105	16
Knox	30,403	77,929	64,344	172,675	12,208	8,528
Loudon	4,044	15,268	12,745	32,058	2,154	1,058
Marion	7,398	18,465	14,278	40,141	3,010	1,834
McMinn	1,662	2,963	2,770	7,394	699	121
Meigs	2,931	4,814	5,230	12,975	1,190	385
Monroe	1,066	1,676	1,627	4,370	362	44
Morgan	722	1,271	1,313	3,307	283	76
Polk	1,400	3,479	3,116	7,994	520	150
Rhea	6,962	8,291	8,247	23,501	2,899	1,540
Roane	19,843	44,632	40,387	104,862	7,334	4,555
Sevier	7,754	17,519	12,859	38,132	3,299	2,326
Sullivan	11,977	30,799	25,238	68,013	3,528	2,256
Unicoi	1,266	5,142	4,846	11,254	566	289
Union	815	1,338	1,384	3,537	233	57
Washington	3,305	5,031	4,952	13,288	1,513	745
Total =	**284,534**	**830,888**	**678,613**	**1,794,035**	**86,985**	**59,095**

Table 17 – HAZUS Model 6, Economic Loss Report						
County	Capital Stock Losses				Income Losses	Total
	Structural	Contents	Inventory	Ratio		
Anderson	$185,563,000	$213,304,000	$15,309,000	12.60%	$414,176,000	$416,218,000
Blount	$121,113,000	$99,869,000	$3,228,000	9.30%	$224,210,000	$224,942,000
Bradley	$39,221,000	$37,811,000	$1,038,000	7.00%	$78,070,000	$78,559,000
Campbell	$5,432,000	$5,363,000	$70,000	1.50%	$10,865,000	$10,915,000
Carter	$94,917,000	$104,949,000	$3,863,000	11.10%	$203,729,000	$205,050,000
Claiborne	$10,637,000	$8,340,000	$295,000	4.20%	$19,272,000	$19,325,000
Cocke	$77,019,000	$129,130,000	$14,920,000	14.60%	$221,069,000	$222,665,000
Cumberland	$2,018,000	$1,432,000	$43,000	2.40%	$3,493,000	$3,496,000
Grainger	$667,000	$617,000	$45,000	1.30%	$1,329,000	$1,336,000
Greene	$14,526,000	$14,780,000	$1,486,000	5.30%	$30,792,000	$30,817,000
Hamblen	$1,947,000	$1,297,000	$49,000	10.40%	$3,293,000	$3,293,000
Hamilton	$1,667,429,000	$2,408,681,000	$188,902,000	20.40%	$4,265,012,000	$4,293,660,000
Hancock	$643,000	$317,000	$0	7.80%	$960,000	$960,000
Hawkins	$41,193,000	$34,047,000	$2,671,000	6.90%	$77,911,000	$78,012,000
Jefferson	$8,950,000	$10,978,000	$310,000	2.10%	$20,238,000	$20,397,000
Johnson	$1,950,000	$2,391,000	$121,000	2.60%	$4,462,000	$4,472,000
Knox	$521,050,000	$527,912,000	$27,350,000	9.00%	$1,076,312,000	$1,080,309,000
Loudon	$100,242,000	$128,768,000	$12,722,000	8.50%	$241,732,000	$243,202,000
Marion	$97,280,000	$102,270,000	$4,932,000	17.80%	$204,482,000	$205,326,000
McMinn	$15,399,000	$15,795,000	$962,000	5.20%	$32,156,000	$32,205,000
Meigs	$29,940,000	$21,341,000	$399,000	14.90%	$51,680,000	$51,814,000
Monroe	$7,640,000	$9,201,000	$858,000	2.90%	$17,699,000	$17,820,000
Morgan	$6,378,000	$4,571,000	$213,000	3.90%	$11,162,000	$11,166,000
Polk	$17,429,000	$20,265,000	$719,000	7.80%	$38,413,000	$38,609,000
Rhea	$62,998,000	$74,463,000	$2,297,000	10.30%	$139,758,000	$140,307,000
Roane	$258,210,000	$249,803,000	$3,795,000	16.10%	$511,808,000	$515,449,000
Sevier	$165,022,000	$265,043,000	$10,337,000	10.30%	$440,402,000	$445,575,000
Sullivan	$119,655,000	$147,881,000	$7,731,000	7.80%	$275,267,000	$276,611,000
Unicoi	$18,957,000	$26,979,000	$3,646,000	14.10%	$49,582,000	$49,677,000
Union	$6,167,000	$4,214,000	$44,000	4.40%	$10,425,000	$10,439,000
Washington	$35,709,000	$27,208,000	$1,215,000	8.20%	$64,132,000	$64,212,000
Total =	**$3,735,301,000**	**$4,699,020,000**	**$309,570,000**	-	**$8,743,891,000**	**$8,796,838,000**

Table 18 – HAZUS Model 6, Aggregate Losses					
Building Losses	**Residential**	**Commercial**	**Industrial**	**Other**	**Total**
Building	$1,819,520,000	$1,218,060,000	$496,910,000	$200,810,000	$3,735,300,000
Content	$1,056,750,000	$2,114,890,000	$1,047,910,000	$479,470,000	$4,699,020,000
Inventory	$0	$72,920,000	$233,640,000	$3,000,000	$309,570,000
Subtotal =	$2,876,270,000	$3,405,870,000	$1,778,460,000	$683,290,000	$8,743,890,000
Business Losses					
Income	$480,000	$12,620,000	$140,000	$1,340,000	$14,580,000
Relocation	$1,760,000	$3,500,000	$180,000	$630,000	$6,080,000
Rental Income	$1,130,000	$2,120,000	$20,000	$50,000	$3,310,000
Wages	$1,240,000	$13,420,000	$200,000	$14,120,000	$28,980,000
Subtotal =	$4,610,000	$31,660,000	$540,000	$16,140,000	$52,950,000
Total =	**$2,880,880,000**	**$3,437,530,000**	**$1,779,000,000**	**$699,430,000**	**$8,796,840,000**

Map 9 – HAZUS Model 6 – Upper Tennessee River Basin, 500 Year Flood



Data Sources: HAZUS-MH 4.0 (2013), US Census (2012), USGS (2012)

Appendix 2 – Social Vulnerability & Risk Assessments

2.1 – Risk Assessment by Statewide Analysis

Social Vulnerability Index© (SoVI)

The Social Vulnerability Index© is an important disaster mitigation planning tool as it depicts an areas vulnerability using historical hazard data as well as by their social conditions. Social vulnerability describes those aspects and elements of a population that influence the capacity of a community to prepare for, respond to, and recover from hazards and disasters. The social vulnerability of a population interacts with natural disasters and processes as well as the built environment to distribute the risks and impacts of natural hazards and in this way creates the social impacts of those hazards and disasters.

Several algorithms and methods have been developed for estimating social vulnerability. However, the index compiled by the Hazards and Vulnerability Research Institute at the Department of Geography, University of South Carolina has come to be the accepted method in the emergency management community. Hazard Vulnerability Research Institute's (HVRI) index measures the social vulnerability of U.S. counties to environmental hazards. Based on national data sources, primarily the 2010 U.S. Decennial Census, it synthesizes 30 socioeconomic and built environment variables that various research literatures suggest contribute to a reduction or increase in a community's ability to prepare for, respond to, and recover from hazards. Of these 30 socioeconomic factors used to evaluate a given population's social vulnerability, 7 components explain 72% of the variance in the data. The 7 factors that explain the relative level of social vulnerability in HVRI's index include: race and class; wealth; vulnerable populations; residents of Hispanic ethnicity; special needs individuals; individuals of Native American ethnicity and individuals with service industry employment.

Utilizing the SoVI© index as a measure of jurisdictional vulnerability is superior to using historical impact data. Although there is a great amount to learn from using historical impact data, it lacks explanatory power by neglecting recent changes in growth and development. On the other hand, the SoVI© has been modeled using historical hazard impacts and that model is based on recent growth and development.

HVRI's SoVI© index can be used by Tennessee to help determine where social vulnerability and exposure to hazards overlaps and how and where mitigation resources might best be used. The color coded maps that follow will show the county variation in Tennessee for all 7 of the social vulnerability index main components.

For more information on the Social Vulnerability Index©, please follow this link:
http://artsandsciences.sc.edu/geog/hvri/hvri-resources

Threat Assessment by GIS Analysis

The statewide threat assessment involves a variety of data sources and analysis methodologies to address each hazard county by county. The approach centered around assigning threat ranks, 1 through 5, to areas of the county. These areas were then taken as a percentage of the county's area and totaled together to achieve an aggregate threat score for the county. The following methods were used to achieve threat scores for the county:

- Drought – Historical Impact Density
- Earthquake – Seismic Zones
- Expansive Soils – Linear Extensibility Scoring
- Extreme Temperature – Historical Impact Density
- Flash Flood – Historical Impact Density
- Hail – Historical Impact Density
- High & Strong Winds – Historical Impact Density
- Land Subsidence/Sinkholes – Karst Formations
- Landslides – USGS Threat Index
- Lightning – Historical Impact Density
- Riverine Flood – Floodplain Size
- Thunderstorm Winds – Historical Impact Density
- Tornado – Historical Impact Density (Weighted by EF magnitude)
- Wildfire – WUI Size
- Winter Storm – Historical Impact Density

Composite Risk Assessment by GIS Analysis

Each areas rank was analyzed as a percentage of each county's total area. The newly calculated composite threat scores, per county, were then divided into 5 ordinal ranks, 5 being exposed to the greatest threat and 1 being the least.

The following tables display the threat rank index of each hazard per county. The maps following these tables geographically show the threat index across the state. For comparison purposes, the county's SoVI© score is listed.

The following pages illustrate the assessment process.

Step 1: Illustrating the SoVI©

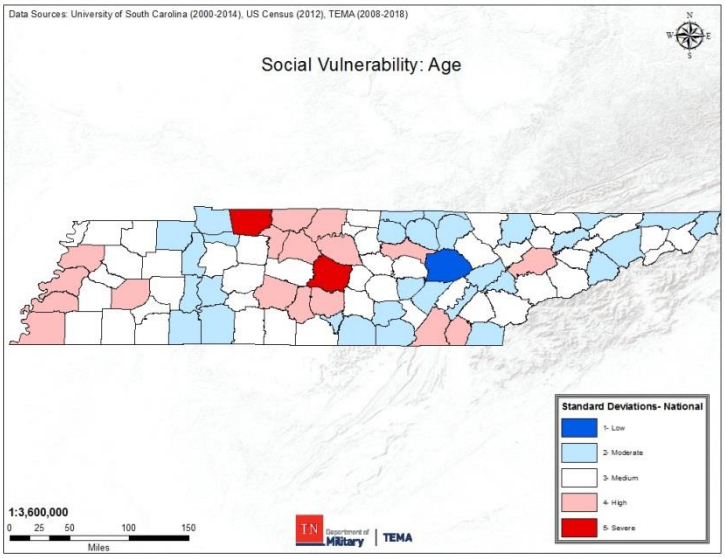
The 1st step was incorporating the University of South Carolina's SoVI© into tables (Table 19) and developing a series of maps (Maps 10-18). The table and maps diagram the 7 components of the SoVI© into 5 rankings based on national comparative scores. This was done for all 95 Tennessee counties. The statistical values using in computing the SoVI© are drawn the 2010-2014 5 Year Census Data Product, and all calculations of these values were done by the University of South Carolina's Hazard Vulnerability Institute.

This table and maps assist Tennessee in determining where social vulnerability and exposure to hazards overlaps the greatest and least. Below are screenshots of the table and an example SoVI© map.

Table 62 – Social Vulnerability Index©, Tennessee

Rank 1 = Low <-1.50 Std.Dev. Rank 2 = -0.50 - -1.5 Std. Dev. Rank 3 = -0.50 - 0.50 Std. Dev.
Rank 4 = 1.5 – 0.50 Std. Dev Rank 5 = High > 1.5 Std. Dev.

County	National Percentile	Age	Ethnicity (Hispanic)	Ethnicity (Native American)	Race & Class	Service Industry Employment	Vulnerable Populations	Wealth (- Correlation)
Anderson	47.60%	3	4	3	3	3	3	3
Bedford	46.40%	4	2	4	3	5	3	2
Benton	75.20%	2	3	3	2	3	4	2
Bledsoe	15.50%	2	3	3	3	2	5	2
Blount	34.60%	3	4	4	3	3	3	3
Bradley	43.80%	4	3	4	3	3	3	3
Campbell	79.00%	2	3	3	2	4	3	2
Cannon	40.80%	3	3	3	3	4	4	2
Carroll	68.50%	3	4	3	2	4	3	2
Carter	73.30%	3	3	3	2	3	3	2
Cheatham	8.10%	4	3	3	4	4	4	3
Chester	33.80%	3	3	3	3	4	3	2
Claiborne	42.30%	3	3	3	2	4	4	2
Clay	85.80%	2	2	4	3	4	3	2
Cocke	84.90%	2	3	3	2	3	4	2
Coffee	49.20%	3	3	3	3	4	3	3
Crockett	63.60%	3	3	4	2	4	3	2
Cumberland	90.00%	1	3	3	3	3	3	3
Davidson	39.10%	4	4	4	2	3	2	4
Decatur	82.90%	2	2	4	2	5	3	2
DeKalb	39.30%	3	3	4	2	4	3	3
Dickson	26.20%	3	3	3	3	3	4	3
Dyer	47.90%	4	4	3	2	3	3	3
Fayette	12.00%	3	4	3	3	4	4	3
Fentress	77.90%	2	3	3	3	4	4	2
Franklin	42.50%	2	3	3	3	4	3	3
Gibson	70.90%	3	4	3	2	4	2	2
Giles	48.80%	3	3	3	3	4	3	2
Grainger	22.60%	2	2	3	3	4	4	2
Greene	55.90%	2	3	3	3	4	4	2
Grundy	85.00%	2	3	3	2	3	4	2
Hamblen	59.90%	3	3	4	3	4	3	3
Hamilton	40.80%	4	4	4	3	3	2	4
Hancock	83.40%	2	3	3	2	4	4	2
Hardeman	34.40%	3	3	3	2	2	4	2
Hardin	73.00%	2	3	3	2	3	3	3
Hawkins	36.70%	3	3	3	3	4	4	3
Haywood	86.50%	3	4	3	1	3	3	2
Henderson	36.80%	3	3	3	3	4	4	2
Henry	67.60%	2	4	3	2	3	3	3
Hickman	17.50%	3	3	2	3	3	4	2

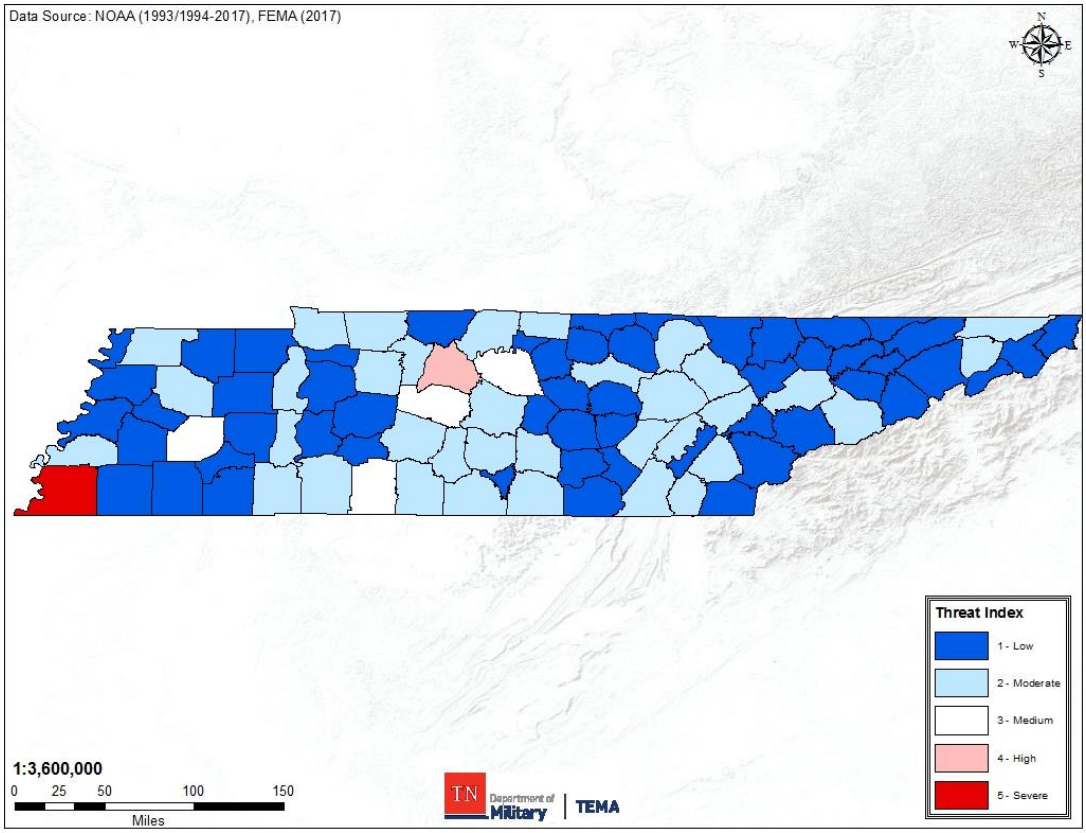


Step 2: Illustrating Probability

The 2nd step was mapping and recording probability based on previous incidents that have occurred within each county. The values were entered into ArcGIS, by county per hazard, mapped, and exported into tables. The unified index developed in step 1 ranks each jurisdiction's hazard probability 1 through 5, from lowest number of incidents (ranking 1 – dark blue) to highest number of incidents (ranking 5 – dark red) for each of Tennessee's counties.

These illustrations can be seen in Section 4.3.3 for each of the 13 Hazards of Prime Concern.

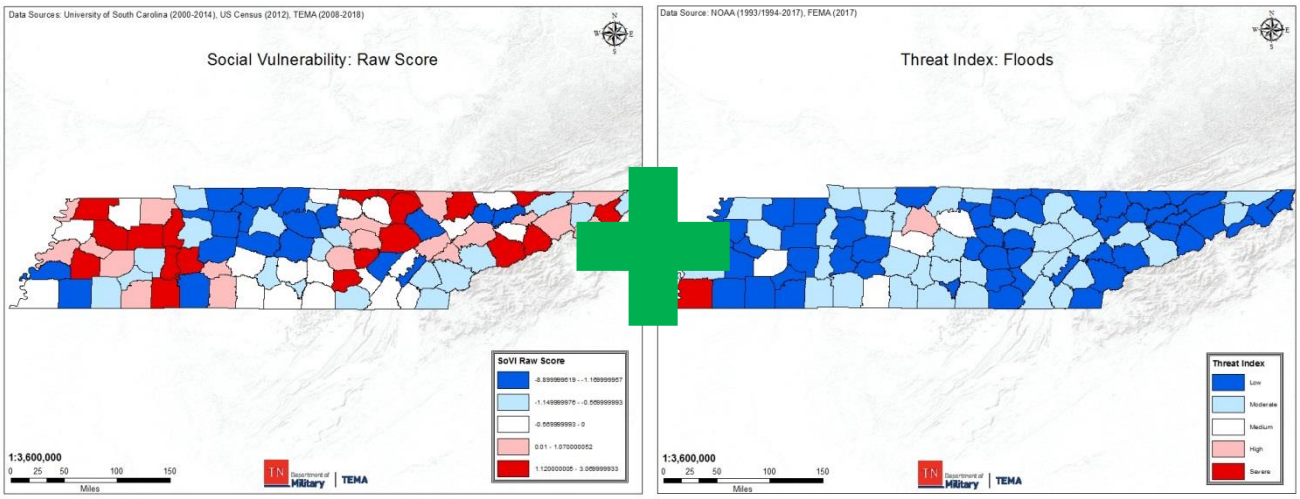
The image below shows an example of hazard probability maps.

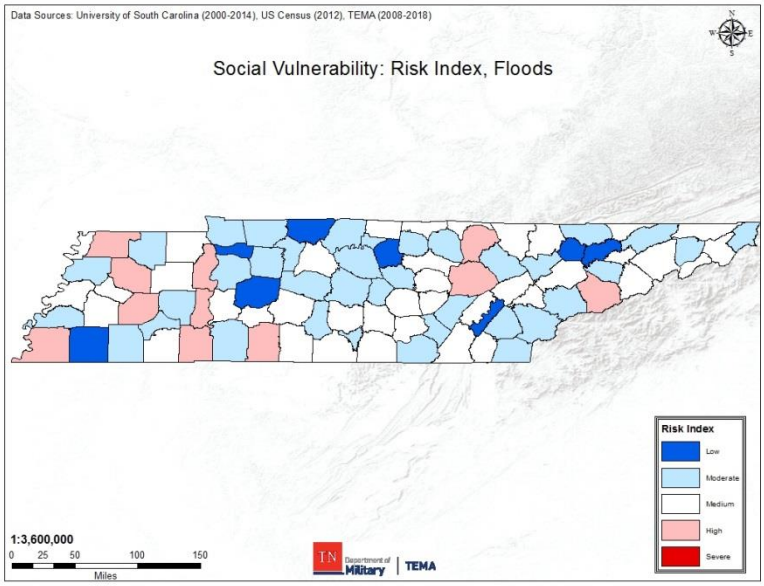


Step 3: Composite Risk Assessment by GIS Analysis

For the 3rd step, planners combined the resulting maps from Step 1 and Step 2 to output the composite risk assessment. To complete this calculation, the SoVI© composite scores were added and averaged with the threat assessment data from Step 2 of this process. The composite risk is therefore a depiction of a county's social vulnerability overlaid with its threats.

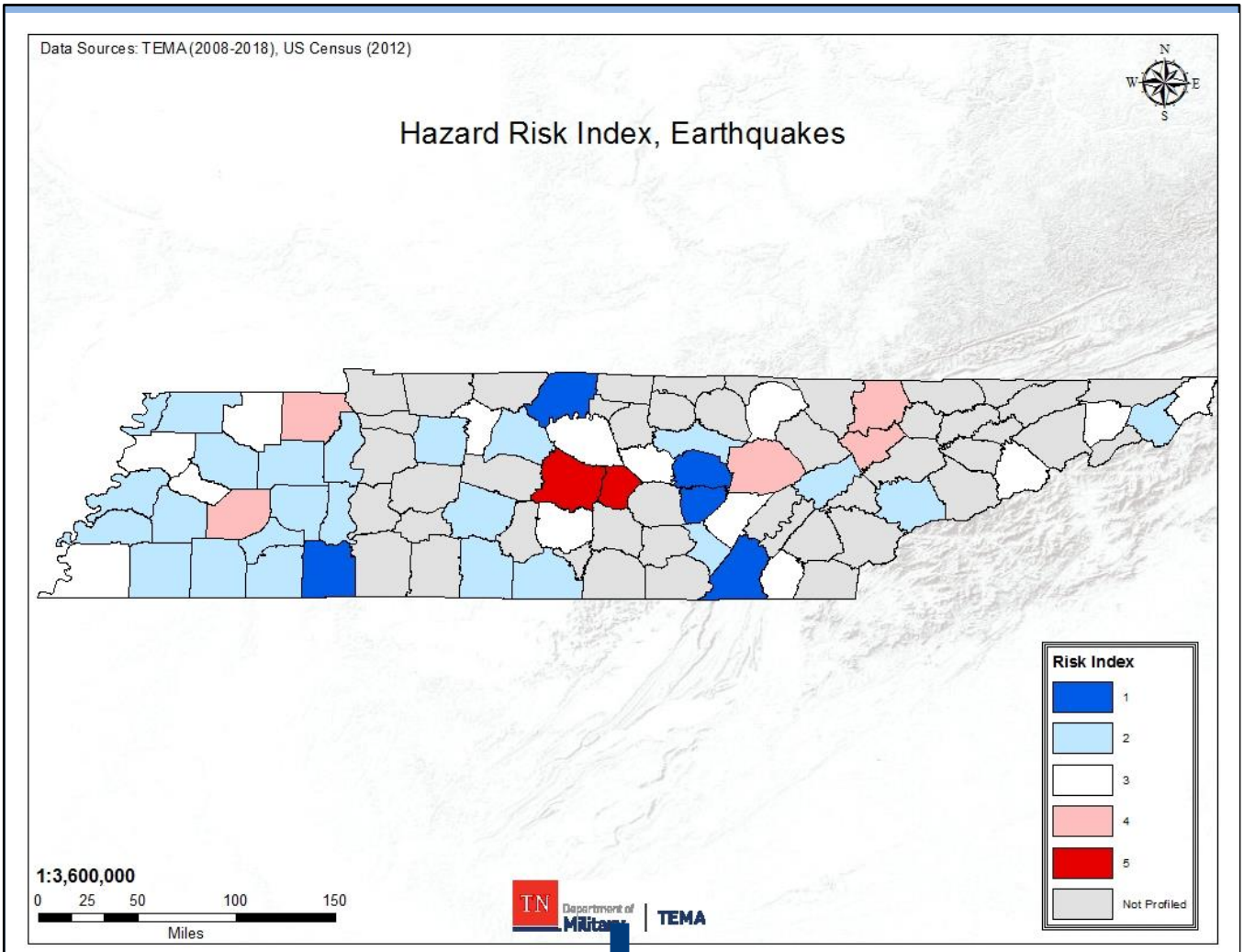
Composite risk was broken down into 5 categories from lowest threat (ranking 1 – dark blue) to highest threat (ranking 5 – dark red) for each of Tennessee's 95 counties. This was done per hazard. Tables 22 and 23 and Maps 19-26 profile the categorical composite risk assessment results by each natural hazard. The coupling of Step 1 and Step 2 provided a way to view both social vulnerabilities and historic disaster susceptibilities into a single picture.





Step 4: Potential Losses by GIS Analysis

For the final step, mitigation planners took the composite risk assessment maps from step 3, and overlaid each of these maps with the structural inventory database from FEMA's HAZUS-MH 4.0 SP1 software. The final result of the GIS analysis is a table that describes the total structural loss estimation per county risk rankings for each hazard. The following diagram shows this process. The results can be seen in Tables 24 through 37.



Loss Estimation by GIS Analysis, Tennessee

Hazard	Risk Index by GIS Analysis					
	1	2	3	4	5	6
Tornadoes	$828,101,000	$25,971,907,000	$101,264,325,000	$171,452,554,000	$9,205,538,000	$573,379,000

4.2.1 – State Vulnerability Assessment by Social Vulnerability Index©

Age
Much of Eastern Tennessee has an older population while the rest of the state, especially the vibrant counties around Nashville and those along the Mississippi River, are quite young. In the entire state, only Cumberland County shows high social vulnerability due to age.

Ethnicity (Hispanic)
Tennessee has a low percentage of Hispanic residents relative to the national average, thus this factor does not heavily influence Tennessee's social vulnerability. Some of the state's rural farming areas have Hispanic populations, but none of these counties has a high social vulnerability.

Ethnicity (Native American)
Only Hickman County has a significant number of Native Americans to raise it social vulnerability index. The rest of Tennessee has a significantly lower number of Native American residents relative to the national average.

Race & Class
Tennessee displays some social vulnerability due to class and race in its westernmost counties, especially Shelby and Haywood. There is also some weakness in this area along the northeast border of the state with Kentucky. However, Tennessee shows much less social vulnerability due to race and class than its neighboring states other than Missouri. A few Tennessee counties in the Nashville area have a low concentration of poverty and thus demonstrate extremely low social vulnerability from race and class.

Service Industry Employment
A few counties near the Great Smoky Mountain National Park have a relatively high level of service employment. However, proportionately, Tennessee has a very low level of service employment due to its high number of farming, manufacturing, mining, and transportation jobs.

Vulnerable Populations
Tennessee has a very few concentrations of vulnerable populations and people in long term care facilities relative to the national average. No counties in Tennessee display a high social vulnerability from this factor.

Wealth
As with many states, many of Tennessee's rural counties are not wealthy, but its large metropolitan areas have significant wealth and thus lower social vulnerability to hazards and disasters.

Combined Social Vulnerability Index©
Maps 10-18 on the following pages illustrate the geographic variation in each Tennessee county's social vulnerability relative to all counties in the United States. The data is depicted in standard deviations. From there the data is broken down into 5 categories where the middle deviation category represents 38.29% of all counties, the 2nd deviation category the next 48.35% of all counties, and the 3rd deviation category and greater represents the last 13.36% of all counties.

Map 11 illustrates the SoVI© raw score throughout Tennessee.

Table 19 on the next page lists the total and individual SoVI© ranks throughout Tennessee.

Table 19 – Social Vulnerability Index©, Tennessee

Rank 1 = Low <-1.50 Std.Dev. Rank 2 = -0.50 - -1.5 Std. Dev. Rank 3 = -0.50 - 0.50 Std. Dev.
Rank 4 = 1.5 – 0.50 Std. Dev Rank 5 = High > 1.5 Std. Dev.

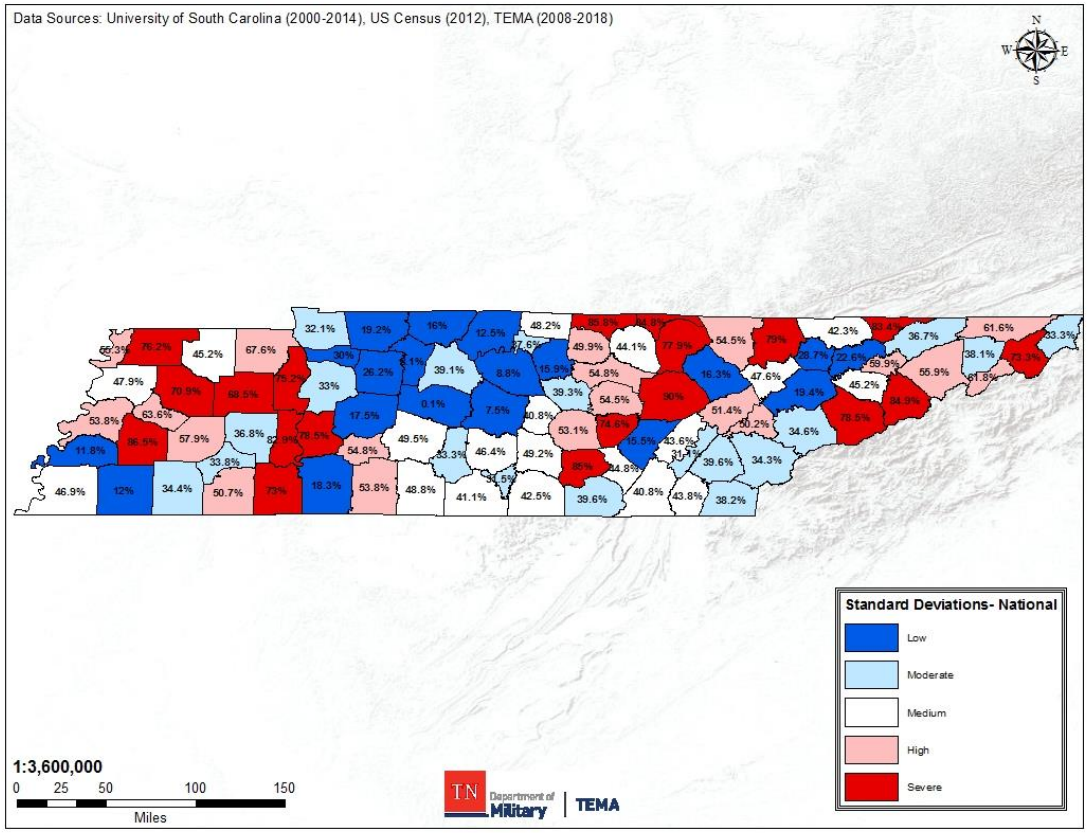
County	National Percentile	Age	Ethnicity (Hispanic)	Ethnicity (Native American)	Race & Class	Service Industry Employment	Vulnerable Populations	Wealth (- Correlation)
Anderson	47.60%	3	4	3	3	3	3	3
Bedford	46.40%	4	2	4	3	5	3	2
Benton	75.20%	2	3	3	2	3	4	2
Bledsoe	15.50%	2	3	3	3	2	5	2
Blount	34.60%	3	4	4	3	3	3	3
Bradley	43.80%	4	3	4	3	3	3	3
Campbell	79.00%	2	3	3	2	4	3	2
Cannon	40.80%	3	3	3	3	4	4	2
Carroll	68.50%	3	4	3	2	4	3	2
Carter	73.30%	3	3	3	2	3	3	2
Cheatham	8.10%	4	3	3	4	4	4	3
Chester	33.80%	3	3	3	3	4	3	2
Claiborne	42.30%	3	3	3	2	4	4	2
Clay	85.80%	2	2	4	3	4	3	2
Cocke	84.90%	2	3	3	2	3	4	2
Coffee	49.20%	3	3	3	3	4	3	3
Crockett	63.60%	3	3	4	2	4	3	2
Cumberland	90.00%	1	3	3	3	3	3	3
Davidson	39.10%	4	4	4	2	3	2	4
Decatur	82.90%	2	2	4	2	5	3	2
DeKalb	39.30%	3	3	4	2	4	3	3
Dickson	26.20%	3	3	3	3	3	4	3
Dyer	47.90%	4	4	3	2	3	3	3
Fayette	12.00%	3	4	3	3	4	4	3
Fentress	77.90%	2	3	3	3	4	4	2
Franklin	42.50%	2	3	3	3	4	3	3
Gibson	70.90%	3	4	3	2	4	2	2
Giles	48.80%	3	3	3	3	4	3	2
Grainger	22.60%	2	2	3	3	4	4	2
Greene	55.90%	2	3	3	3	4	4	2
Grundy	85.00%	2	3	3	2	3	4	2
Hamblen	59.90%	3	3	4	3	4	3	3
Hamilton	40.80%	4	4	4	3	3	2	4
Hancock	83.40%	2	3	3	2	4	4	2
Hardeman	34.40%	3	3	3	2	2	4	2
Hardin	73.00%	2	3	3	2	3	3	3
Hawkins	36.70%	3	3	3	3	4	4	3
Haywood	86.50%	3	4	3	1	3	3	2
Henderson	36.80%	3	3	3	3	4	4	2
Henry	67.60%	2	4	3	2	3	3	3
Hickman	17.50%	3	3	2	3	3	4	2

County	National Percentile	Age	Ethnicity (Hispanic)	Ethnicity (Native American)	Race & Class	Service Industry Employment	Vulnerable Populations	Wealth (-Correlation)
Houston	30.00%	2	3	3	3	4	3	2
Humphreys	33.00%	3	3	4	3	3	4	3
Jackson	49.90%	2	3	3	2	3	4	2
Jefferson	45.20%	3	3	3	3	4	4	3
Johnson	33.30%	2	3	3	3	3	4	2
Knox	19.40%	4	4	3	3	3	3	4
Lake	55.30%	3	2	3	2	1	3	2
Lauderdale	53.80%	4	3	3	2	3	3	2
Lawrence	53.80%	3	3	3	3	4	3	2
Lewis	54.80%	3	3	4	3	3	3	2
Lincoln	41.10%	3	3	3	3	4	3	3
Loudon	50.20%	2	3	3	3	4	3	3
Macon	48.20%	3	2	3	2	5	3	2
Madison	57.90%	4	4	3	2	3	3	3
Marion	39.60%	2	3	3	3	4	4	3
Marshall	33.30%	4	3	3	3	4	3	2
Maury	49.50%	4	4	3	3	3	3	3
McMinn	39.60%	3	3	4	3	4	3	3
McNairy	50.70%	3	3	3	3	4	3	2
Meigs	31.10%	2	3	3	3	4	5	2
Monroe	34.30%	3	3	3	3	4	4	2
Montgomery	19.20%	5	4	3	3	2	3	3
Moore	31.50%	2	3	3	3	4	3	3
Morgan	16.30%	3	2	3	3	3	5	2
Obion	76.20%	3	3	3	2	4	3	3
Overton	44.10%	2	3	4	3	3	4	2
Perry	78.50%	2	3	3	3	2	4	2
Pickett	84.80%	2	2	3	3	5	3	3
Polk	38.20%	2	3	3	3	4	4	2
Putnam	54.80%	4	3	3	3	3	3	3
Rhea	43.60%	3	3	3	3	4	3	2
Roane	51.40%	2	3	3	3	3	4	3
Robertson	16.00%	4	3	3	3	4	4	3
Rutherford	7.50%	5	4	4	3	3	3	3
Scott	54.50%	3	3	3	2	4	4	2
Sequatchie	44.80%	3	3	3	3	4	4	2
Sevier	78.50%	3	3	3	3	2	4	3
Shelby	46.90%	4	4	3	1	3	3	4
Smith	15.90%	3	3	3	3	3	4	2
Stewart	32.10%	2	3	3	3	3	4	3
Sullivan	61.60%	2	4	3	3	3	3	3
Sumner	12.50%	4	4	4	4	4	3	3
Tipton	11.80%	4	4	3	3	3	4	2
Trousdale	37.60%	3	3	3	3	4	4	2
Unicoi	61.80%	3	3	3	3	3	3	3
Union	28.70%	3	3	3	3	4	4	2

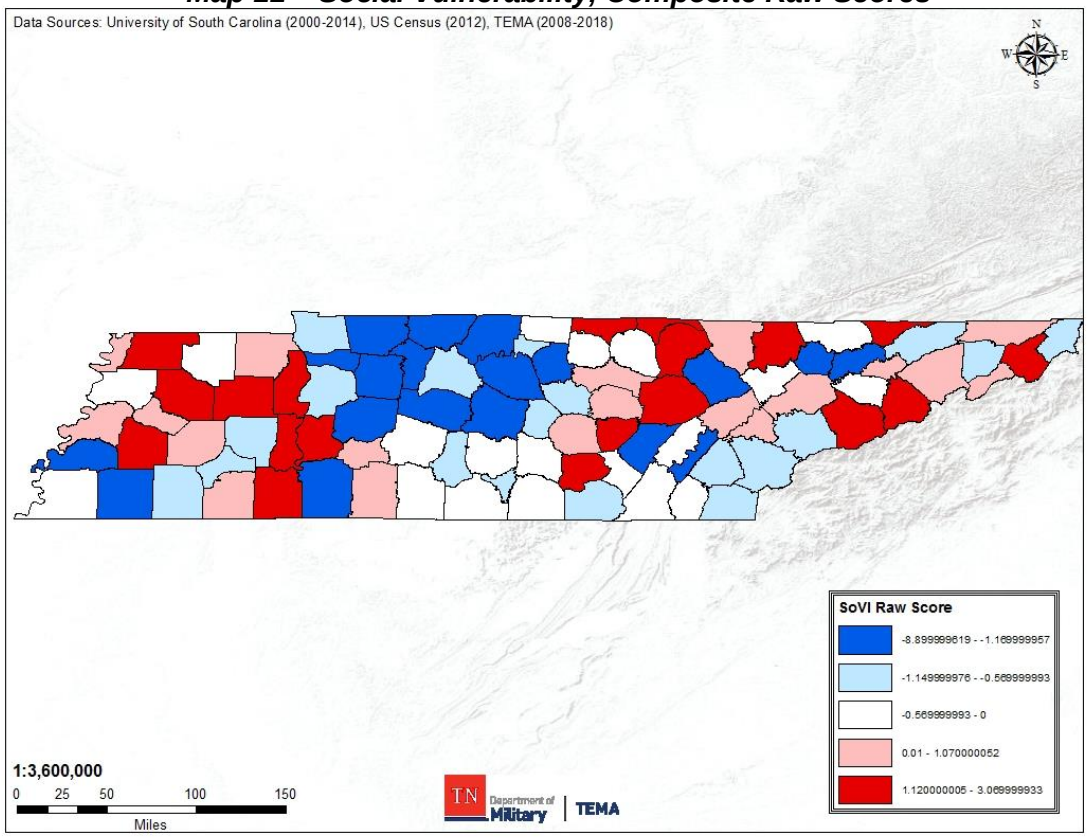
County	National Percentile	Age	Ethnicity (Hispanic)	Ethnicity (Native American)	Race & Class	Service Industry Employment	Vulnerable Populations	Wealth (-Correlation)
Van Buren	74.60%	2	3	3	3	3	4	2
Warren	53.10%	3	3	4	3	3	3	2
Washington	38.10%	3	4	3	3	3	3	3
Wayne	18.30%	2	2	3	3	2	4	2
Weakley	45.20%	3	4	3	3	3	3	2
White	54.50%	3	3	3	3	3	3	2
Williamson	0.10%	3	4	3	5	3	5	5
Wilson	8.80%	4	4	3	4	4	4	3

**The data are from the University of South Carolina, Department of Geography, Hazards & Vulnerability Research Institute.*

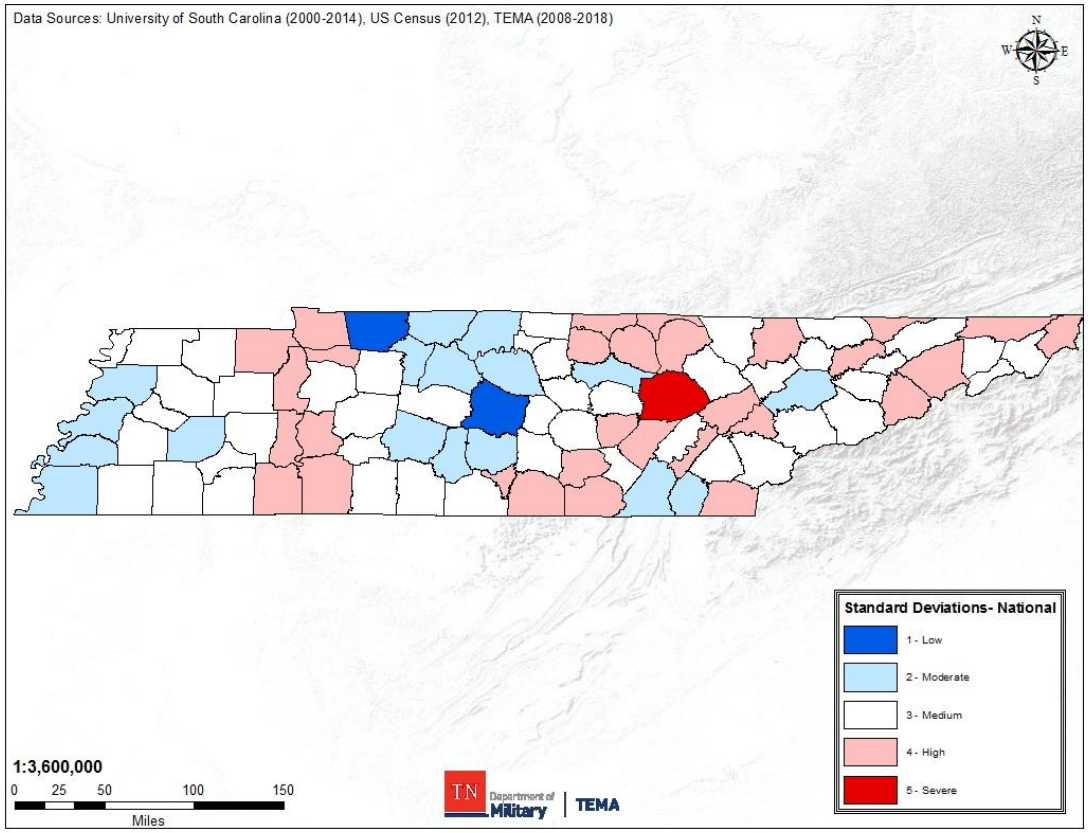
Map 10 – Social Vulnerability, Composite National Rank



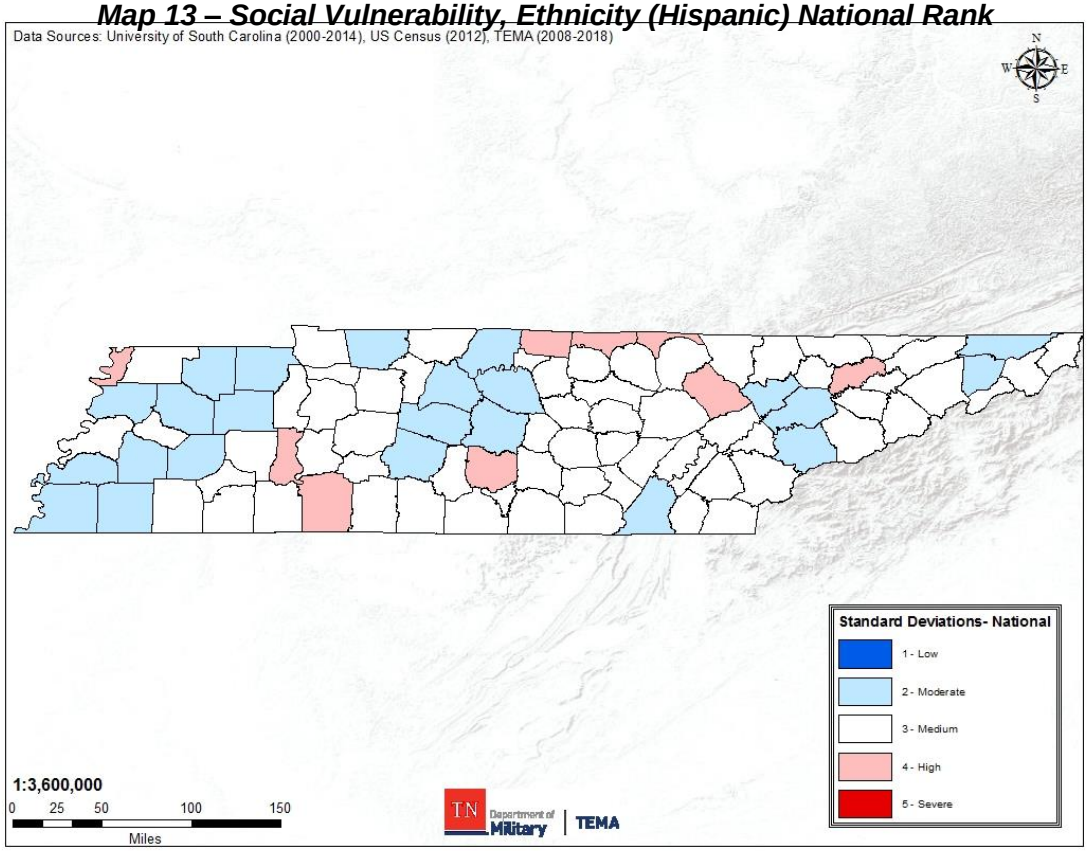
Map 11 – Social Vulnerability, Composite Raw Scores



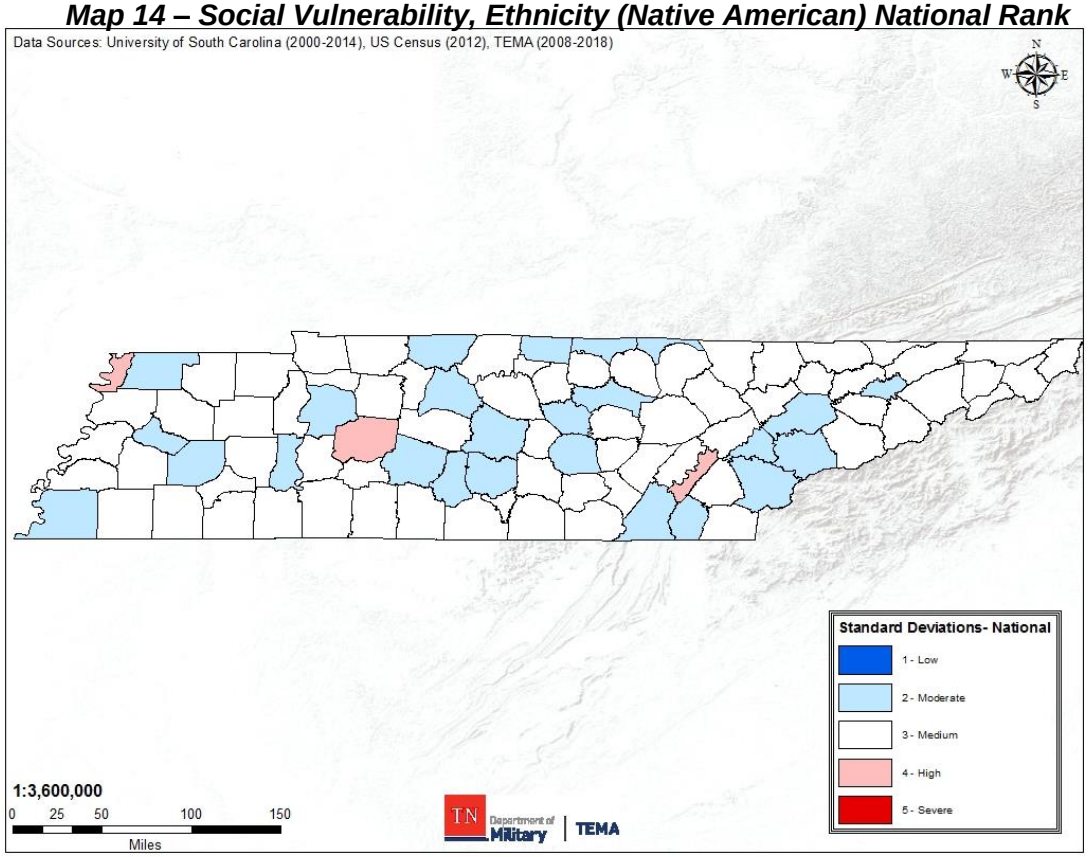
Map 12 – Social Vulnerability, Age National Rank



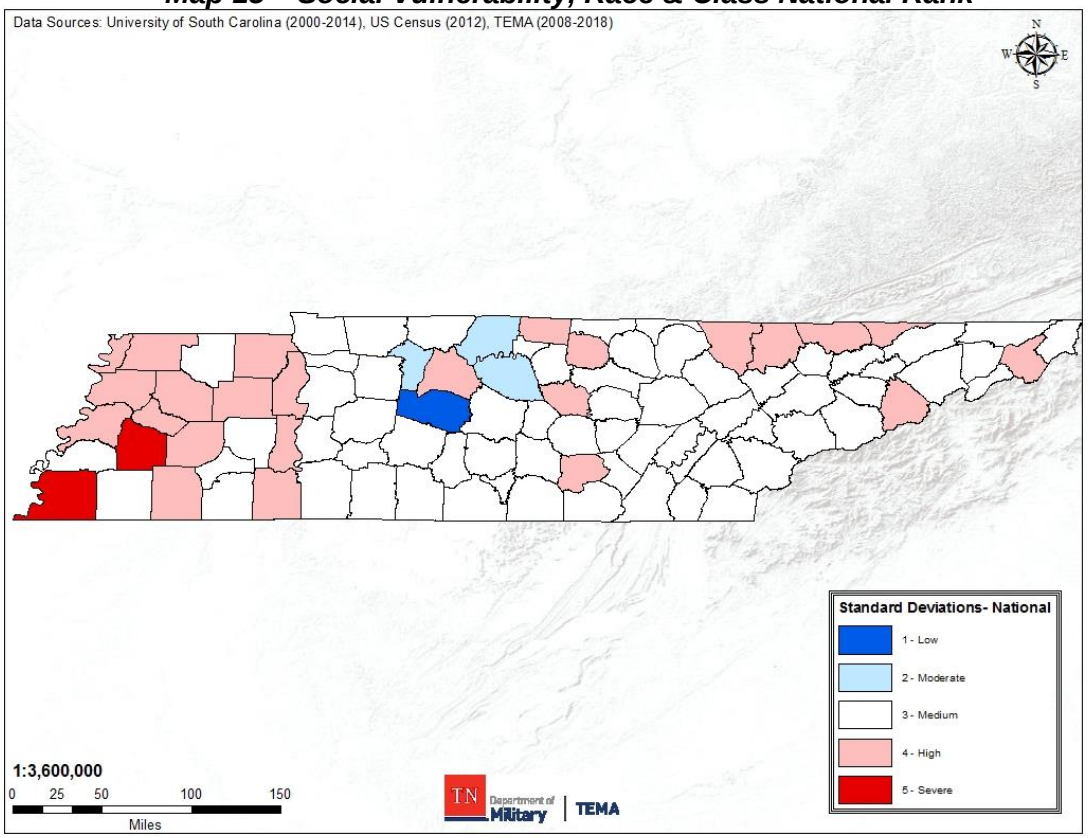
Map 13 – Social Vulnerability, Ethnicity (Hispanic) National Rank



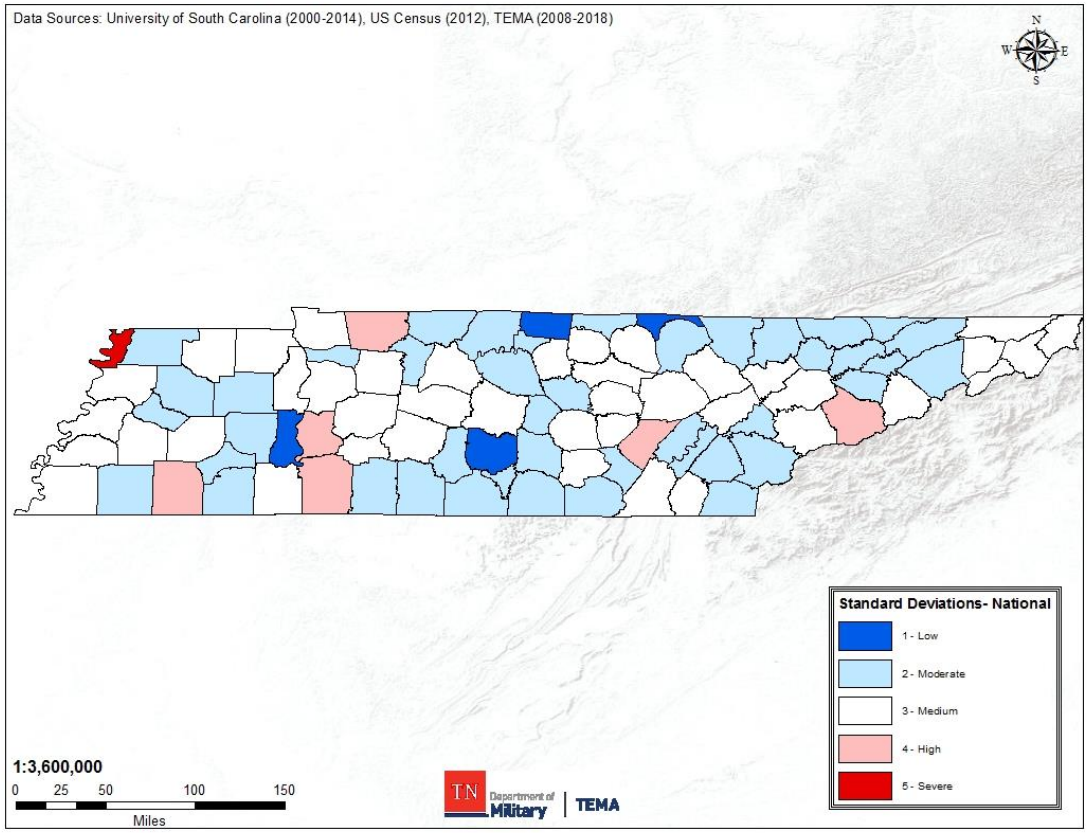
Map 14 – Social Vulnerability, Ethnicity (Native American) National Rank



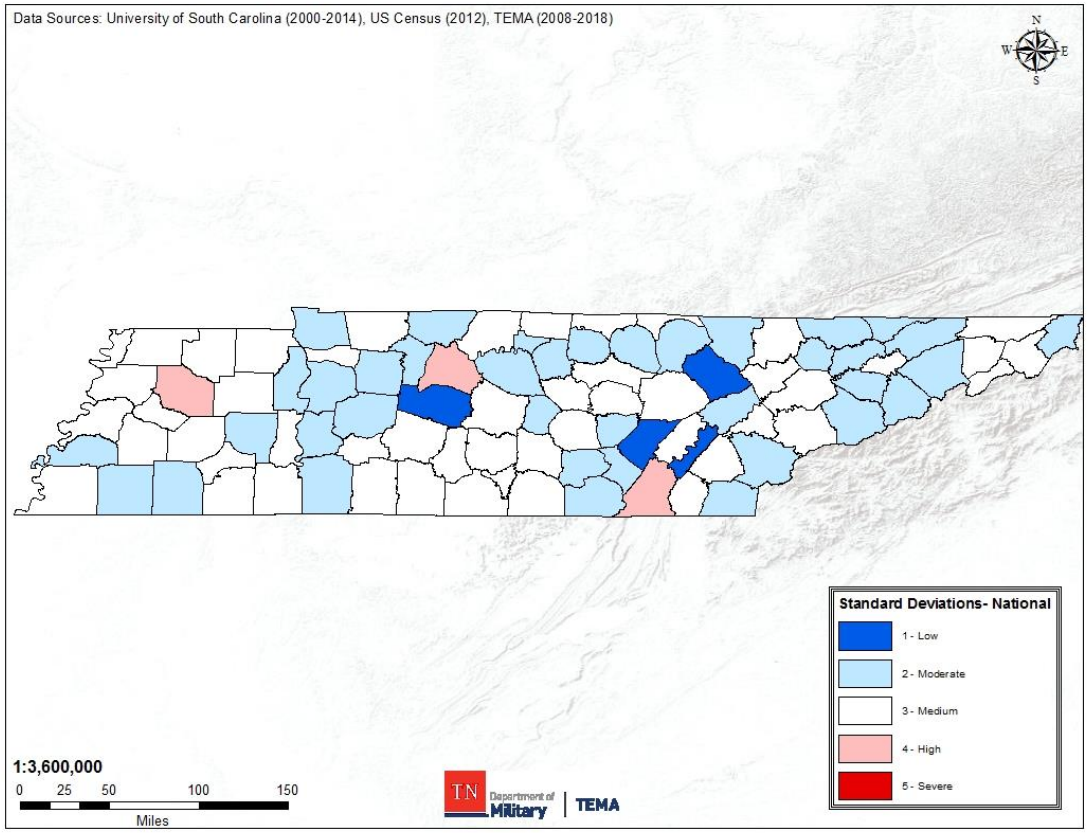
Map 15 – Social Vulnerability, Race & Class National Rank



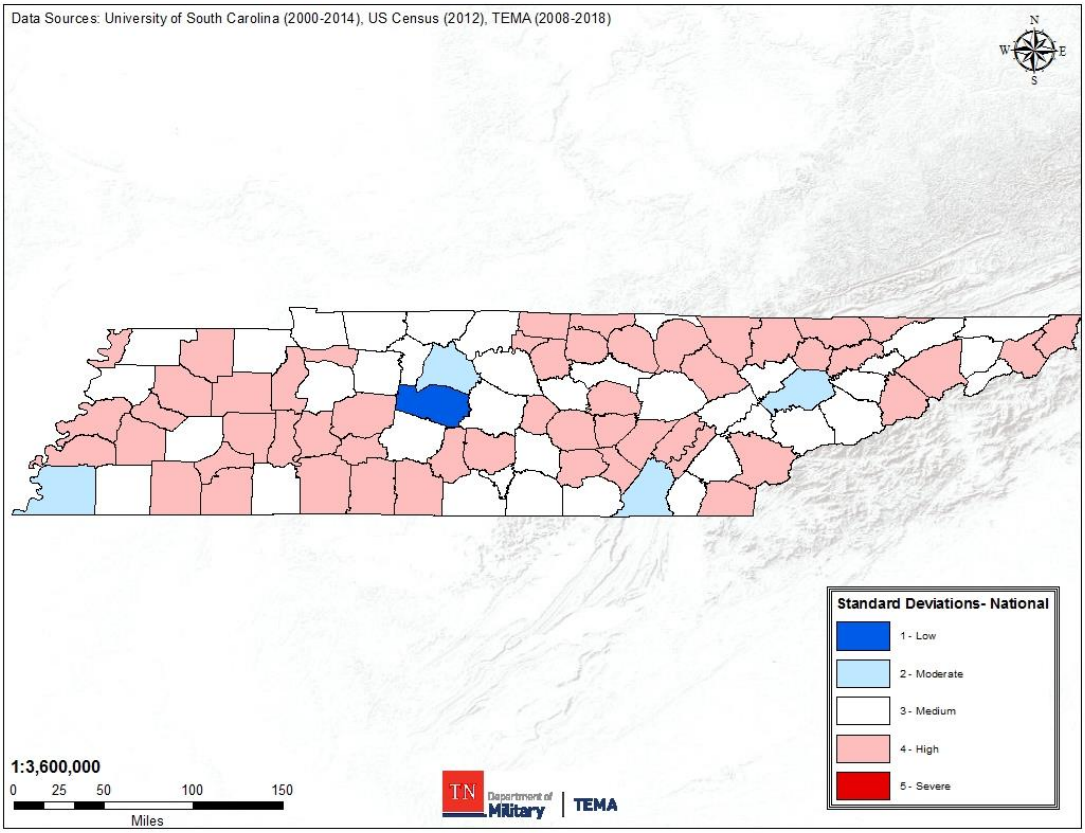
Map 16 – Social Vulnerability, Service Industry Employment National Rank



Map 17 – Social Vulnerability, Vulnerable Populations National Rank



Map 18 – Social Vulnerability, Wealth National Rank



4.2.2 – State Threat Assessment by GIS Analysis

Table 20 – Hazard Threat Index Part 1, Tennessee							
County	**Droughts**	**Earthquakes**	**Extreme Temperatures**	**Flash Floods**	**Riverine Floods**	**Expansive Soils**	**Landslides**
Anderson	1	1	2	4	1	4	4
Bedford	5	1	2	4	1	5	1
Benton	3	4	2	4	1	2	1
Bledsoe	2	1	1	4	1	2	2
Blount	1	2	2	3	1	3	4
Bradley	2	2	1	4	1	4	2
Campbell	1	1	1	4	1	4	6
Cannon	3	1	1	5	1	4	2
Carroll	3	4	3	3	2	1	1
Carter	1	1	1	3	1	2	5
Cheatham	2	1	1	4	2	3	1
Chester	3	4	6	3	1	2	1
Claiborne	1	1	1	3	1	3	4
Clay	1	1	1	4	1	3	3
Cocke	1	2	1	3	1	3	5
Coffee	6	1	2	4	1	4	1
Crockett	4	5	6	4	3	1	1
Cumberland	2	1	1	4	1	1	4
Davidson	2	1	1	6	2	3	1
Decatur	3	3	5	4	2	3	1
DeKalb	2	1	1	4	1	3	2
Dickson	2	2	1	4	1	4	1
Dyer	3	6	3	3	6	2	3
Fayette	2	4	3	4	2	1	1
Fentress	1	1	1	4	1	1	4
Franklin	5	1	2	4	1	3	2
Gibson	3	5	4	4	2	1	1
Giles	3	1	2	4	2	3	1
Grainger	1	2	1	3	1	4	4
Greene	1	1	1	3	1	4	3
Grundy	4	1	1	3	1	2	3
Hamblen	1	2	1	3	1	6	3
Hamilton	2	2	2	4	1	4	3
Hancock	1	1	1	3	1	4	4
Hardeman	2	4	3	3	2	2	1
Hardin	2	2	3	3	3	3	1
Hawkins	1	1	1	3	1	4	3
Haywood	3	4	6	3	4	2	1
Henderson	3	4	5	4	1	2	1
Henry	3	4	2	3	2	1	1
Hickman	2	2	2	3	1	3	1
Houston	2	3	1	4	1	4	1

County	Droughts	Earthquakes	Extreme Temperatures	Flash Floods	Riverine Floods	Expansive Soils	Landslides
Humphreys	2	3	1	4	2	1	1
Jackson	2	1	1	4	1	2	2
Jefferson	1	2	1	3	1	6	2
Johnson	1	1	1	3	1	2	6
Knox	1	2	2	4	1	4	2
Lake	3	6	2	3	5	5	4
Lauderdale	3	6	5	3	6	2	4
Lawrence	2	1	1	6	1	2	1
Lewis	2	1	2	3	1	1	1
Lincoln	5	1	2	5	1	6	1
Loudon	1	2	1	4	1	5	2
Macon	1	1	1	4	1	2	1
Madison	3	4	6	4	2	1	1
Marion	2	1	1	3	1	1	3
Marshall	3	1	2	4	1	6	1
Maury	2	1	2	4	1	2	1
McMinn	2	2	1	4	1	4	2
McNairy	2	2	3	3	2	2	1
Meigs	2	2	1	4	1	5	2
Monroe	2	2	1	3	1	4	4
Montgomery	2	2	1	4	1	5	1
Moore	6	1	3	5	1	5	1
Morgan	1	1	1	4	1	2	5
Obion	3	6	2	3	3	1	4
Overton	1	1	1	3	1	4	2
Perry	2	2	3	3	2	4	1
Pickett	1	1	1	3	1	2	3
Polk	2	2	1	3	1	2	4
Putnam	2	1	1	4	1	4	2
Rhea	2	1	1	4	1	2	3
Roane	1	2	1	4	1	4	3
Robertson	2	1	1	3	1	4	1
Rutherford	2	1	2	4	2	6	1
Scott	1	1	1	3	1	1	6
Sequatchie	2	1	1	3	1	2	3
Sevier	1	2	1	3	1	3	5
Shelby	3	4	5	6	3	1	3
Smith	2	1	1	4	1	6	1
Stewart	2	4	1	4	1	2	1
Sullivan	1	1	1	4	1	2	3
Sumner	1	1	1	4	1	3	1
Tipton	3	5	6	4	4	2	3
Trousdale	1	1	2	5	2	6	1
Unicoi	1	1	1	3	1	1	6
Union	1	2	2	3	1	4	4

County	Droughts	Earthquakes	Extreme Temperatures	Flash Floods	Riverine Floods	Expansive Soils	Landslides
Van Buren	4	1	1	4	1	2	4
Warren	5	1	1	4	1	3	1
Washington	1	1	2	4	1	3	3
Wayne	2	1	2	4	1	2	1
Weakley	3	5	2	3	2	1	1
White	3	1	1	4	1	3	2
Williamson	1	1	2	4	1	3	1
Wilson	1	1	2	5	1	6	1

Table 21 – Hazard Threat Index Part 2, Tennessee

County	Land Subsidence	High & Strong Wind	Lightning	Hail	Winter Storms	Thunderstorm Winds	Tornadoes	Wildfires
Anderson	2	4	2	4	5	5	3	6
Bedford	1	5	4	4	5	4	4	3
Benton	1	4	3	2	5	3	4	5
Bledsoe	4	4	3	4	6	4	3	5
Blount	3	5	2	4	4	5	3	5
Bradley	1	6	4	5	5	5	5	6
Campbell	2	3	2	2	5	4	3	5
Cannon	2	4	3	2	6	3	4	5
Carroll	1	5	4	2	5	3	4	4
Carter	1	6	3	4	6	3	3	5
Cheatham	1	4	3	4	5	4	4	6
Chester	1	4	3	4	5	3	4	5
Claiborne	4	3	3	2	5	4	3	6
Clay	4	3	4	2	5	3	3	5
Cocke	1	5	3	2	5	4	3	5
Coffee	3	4	4	4	6	3	4	4
Crockett	1	5	4	2	6	3	6	2
Cumberland	4	4	5	4	6	3	4	5
Davidson	1	4	5	6	5	6	6	5
Decatur	1	4	2	2	4	3	3	5
DeKalb	2	4	4	2	6	3	4	5
Dickson	1	4	2	4	5	4	4	6
Dyer	1	4	3	2	5	3	6	3
Fayette	1	4	3	4	4	3	4	4
Fentress	3	3	5	2	5	3	5	5
Franklin	3	4	4	2	4	3	4	4
Gibson	1	5	3	4	5	3	5	3
Giles	1	4	3	4	4	4	5	4
Grainger	4	4	3	4	6	5	3	6
Greene	1	6	3	2	5	4	3	4
Grundy	4	4	2	2	5	3	4	5
Hamblen	2	5	3	4	6	5	3	4

County	Land Subsidence	High & Strong Wind	Lightning	Hail	Winter Storms	Thunderstorm Winds	Tornadoes	Wildfire
Hamilton	1	4	3	5	5	5	5	6
Hancock	2	3	2	2	5	4	3	5
Hardeman	1	4	3	4	4	3	4	4
Hardin	1	3	2	2	3	3	4	4
Hawkins	1	4	2	2	5	4	3	6
Haywood	1	4	3	2	5	3	5	3
Henderson	1	4	3	4	4	3	4	5
Henry	1	4	5	2	4	3	4	4
Hickman	1	4	2	2	5	3	3	5
Houston	1	4	3	2	5	3	4	5
Humphreys	1	4	2	2	5	3	3	5
Jackson	3	4	4	2	6	4	4	5
Jefferson	2	6	3	4	5	5	3	5
Johnson	1	4	2	2	5	3	3	6
Knox	2	5	2	5	5	6	3	6
Lake	1	3	2	2	4	3	3	2
Lauderdale	1	4	3	2	4	3	4	3
Lawrence	1	3	3	4	4	4	5	4
Lewis	1	4	2	2	5	3	4	5
Lincoln	1	4	4	4	4	4	5	3
Loudon	1	5	2	4	5	5	4	4
Macon	1	3	5	2	5	4	4	6
Madison	1	5	5	5	5	4	5	4
Marion	3	3	3	4	4	4	4	5
Marshall	1	5	3	4	5	3	4	4
Maury	1	4	5	4	5	4	4	4
McMinn	1	6	2	5	5	5	4	5
McNairy	1	3	2	4	4	3	5	5
Meigs	2	6	2	4	5	5	4	5
Monroe	2	5	2	2	4	4	4	5
Montgomery	1	3	5	2	4	4	5	5
Moore	2	4	4	4	5	4	5	5
Morgan	2	3	3	4	5	4	3	5
Obion	1	3	3	2	4	3	4	3
Overton	6	4	5	4	6	3	4	5
Perry	1	4	2	2	5	3	3	4
Pickett	3	3	4	2	5	3	5	4
Polk	1	5	2	2	4	3	4	4
Putnam	5	4	4	4	6	4	4	5
Rhea	3	5	3	4	6	4	3	5
Roane	2	4	2	4	5	5	3	6
Robertson	1	3	3	4	4	4	5	4
Rutherford	1	5	5	5	5	4	5	4
Scott	1	3	2	2	5	3	3	5
Sequatchie	4	4	3	4	5	4	4	5
Sevier	2	5	2	2	4	4	3	6

County	Land Subsidence	High & Strong Wind	Lightning	Hail	Winter Storms	Thunderstorm Winds	Tornadoes	Wildfire
Shelby	1	4	6	6	3	5	6	3
Smith	1	4	3	2	6	3	4	5
Stewart	1	3	3	2	4	3	4	4
Sullivan	1	5	3	4	5	5	3	5
Sumner	1	4	4	4	5	5	6	5
Tipton	1	4	3	4	4	3	5	3
Trousdale	1	4	4	2	6	4	4	5
Unicoi	1	6	3	2	6	3	3	5
Union	4	4	3	2	5	4	3	6
Van Buren	6	4	3	2	6	3	3	4
Warren	4	4	3	2	6	3	4	3
Washington	1	6	3	4	6	4	3	4
Wayne	1	3	3	2	4	3	4	4
Weakley	1	4	3	2	4	3	5	3
White	6	4	3	4	6	3	4	4
Williamson	1	4	6	4	5	4	5	5
Wilson	1	4	6	4	6	4	5	4

4.2.3 – Composite State Risk Assessment by GIS Analysis

In order to calculate composite risk, a combination of the state's vulnerability and its hazards' threats, the hazard threat index was aggregated with the state's SoVI© index. Both values were combined and ranked 1 through 5, 5 being the greatest risk. This was done for each county and for each hazard.

The table below outlines each county's composite risk score. The maps following the table graphically depict the composite risk index.

Table 22 – Hazard Risk Index, Part 1, Tennessee

County	Droughts	Earthquakes	Expansive Soils	Extreme Temperatures	Flash Floods	Riverine Flood	Hail
Anderson	3	3	3	3	3	2	4
Bedford	4	2	3	3	3	2	3
Benton	4	4	4	4	4	2	3
Bledsoe	4	3	4	4	4	2	5
Blount	2	2	3	3	2	1	3
Bradley	3	2	3	3	3	2	4
Campbell	3	3	4	3	4	2	4
Cannon	4	2	3	3	4	2	3
Carroll	4	4	3	4	3	2	3
Carter	3	3	4	4	4	2	4
Cheatham	2	2	2	1	2	2	2
Chester	4	3	3	6	3	2	4
Claiborne	3	3	4	3	4	2	3
Clay	3	3	4	3	4	2	3
Cocke	3	3	4	3	4	2	4
Coffee	5	2	3	3	4	2	3
Crockett	5	4	3	6	4	3	3
Cumberland	4	3	4	3	4	2	4
Davidson	3	2	3	2	4	2	5
Decatur	4	3	4	6	4	3	4
DeKalb	4	2	3	3	4	2	3
Dickson	3	2	3	2	3	1	3
Dyer	4	5	3	5	3	6	3
Fayette	3	3	2	3	2	2	2
Fentress	3	3	3	3	4	2	3
Franklin	5	2	3	4	3	2	3
Gibson	5	4	3	5	4	3	4
Giles	4	2	3	3	4	2	3
Grainger	3	3	3	3	3	2	4
Greene	3	2	4	3	3	2	3
Grundy	5	3	4	4	4	2	4
Hamblen	2	3	3	2	3	2	3
Hamilton	3	3	3	3	3	2	4
Hancock	4	3	4	4	4	2	4
Hardeman	4	4	4	5	4	3	5

County	Drought	Earthquake	Expansive Soils	Extreme Temperatures	Flash Floods	Riverine Flood	Hail
Hardin	4	3	4	5	4	3	4
Hawkins	3	2	3	3	3	2	3
Haywood	5	4	4	6	4	4	3
Henderson	4	3	3	5	3	2	3
Henry	4	4	3	4	4	3	4
Hickman	4	3	3	4	3	2	4
Houston	4	4	4	3	4	2	4
Humphreys	3	3	3	3	3	2	3
Jackson	4	3	4	3	5	2	4
Jefferson	3	3	3	3	3	1	3
Johnson	3	3	4	3	4	2	4
Knox	2	2	3	3	3	1	4
Lake	6	6	6	6	6	6	6
Lauderdale	4	5	4	6	4	5	4
Lawrence	3	2	3	3	5	2	4
Lewis	4	3	4	4	4	2	4
Lincoln	5	2	3	3	4	2	3
Loudon	3	3	3	3	3	1	4
Macon	3	2	3	3	4	2	3
Madison	4	3	3	6	3	2	4
Marion	4	2	3	3	3	2	4
Marshall	4	2	3	3	3	2	3
Maury	3	2	3	3	3	2	3
McMinn	3	3	3	3	4	2	4
McNairy	3	3	3	4	3	2	4
Meigs	3	3	4	3	4	2	4
Monroe	3	3	3	3	3	2	3
Montgomery	3	2	3	2	3	2	2
Moore	5	2	3	4	4	1	3
Morgan	3	3	4	3	4	2	4
Obion	4	4	3	4	3	3	3
Overton	3	2	3	3	3	1	3
Perry	4	4	4	5	5	3	4
Pickett	3	2	3	3	3	2	3
Polk	3	3	3	3	3	2	3
Putnam	3	2	3	2	4	1	3
Rhea	3	3	3	3	4	2	4
Roane	3	3	3	3	4	2	4
Robertson	2	2	2	2	2	1	2
Rutherford	2	1	2	2	2	2	2
Scott	3	3	4	3	4	2	3
Sequatchie	4	3	3	3	3	2	4
Sevier	3	3	3	3	3	2	3
Shelby	3	3	2	4	4	3	4
Smith	3	2	3	3	3	2	3
Stewart	3	4	3	3	4	2	3

County	Drought	Earthquake	Expansive Soils	Extreme Temperatures	Flash Floods	Riverine Flood	Hail
Sullivan	3	2	3	3	3	2	4
Sumner	2	2	2	2	3	1	3
Tipton	3	4	3	5	3	3	3
Trousdale	2	2	3	3	4	2	3
Unicoi	3	3	4	3	4	2	4
Union	3	3	4	3	3	2	3
Van Buren	5	3	4	4	5	2	4
Warren	5	2	3	3	4	2	3
Washington	3	2	3	3	4	2	3
Wayne	4	3	4	4	5	2	4
Weakley	4	4	4	4	4	3	4
White	4	2	3	3	4	2	4
Williamson	1	1	1	1	1	1	1
Wilson	2	1	2	2	3	1	2

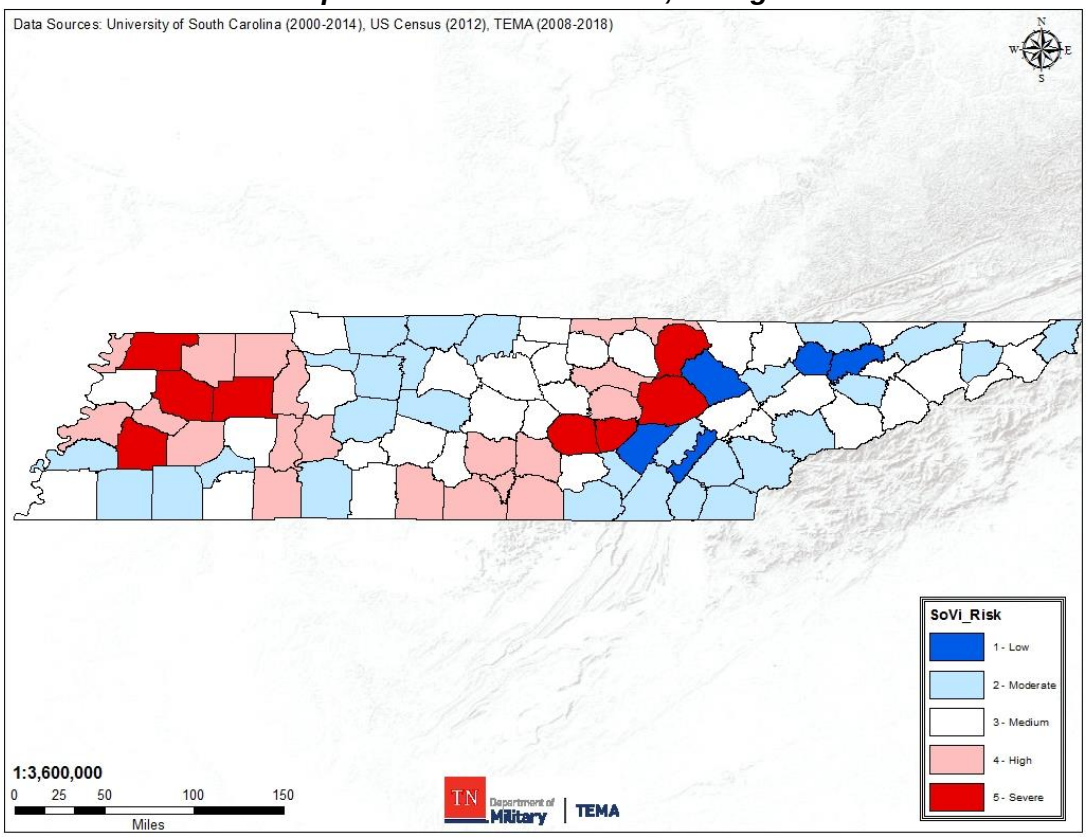
Table 23 – Hazard Risk Index, Part 2, Tennessee

County	High & Strong Wind	Landslides	Land Subsidence	Lightning	Thunderstorm Winds	Tornadoes	Wildfire	Winter Storms
Anderson	4	4	3	1	4	3	4	4
Bedford	4	2	2	2	3	3	2	4
Benton	4	3	3	3	4	4	5	4
Bledsoe	5	4	5	4	5	4	5	5
Blount	4	3	3	1	4	2	3	3
Bradley	5	3	3	2	4	4	4	3
Campbell	4	5	4	3	5	4	5	4
Cannon	3	3	3	3	3	4	4	5
Carroll	5	3	3	3	3	4	4	4
Carter	6	5	4	4	4	4	5	6
Cheatham	2	1	2	1	2	2	3	2
Chester	4	2	3	2	3	3	4	4
Claiborne	4	5	5	3	4	3	5	4
Clay	3	4	4	4	4	4	5	5
Cocke	6	5	4	4	4	4	5	5
Coffee	4	2	3	3	3	4	3	4
Crockett	5	3	3	3	3	5	3	5
Cumberland	4	5	5	5	4	4	5	5
Davidson	3	2	2	3	5	4	3	3
Decatur	4	3	3	2	4	3	4	4
DeKalb	4	3	4	3	3	4	4	6
Dickson	3	2	2	1	3	3	4	4
Dyer	4	4	3	3	3	5	3	4
Fayette	3	2	2	1	2	2	2	2
Fentress	4	4	4	5	4	4	4	5
Franklin	3	3	4	3	3	3	3	3

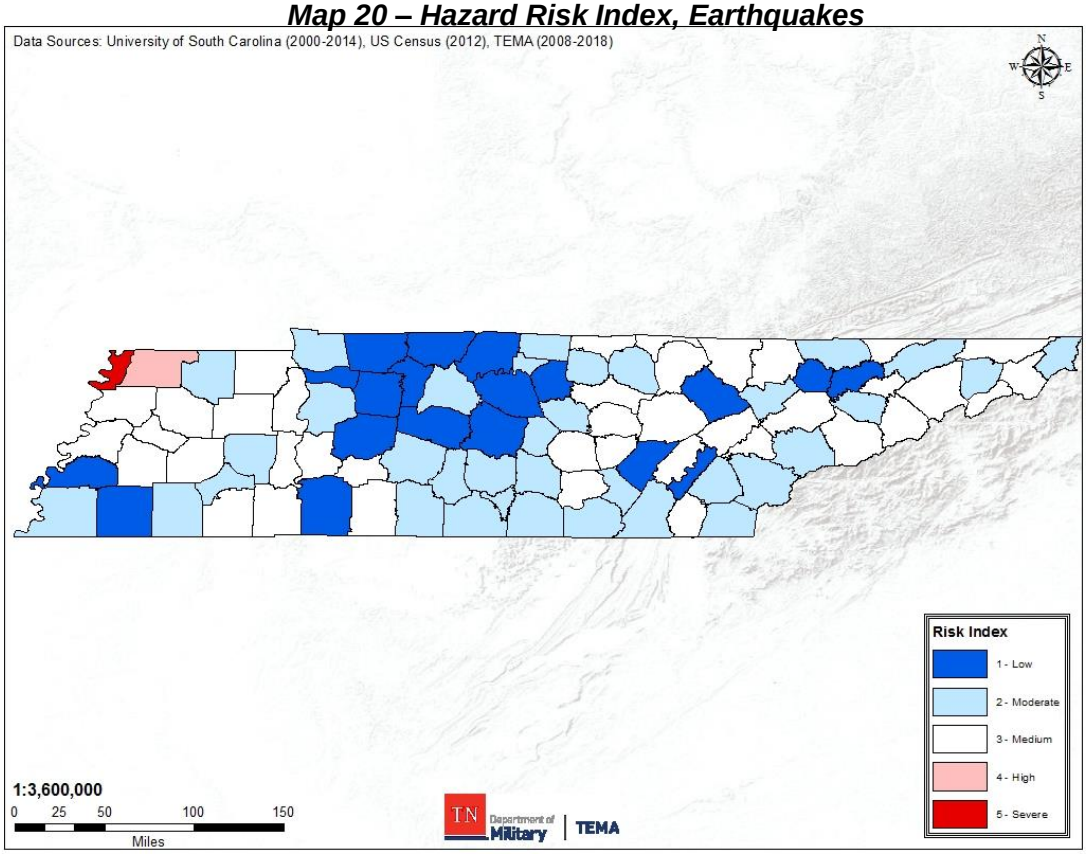
County	High & Strong Wind	Landslides	Land Subsidence	Lightning	Thunderstorm Winds	Tornadoes	Wildfire	Winter Storms
Gibson	5	3	3	3	3	5	3	5
Giles	3	3	3	2	4	4	4	3
Grainger	4	4	4	3	5	3	5	5
Greene	6	3	3	2	4	3	4	5
Grundy	5	5	5	3	4	4	5	5
Hamblen	4	4	3	2	4	3	3	5
Hamilton	4	3	3	2	4	4	4	3
Hancock	4	5	4	3	5	4	6	5
Hardeman	5	3	4	4	4	5	5	4
Hardin	4	3	3	2	4	4	4	3
Hawkins	4	4	3	2	4	3	4	4
Haywood	4	3	3	3	4	4	4	5
Henderson	3	2	3	2	3	3	3	3
Henry	4	3	3	4	3	4	4	4
Hickman	4	3	3	2	4	3	4	4
Houston	4	3	3	3	4	4	5	5
Humphreys	3	2	3	2	3	3	4	4
Jackson	4	4	5	5	4	4	5	6
Jefferson	5	3	3	2	4	3	4	4
Johnson	5	6	4	3	4	4	5	5
Knox	4	3	3	1	4	2	3	3
Lake	6	6	5	6	6	6	6	6
Lauderdale	4	4	3	3	3	4	3	4
Lawrence	3	2	3	3	4	4	4	3
Lewis	4	3	3	3	4	4	5	4
Lincoln	3	2	3	3	3	4	3	3
Loudon	5	3	3	1	4	3	3	3
Macon	3	2	3	4	3	3	4	4
Madison	4	2	3	3	3	4	3	4
Marion	3	3	4	2	4	3	4	3
Marshall	4	2	2	2	2	3	3	3
Maury	3	2	2	3	3	3	3	3
McMinn	6	3	3	1	5	4	4	4
McNairy	3	2	3	2	3	4	4	3
Meigs	5	3	3	2	5	3	4	5
Monroe	5	4	3	1	4	3	4	3
Montgomery	2	2	2	3	3	3	3	3
Moore	4	2	3	3	3	3	3	3
Morgan	4	5	3	3	4	3	4	5
Obion	3	4	3	2	3	4	3	3
Overton	3	3	5	4	3	4	4	5
Perry	5	3	4	3	4	4	5	5
Pickett	3	4	4	3	3	4	4	4
Polk	5	4	3	2	4	3	4	3
Putnam	3	3	5	3	3	3	4	5
Rhea	5	4	3	2	4	3	4	5

County	High & Strong Wind	Landslides	Land Subsidence	Lightning	Thunderstorm Winds	Tornadoes	Wildfire	Winter Storms
Roane	4	4	3	2	4	3	4	4
Robertson	2	2	2	1	2	3	2	2
Rutherford	3	1	2	2	2	3	2	3
Scott	3	5	3	3	4	4	4	4
Sequatchie	4	4	4	2	4	4	4	5
Sevier	5	4	3	2	3	3	5	3
Shelby	3	3	2	4	3	4	2	2
Smith	3	3	3	2	3	3	4	5
Stewart	3	3	3	3	3	4	4	4
Sullivan	5	4	3	3	4	3	4	4
Sumner	2	1	2	1	3	3	3	3
Tipton	3	3	2	2	3	3	2	3
Trousdale	3	2	3	3	4	3	4	4
Unicoi	6	6	3	3	4	4	5	5
Union	4	4	4	3	4	3	5	5
Van Buren	5	5	6	4	4	4	5	6
Warren	4	3	5	2	4	4	3	5
Washington	6	3	3	2	4	3	3	5
Wayne	4	3	4	3	4	4	5	4
Weakley	4	3	3	3	4	5	4	4
White	4	3	6	3	3	4	4	5
Williamson	1	1	1	1	1	1	1	1
Wilson	3	1	2	3	3	2	2	3

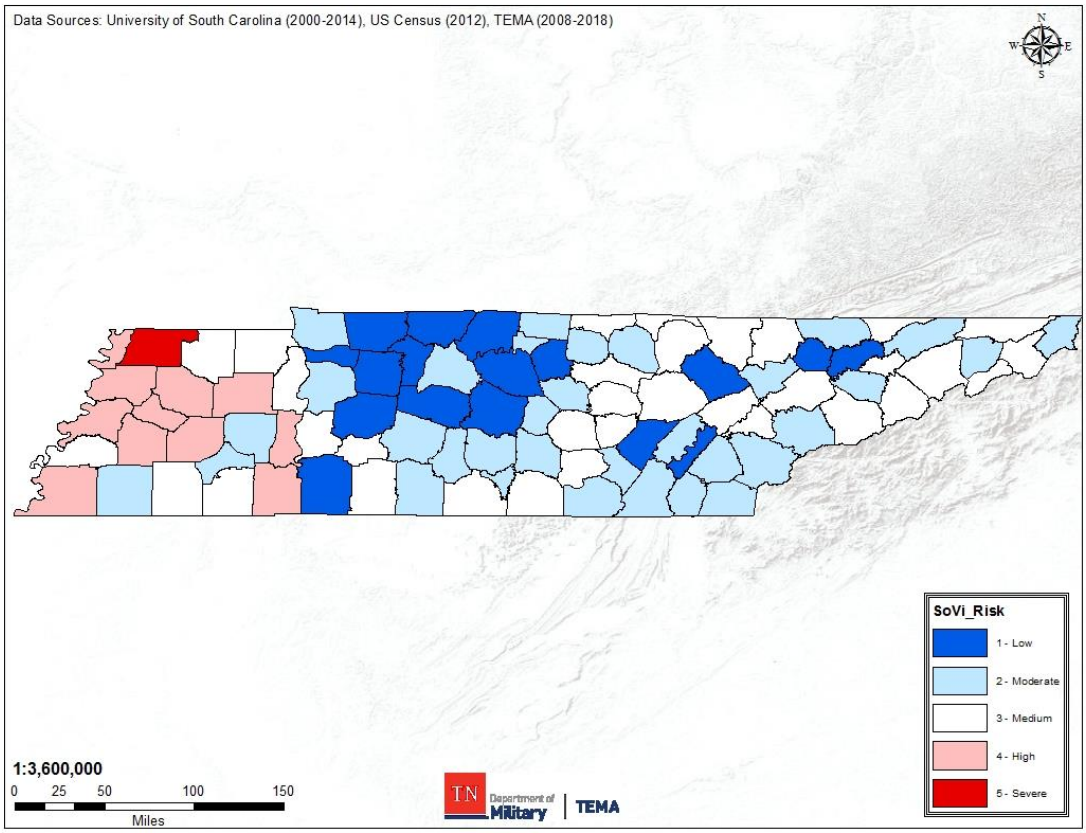
Map 19 – Hazard Risk Index, Droughts



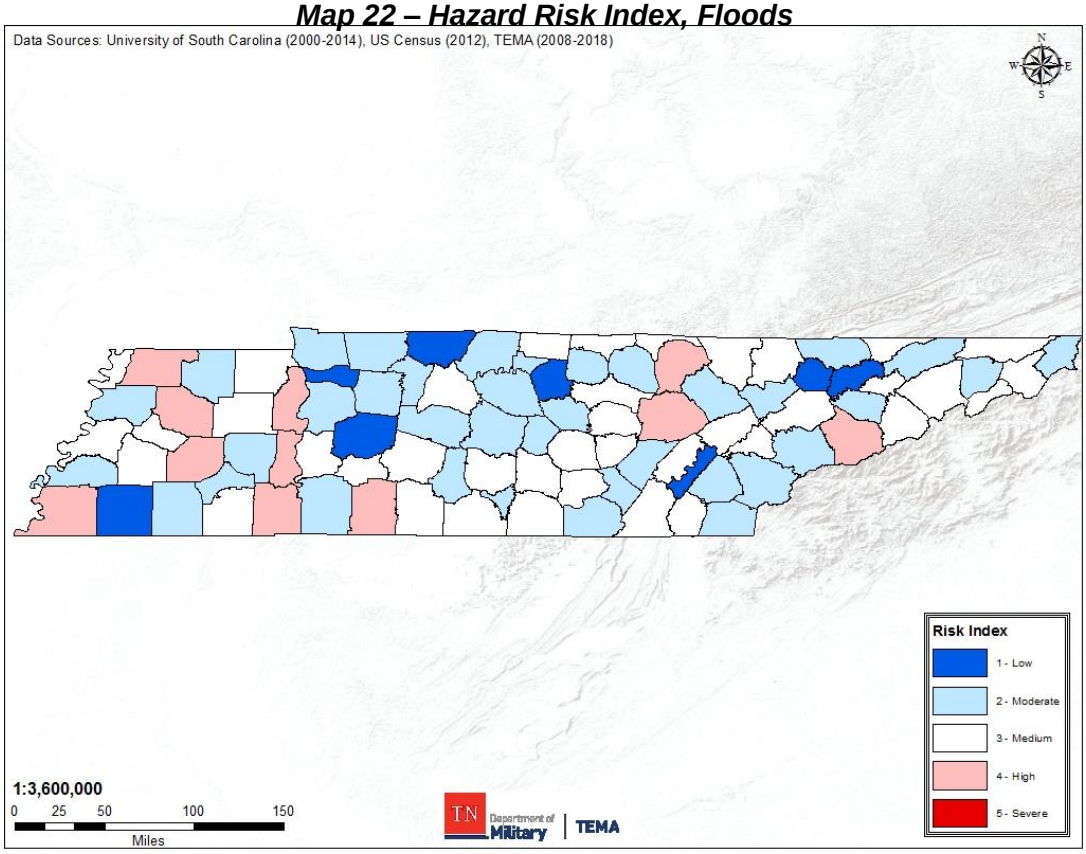
Map 20 – Hazard Risk Index, Earthquakes



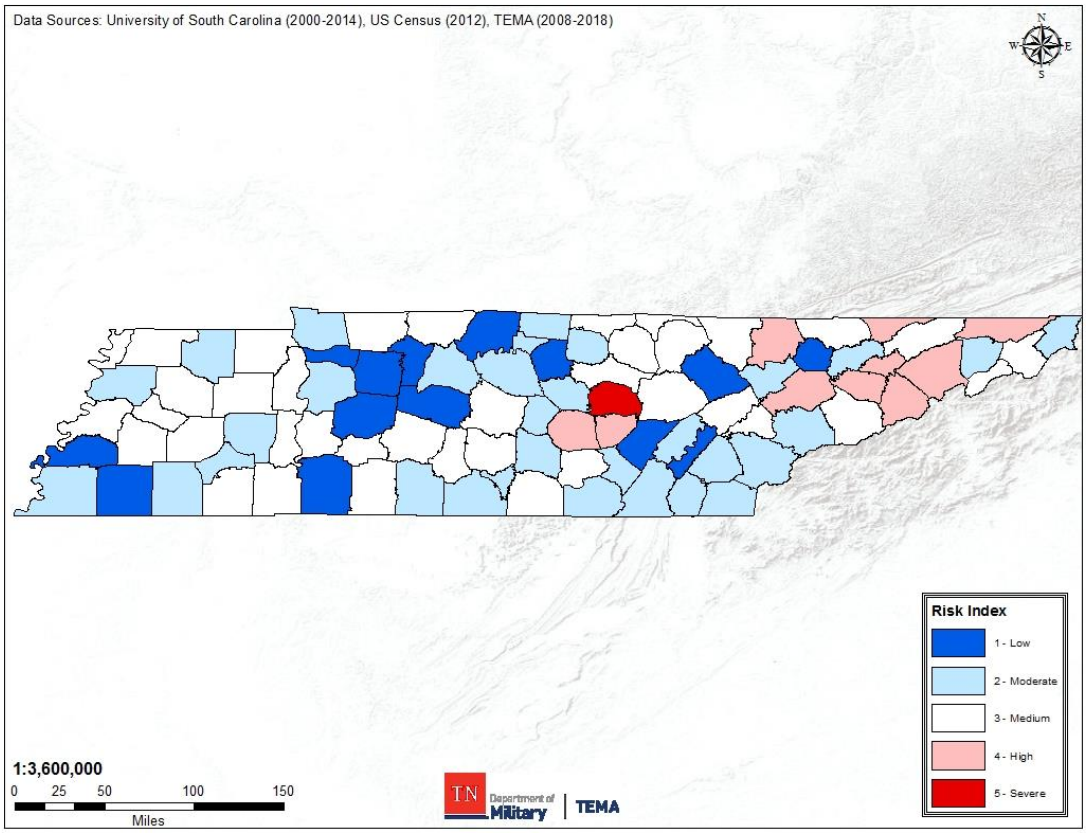
Map 21 – Hazard Risk Index, Extreme Temperatures



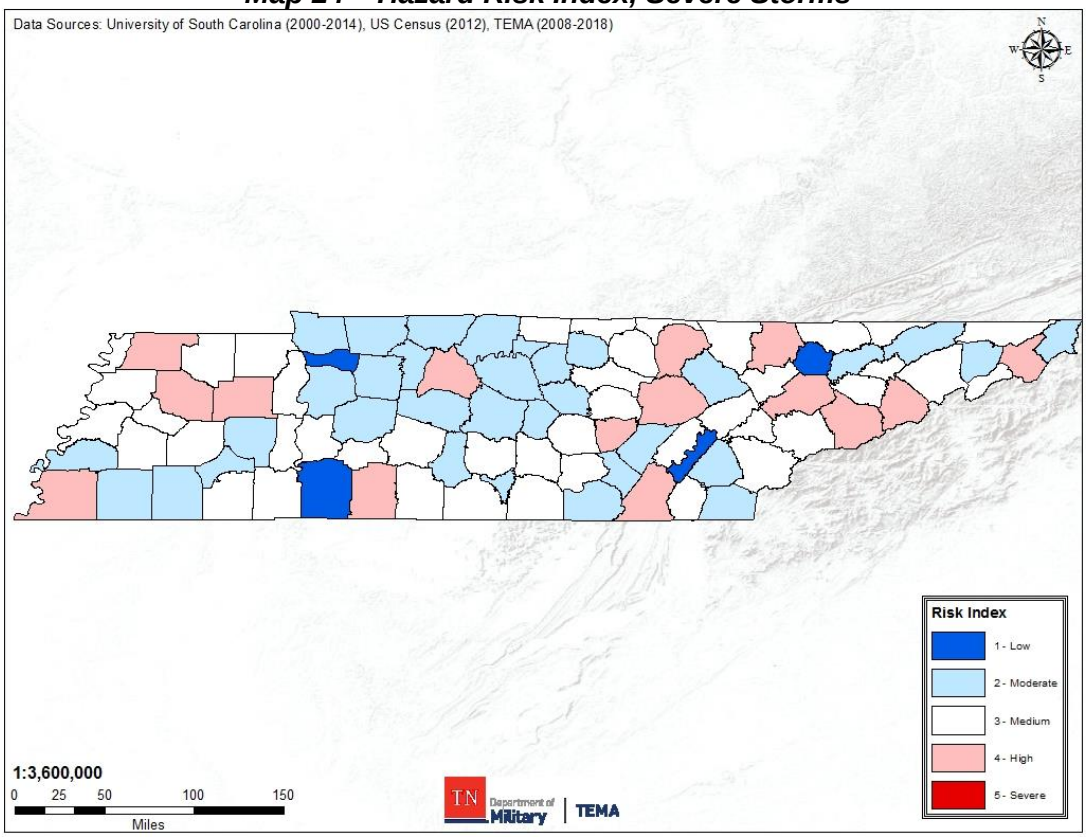
Map 22 – Hazard Risk Index, Floods



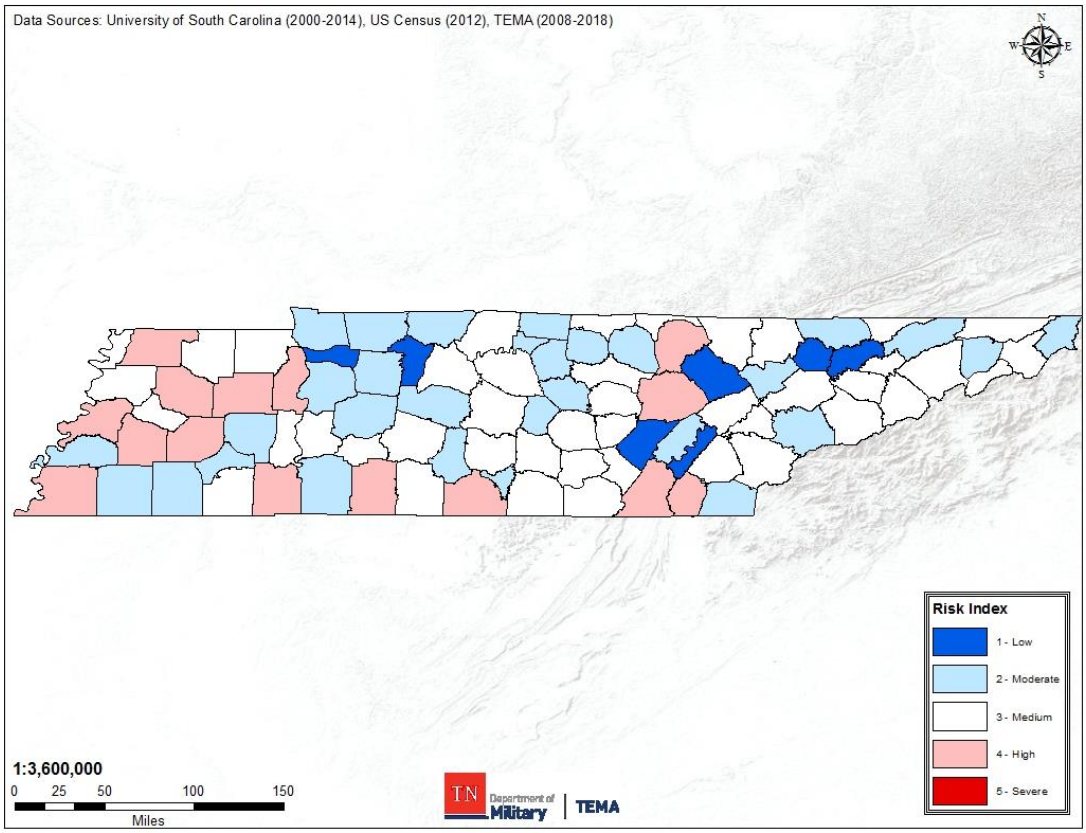
Map 23 – Hazard Risk Index, Geologic Hazards



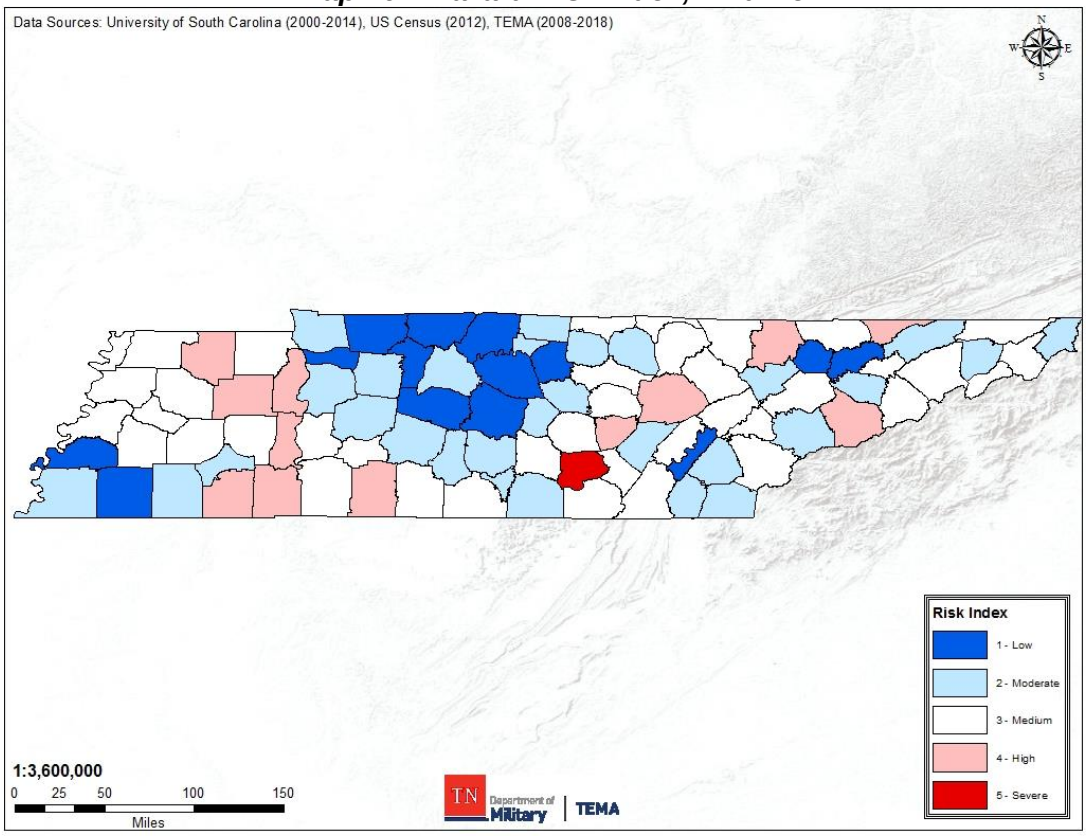
Map 24 – Hazard Risk Index, Severe Storms



Map 25 – Hazard Risk Index, Tornadoes



Map 26 – Hazard Risk Index, Wildfire



4.2.4 – Potential Losses by GIS Analysis

As in the loss estimation based on local hazard mitigation plan risk assessments, the state analysis uses the exported structural inventory from FEMA's HAZUS-MH 4.0. Each county's structural inventory was then cross referenced by the hazard risk index as described in the beginning of Section 4.2. Tables 24 through 37 below show the loss estimate results by county per hazard risk index. Drought and Extreme Temperatures were not profiled as they do not pose a risk to buildings and inventory. All values shown are in thousands.

Table 24 – Loss Estimation by GIS Analysis

Hazard	Risk Index by GIS Analysis					
	1	2	3	4	5	6
Earthquakes	$10,568,905,000	$135,729,830,000	$137,732,343,000	$20,820,820,000	$3,870,527,000	$573,379,000
Expansive Soils	$828,101,000	$76,883,862,000	$198,900,867,000	$32,109,595,000	$0	$573,379,000
Flash Floods	$828,101,000	$15,038,268,000	$133,813,956,000	$154,554,795,000	$4,487,305,000	$573,379,000
Floods	$38,629,205,000	$186,055,876,000	$79,386,038,000	$780,779,000	$1,676,186,000	$2,767,720,000
Hail	$828,101,000	$19,761,887,000	$86,162,364,000	$161,205,507,000	$40,764,566,000	$573,379,000
High & Strong Winds	$828,101,000	$11,174,194,000	$149,048,619,000	$94,110,685,000	$40,583,418,000	$13,550,787,000
Land Subsidence	$828,101,000	$140,104,935,000	$137,449,111,000	$17,848,505,000	$12,055,618,000	$1,009,534,000
Landslides	$13,498,790,000	$78,024,473,000	$156,686,551,000	$46,939,083,000	$11,428,063,000	$2,718,844,000
Lightning	$36,747,456,000	$89,487,338,000	$107,925,265,000	$72,221,895,000	$2,340,471,000	$573,379,000
Thunderstorm Winds	$828,101,000	$15,738,718,000	$129,699,810,000	$117,707,789,000	$44,748,007,000	$573,379,000
Tornadoes	$828,101,000	$25,971,907,000	$101,264,325,000	$171,452,554,000	$9,205,538,000	$573,379,000
Wildfires	$828,101,000	$81,072,981,000	$107,228,632,000	$94,367,356,000	$24,623,769,000	$1,174,965,000
Winter Storms	$828,101,000	$64,799,640,000	$141,958,792,000	$59,604,749,000	$36,994,997,000	$5,109,525,000

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 25 – Loss Estimation by GIS Analysis, Earthquakes

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Rutherford	$5,323,121	Bedford	$1,742,550	Anderson	$4,947,581	Benton	$932,359	Dyer	$2,194,341	Lake	$573,379
Williamson	$828,101	Blount	$6,109,706	Bledsoe	$506,717	Carroll	$1,230,667	Lauderdale	$1,676,186		
Wilson	$4,417,683	Bradley	$6,839,962	Campbell	$2,986,882	Crockett	$811,710				
		Cannon	$731,478	Carter	$2,497,728	Gibson	$3,075,817				
		Cheatham	$586,467	Chester	$837,092	Hardeman	$2,178,327				
		Coffee	$2,338,029	Claiborne	$1,746,971	Haywood	$780,779				
		Davidson	$38,079,522	Clay	$377,975	Henry	$1,935,167				
		DeKalb	$724,172	Cocke	$131,260	Houston	$430,177				
		Dickson	$1,032,642	Cumberland	$466,261	Obion	$2,091,659				
		Franklin	$1,902,441	Decatur	$462,436	Perry	$270,866				
		Giles	$1,321,101	Fayette	$1,190,307	Stewart	$761,495				
		Greene	$3,655,855	Fentress	$703,483	Tipton	$5,376,454				
		Hawkins	$3,615,928	Grainger	$589,101	Weakley	$945,343				
		Knox	$13,667,744	Grundy	$750,625						
		Lawrence	$1,516,070	Hamblen	$3,705,824						
		Lincoln	$1,632,692	Hamilton	$17,798,170						
		Macon	$864,479	Hancock	$601,586						
		Marion	$3,764,107	Hardin	$1,044,060						
		Marshall	$1,252,721	Henderson	$1,475,278						
		Maury	$4,972,875	Hickman	$1,642,658						
		Montgomery	$6,415,642	Humphreys	$1,179,269						
		Moore	$189,223	Jackson	$1,170,727						
		Overton	$2,017,695	Jefferson	$1,499,816						
		Pickett	$183,509	Johnson	$677,573						
		Putnam	$3,087,547	Lewis	$553,559						
		Robertson	$1,828,667	Loudon	$1,606,963						
		Smith	$1,289,364	Madison	$6,810,156						
		Sullivan	$12,889,708	McMinn	$1,239,308						
		Sumner	$2,343,418	McNairy	$1,044,059						
		Trousdale	$736,985	Meigs	$731,478						
		Warren	$1,735,696	Monroe	$1,353,139						
		Washington	$3,971,952	Morgan	$813,867						
		White	$866,015	Polk	$1,117,100						
				Rhea	$973,404						
				Roane	$3,143,674						

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Scott	$1,289,364						
				Sequatchie	$339,900						
				Sevier	$3,926,027						
				Shelby	$61,194,199						
				Unicoi	$1,467,892						
				Union	$1,433,100						
				Van Buren	$143,519						
				Wayne	$1,386,123						

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 26 – Loss Estimation by GIS Analysis, Expansive Soils

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Cheatham	$586,467	Anderson	$4,947,581	Benton	$932,359	Lake	$573,379		
		Fayette	$1,190,307	Bedford	$1,742,550	Bledsoe	$506,717				
		Robertson	$1,828,667	Blount	$6,109,706	Campbell	$2,986,882				
		Rutherford	$5,323,121	Bradley	$6,839,962	Carter	$2,497,728				
		Shelby	$61,194,199	Cannon	$731,478	Claiborne	$1,746,971				
		Sumner	$2,343,418	Carroll	$1,230,667	Clay	$377,975				
		Wilson	$4,417,683	Chester	$837,092	Cocke	$131,260				
				Coffee	$2,338,029	Cumberland	$466,261				
				Crockett	$811,710	Decatur	$462,436				
				Davidson	$38,079,522	Greene	$3,655,855				
				DeKalb	$724,172	Grundy	$750,625				
				Dickson	$1,032,642	Hancock	$601,586				
				Dyer	$2,194,341	Hardeman	$2,178,327				
				Fentress	$703,483	Hardin	$1,044,060				
				Franklin	$1,902,441	Haywood	$780,779				
				Gibson	$3,075,817	Houston	$430,177				
				Giles	$1,321,101	Jackson	$1,170,727				
				Grainger	$589,101	Johnson	$677,573				
				Hamblen	$3,705,824	Lauderdale	$1,676,186				
				Hamilton	$17,798,170	Lewis	$553,559				
				Hawkins	$3,615,928	Meigs	$731,478				
				Henderson	$1,475,278	Morgan	$813,867				
				Henry	$1,935,167	Perry	$270,866				

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Hickman	$1,642,658	Scott	$1,289,364				
				Humphreys	$1,179,269	Unicoi	$1,467,892				
				Jefferson	$1,499,816	Union	$1,433,100				
				Knox	$13,667,744	Van Buren	$143,519				
				Lawrence	$1,516,070	Wayne	$1,386,123				
				Lincoln	$1,632,692	Weakley	$945,343				
				Loudon	$1,606,963						
				Macon	$864,479						
				Madison	$6,810,156						
				Marion	$3,764,107						
				Marshall	$1,252,721						
				Maury	$4,972,875						
				McMinn	$1,239,308						
				McNairy	$1,044,059						
				Monroe	$1,353,139						
				Montgomery	$6,415,642						
				Moore	$189,223						
				Obion	$2,091,659						
				Overton	$2,017,695						
				Pickett	$183,509						
				Polk	$1,117,100						
				Putnam	$3,087,547						
				Rhea	$973,404						
				Roane	$3,143,674						
				Sequatchie	$339,900						
				Sevier	$3,926,027						
				Smith	$1,289,364						
				Stewart	$761,495						
				Sullivan	$12,889,708						
				Tipton	$5,376,454						
				Trousdale	$736,985						
				Warren	$1,735,696						
				Washington	$3,971,952						
				White	$866,015						

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 27 – Loss Estimation by GIS Analysis, Flash Floods

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Blount	$6,109,706	Anderson	$4,947,581	Benton	$932,359	Jackson	$1,170,727	Lake	$573,379
		Cheatham	$586,467	Bedford	$1,742,550	Bledsoe	$506,717	Lawrence	$1,516,070		
		Fayette	$1,190,307	Bradley	$6,839,962	Campbell	$2,986,882	Perry	$270,866		
		Robertson	$1,828,667	Carroll	$1,230,667	Cannon	$731,478	Van Buren	$143,519		
		Rutherford	$5,323,121	Chester	$837,092	Carter	$2,497,728	Wayne	$1,386,123		
				Dickson	$1,032,642	Claiborne	$1,746,971				
				Dyer	$2,194,341	Clay	$377,975				
				Franklin	$1,902,441	Cocke	$131,260				
				Grainger	$589,101	Coffee	$2,338,029				
				Greene	$3,655,855	Crockett	$811,710				
				Hamblen	$3,705,824	Cumberland	$466,261				
				Hamilton	$17,798,170	Davidson	$38,079,522				
				Hawkins	$3,615,928	Decatur	$462,436				
				Henderson	$1,475,278	DeKalb	$724,172				
				Hickman	$1,642,658	Fentress	$703,483				
				Humphreys	$1,179,269	Gibson	$3,075,817				
				Jefferson	$1,499,816	Giles	$1,321,101				
				Knox	$13,667,744	Grundy	$750,625				
				Loudon	$1,606,963	Hancock	$601,586				
				Madison	$6,810,156	Hardeman	$2,178,327				
				Marion	$3,764,107	Hardin	$1,044,060				
				Marshall	$1,252,721	Haywood	$780,779				
				Maury	$4,972,875	Henry	$1,935,167				
				McNairy	$1,044,059	Houston	$430,177				
				Monroe	$1,353,139	Johnson	$677,573				
				Montgomery	$6,415,642	Lauderdale	$1,676,186				
				Obion	$2,091,659	Lewis	$553,559				
				Overton	$2,017,695	Lincoln	$1,632,692				
				Pickett	$183,509	Macon	$864,479				
				Polk	$1,117,100	McMinn	$1,239,308				
				Sequatchie	$339,900	Meigs	$731,478				
				Sevier	$3,926,027	Moore	$189,223				
				Smith	$1,289,364	Morgan	$813,867				
				Sullivan	$12,889,708	Putnam	$3,087,547				
				Sumner	$2,343,418	Rhea	$973,404				

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Tipton	$5,376,454	Roane	$3,143,674				
				Union	$1,433,100	Scott	$1,289,364				
				Wilson	$4,417,683	Shelby	$61,194,199				
						Stewart	$761,495				
						Trousdale	$736,985				
						Unicoi	$1,467,892				
						Warren	$1,735,696				
						Washington	$3,971,952				
						Weakley	$945,343				
						White	$866,015				

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 28 – Loss Estimation by GIS Analysis, Floods

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Blount	$6,109,706	Anderson	$4,947,581	Crockett	$811,710	Haywood	$780,779	Lauderdale	$1,676,186	Dyer	$2,194,341
Dickson	$1,032,642	Bedford	$1,742,550	Decatur	$462,436					Lake	$573,379
Jefferson	$1,499,816	Benton	$932,359	Gibson	$3,075,817						
Knox	$13,667,744	Bledsoe	$506,717	Hardeman	$2,178,327						
Loudon	$1,606,963	Bradley	$6,839,962	Hardin	$1,044,060						
Moore	$189,223	Campbell	$2,986,882	Henry	$1,935,167						
Overton	$2,017,695	Cannon	$731,478	Obion	$2,091,659						
Putnam	$3,087,547	Carroll	$1,230,667	Perry	$270,866						
Robertson	$1,828,667	Carter	$2,497,728	Shelby	$61,194,199						
Sumner	$2,343,418	Cheatham	$586,467	Tipton	$5,376,454						
Williamson	$828,101	Chester	$837,092	Weakley	$945,343						
Wilson	$4,417,683	Claiborne	$1,746,971								
		Clay	$377,975								
		Cocke	$131,260								
		Coffee	$2,338,029								
		Cumberland	$466,261								
		Davidson	$38,079,522								
		DeKalb	$724,172								
		Fayette	$1,190,307								
		Fentress	$703,483								
		Franklin	$1,902,441								

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
		Giles	$1,321,101								
		Grainger	$589,101								
		Greene	$3,655,855								
		Grundy	$750,625								
		Hamblen	$3,705,824								
		Hamilton	$17,798,170								
		Hancock	$601,586								
		Hawkins	$3,615,928								
		Henderson	$1,475,278								
		Hickman	$1,642,658								
		Houston	$430,177								
		Humphreys	$1,179,269								
		Jackson	$1,170,727								
		Johnson	$677,573								
		Lawrence	$1,516,070								
		Lewis	$553,559								
		Lincoln	$1,632,692								
		Macon	$864,479								
		Madison	$6,810,156								
		Marion	$3,764,107								
		Marshall	$1,252,721								
		Maury	$4,972,875								
		McMinn	$1,239,308								
		McNairy	$1,044,059								
		Meigs	$731,478								
		Monroe	$1,353,139								
		Montgomery	$6,415,642								
		Morgan	$813,867								
		Pickett	$183,509								
		Polk	$1,117,100								
		Rhea	$973,404								
		Roane	$3,143,674								
		Rutherford	$5,323,121								
		Scott	$1,289,364								
		Sequatchie	$339,900								
		Sevier	$3,926,027								
		Smith	$1,289,364								

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
		Stewart	$761,495								
		Sullivan	$12,889,708								
		Trousdale	$736,985								
		Unicoi	$1,467,892								
		Union	$1,433,100								
		Van Buren	$143,519								
		Warren	$1,735,696								
		Washington	$3,971,952								
		Wayne	$1,386,123								
		White	$866,015								

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 29 – Loss Estimation by GIS Analysis, Hail

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Cheatham	$586,467	Bedford	$1,742,550	Anderson	$4,947,581	Bledsoe	$506,717	Lake	$573,379
		Fayette	$1,190,307	Benton	$932,359	Bradley	$6,839,962	Davidson	$38,079,522		
		Montgomery	$6,415,642	Blount	$6,109,706	Campbell	$2,986,882	Hardeman	$2,178,327		
		Robertson	$1,828,667	Cannon	$731,478	Carter	$2,497,728				
		Rutherford	$5,323,121	Carroll	$1,230,667	Chester	$837,092				
		Wilson	$4,417,683	Claiborne	$1,746,971	Cocke	$131,260				
				Clay	$377,975	Cumberland	$466,261				
				Coffee	$2,338,029	Decatur	$462,436				
				Crockett	$811,710	Gibson	$3,075,817				
				DeKalb	$724,172	Grainger	$589,101				
				Dickson	$1,032,642	Grundy	$750,625				
				Dyer	$2,194,341	Hamilton	$17,798,170				
				Fentress	$703,483	Hancock	$601,586				
				Franklin	$1,902,441	Hardin	$1,044,060				
				Giles	$1,321,101	Henry	$1,935,167				
				Greene	$3,655,855	Hickman	$1,642,658				
				Hamblen	$3,705,824	Houston	$430,177				
				Hawkins	$3,615,928	Jackson	$1,170,727				
				Haywood	$780,779	Johnson	$677,573				
				Henderson	$1,475,278	Knox	$13,667,744				
				Humphreys	$1,179,269	Lauderdale	$1,676,186				
				Jefferson	$1,499,816	Lawrence	$1,516,070				

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Lincoln	$1,632,692	Lewis	$553,559				
				Macon	$864,479	Loudon	$1,606,963				
				Marshall	$1,252,721	Madison	$6,810,156				
				Maury	$4,972,875	Marion	$3,764,107				
				Monroe	$1,353,139	McMinn	$1,239,308				
				Moore	$189,223	McNairy	$1,044,059				
				Obion	$2,091,659	Meigs	$731,478				
				Overton	$2,017,695	Morgan	$813,867				
				Pickett	$183,509	Perry	$270,866				
				Polk	$1,117,100	Rhea	$973,404				
				Putnam	$3,087,547	Roane	$3,143,674				
				Scott	$1,289,364	Sequatchie	$339,900				
				Sevier	$3,926,027	Shelby	$61,194,199				
				Smith	$1,289,364	Sullivan	$12,889,708				
				Stewart	$761,495	Unicoi	$1,467,892				
				Sumner	$2,343,418	Van Buren	$143,519				
				Tipton	$5,376,454	Wayne	$1,386,123				
				Trousdale	$736,985	Weakley	$945,343				
				Union	$1,433,100	White	$866,015				
				Warren	$1,735,696						
				Washington	$3,971,952						

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 30 – Loss Estimation by GIS Analysis, High & Strong Winds

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Cheatham	$586,467	Cannon	$731,478	Anderson	$4,947,581	Bledsoe	$506,717	Carter	$2,497,728
		Montgomery	$6,415,642	Clay	$377,975	Bedford	$1,742,550	Bradley	$6,839,962	Cocke	$131,260
		Robertson	$1,828,667	Davidson	$38,079,522	Benton	$932,359	Carroll	$1,230,667	Greene	$3,655,855
		Sumner	$2,343,418	Dickson	$1,032,642	Blount	$6,109,706	Crockett	$811,710	Lake	$573,379
				Fayette	$1,190,307	Campbell	$2,986,882	Gibson	$3,075,817	McMinn	$1,239,308
				Franklin	$1,902,441	Chester	$837,092	Grundy	$750,625	Unicoi	$1,467,892
				Giles	$1,321,101	Claiborne	$1,746,971	Hardeman	$2,178,327	Washington	$3,971,952
				Henderson	$1,475,278	Coffee	$2,338,029	Jefferson	$1,499,816		
				Humphreys	$1,179,269	Cumberland	$466,261	Johnson	$677,573		
				Lawrence	$1,516,070	Decatur	$462,436	Loudon	$1,606,963		
				Lincoln	$1,632,692	DeKalb	$724,172	Meigs	$731,478		

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Macon	$864,479	Dyer	$2,194,341	Monroe	$1,353,139		
				Marion	$3,764,107	Fentress	$703,483	Perry	$270,866		
				Maury	$4,972,875	Grainger	$589,101	Polk	$1,117,100		
				McNairy	$1,044,059	Hamblen	$3,705,824	Rhea	$973,404		
				Obion	$2,091,659	Hamilton	$17,798,170	Sevier	$3,926,027		
				Overton	$2,017,695	Hancock	$601,586	Sullivan	$12,889,708		
				Pickett	$183,509	Hardin	$1,044,060	Van Buren	$143,519		
				Putnam	$3,087,547	Hawkins	$3,615,928				
				Rutherford	$5,323,121	Haywood	$780,779				
				Scott	$1,289,364	Henry	$1,935,167				
				Shelby	$61,194,199	Hickman	$1,642,658				
				Smith	$1,289,364	Houston	$430,177				
				Stewart	$761,495	Jackson	$1,170,727				
				Tipton	$5,376,454	Knox	$13,667,744				
				Trousdale	$736,985	Lauderdale	$1,676,186				
				Wilson	$4,417,683	Lewis	$553,559				
						Madison	$6,810,156				
						Marshall	$1,252,721				
						Moore	$189,223				
						Morgan	$813,867				
						Roane	$3,143,674				
						Sequatchie	$339,900				
						Union	$1,433,100				
						Warren	$1,735,696				
						Wayne	$1,386,123				
						Weakley	$945,343				
						White	$866,015				

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 31 – Loss Estimation by GIS Analysis, Land Subsidence

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Bedford	$1,742,550	Anderson	$4,947,581	Campbell	$2,986,882	Bledsoe	$506,717	Van Buren	$143,519
		Cheatham	$586,467	Benton	$932,359	Carter	$2,497,728	Claiborne	$1,746,971	White	$866,015
		Davidson	$38,079,522	Blount	$6,109,706	Clay	$377,975	Cumberland	$466,261		
		Dickson	$1,032,642	Bradley	$6,839,962	Cocke	$131,260	Grundy	$750,625		

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
		Fayette	$1,190,307	Cannon	$731,478	DeKalb	$724,172	Jackson	$1,170,727		
		Marshall	$1,252,721	Carroll	$1,230,667	Fentress	$703,483	Lake	$573,379		
		Maury	$4,972,875	Chester	$837,092	Franklin	$1,902,441	Overton	$2,017,695		
		Montgomery	$6,415,642	Coffee	$2,338,029	Grainger	$589,101	Putnam	$3,087,547		
		Robertson	$1,828,667	Crockett	$811,710	Hancock	$601,586	Warren	$1,735,696		
		Rutherford	$5,323,121	Decatur	$462,436	Hardeman	$2,178,327				
		Shelby	$61,194,199	Dyer	$2,194,341	Johnson	$677,573				
		Sumner	$2,343,418	Gibson	$3,075,817	Marion	$3,764,107				
		Tipton	$5,376,454	Giles	$1,321,101	Perry	$270,866				
		Wilson	$4,417,683	Greene	$3,655,855	Pickett	$183,509				
				Hamblen	$3,705,824	Sequatchie	$339,900				
				Hamilton	$17,798,170	Union	$1,433,100				
				Hardin	$1,044,060	Wayne	$1,386,123				
				Hawkins	$3,615,928						
				Haywood	$780,779						
				Henderson	$1,475,278						
				Henry	$1,935,167						
				Hickman	$1,642,658						
				Houston	$430,177						
				Humphreys	$1,179,269						
				Jefferson	$1,499,816						
				Knox	$13,667,744						
				Lauderdale	$1,676,186						
				Lawrence	$1,516,070						
				Lewis	$553,559						
				Lincoln	$1,632,692						
				Loudon	$1,606,963						
				Macon	$864,479						
				Madison	$6,810,156						
				McMinn	$1,239,308						
				McNairy	$1,044,059						
				Meigs	$731,478						
				Monroe	$1,353,139						
				Moore	$189,223						
				Morgan	$813,867						
				Obion	$2,091,659						
				Polk	$1,117,100						

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Rhea	$973,404						
				Roane	$3,143,674						
				Scott	$1,289,364						
				Sevier	$3,926,027						
				Smith	$1,289,364						
				Stewart	$761,495						
				Sullivan	$12,889,708						
				Trousdale	$736,985						
				Unicoi	$1,467,892						
				Washington	$3,971,952						
				Weakley	$945,343						

**The structure values are estimates extracted from FEMA's HAZUS-MH4.0 inventory database.*

Table 32 – Loss Estimation by GIS Analysis, Landslides

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Cheatham	$586,467	Bedford	$1,742,550	Benton	$932,359	Anderson	$4,947,581	Campbell	$2,986,882	Johnson	$677,573
Rutherford	$5,323,121	Chester	$837,092	Blount	$6,109,706	Bledsoe	$506,717	Carter	$2,497,728	Lake	$573,379
Sumner	$2,343,418	Coffee	$2,338,029	Bradley	$6,839,962	Clay	$377,975	Claiborne	$1,746,971	Unicoi	$1,467,892
Williamson	$828,101	Davidson	$38,079,522	Cannon	$731,478	Dyer	$2,194,341	Cocke	$131,260		
Wilson	$4,417,683	Dickson	$1,032,642	Carroll	$1,230,667	Fentress	$703,483	Cumberland	$466,261		
		Fayette	$1,190,307	Crockett	$811,710	Grainger	$589,101	Grundy	$750,625		
		Henderson	$1,475,278	Decatur	$462,436	Hamblen	$3,705,824	Hancock	$601,586		
		Humphreys	$1,179,269	DeKalb	$724,172	Hawkins	$3,615,928	Morgan	$813,867		
		Lawrence	$1,516,070	Franklin	$1,902,441	Jackson	$1,170,727	Scott	$1,289,364		
		Lincoln	$1,632,692	Gibson	$3,075,817	Lauderdale	$1,676,186	Van Buren	$143,519		
		Macon	$864,479	Giles	$1,321,101	Monroe	$1,353,139				
		Madison	$6,810,156	Greene	$3,655,855	Obion	$2,091,659				
		Marshall	$1,252,721	Hamilton	$17,798,170	Pickett	$183,509				
		Maury	$4,972,875	Hardeman	$2,178,327	Polk	$1,117,100				
		McNairy	$1,044,059	Hardin	$1,044,060	Rhea	$973,404				
		Montgomery	$6,415,642	Haywood	$780,779	Roane	$3,143,674				
		Moore	$189,223	Henry	$1,935,167	Sequatchie	$339,900				
		Robertson	$1,828,667	Hickman	$1,642,658	Sevier	$3,926,027				
		Trousdale	$736,985	Houston	$430,177	Sullivan	$12,889,708				
				Jefferson	$1,499,816	Union	$1,433,100				

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Knox	$13,667,744						
				Lewis	$553,559						
				Loudon	$1,606,963						
				Marion	$3,764,107						
				McMinn	$1,239,308						
				Meigs	$731,478						
				Overton	$2,017,695						
				Perry	$270,866						
				Putnam	$3,087,547						
				Shelby	$61,194,199						
				Smith	$1,289,364						
				Stewart	$761,495						
				Tipton	$5,376,454						
				Warren	$1,735,696						
				Washington	$3,971,952						
				Wayne	$1,386,123						
				Weakley	$945,343						
				White	$866,015						

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 33 – Loss Estimation by GIS Analysis, Lightning

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Anderson	$4,947,581	Bedford	$1,742,550	Benton	$932,359	Bledsoe	$506,717	Cumberland	$466,261	Jackson	$1,170,727
Blount	$6,109,706	Bradley	$6,839,962	Campbell	$2,986,882	Carter	$2,497,728	Fentress	$703,483	Lake	$573,379
Cheatham	$586,467	Chester	$837,092	Cannon	$731,478	Clay	$377,975				
Dickson	$1,032,642	Decatur	$462,436	Carroll	$1,230,667	Cocke	$131,260				
Fayette	$1,190,307	Giles	$1,321,101	Claiborne	$1,746,971	Hardeman	$2,178,327				
Knox	$13,667,744	Greene	$3,655,855	Coffee	$2,338,029	Henry	$1,935,167				
Loudon	$1,606,963	Hamblen	$3,705,824	Crockett	$811,710	Macon	$864,479				
McMinn	$1,239,308	Hamilton	$17,798,170	Davidson	$38,079,522	Overton	$2,017,695				
Monroe	$1,353,139	Hardin	$1,044,060	DeKalb	$724,172	Shelby	$61,194,199				
Robertson	$1,828,667	Hawkins	$3,615,928	Dyer	$2,194,341	Van Buren	$143,519				
Sumner	$2,343,418	Henderson	$1,475,278	Franklin	$1,902,441						
Williamson	$828,101	Hickman	$1,642,658	Gibson	$3,075,817						
		Humphreys	$1,179,269	Grainger	$589,101						

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
		Jefferson	$1,499,816	Grundy	$750,625						
		Marion	$3,764,107	Hancock	$601,586						
		Marshall	$1,252,721	Haywood	$780,779						
		McNairy	$1,044,059	Houston	$430,177						
		Meigs	$731,478	Johnson	$677,573						
		Obion	$2,091,659	Lauderdale	$1,676,186						
		Polk	$1,117,100	Lawrence	$1,516,070						
		Rhea	$973,404	Lewis	$553,559						
		Roane	$3,143,674	Lincoln	$1,632,692						
		Rutherford	$5,323,121	Madison	$6,810,156						
		Sequatchie	$339,900	Maury	$4,972,875						
		Sevier	$3,926,027	Montgomery	$6,415,642						
		Smith	$1,289,364	Moore	$189,223						
		Tipton	$5,376,454	Morgan	$813,867						
		Warren	$1,735,696	Perry	$270,866						
		Washington	$3,971,952	Pickett	$183,509						
				Putnam	$3,087,547						
				Scott	$1,289,364						
				Stewart	$761,495						
				Sullivan	$12,889,708						
				Trousdale	$736,985						
				Unicoi	$1,467,892						
				Union	$1,433,100						
				Wayne	$1,386,123						
				Weakley	$945,343						
				White	$866,015						
				Wilson	$4,417,683						

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 34 – Loss Estimation by GIS Analysis, Thunderstorm Winds

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Cheatham	$586,467	Bedford	$1,742,550	Anderson	$4,947,581	Bledsoe	$506,717	Lake	$573,379
		Fayette	$1,190,307	Cannon	$731,478	Benton	$932,359	Campbell	$2,986,882		
		Marshall	$1,252,721	Carroll	$1,230,667	Blount	$6,109,706	Davidson	$38,079,522		
		Robertson	$1,828,667	Chester	$837,092	Bradley	$6,839,962	Grainger	$589,101		

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
		Rutherford	$5,323,121	Coffee	$2,338,029	Carter	$2,497,728	Hancock	$601,586		
				Crockett	$811,710	Claiborne	$1,746,971	McMinn	$1,239,308		
				DeKalb	$724,172	Clay	$377,975	Meigs	$731,478		
				Dickson	$1,032,642	Cocke	$131,260				
				Dyer	$2,194,341	Cumberland	$466,261				
				Franklin	$1,902,441	Decatur	$462,436				
				Gibson	$3,075,817	Fentress	$703,483				
				Henderson	$1,475,278	Giles	$1,321,101				
				Henry	$1,935,167	Greene	$3,655,855				
				Humphreys	$1,179,269	Grundy	$750,625				
				Lauderdale	$1,676,186	Hamblen	$3,705,824				
				Lincoln	$1,632,692	Hamilton	$17,798,170				
				Macon	$864,479	Hardeman	$2,178,327				
				Madison	$6,810,156	Hardin	$1,044,060				
				Maury	$4,972,875	Hawkins	$3,615,928				
				McNairy	$1,044,059	Haywood	$780,779				
				Montgomery	$6,415,642	Hickman	$1,642,658				
				Moore	$189,223	Houston	$430,177				
				Obion	$2,091,659	Jackson	$1,170,727				
				Overton	$2,017,695	Jefferson	$1,499,816				
				Pickett	$183,509	Johnson	$677,573				
				Putnam	$3,087,547	Knox	$13,667,744				
				Sevier	$3,926,027	Lawrence	$1,516,070				
				Shelby	$61,194,199	Lewis	$553,559				
				Smith	$1,289,364	Loudon	$1,606,963				
				Stewart	$761,495	Marion	$3,764,107				
				Sumner	$2,343,418	Monroe	$1,353,139				
				Tipton	$5,376,454	Morgan	$813,867				
				White	$866,015	Perry	$270,866				
				Wilson	$4,417,683	Polk	$1,117,100				
						Rhea	$973,404				
						Roane	$3,143,674				
						Scott	$1,289,364				
						Sequatchie	$339,900				
						Sullivan	$12,889,708				
						Trousdale	$736,985				
						Unicoi	$1,467,892				

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
						Union	$1,433,100				
						Van Buren	$143,519				
						Warren	$1,735,696				
						Washington	$3,971,952				
						Wayne	$1,386,123				
						Weakley	$945,343				

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 35 – Loss Estimation by GIS Analysis, Tornadoes

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Blount	$6,109,706	Anderson	$4,947,581	Benton	$932,359	Crockett	$811,710	Lake	$573,379
		Cheatham	$586,467	Bedford	$1,742,550	Bledsoe	$506,717	Dyer	$2,194,341		
		Fayette	$1,190,307	Chester	$837,092	Bradley	$6,839,962	Gibson	$3,075,817		
		Knox	$13,667,744	Claiborne	$1,746,971	Campbell	$2,986,882	Hardeman	$2,178,327		
		Wilson	$4,417,683	Decatur	$462,436	Cannon	$731,478	Weakley	$945,343		
				Dickson	$1,032,642	Carroll	$1,230,667				
				Franklin	$1,902,441	Carter	$2,497,728				
				Grainger	$589,101	Clay	$377,975				
				Greene	$3,655,855	Cocke	$131,260				
				Hamblen	$3,705,824	Coffee	$2,338,029				
				Hawkins	$3,615,928	Cumberland	$466,261				
				Henderson	$1,475,278	Davidson	$38,079,522				
				Hickman	$1,642,658	DeKalb	$724,172				
				Humphreys	$1,179,269	Fentress	$703,483				
				Jefferson	$1,499,816	Giles	$1,321,101				
				Loudon	$1,606,963	Grundy	$750,625				
				Macon	$864,479	Hamilton	$17,798,170				
				Marion	$3,764,107	Hancock	$601,586				
				Marshall	$1,252,721	Hardin	$1,044,060				
				Maury	$4,972,875	Haywood	$780,779				
				Meigs	$731,478	Henry	$1,935,167				
				Monroe	$1,353,139	Houston	$430,177				
				Montgomery	$6,415,642	Jackson	$1,170,727				
				Moore	$189,223	Johnson	$677,573				
				Morgan	$813,867	Lauderdale	$1,676,186				

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Polk	$1,117,100	Lawrence	$1,516,070				
				Putnam	$3,087,547	Lewis	$553,559				
				Rhea	$973,404	Lincoln	$1,632,692				
				Roane	$3,143,674	Madison	$6,810,156				
				Robertson	$1,828,667	McMinn	$1,239,308				
				Rutherford	$5,323,121	McNairy	$1,044,059				
				Sevier	$3,926,027	Obion	$2,091,659				
				Smith	$1,289,364	Overton	$2,017,695				
				Sullivan	$12,889,708	Perry	$270,866				
				Sumner	$2,343,418	Pickett	$183,509				
				Tipton	$5,376,454	Scott	$1,289,364				
				Trousdale	$736,985	Sequatchie	$339,900				
				Union	$1,433,100	Shelby	$61,194,199				
				Washington	$3,971,952	Stewart	$761,495				
						Unicoi	$1,467,892				
						Van Buren	$143,519				
						Warren	$1,735,696				
						Wayne	$1,386,123				
						White	$866,015				

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 36 – Loss Estimation by GIS Analysis, Wildfires

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Bedford	$1,742,550	Blount	$6,109,706	Anderson	$4,947,581	Benton	$932,359	Hancock	$601,586
		Fayette	$1,190,307	Cheatham	$586,467	Bradley	$6,839,962	Bledsoe	$506,717	Lake	$573,379
		Robertson	$1,828,667	Coffee	$2,338,029	Cannon	$731,478	Campbell	$2,986,882		
		Rutherford	$5,323,121	Crockett	$811,710	Carroll	$1,230,667	Carter	$2,497,728		
		Shelby	$61,194,199	Davidson	$38,079,522	Chester	$837,092	Claiborne	$1,746,971		
		Tipton	$5,376,454	Dyer	$2,194,341	Decatur	$462,436	Clay	$377,975		
		Wilson	$4,417,683	Franklin	$1,902,441	DeKalb	$724,172	Cocke	$131,260		
				Gibson	$3,075,817	Dickson	$1,032,642	Cumberland	$466,261		
				Hamblen	$3,705,824	Fentress	$703,483	Grainger	$589,101		
				Henderson	$1,475,278	Giles	$1,321,101	Grundy	$750,625		
				Knox	$13,667,744	Greene	$3,655,855	Hardeman	$2,178,327		
				Lauderdale	$1,676,186	Hamilton	$17,798,170	Houston	$430,177		

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
				Lincoln	$1,632,692	Hardin	$1,044,060	Jackson	$1,170,727		
				Loudon	$1,606,963	Hawkins	$3,615,928	Johnson	$677,573		
				Madison	$6,810,156	Haywood	$780,779	Lewis	$553,559		
				Marshall	$1,252,721	Henry	$1,935,167	Perry	$270,866		
				Maury	$4,972,875	Hickman	$1,642,658	Sevier	$3,926,027		
				Montgomery	$6,415,642	Humphreys	$1,179,269	Unicoi	$1,467,892		
				Moore	$189,223	Jefferson	$1,499,816	Union	$1,433,100		
				Obion	$2,091,659	Lawrence	$1,516,070	Van Buren	$143,519		
				Sumner	$2,343,418	Macon	$864,479	Wayne	$1,386,123		
				Warren	$1,735,696	Marion	$3,764,107				
				Washington	$3,971,952	McMinn	$1,239,308				
						McNairy	$1,044,059				
						Meigs	$731,478				
						Monroe	$1,353,139				
						Morgan	$813,867				
						Overton	$2,017,695				
						Pickett	$183,509				
						Polk	$1,117,100				
						Putnam	$3,087,547				
						Rhea	$973,404				
						Roane	$3,143,674				
						Scott	$1,289,364				
						Sequatchie	$339,900				
						Smith	$1,289,364				
						Stewart	$761,495				
						Sullivan	$12,889,708				
						Trousdale	$736,985				
						Weakley	$945,343				
						White	$866,015				

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Table 37 – Loss Estimation by GIS Analysis, Winter Storms

Risk Rank 1	Loss Estimate	Risk Rank 2	Loss Estimate	Risk Rank 3	Loss Estimate	Risk Rank 4	Loss Estimate	Risk Rank 5	Loss Estimate	Risk Rank 6	Loss Estimate
Williamson	$828,101	Cheatham	$586,467	Blount	$6,109,706	Anderson	$4,947,581	Bledsoe	$506,717	Carter	$2,497,728
		Fayette	$1,190,307	Bradley	$6,839,962	Bedford	$1,742,550	Cannon	$731,478	DeKalb	$724,172
		Robertson	$1,828,667	Davidson	$38,079,522	Benton	$932,359	Clay	$377,975	Jackson	$1,170,727
		Shelby	$61,194,199	Franklin	$1,902,441	Campbell	$2,986,882	Cocke	$131,260	Lake	$573,379
				Giles	$1,321,101	Carroll	$1,230,667	Crockett	$811,710	Van Buren	$143,519
				Hamilton	$17,798,170	Chester	$837,092	Cumberland	$466,261		
				Hardin	$1,044,060	Claiborne	$1,746,971	Fentress	$703,483		
				Henderson	$1,475,278	Coffee	$2,338,029	Gibson	$3,075,817		
				Knox	$13,667,744	Decatur	$462,436	Grainger	$589,101		
				Lawrence	$1,516,070	Dickson	$1,032,642	Greene	$3,655,855		
				Lincoln	$1,632,692	Dyer	$2,194,341	Grundy	$750,625		
				Loudon	$1,606,963	Hardeman	$2,178,327	Hamblen	$3,705,824		
				Marion	$3,764,107	Hawkins	$3,615,928	Hancock	$601,586		
				Marshall	$1,252,721	Henry	$1,935,167	Haywood	$780,779		
				Maury	$4,972,875	Hickman	$1,642,658	Houston	$430,177		
				McNairy	$1,044,059	Humphreys	$1,179,269	Johnson	$677,573		
				Monroe	$1,353,139	Jefferson	$1,499,816	Meigs	$731,478		
				Montgomery	$6,415,642	Lauderdale	$1,676,186	Morgan	$813,867		
				Moore	$189,223	Lewis	$553,559	Overton	$2,017,695		
				Obion	$2,091,659	Macon	$864,479	Perry	$270,866		
				Polk	$1,117,100	Madison	$6,810,156	Putnam	$3,087,547		
				Rutherford	$5,323,121	McMinn	$1,239,308	Rhea	$973,404		
				Sevier	$3,926,027	Pickett	$183,509	Sequatchie	$339,900		
				Sumner	$2,343,418	Roane	$3,143,674	Smith	$1,289,364		
				Tipton	$5,376,454	Scott	$1,289,364	Unicoi	$1,467,892		
				Wilson	$4,417,683	Stewart	$761,495	Union	$1,433,100		
						Sullivan	$12,889,708	Warren	$1,735,696		
						Trousdale	$736,985	Washington	$3,971,952		
						Wayne	$1,386,123	White	$866,015		
						Weakley	$945,343				

**The structure values are estimates extracted from FEMA's HAZUS-MH 4.0 inventory database.*

Appendix 3 -- Vulnerability Assessment of Critical Facilities

The State of Tennessee owns and operates 1190 critical facilities covering 13,042,650 square feet. The Tennessee Department of the Treasury reports these properties and structures are worth $2,140,994,000 with a total content value of $231,741,300. These are depicted in Maps 141 through 144. TEMA has designed its critical facilities as state owned and operated property under the direction of the Tennessee Department of the Military, the Tennessee Bureau of Investigation, the Tennessee Department of Safety, and the Tennessee Department of Corrections, with the primary functions of corrections, communications, medical, or health services.

Of these properties and structures, the vast majority of their worth is located in hazard areas ranked 3 or lower. However, due to the high threat level in West Tennessee along the Mississippi River, there is a sizable worth of property and structures located in a high threat hazard area.

Out of the State of Tennessee's Department of the Treasury's property list, TEMA has defined its state critical facilities under the following classifications:

Communications: This classification is for any radio or telecommunications purposed structure.
Corrections: This classification includes any non-communications facilities under the Tennessee correctional system.
Medical: Any state owned or operated facilities associated with a healthcare practice. These are typically mental healthcare, rehabilitation, or therapy associated facilities. The state does not own or operate any hospitals.
Military: This classification includes any non-communications facilities under the Tennessee National Guard..
Safety: This classification includes and structures used by the Tennessee Department of Safety.
Tennessee Bureau of Investigation (TBI): This classification includes and structures used by the Tennessee Bureau of Investigation.

The following table breaks down the number, size, structure value, contents value, and total value all critical facilities located in each hazard's threat zone, 1 through 6. Due to their nature, neither drought nor extreme temperatures pose a threat to critical facilities. For dam failure, each of the dams of prime concern is listed along with the values that are within their failure inundation.

Table 41 – Loss Estimates, State of Tennessee Critical Facilities

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Dam Failures					
Center Hill Dam	23	312,000	$71,615,500	$7,809,800	$79,425,300
Communications	1	100	$350,000	$0	$350,000
Corrections	20	307,700	$6,834,800	$404,000	$7,238,800
Medical	0	0	$0	$0	$0
Military	2	4,200	$20,800	$1,500	$22,300
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Tellico Dam	0	0	$0	$0	$0
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Wolf Creek Dam	48	451,200	$100,709,000	$10,187,000	$110,896,000
Communications	2	100	$148,000	$200,000	$348,000
Corrections	45	448,100	$100,561,000	$9,887,000	$110,448,000
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	1	3,000	$0	$100,000	$100,000
Droughts	No Threat	No Threat	No Threat	No Threat	No Threat
Earthquakes					
Earthquake 1	613	6,532,400	$1,026,558,800	$124,195,300	$1,150,754,100
Communications	59	231,500	$37,696,500	$24,823,700	$62,520,200
Corrections	285	2,887,900	$0	$48,384,600	$48,384,600
Medical	80	977,500	$0	$7,950,500	$7,950,500
Military	109	1,528,400	$0	$5,718,600	$5,718,600
Safety	30	103,500	$0	$12,252,700	$12,252,700
TBI	5	157,200	$0	$16,786,200	$16,786,200
Earthquake 2	209	2,535,070	$413,583,900	$35,465,700	$449,049,600
Communications	24	113,600	$20,484,100	$10,890,600	$31,374,700
Corrections	69	868,570	$189,025,800	$5,634,300	$194,660,100
Medical	21	378,900	$37,039,700	$3,220,200	$40,259,900
Military	55	546,200	$87,197,400	$752,700	$87,950,100
Safety	13	30,700	$412,800	$4,575,000	$4,987,800
TBI	2	43,300	$0	$5,250,000	$5,250,000

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Earthquake 3	14	77,900	$11,059,100	$1,778,300	$12,837,400
Communications	7	4,600	$367,300	$1,368,300	$1,735,600
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	6	73,100	$10,616,800	$110,000	$10,726,800
Safety	1	200	$75,000	$300,000	$375,000
TBI	0	0	$0	$0	$0
Earthquake 4	148	1,657,767	$282,419,400	$23,521,000	$305,940,400
Communications	30	42,970	$8,163,200	$6,485,000	$14,648,200
Corrections	18	208,900	$42,071,300	$1,331,000	$43,402,300
Medical	38	644,400	$122,789,800	$7,987,200	$130,777,000
Military	35	386,000	$58,600,000	$781,000	$59,381,000
Safety	9	38,400	$350,000	$2,800,000	$3,150,000
TBI	2	24,497	$0	$2,157,200	$2,157,200
Earthquake 5	100	1,097,913	$215,256,300	$28,554,800	$243,811,100
Communications	6	102,613	$15,181,100	$2,883,800	$18,064,900
Corrections	70	760,800	$167,117,000	$22,935,400	$190,052,400
Medical	3	16,900	$2,176,700	$0	$2,176,700
Military	9	149,200	$22,978,300	$235,600	$23,213,900
Safety	2	3,900	$0	$125,000	$125,000
TBI	0	0	$0	$0	$0
Earthquake 6	77	749,000	$155,577,300	$11,926,200	$167,503,500
Communications	6	70,700	$14,287,400	$3,705,000	$17,992,400
Corrections	62	608,300	$130,518,800	$7,671,700	$138,190,500
Medical	0	0	$0	$0	$0
Military	2	45,800	$7,544,000	$70,000	$7,614,000
Safety	1	1,400	$0	$125,000	$125,000
TBI	0	0	$0	$0	$0
Extreme Temperatures	No Threat	No Threat	No Threat	No Threat	No Threat
Floods - Flash Floods					
Flash Flood 1	0	0	$0	$0	$0
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Flash Flood 2	559	5,572,753	$1,028,207,000	$94,109,100	$1,122,316,100
Communications	49	218,383	$39,643,100	$17,775,200	$57,418,300
Corrections	321	3,150,270	$637,540,000	$49,597,700	$687,137,700
Medical	50	808,100	$135,427,400	$8,047,300	$143,474,700
Military	60	704,200	$109,130,400	$1,110,000	$110,240,400
Safety	23	22,300	$1,561,100	$7,450,000	$9,011,100
TBI	0	0	$0	$0	$0
Flash Flood 3	315	3,295,200	$510,995,200	$58,222,100	$569,217,300
Communications	53	235,300	$42,378,900	$23,222,900	$65,601,800
Corrections	68	835,000	$165,937,900	$15,876,000	$181,813,900
Medical	24	373,300	$37,608,700	$3,429,200	$41,037,900
Military	116	1,268,700	$200,007,300	$2,915,300	$202,922,600
Safety	18	50,900	$212,600	$4,275,000	$4,487,600
TBI	5	52,200	$0	$5,518,000	$5,518,000
Flash Flood 4	31	349,697	$61,083,700	$6,125,700	$67,209,400
Communications	12	31,800	$6,765,700	$3,479,700	$10,245,400
Corrections	0	0	$0	$0	$0
Medical	5	35,100	$5,031,000	$300,000	$5,331,000
Military	9	161,900	$24,087,000	$171,000	$24,258,000
Safety	3	9,900	$200,000	$975,000	$1,175,000
TBI	1	7,997	$0	$200,000	$200,000
Flash Flood 5	198	2,767,900	$399,426,500	$39,188,400	$438,614,900
Communications	13	58,500	$4,430,000	$4,069,500	$8,499,500
Corrections	79	916,300	$210,865,500	$16,122,300	$226,987,800
Medical	56	783,600	$92,095,000	$7,335,900	$99,430,900
Military	31	593,900	$59,228,300	$3,471,600	$62,699,900
Safety	7	72,400	$75,000	$4,327,700	$4,402,700
TBI	0	0	$0	$0	$0
Flash Flood 6	58	664,500	$104,742,400	$27,796,000	$132,538,400
Communications	5	22,000	$2,961,900	$1,609,100	$4,571,000
Corrections	36	432,900	$95,320,000	$4,361,000	$99,681,000
Medical	7	17,600	$1,706,500	$45,500	$1,752,000
Military	0	0	$0	$0	$0
Safety	5	22,600	$4,000,000	$3,150,000	$7,150,000
TBI	3	164,800	$0	$18,475,400	$18,475,400
Floods - Riverine Floods					
Riverine Flood (100 Year)	63	900,270	$187,704,200	$12,423,800	$200,128,000
Communications	1	100	$8,000	$200,000	$208,000
Corrections	47	716,370	$160,448,200	$8,252,000	$168,700,200
Medical	1	1,400	$89,000	$4,500	$93,500
Military	10	102,800	$15,249,500	$977,000	$16,226,500
Safety	0	0	$0	$0	$0
TBI	1	3,800	$0	$150,000	$150,000

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Riverine Flood (500 Year)	2	30,400	$4,355,800	$220,000	$4,575,800
Communications	1	4,000	$0	$200,000	$200,000
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	1	26,400	$4,355,800	$20,000	$4,375,800
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Riverine Flood (100 & 500)	65	930,670	$192,060,000	$12,643,800	$204,703,800
Communications	2	4,100	$8,000	$400,000	$408,000
Corrections	47	716,370	$160,448,200	$8,252,000	$168,700,200
Medical	1	1,400	$89,000	$4,500	$93,500
Military	11	129,200	$19,605,300	$997,000	$20,602,300
Safety	0	0	$0	$0	$0
TBI	1	3,800	$0	$150,000	$150,000
Geologic - Expansive Soils					
Expansive Soils 1	119	1,314,400	$179,265,600	$17,174,900	$196,440,500
Communications	9	80,300	$15,674,300	$6,338,800	$22,013,100
Corrections	17	74,600	$15,226,600	$765,500	$15,992,100
Medical	34	551,200	$59,152,600	$4,150,900	$63,303,500
Military	35	340,500	$53,377,900	$391,500	$53,769,400
Safety	13	23,100	$487,800	$3,875,000	$4,362,800
TBI	2	6,400	$0	$400,000	$400,000
Expansive Soils 2	839	8,989,650	$1,599,170,500	$170,042,600	$1,769,213,100
Communications	83	421,683	$69,940,600	$32,701,400	$102,642,000
Corrections	463	4,896,770	$1,012,496,800	$77,047,400	$1,089,544,200
Medical	58	729,800	$132,350,000	$8,517,200	$140,867,200
Military	120	1,701,000	$229,865,100	$5,740,200	$235,605,300
Safety	32	134,000	$5,250,200	$13,477,700	$18,727,900
TBI	5	176,797	$0	$18,775,400	$18,775,400
Expansive Soils 3	196	2,249,600	$309,936,000	$37,961,800	$347,897,800
Communications	38	60,000	$9,694,700	$11,016,200	$20,710,900
Corrections	23	360,300	$81,436,000	$8,142,100	$89,578,100
Medical	50	736,700	$80,366,000	$6,489,800	$86,855,800
Military	57	597,600	$94,501,300	$1,376,200	$95,877,500
Safety	11	21,000	$310,700	$2,825,000	$3,135,700
TBI	2	41,800	$0	$5,018,000	$5,018,000
Expansive Soils 4	5	69,600	$11,622,100	$210,000	$11,832,100
Communications	2	4,000	$870,000	$100,000	$970,000
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	3	65,600	$10,752,100	$110,000	$10,862,100
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Expansive Soils 5	2	26,800	$4,460,600	$52,000	$4,512,600
Communications	0	0	$0	$0	$0
Corrections	1	2,800	$504,000	$2,000	$506,000
Medical	0	0	$0	$0	$0
Military	1	24,000	$3,956,600	$50,000	$4,006,600
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Expansive Soils 6	0	0	$0	$0	$0
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Geologic - Land Subsidence					
Land Subsidence 1	978	11,160,750	$1,899,198,500	$201,330,300	$2,100,528,800
Communications	108	448,283	$77,162,300	$45,491,500	$122,653,800
Corrections	433	4,920,270	$1,032,141,000	$78,696,700	$1,110,837,700
Medical	134	1,822,600	$253,755,100	$18,005,100	$271,760,200
Military	171	2,312,700	$333,626,800	$7,024,100	$340,650,900
Safety	46	151,200	$5,825,400	$16,677,700	$22,503,100
TBI	7	180,297	$0	$19,093,400	$19,093,400
Land Subsidence 2	91	961,600	$112,489,000	$14,469,900	$126,958,900
Communications	13	87,900	$12,751,600	$2,558,100	$15,309,700
Corrections	21	136,500	$22,721,100	$3,217,600	$25,938,700
Medical	8	195,100	$18,113,500	$1,152,800	$19,266,300
Military	30	252,500	$33,219,600	$353,800	$33,573,400
Safety	4	14,900	$23,100	$1,050,000	$1,073,100
TBI	1	40,700	$0	$5,000,000	$5,000,000
Land Subsidence 3	72	388,000	$72,262,600	$7,090,800	$79,353,400
Communications	5	19,800	$4,333,100	$1,106,500	$5,439,600
Corrections	50	277,700	$54,801,300	$4,042,700	$58,844,000
Medical	0	0	$0	$0	$0
Military	5	49,600	$7,034,500	$90,000	$7,124,500
Safety	3	200	$200,200	$1,200,000	$1,400,200
TBI	0	0	$0	$0	$0
Land Subsidence 4	7	35,900	$6,013,700	$350,400	$6,364,100
Communications	3	800	$450,000	$200,400	$650,400
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	3	33,700	$5,563,700	$100,000	$5,663,700
Safety	1	1,400	$0	$50,000	$50,000
TBI	0	0	$0	$0	$0

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Land Subsidence 5	11	82,200	$10,937,600	$2,169,900	$13,107,500
Communications	3	9,200	$1,482,600	$799,900	$2,282,500
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	5	58,600	$9,455,000	$70,000	$9,525,000
Safety	2	10,400	$0	$1,200,000	$1,200,000
TBI	1	4,000	$0	$100,000	$100,000
Military	0	0	$0	$0	$0
Land Subsidence 6	2	21,600	$3,553,400	$30,000	$3,583,400
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	2	21,600	$3,553,400	$30,000	$3,583,400
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Geologic - Landslides					
Landslide 1	542	6,500,337	$1,069,346,500	$119,412,500	$1,188,759,000
Communications	78	303,170	$48,820,600	$33,873,200	$82,693,800
Corrections	187	2,186,570	$482,318,100	$28,989,600	$511,307,700
Medical	77	1,148,400	$174,755,900	$12,226,200	$186,982,100
Military	121	1,653,000	$223,586,800	$6,030,200	$229,617,000
Safety	29	116,700	$4,712,600	$11,552,700	$16,265,300
TBI	5	161,397	$0	$16,836,200	$16,836,200
Landslide 2	141	1,633,100	$193,041,500	$18,265,200	$211,306,700
Communications	16	37,400	$5,167,700	$3,876,500	$9,044,200
Corrections	1	12,400	$1,202,100	$47,300	$1,249,400
Medical	46	684,800	$76,764,500	$4,591,300	$81,355,800
Military	53	576,000	$84,782,100	$776,500	$85,558,600
Safety	10	22,500	$350,200	$3,100,000	$3,450,200
TBI	2	44,500	$0	$5,150,000	$5,150,000
Landslide 3	104	805,900	$138,230,100	$17,043,400	$155,273,500
Communications	11	60,400	$13,048,700	$5,985,500	$19,034,200
Corrections	50	277,700	$54,801,300	$4,042,700	$58,844,000
Medical	11	161,000	$16,595,200	$2,067,400	$18,662,600
Military	12	116,100	$24,580,300	$161,200	$24,741,500
Safety	7	9,700	$337,800	$3,000,000	$3,337,800
TBI	1	2,600	$0	$250,000	$250,000
Landslide 4	78	714,800	$147,544,100	$8,318,100	$155,862,200
Communications	6	21,300	$4,300,200	$171,900	$4,472,100
Corrections	62	608,300	$130,518,800	$7,671,700	$138,190,500
Medical	0	0	$0	$0	$0
Military	5	62,400	$9,527,100	$120,000	$9,647,100
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Landslide 5	202	2,157,513	$422,255,700	$48,651,300	$470,907,000
Communications	14	139,513	$24,017,200	$4,205,300	$28,222,500
Corrections	135	1,635,800	$348,073,500	$36,385,800	$384,459,300
Medical	7	19,500	$2,853,000	$173,000	$3,026,000
Military	16	198,800	$30,731,300	$330,000	$31,061,300
Safety	9	29,000	$573,100	$2,225,000	$2,798,100
TBI	1	16,500	$0	$1,957,200	$1,957,200
Landslide 6	94	838,400	$134,036,900	$13,750,800	$147,787,700
Communications	7	4,200	$825,200	$2,044,000	$2,869,200
Corrections	69	613,700	$92,749,600	$8,819,900	$101,569,500
Medical	1	4,000	$900,000	$100,000	$1,000,000
Military	9	122,400	$19,245,400	$250,000	$19,495,400
Safety	1	200	$75,000	$300,000	$375,000
TBI	0	0	$0	$0	$0
Severe Storms - Hail					
Hail 1	0	0	$0	$0	$0
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Hail 2	330	3,483,770	$651,612,400	$49,523,700	$701,136,100
Communications	40	167,200	$33,734,900	$13,922,700	$47,657,600
Corrections	166	1,870,170	$406,816,100	$21,391,100	$428,207,200
Medical	40	498,500	$59,987,500	$3,538,500	$63,526,000
Military	43	516,300	$79,631,500	$830,600	$80,462,100
Safety	12	8,000	$923,300	$3,075,000	$3,998,300
TBI	0	0	$0	$0	$0
Hail 3	427	4,076,283	$722,271,600	$72,271,000	$794,542,600
Communications	41	184,683	$31,208,800	$11,157,700	$42,366,500
Corrections	222	2,102,700	$395,459,700	$44,035,300	$439,495,000
Medical	15	345,400	$80,095,900	$4,708,800	$84,804,700
Military	80	972,400	$151,420,000	$1,500,000	$152,920,000
Safety	20	33,900	$712,800	$5,500,000	$6,212,800
TBI	3	8,900	$0	$268,000	$268,000
Hail 4	83	831,897	$113,610,700	$26,217,700	$139,828,400
Communications	27	52,900	$8,381,100	$14,356,100	$22,737,200
Corrections	0	0	$0	$0	$0
Medical	17	310,200	$43,022,100	$3,064,400	$46,086,500
Military	22	309,800	$53,618,300	$607,200	$54,225,500
Safety	9	24,800	$275,000	$2,475,000	$2,750,000
TBI	2	48,697	$0	$5,200,000	$5,200,000

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Hail 5	162	1,895,800	$323,446,500	$32,099,000	$355,545,500
Communications	15	86,400	$16,789,200	$7,410,800	$24,200,000
Corrections	79	927,000	$208,786,700	$15,819,600	$224,606,300
Medical	22	359,500	$35,373,700	$3,249,700	$38,623,400
Military	28	218,900	$29,150,700	$1,155,800	$30,306,500
Safety	6	23,900	$137,600	$2,800,000	$2,937,600
TBI	1	2,600	$0	$250,000	$250,000
Hail 6	159	2,362,300	$293,513,600	$45,329,900	$338,843,500
Communications	9	74,800	$6,065,600	$3,309,100	$9,374,700
Corrections	37	434,600	$98,600,900	$4,711,000	$103,311,900
Medical	48	504,100	$53,389,400	$4,596,500	$57,985,900
Military	43	711,300	$78,632,500	$3,574,300	$82,206,800
Safety	9	87,500	$4,000,000	$6,327,700	$10,327,700
TBI	3	164,800	$0	$18,475,400	$18,475,400
Severe Storms - High/Strong Winds					
High/Strong Winds 1	0	0	$0	$0	$0
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
High/Strong Winds 2	94	988,400	$180,923,900	$13,396,400	$194,320,300
Communications	5	4,500	$236,000	$563,300	$799,300
Corrections	62	608,300	$130,518,800	$7,671,700	$138,190,500
Medical	12	163,600	$16,995,200	$2,071,900	$19,067,100
Military	5	61,200	$9,793,100	$120,000	$9,913,100
Safety	3	8,100	$137,600	$1,750,000	$1,887,600
TBI	0	0	$0	$0	$0
High/Strong Winds 3	644	6,674,483	$1,279,614,300	$117,724,200	$1,397,338,500
Communications	69	429,813	$79,170,800	$27,864,400	$107,035,200
Corrections	385	4,182,870	$864,768,000	$66,586,300	$931,354,300
Medical	33	412,900	$84,836,800	$4,746,300	$89,583,100
Military	76	933,100	$145,263,400	$1,427,700	$146,691,100
Safety	21	59,200	$448,300	$5,400,000	$5,848,300
TBI	4	24,200	$0	$2,325,200	$2,325,200
High/Strong Winds 4	303	3,802,567	$489,151,700	$76,730,200	$565,881,900
Communications	42	107,670	$13,885,000	$18,646,500	$32,531,500
Corrections	51	537,200	$111,172,200	$11,605,200	$122,777,400
Medical	57	942,500	$110,086,600	$8,801,200	$118,887,800
Military	98	1,345,800	$176,289,600	$5,435,200	$181,724,800
Safety	21	99,800	$4,562,600	$9,927,700	$14,490,300
TBI	3	156,297	$0	$16,718,200	$16,718,200

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
High/Strong Winds 5	79	844,800	$96,657,300	$14,403,300	$111,060,600
Communications	13	21,000	$2,486,600	$2,022,200	$4,508,800
Corrections	6	6,100	$3,204,400	$93,800	$3,298,200
Medical	23	390,400	$42,431,400	$2,083,500	$44,514,900
Military	21	171,100	$21,332,300	$283,800	$21,616,100
Safety	9	8,200	$900,200	$3,000,000	$3,900,200
TBI	1	40,700	$0	$5,000,000	$5,000,000
High/Strong Winds 6	41	339,800	$58,107,600	$3,187,200	$61,294,800
Communications	3	3,000	$401,200	$1,060,000	$1,461,200
Corrections	0	0	$0	$0	$0
Medical	17	108,300	$17,518,600	$1,455,000	$18,973,600
Military	16	217,500	$39,774,600	$401,200	$40,175,800
Safety	2	2,800	$0	$100,000	$100,000
TBI	1	3,800	$0	$150,000	$150,000
Severe Storms - Lightning					
Lightning 1	347	4,189,870	$746,038,700	$53,346,300	$799,385,000
Communications	31	159,300	$30,040,300	$8,533,600	$38,573,900
Corrections	182	2,211,070	$426,821,400	$27,561,800	$454,383,200
Medical	20	505,600	$96,001,700	$6,161,600	$102,163,300
Military	64	745,500	$115,231,400	$1,005,000	$116,236,400
Safety	13	20,400	$837,600	$4,075,000	$4,912,600
TBI	0	0	$0	$0	$0
Lightning 2	417	3,948,213	$678,777,600	$78,610,000	$757,387,600
Communications	43	252,113	$44,860,000	$18,734,000	$63,594,000
Corrections	187	1,650,100	$355,137,500	$34,741,600	$389,879,100
Medical	54	679,800	$78,259,400	$5,505,900	$83,765,300
Military	69	800,600	$125,093,400	$1,353,300	$126,446,700
Safety	21	25,200	$1,011,100	$6,625,000	$7,636,100
TBI	3	47,100	$0	$5,400,000	$5,400,000
Lightning 3	185	2,033,070	$365,646,900	$47,369,100	$413,016,000
Communications	21	23,770	$2,968,100	$2,503,700	$5,471,800
Corrections	95	1,110,800	$255,794,300	$19,142,300	$274,936,600
Medical	14	298,000	$41,048,100	$2,864,400	$43,912,500
Military	31	298,600	$48,535,000	$1,507,000	$50,042,000
Safety	9	35,700	$4,000,000	$3,950,000	$7,950,000
TBI	4	153,400	$0	$16,636,200	$16,636,200
Lightning 4	139	1,973,597	$231,113,700	$36,060,300	$267,174,000
Communications	31	106,500	$15,158,100	$18,669,500	$33,827,600
Corrections	3	62,500	$12,750,500	$550,000	$13,300,500
Medical	43	503,100	$52,610,000	$4,409,500	$57,019,500
Military	45	815,200	$93,200,100	$3,642,600	$96,842,700
Safety	8	71,000	$200,000	$4,352,700	$4,552,700
TBI	1	7,997	$0	$200,000	$200,000

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Lightning 5	42	263,900	$40,895,000	$5,037,800	$45,932,800
Communications	3	2,700	$316,500	$756,500	$1,073,000
Corrections	20	124,100	$21,519,000	$3,170,300	$24,689,300
Medical	9	26,200	$3,371,400	$196,000	$3,567,400
Military	5	64,200	$10,219,500	$100,000	$10,319,500
Safety	1	12,600	$0	$100,000	$100,000
TBI	0	0	$0	$0	$0
Lightning 6	31	241,400	$41,982,900	$5,017,800	$47,000,700
Communications	3	21,600	$2,836,600	$959,100	$3,795,700
Corrections	17	175,900	$37,640,700	$791,000	$38,431,700
Medical	2	5,000	$578,000	$20,500	$598,500
Military	2	4,600	$173,600	$60,000	$233,600
Safety	4	13,200	$0	$1,075,000	$1,075,000
TBI	1	16,500	$0	$1,957,200	$1,957,200
Severe Storms - Thunderstorm Winds					
Thunderstorm Winds 1	0	0	$0	$0	$0
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Thunderstorm Winds 2	389	4,199,253	$849,932,600	$72,610,100	$922,542,700
Communications	40	128,283	$22,468,300	$10,562,700	$33,031,000
Corrections	236	2,663,370	$578,264,700	$44,865,500	$623,130,200
Medical	14	327,400	$78,201,400	$4,708,800	$82,910,200
Military	45	488,600	$74,766,400	$750,600	$75,517,000
Safety	9	3,800	$500,200	$2,500,000	$3,000,200
TBI	0	0	$0	$0	$0
Thunderstorm Winds 3	389	3,500,497	$534,309,200	$63,100,400	$597,409,600
Communications	52	163,300	$34,708,800	$23,403,600	$58,112,400
Corrections	152	1,309,500	$224,011,100	$20,560,900	$244,572,000
Medical	56	800,300	$102,263,100	$6,607,400	$108,870,500
Military	69	873,600	$135,125,600	$1,536,000	$136,661,600
Safety	25	49,400	$1,335,900	$7,625,000	$8,960,900
TBI	3	13,097	$0	$318,000	$318,000
Thunderstorm Winds 4	142	1,421,700	$219,475,100	$18,487,200	$237,962,300
Communications	17	108,500	$15,926,200	$6,151,200	$22,077,400
Corrections	17	175,900	$37,640,700	$791,000	$38,431,700
Medical	23	211,100	$22,979,200	$2,276,900	$25,256,100
Military	59	681,800	$114,386,700	$1,825,900	$116,212,600
Safety	15	51,300	$212,600	$3,975,000	$4,187,600
TBI	3	22,900	$0	$2,357,200	$2,357,200

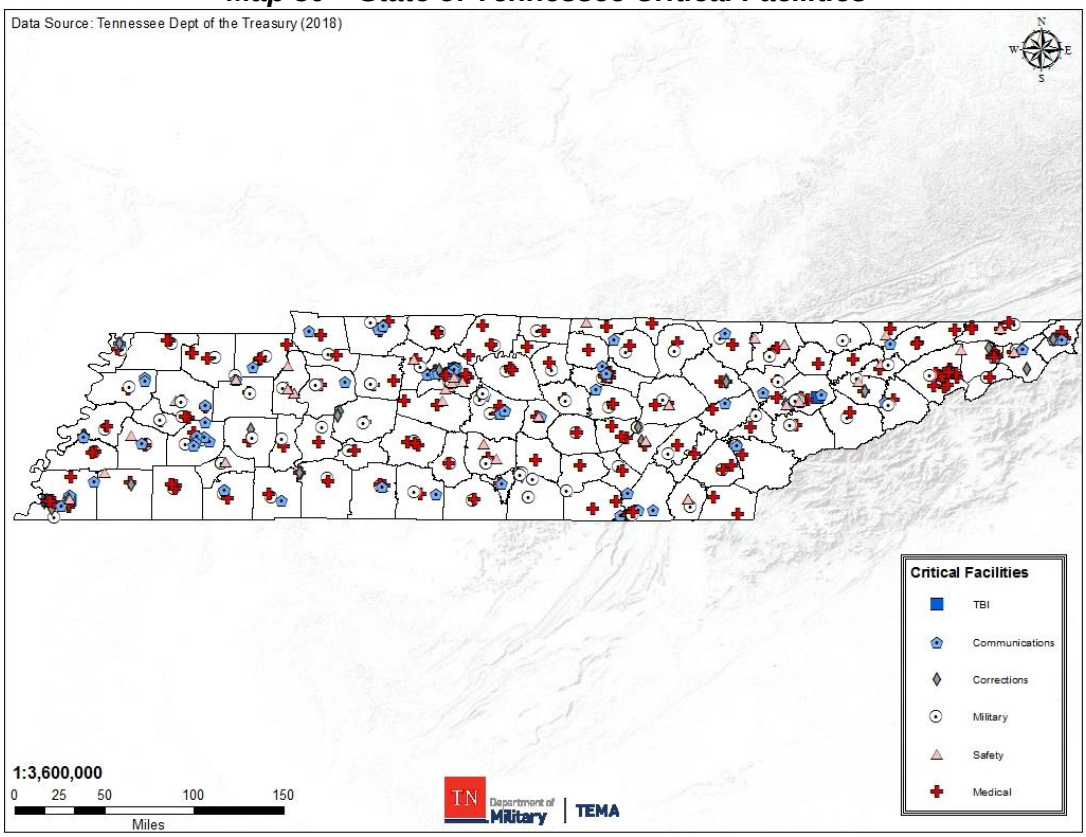
Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Thunderstorm Winds 5	96	1,206,300	$257,524,900	$28,621,700	$286,146,600
Communications	11	107,000	$18,623,000	$6,513,900	$25,136,900
Corrections	78	914,600	$207,584,600	$15,772,300	$223,356,900
Medical	1	5,000	$399,000	$0	$399,000
Military	0	0	$0	$0	$0
Safety	1	3,000	$0	$100,000	$100,000
TBI	1	40,700	$0	$5,000,000	$5,000,000
Thunderstorm Winds 6	145	2,322,300	$243,213,000	$42,621,900	$285,834,900
Communications	12	58,900	$4,453,300	$3,525,000	$7,978,300
Corrections	21	271,100	$62,162,300	$3,967,300	$66,129,600
Medical	48	673,900	$68,025,900	$5,564,800	$73,590,700
Military	43	684,700	$68,174,300	$3,555,400	$71,729,700
Safety	6	70,600	$4,000,000	$5,977,700	$9,977,700
TBI	2	148,300	$0	$16,518,200	$16,518,200
Severe Storms - Winter Storms					
Winter Storm 1	0	0	$0	$0	$0
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Winter Storm 2	6	176,400	$34,407,400	$1,164,500	$35,571,900
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	1	2,600	$400,000	$4,500	$404,500
Military	3	58,200	$9,007,400	$60,000	$9,067,400
Safety	1	12,600	$0	$100,000	$100,000
TBI	0	0	$0	$0	$0
Winter Storm 3	196	2,013,270	$371,379,100	$26,934,900	$398,314,000
Communications	17	26,000	$3,728,800	$4,668,400	$8,397,200
Corrections	107	1,215,170	$261,124,300	$9,169,900	$270,294,200
Medical	22	192,100	$20,737,200	$2,276,900	$23,014,100
Military	26	304,700	$48,181,600	$472,700	$48,654,300
Safety	10	27,100	$287,600	$4,175,000	$4,462,600
TBI	1	16,500	$0	$1,957,200	$1,957,200
Winter Storm 4	525	6,152,780	$1,025,759,500	$120,965,500	$1,146,725,000
Communications	74	341,283	$58,549,900	$22,275,400	$80,825,300
Corrections	209	2,403,000	$532,872,500	$47,744,800	$580,617,300
Medical	53	904,300	$144,859,900	$9,063,000	$153,922,900
Military	112	1,536,600	$204,856,100	$4,667,600	$209,523,700
Safety	21	106,100	$4,625,200	$9,952,700	$14,577,900
TBI	6	200,697	$0	$21,986,200	$21,986,200

Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Winter Storm 5	399	4,098,000	$643,152,800	$71,106,500	$714,259,300
Communications	31	184,900	$31,743,900	$20,382,700	$52,126,600
Corrections	188	1,716,300	$315,666,600	$29,042,300	$344,708,900
Medical	66	918,700	$105,871,500	$7,813,500	$113,685,000
Military	58	654,800	$102,958,900	$2,202,600	$105,161,500
Safety	18	18,700	$985,900	$4,025,000	$5,010,900
TBI	0	0	$0	$0	$0
Winter Storm 6	35	209,600	$29,756,000	$5,269,900	$35,025,900
Communications	10	13,800	$2,157,000	$2,829,900	$4,986,900
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	17	174,400	$27,449,000	$265,000	$27,714,000
Safety	6	13,600	$150,000	$1,925,000	$2,075,000
TBI	2	7,800	$0	$250,000	$250,000
Tornadoes					
Tornado 1	0	0	$0	$0	$0
Communications	0	0	$0	$0	$0
Corrections	0	0	$0	$0	$0
Medical	0	0	$0	$0	$0
Military	0	0	$0	$0	$0
Safety	0	0	$0	$0	$0
TBI	0	0	$0	$0	$0
Tornado 2	505	5,421,370	$925,026,500	$68,826,600	$993,853,100
Communications	32	164,700	$28,505,200	$6,494,600	$34,999,800
Corrections	298	3,067,370	$610,411,300	$38,828,000	$649,239,300
Medical	31	584,500	$61,045,900	$3,336,300	$64,382,200
Military	70	829,600	$121,780,700	$1,338,800	$123,119,500
Safety	16	28,000	$1,060,900	$4,975,000	$6,035,900
TBI	3	45,600	$0	$5,168,000	$5,168,000
Tornado 3	269	2,358,483	$448,724,800	$54,790,300	$503,515,100
Communications	47	35,883	$8,830,700	$13,295,900	$22,126,600
Corrections	91	917,900	$193,066,600	$26,645,700	$219,712,300
Medical	27	414,800	$92,643,300	$6,063,800	$98,707,100
Military	64	709,300	$117,479,000	$1,011,200	$118,490,200
Safety	16	20,000	$575,200	$4,225,000	$4,800,200
TBI	1	4,000	$0	$100,000	$100,000
Tornado 4	270	3,359,597	$528,507,900	$66,897,800	$595,405,700
Communications	43	342,600	$55,106,600	$27,056,800	$82,163,400
Corrections	79	916,300	$210,865,500	$16,122,300	$226,987,800
Medical	61	936,600	$110,717,900	$9,518,300	$120,236,200
Military	50	571,300	$89,943,100	$1,806,300	$91,749,400
Safety	17	93,500	$412,600	$7,602,700	$8,015,300
TBI	2	10,597	$0	$450,000	$450,000

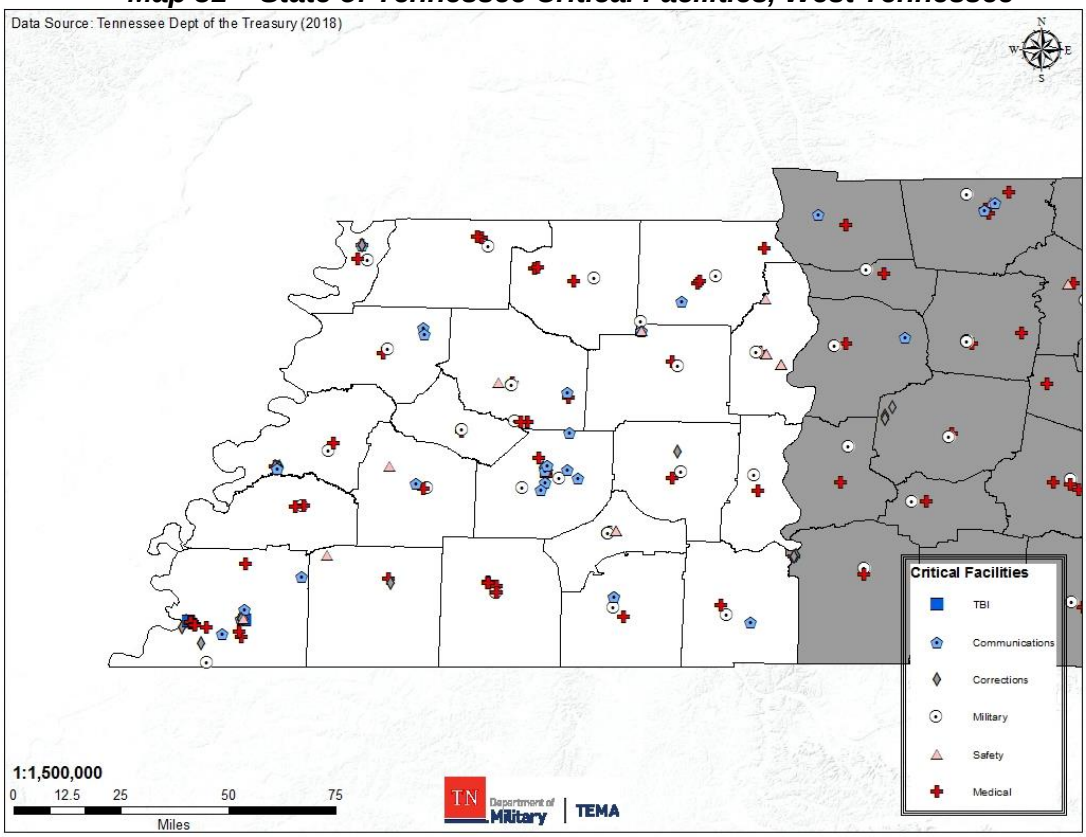
Hazard Threat Zone	Structure Count	Size (Sq. Ft.)	Structure Value	Content Value	Total Value
Tornado 5	107	1,308,000	$164,864,500	$33,043,000	$197,907,500
Communications	8	1,200	$987,000	$2,650,000	$3,637,000
Corrections	36	432,900	$95,320,000	$4,361,000	$99,681,000
Medical	22	79,200	$7,061,500	$235,000	$7,296,500
Military	27	555,700	$54,069,200	$3,391,600	$57,460,800
Safety	6	24,000	$4,000,000	$3,275,000	$7,275,000
TBI	3	164,800	$0	$18,475,400	$18,475,400
Tornado 6	10	202,600	$37,331,100	$1,883,600	$39,214,700
Communications	2	21,600	$2,750,100	$659,100	$3,409,200
Corrections	0	0	$0	$0	$0
Medical	1	2,600	$400,000	$4,500	$404,500
Military	5	62,800	$9,181,000	$120,000	$9,301,000
Safety	1	12,600	$0	$100,000	$100,000
TBI	0	0	$0	$0	$0
Wildfires					
Wildfire (WUI)	385	3,927,570	$708,071,500	$53,314,700	$761,386,200
Communications	44	152,400	$28,791,400	$9,033,400	$37,824,800
Corrections	242	2,405,670	$453,995,000	$30,296,000	$484,291,000
Medical	29	726,900	$126,071,400	$8,570,200	$134,641,600
Military	57	626,200	$98,552,800	$1,015,100	$99,567,900
Safety	13	16,400	$660,900	$4,400,000	$5,060,900
TBI	0	0	$0	$0	$0

**The compiled data are from the Tennessee Department of the Treasury.*

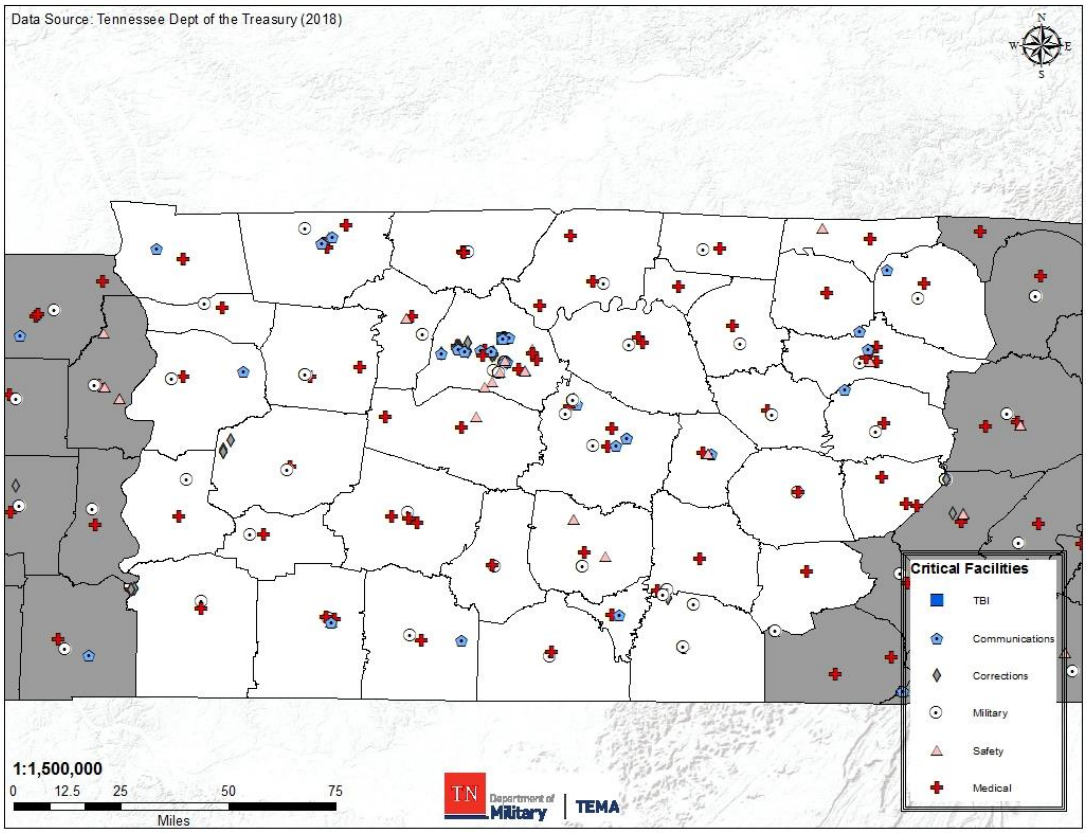
Map 30 – State of Tennessee Critical Facilities



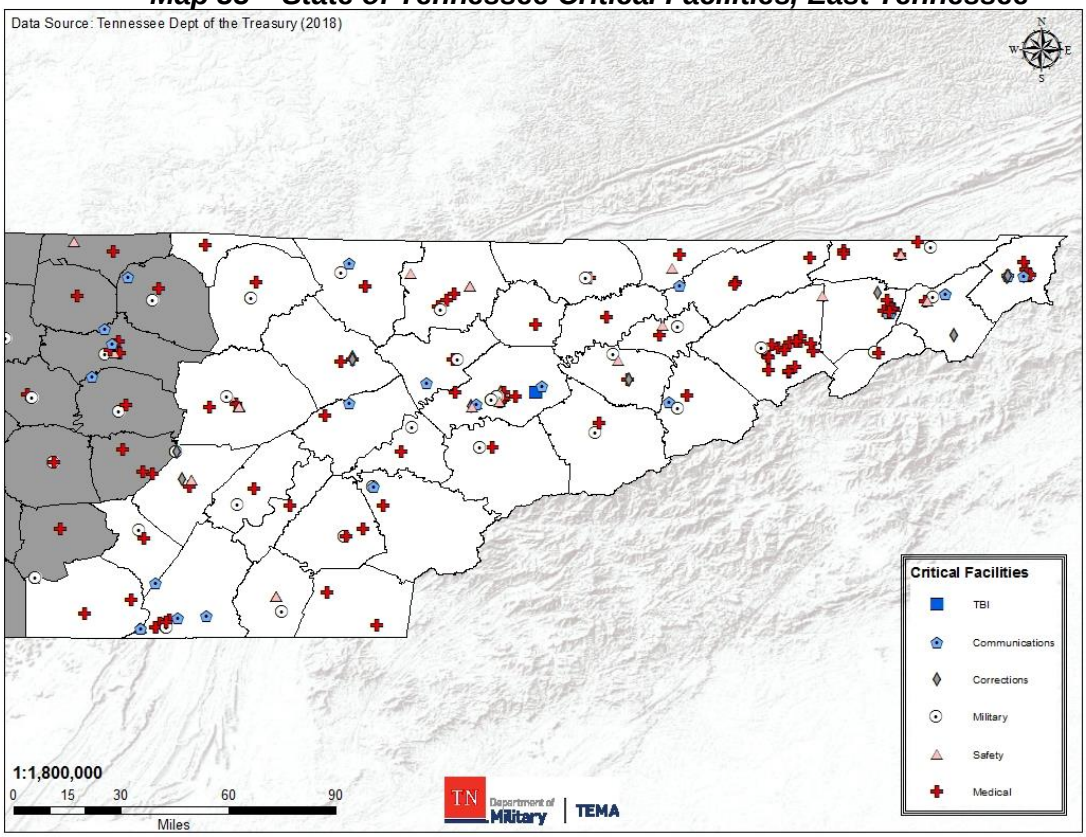
Map 31 – State of Tennessee Critical Facilities, West Tennessee



Map 32 – State of Tennessee Critical Facilities, Middle Tennessee



Map 33 – State of Tennessee Critical Facilities, East Tennessee



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TEMP Review- TN Department of Children Services **11 Jan 2018**

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Krissy Hurley	12/11/17	NWS Nashville	615-754-8502 901-653-6385	Krissy.Hurley@noaa.gov
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TEMP Review- TN Department of Safety- THP **20 Feb 2018**

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Name	Date	Agency/Department	Phone Number	E-Mail
Larry Hitchcock	2-20	THP	615 347 7539	larry.hitchcock@tn.gov
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TEMP Review- TN Department of Environment and Conservation **05 Jan 2018**

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Joshua Case	1/5/18	TEMA	615 428 8923	Joshua.Case@tn.gov
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TEMP ESF Review- TN Department of Environment and Conservation Meeting #2 **2 Mar 2018**

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Name	Date	Agency/Department	Phone Number	E-Mail
Lyle Bentley	3/2/18	TDEC - DWR	615-532-0154	Lyle.Bentley@tn.gov
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Barry Brawley	3/2/18	TDEC OES	615-521-4397	barry.brawley@tn.gov
Ben Bolton	3/2/18	TDEC - OEP	615-741-2994	BEN.BOLTON@TN.GOV
Chad Kimes	3/2/18	TDEC - OEP	615-253-3676	chad.kimes@tn.gov
Josh Wickham	3/2/18	TEMA	615-815-8055	joshua.wickham@tn.gov
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TEMP Review- TN Department of Transportation **11 Jan 2018**

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Josh Wickham	1/11/18	TEMA	615-815-8055	joshua.wickham@tn.gov

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Name	Date	Agency/Department	Phone Number	E-Mail
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Sean McAteer	2/26/18	TEMA	615 961 7024	Sean.mcateer@tn.gov
Josh Wickham	2/26/18	TEMA	615-815-8055	joshua.wickham@tn.gov

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Ronald Murphy	2/22/18	TDA	615 837 5153	ronald.murphy@tn.gov
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TEMP ESF Review- TN Department of Economic & Community Development **1 Mar 2018**

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TEMP ESF Review- TN Department of Education **1 Mar 2018**

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Name	Date	Agency/Department	Phone Number	E-Mail
Brenna Moose	3/1/18	Education	(423) 716-1841	brenna.robinson2@tn.gov
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TEMP Review- TN Department of Finance and Administration **19 Jan 2018**

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TEMP Review- TN Department of Finance and Administration- STS **27 Feb 2018**

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TEMP Review- TN Department of Financial Institutions **28 Feb 2018**

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Joshua Cook	2/28/18	TEMA	615-468-8923	Joshua.Cook@tn.gov
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Leslie Yanez	2-28-18	TDFI	615-290-0422	leslie.yanez@tn.gov
Josh Wickham	2/28/18	TEMA	615-815-8055	joshua.wickham@tn.gov

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TEMP Review- TN Department of General Services 30 ~~29~~ Jan 2018

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	Name	Date	Agency/Department	Phone Number	E-Mail
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	Sean McAleer	1/30/18	TEMA	6159617024	sean.mcaleer@tn.gov
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	Josh Wickham	1/30/18	TEMA	615-815-9055	joshua.wickham@tn.gov

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Name	Date	Agency/Department	Phone Number	E-Mail
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TEMP Review- TN Department of Safety- Homeland Security; TBI- TN Fusion Center **21 Feb 2018**

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TEMP Review- TN Department of Revenue **03 April 2018**

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Josh Wickham	2-23-18	TEMA	615-815-8055	joshua.wickham@tn.gov

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TEMP ESF Review- TN Department of Tourist Development **6 Mar 2018**

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Tami Giles	3-6-18	Tourism	615-5[illegible]6-1061	Tami.Giles @tn.gov
Michael Ross	3/6/18	Tourism	931-449-0891	Michael.Ross@ tn.gov

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Kenneth Reeves	12-19-17	Goodlettsville	615-347-3699	kreeves@goodlettsville.gov
Mark Foulks	12-19-17	Murfreesboro Fire Rescue	615-893 1422	mfoulks@murfreesborotn.gov

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Josh Wickham	2/26/18	TEMA	615-815-8055	joshua.wickham@tn.gov

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TEMP Review- TN Wildlife Resources Agency **02 April 2018**

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Tennessee Emergency Management Agency, Planning and Exercise Branch

TN Department of Military TEMA

Sign-in Sheet:

TEMP Review- TN Department of Finance and Admin- Volunteer TN **27 Feb 2018**

SIGN-IN SHEET

(PLEASE PRINT CLEARLY)

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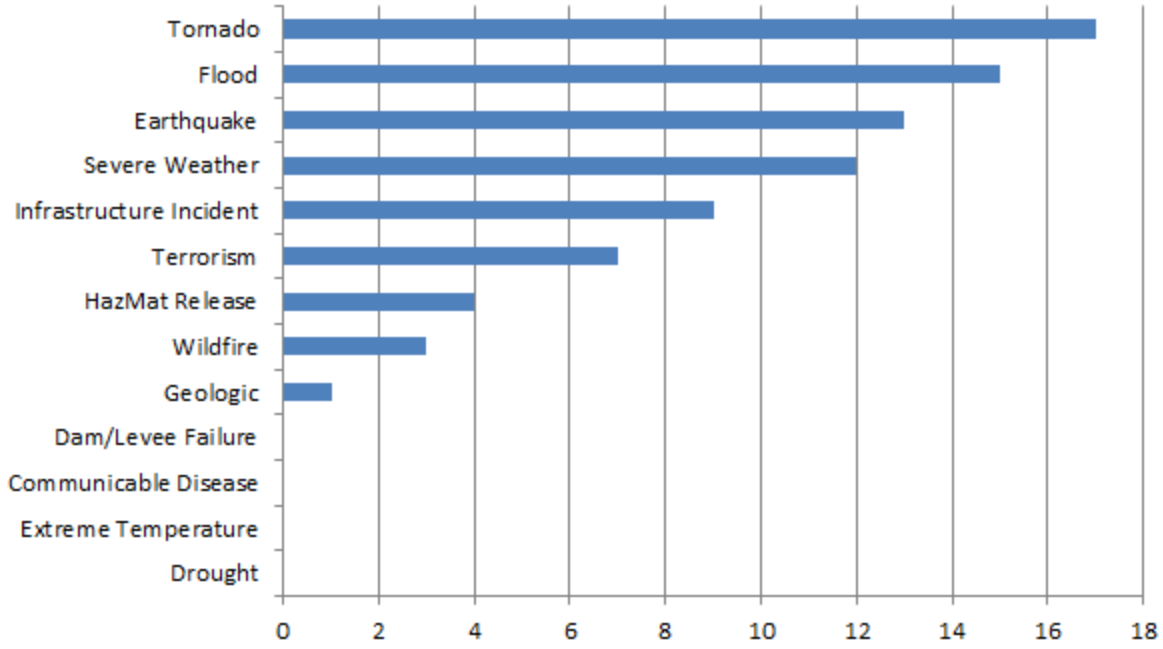
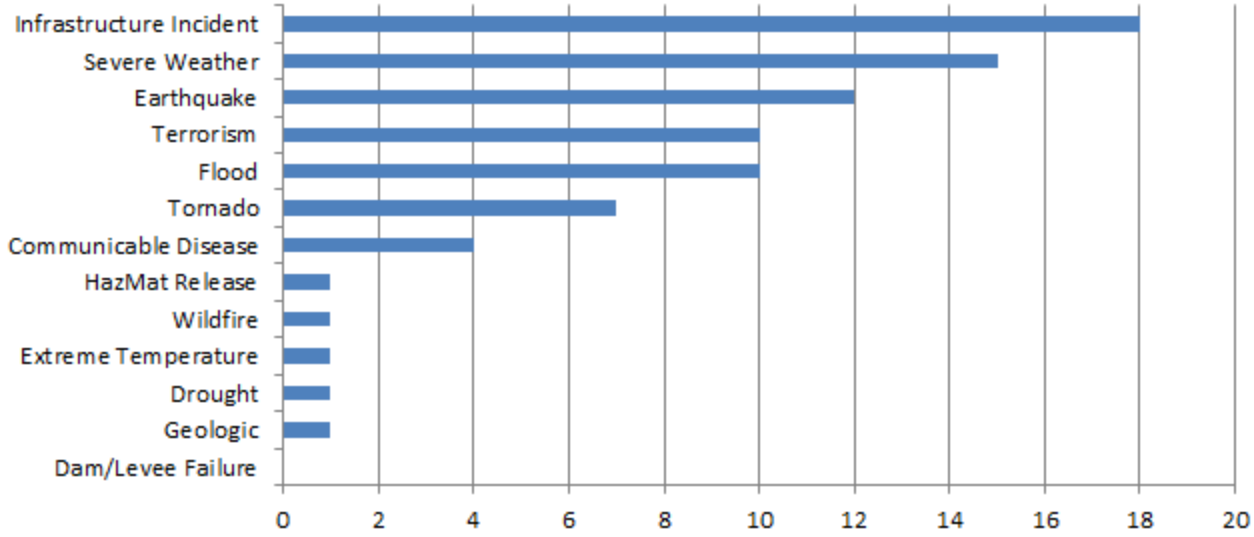
Appendix 5 – Partner Feedback

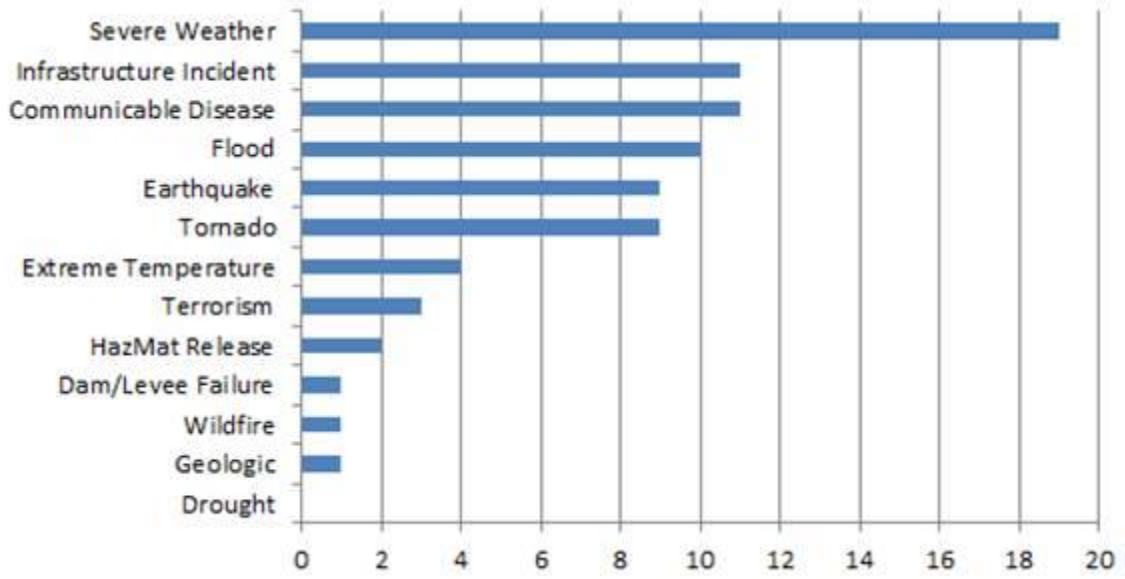
1. Identify the top 3 hazards that could most impact your organization's facilities/property/infrastructure



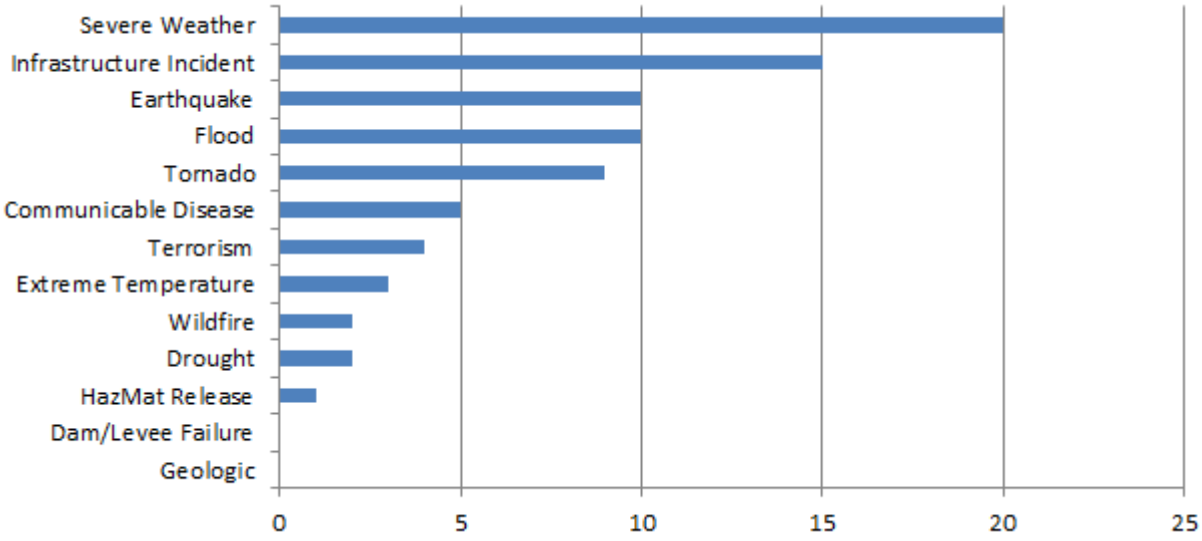
2. Identify the top 3 hazards that could most impact your organization's delivery of services



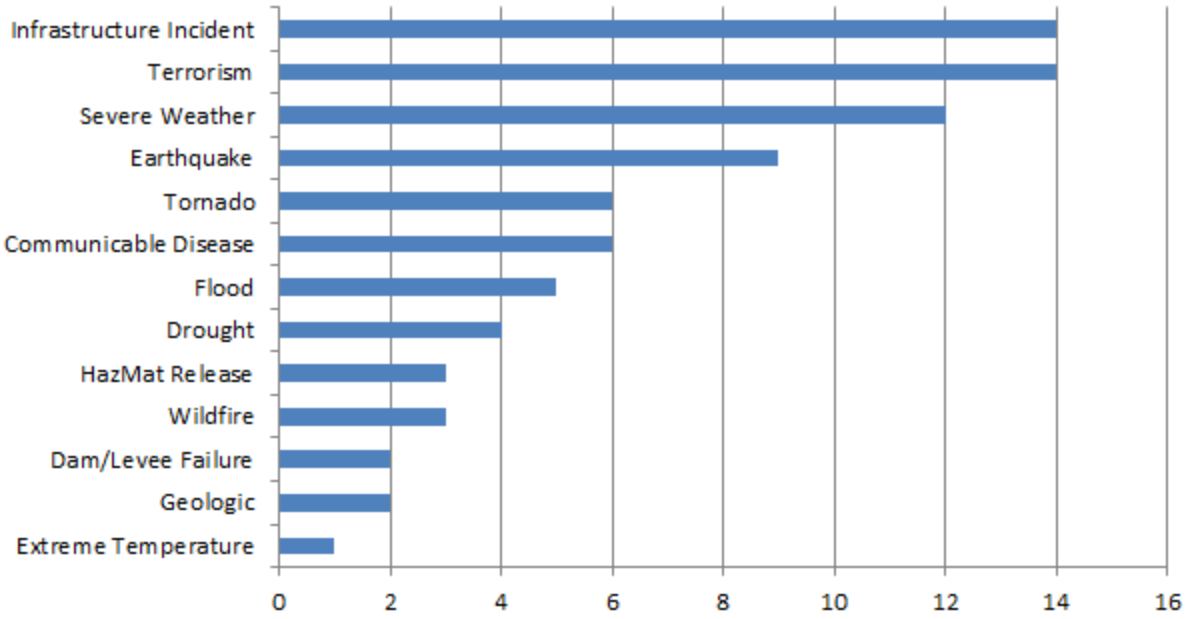
3. Identify the top 3 hazards that could most impact your organization's emergency support employees



4. Identify the top 3 hazards that could most impact your organization's primary customers



5. Identify the top 3 hazards that could most test your organization's public image



1	National Weather Service
2	TN Dept. of Commerce & Insurance
3	TN Fire Chiefs Association
4	TN Dept. of Environment & Conservation
5	TN Dept. of Transportation
6	TN Dept. of Children Services
7	TN Dept. of Health
8	TN Dept. of Finance & Administration
9	TN Dept. of General Services
10	TN Dept. of Safety- Tennessee Highway Patrol
11	TN Dept. of Safety- Homeland Security & Fusion Center
12	TN Dept. of Mental Health & Substance Abuse
13	TN Dept. of Labor & Workforce Development
14	TN Dept. of Agriculture
15	TN Dept. of Human Services
16	TN Dept. of Military- National Guard
17	Volunteer Organizations Active in Disasters
18	Volunteer TN
19	Strategic Technology Solutions
20	TN Dept. of Financial Institutions
21	TN Dept. of Correction
22	TN Dept. of Education
23	TN Dept. of Economic & Community Development
24	TN Dept. of Human Resources
25	TN Dept. of Tourist Development
26	TN Wildlife Resources Agency
27	TN Dept. of Revenue
28	TN Div. of Forestry
29	TN Dept. of Veteran Services
30	TN Dept. of Intellectual & Developmental Disabilities
31	American Red Cross

Appendix 6 – EMAP HIRA Analysis

Hazard	Category	Impact Description
Drought	**Public**	The health and safety of persons affected by drought and severe temperatures will vary greatly depending on the severity of the drought. Populations affected by drought are dependent on the amount of moisture deficiency, length of event, and the extent of the impacted area. Droughts occur over a period of days or even months and are by definition a prolonged event. Depending upon the length of the drought, those exposed have the potential to experience a myriad of health and safety concerns. During a drought, individuals will experience moderate to severe shortages in water supply, leading to dehydration and other health Dehydration is most dangerous for infants, children, and older adults. Continued exposure to drought will increase the risk of injury and health deterioration, leading to increased fatalities. While droughts can have devastating consequences, there are methods to help prepare the public through education, and water conservation techniques. Technological advances in climate prediction and information systems developed by NOAA and the NWS assist individuals and communities by providing advanced warning and knowledge.
Drought	**Responders**	Although drought should pose little threat to properly equipped and trained emergency responders, TEMA and other personnel involved in an incident should observe life safety and health standards and practices. Responders are trained to the level necessary to respond in a safe and efficient manner with scene safety being the number 1 priority. Personnel responding will utilize intelligence gathered from local responders to properly address any hazards that may pose a threat. The most likely hazards encountered when responding to a drought situation are dehydration and other exposure-related illnesses.
Drought	**Continuity of Operations**	During a drought, critical infrastructure, essential functions, and other areas necessary for the state and its various departments to function and respond efficiently could be compromised. Additionally, cascading events, such as wildfires, power outages, and water shortages, may accompany droughts, putting added pressure on the state to address the needs of its citizens and facilities. Various departments may require activation of their COOP to remain functional. These departments perform various functions, from maintaining the state's environmental safety, to providing for the health and safety needs of adults and children.

Drought	**Property, Facilities, Infrastructure**	Droughts may cause severe impacts to property, facilities, and infrastructure. Water supplies will run low and pipes may crack due to increased use when water is restored or permitted for use, making hydration from readily available, clean water difficult. The cost of new water resources can be high. As temperatures increase, so does the demand for energy. Increased energy demands can lead to power outages and higher prices, as more expensive fuels are substituted for power. Roadways and bridges may become impassable due to fractured surfaces or landslides. Transportation infrastructure will also be impacted in the waters as streams, rivers, and canals become impossible to navigate. As the number of individuals affected by the drought increases, shelters and hospitals may become overcrowded and unable to handle the influx.
Drought	**Environment**	In the larger picture, drought may have a negligible impact on the environment. Both plants and animals depend on water to sustain life. Fish and other marine life are highly susceptible as droughts lead to increased water temperatures and decreased dissolved oxygen levels in lakes, ponds, rivers, and streams. The salt concentration and pH levels may also shift, hurting both fish and local wildlife. Crowding, stress, and even death may occur among the wildlife. Decreases in drinking water and food will negatively impact wildlife, as they begin to expand their movements, often resulting in dangerous human-wildlife encounters. Additionally, severe drought conditions will eventually lead to starvation, reductions in wildlife reproduction, and disease. Plants face secondary hazards associated with drought, such as “tinder box” conditions. These may develop in forests, etc. resulting in scattered wildfires, which wreak havoc on surrounding communities, timber, and other resources. Polluted water and diminished soil quality may hinder the growth of plant life. Insect infestations can also increase with drought. Depending on the catalyst for the drought, severe heat may result in poorer air quality days and dangerous air quality in non-attainment zones in the state, as the level of dust and other pollutants increases.

Drought	**Economic Condition**	The economic and financial impacts of drought are largely based on the impacted areas and the magnitude/duration of the event. Tennessee is home to a large agricultural, swine, and cattle industry. Since agriculture is the largest consumer of water, if the industry is impacted by drought, the economic and financial repercussions would be severe. Plants are extremely susceptible to drought; lack of water and nutrients increases the likelihood of insects and disease, and reduces the survival of perennial crops. The quantity and quality of crops is also affected, resulting in increased prices to the consumer and decreased revenue for farmers. Ranchers face similar hardships, as damage to grazing lands forces them to increase supplemental feeding, lease available lands, and/or reduce the amount of livestock. When such alternatives are not available, ranchers may be forced to sell off livestock in unfavorable market conditions. Other costs and losses resulting from drought include a potential reduction in milk production, disruption of reproductive cycles, and higher livestock mortality rates. Previous droughts have cost billions of dollars in damages and revenue losses to farmers and ranchers alike. The economic impact of drought cascades into indirect impacts beyond farms and ranches. Industries directly dependent upon agricultural production may see steep financial losses. An inability to provide water transportation may prove devastating to businesses that rely on transportation for their goods. Seasonal unemployment rates could increase, due to the lack of agricultural production.
Drought	**Public Confidence in Governance**	Droughts can shake public confidence in government if services become limited for an extended period of time. Delayed or limited services can lead to frustration, and government entities can become the focal point. Additionally, businesses affected through measures such as water usage limits may become frustrated.

Hazard	**Category**	**Impact Description**

Earthquake	**Public**	The health and safety of persons will vary greatly depending on a number of earthquake conditions. Populations affected by earthquakes are dependent on the magnitude of the event, the proximity to the epicenter, soil conditions, and structure materials. Depending on these factors, earthquakes can cause no harm or can cause the death of thousands. Injuries and deaths are most often caused as a result of the falling debris, including collapsing walls and flying glass. Secondary effects can develop, such as fires and landslides. Those living in and around mountainous areas, unstable slopes, and cliffs are at risk to injuries resulting from landslides. Individuals may be at risk of carbon monoxide exposure from damaged pipes, and parasites resulting from compromised water sources. In addition to the initial earthquake, aftershocks can often follow, occurring minutes, days, weeks, and even months afterwards. In many cases, they can be of equal magnitude to the original event, and can increase injuries and death in areas already impacted.
Earthquake	**Responders**	Personnel responding to earthquakes have the potential to be seriously injured, facing health and safety hazards throughout the incident. The most likely hazards encountered when responding to an earthquake event would be structural instability and broken/fractured power and natural gas lines. Debris, including broken glass, will also make it difficult for emergency personnel to assist the injured and trapped. The structural instability of buildings will make it difficult to reach those trapped inside, and personnel responding may become trapped themselves. Emergency responders may injure themselves on glass, falling debris from unstable structures, electrocute themselves on broken power lines, and or become exposed to toxic chemicals and gases, causing mild to severe injuries and/or death.

Earthquake	**Continuity of Operations**	During an earthquake, critical infrastructure, essential functions, and other areas necessary for the state and its various departments to function and respond efficiently are likely to become compromised. Additionally, cascading events, such as power outages, may accompany earthquakes, putting added pressure on the state to address the needs of its citizens. Earthquakes in the State of Tennessee may result in minimal to major effects on public service(s). Business, infrastructure, vehicles, roadways, railways, water transportation, and communications may be significantly impacted or devastated as a result. Interruptions to vehicles and roadways will make it difficult for police and fireman to respond to emergency calls. Public transportation may also be interrupted. Damage to business and communication may delay healthcare services. Depending upon the magnitude of the earthquake, public housing could face significant structural damage, requiring temporary and/or permanent relocation of residents. The capacities for both waste management and water supply could be compromised, making it difficult for residents to have access to safe drinking water.
Earthquake	**Property, Facilities, Infrastructure**	The impact a building sustains is dependent upon both the magnitude of the earthquake, and the building's age and construction. Mobile homes and homes not connected to their foundations are at increased risk from earthquake damage. Buildings whose foundations are over landfills or other unstable soils are also at an increased risk of damage. Roadways may become impassable due to debris or fractured surfaces. Power lines may be down in some areas, natural gas lines may have leaks, and sewer and water lines may be damaged. An interruption in transportation, communication, and fuel supply are also possible.
Earthquake	**Environment**	Earthquakes may have a marginal to large impact on the environment. They have the potential to result in major geologic metamorphoses, such as the New Madrid Earthquake of 1811/12 and the creation of Reel Foot Lake. Collateral events such as hazardous material (HAZMAT) spills, ruptured product lines, and contamination of water supplies could also result in long-term impacts on the environment. Soil can become poisoned and plants damaged. Air quality may also be compromised as dust, chemical spills, and gas permeates the area.

Earthquake	**Economic Condition**	There are 4 major urban centers in the State of Tennessee: Memphis, Nashville, Chattanooga, and Knoxville. If any of these major urban areas were subjected to an earthquake, the economic and financial repercussions would be severe. Interruptions in transportation and fuel supply can cripple commerce across the state. Property damage and repairs could reach into the millions of dollars. In addition, businesses may lose revenue and face relocation from damages caused by the earthquake. The economic impact of an earthquake can be felt in less urbanized areas as well. Harvests, livestock, and other agricultural infrastructure are at risk. Crops could be damaged or lost if irrigation systems are damaged or destroyed. These impacts on the agriculture would be financially devastating to farmers, and result in a shortage for consumers.
Earthquake	**Public Confidence in Governance**	Earthquakes can shake public confidence if there is a perception that more could have been done to prepare for or prevent against damages. Additionally, government actions immediately following an earthquake can affect public confidence if interpreted as the wrong decision. Recovery can be costly and time consuming, which will cause both public and media attention.

Hazard	**Category**	**Impact Description**

Extreme Temperature	**Public**	The health and safety of persons affected by extreme temperatures will vary, depending on the length and severity of the temperature condition. Both extreme heat and extreme cold can negatively impact individuals in the affected area. Tennessee is known to have temperatures well over 100 degrees in summer months, and as low as 20 degrees below zero in the winter. Historically, such extreme temperature events have been credited with numerous injuries and fatalities. Children, people with disabilities, and the elderly are especially susceptible to the effects of extreme temperatures. Heat is the number 1 weather-related killer in the U.S. There are a number of health complications that can be associated with prolonged exposure to extreme heat. The stagnant atmospheric conditions and poor air quality that accompany extreme heat can put individuals at risk of developing a heat disorder, as the body becomes unable to circulate and/or sweats too much. Heat disorders can lead to serious health complications, such as heat cramps, heat exhaustion, and heat strokes. Sunburn from excessive exposure to ultraviolet radiation may also restrict the skin's ability to dispose of the heat and this may cause burns. Individuals living in urbanized areas are at a greater risk than those in rural areas due in part to the overheated asphalt and concrete. Similarly, extreme cold can impact individuals' health and safety. Wet areas may freeze, making driving dangerous. Continued exposure to extreme cold can result in serious health complications in those unable to generate body heat, such as hypothermia, as well as carbon monoxide poisoning from the use of space heaters and fireplaces.
Extreme Temperature	**Responders**	As with individuals in the area at the time of an incident, personnel responding to extreme temperature events face personal health and safety risks. While several risks are possible, the most likely hazards encountered when responding to an extreme temperature situation will be heat exhaustion, frostbite, and dehydration. Extreme heat can also result in heat stroke for responders assisting individuals outside or in non-air conditioned buildings. Responding to individuals impacted by extreme cold could also prove difficult if streets are iced over.

Extreme Temperature	**Continuity of Operations**	During extreme temperature events, it is important that critical infrastructure, essential functions, and other areas necessary for the state and its various departments to function and respond be maintained. These essential functions may become compromised, either from extreme temperatures, or from cascading events. Wildfires, power outages, and water shortages, may accompany extreme temperatures, placing added pressure on the state to address the needs of its citizens. Extreme temperatures in the State of Tennessee would likely result in only a minimal effect on public services. As the demand for heat or air conditioning increases, brownouts or blackouts are likely to occur, lasting for days or weeks. These power outages will make communication difficult, and impact the abilities of hospitals to provide for healthcare needs. Loss of power, when combined with temperature and the inability to operate medical equipment can become life threatening. Frozen or damaged roadways and bridges will make it difficult for police and fireman to respond to emergency calls. Public transportation may also be temporarily interrupted. The capacities for both waste management and water supply may be compromised, making it difficult for residents to have access to safe drinking water.
Extreme Temperature	**Property, Facilities, Infrastructure**	Both extreme heat and extreme cold can impact property, facilities, and infrastructure. Power outages may occur as people use more heat or air conditioning during extreme temperatures. Hospitals, nursing homes, shelters, and schools could suffer significantly if power is lost, rendering them incapable of providing necessary services. Communication systems may be impacted as well if a brownout or blackout occurs. Extreme heating of asphalt and concrete can produce what is called the “urban heat island effect”. Extreme cold may freeze water pipes, reducing the availability of drinking water. Frozen roads and bridges may make travel difficult or impossible. The same is true during extreme heat, when roadways and bridges may develop fractured surfaces.
Extreme Temperature	**Environment**	Extreme heat can lead to droughts, which kills grass, trees, and disrupts wildlife; prolonged heat and the accompanying drought can also cause soil to dry and loosen, spreading across the state by windstorms, such as those during the Dust Bowl. Low dissolved oxygen levels in lakes and ponds may have devastating impacts on marine life populations. In extreme heat, dry conditions increase the risk of wildfires. Prolonged periods of extreme heat may result in days of poorer and potentially dangerous air quality in the more urbanized zones in the state.

Extreme Temperature	**Economic Condition**	The economic and financial impacts of severe heat are largely based on the impacted areas and damage. Tennessee is home to a large agricultural, swine, and cattle industry. If this industry is impacted by prolonged temperature extremes, the economic and financial repercussions could be severe. Extreme heat will make it difficult to grow crops, as well as ensure the health and safety of swine and cattle. Damages to the state's agricultural economy can span into the millions, compromising crop yield and affecting the price of goods. Milk and cattle production decreases in extreme heat events. Damages done to transportation and energy may also impact the state's economic condition with costly repairs, relocation of services, and loss in revenue from decreased commerce. Cold temperatures can have devastating effects on trees and winter crops. Frost and freeze have the potential to impact other crops early or late in the growing season. Livestock can be impacted by prolonged cold snaps if not properly protected from severe temperatures. These hazards can weigh heavily on farmers, costing them in reduced crop yield and revenue.
Extreme Temperature	**Public Confidence in Governance**	Depending upon the length and extent of an extreme temperature event, recovery may last a few weeks, months, or years. The State of Tennessee has a large agricultural, swine, and cattle industry that will have significant difficulties recovering from extreme temperatures. Other areas of the state may take significant time as well. Recovery efforts will require government, private, and non-profit organizations to work together in rebuilding the areas affected. Such efforts should include the implementation of plans that prioritize the needs of the communities most affected, moving down to less significant services as the process unfolds. Personal lives will have been impacted by the devastating effects of extreme temperatures as well, requiring resources that focus more on the individual, such as medical supplies.

Hazard	**Category**	**Impact Description**

Flood	**Public**	Flooding is considered a major area of concern to the state. Populations affected by floods are dependent on terrain, and the type of flood. Overall, any area is susceptible to flooding; however, low-lying and urban areas have the potential to be severely impacted. Riverine floods develop with warning, allowing individuals some time to react and minimize the physical impact on residents. Flash floods, however, come without warning, leaving little, if any, time to react. In general, floods pose extreme hazards to individuals in vehicles, who may lose control, become trapped inside, and be washed away. Additionally, lack of visibility during a flood may cause drivers to become stranded or trapped when the roadbed has been washed out under the water. There is the potential for electrical fires and sewage backup in high-risk areas. Water sources contaminated by oils or sewage create large impacts on the community's health and availability of drinking water. Ingesting food that has come in contact with floodwater is also hazardous. Further sewage and chemical spills onto living surfaces pose serious health hazards. Damaged gas lines may cause explosions and/or exposure to harmful carbon monoxide. Mold may develop after the floodwaters recede, overwhelming individuals with compromised respiratory systems.
Flood	**Responders**	The potential for responding personnel to be affected by an event will be hazard specific. Rushing waters from flash flooding may sweep responders and emergency vehicles away. Weakened levies may burst, sending a surge of water toward responders and compromising rescue missions. Rescue efforts may also be hindered by damaged foundations and collapsed buildings.

Flood	**Continuity of Operations**	During a flood, critical infrastructure, essential functions, and other areas necessary for the state and its various departments to function and respond efficiently may become compromised. Additionally, cascading events, such as sewage leaks and water contamination, may accompany floods, putting added pressure on the state to address the needs of its citizens. Floods can greatly impact public services. Roadways may become impassible and dangerous to vehicles, making it difficult for personnel to respond throughout the incident. Highways and bridges may be significantly damaged, temporarily halting transportation services, including public and emergency transportation. Power outages are common, making it difficult to access documents, vital records, and logistics command and control. Such brownouts or blackouts may make a simple relocation of services impossible. Waste management and water supply could also be temporarily out of order. Floodwaters can cause damage to the waste water system, and may contaminate the general water supply. Depending on the severity of the flood, potable water may be distributed to offset this obstacle. Railways and water transports, which could be used to deliver resources for response and recovery efforts, may become incapacitated by the flooding, prolonging emergency operations. Communications may be significantly impacted; emergency personnel may find it difficult or impossible to contact incident command and others in the field. In addition, 9-1-1 centers may become overwhelmed with calls, paralyzing these critical services.
Flood	**Property, Facilities, Infrastructure**	Both riverine and flash floods can pose significant damage to property, facilities, and infrastructure. Drainage systems may become clogged during torrential rains, placing low-lying and urban areas at risk of flash floods. Damage to property, facilities, and infrastructure may also depend upon new construction and development, which can alter the natural drainage and create new flood risks. In addition, flash floods may roll boulders and tear down trees, plowing into buildings and destroying bridges. The foundations of buildings may become compromised, requiring repairs and relocation of whatever services it housed. Jurisdictions affected by the flood may face water shortages, as drinking water may have come in contact with sewage and other hazardous liquids. Potable water, wastewater treatment, telecommunications, and reinstatement of electricity are among the items that will require immediate attention. These endeavors may prove costly in time, manpower, and finances.

Flood	**Environment**	Floods may have a marginal to a devastating impact on the environment. Flooding may occur any time of the year and may leave miles of property contaminated with materials that precludes habitability. Standing water may develop, and remain after the flood recedes. Standing water is a breeding ground for mosquitos, which may carry harmful diseases. As floodwaters rise, overflowing creeks and rivers, they destroy habitats. Wild animals, including poisonous snakes, may seek refuge in homes and other buildings, risking dangerous encounters with people. Trees and other plants may become choked by the over-soaked soil and die. In addition, natural drinking water sources may become contaminated with sewage, causing wild animals to become sick and/or die off. Some of these effects can develop into long-term impacts for months or years to come.
Flood	**Economic Condition**	Depending upon the type and severity of the flood, there can be significant economic and financial impacts. Tennessee has numerous large industries, including nuclear power, chemical plants, livestock farms, crop farming and pipeline industries that could greatly impact the economic and financial condition of the state if destroyed. Severe flooding may drown out farmland, making it unworkable and preventing both the harvest of current crops and future planting. Without this crop yield, farmers will lose significant revenue. Floodwaters can contaminate drinking water and food for livestock, leaving them without nourishment. Over soaked grounds may pose hazardous for the nuclear power and chemical plants , as well as underground pipelines. The state's tourism may also decline, resulting in revenue losses for local businesses as well.
Flood	**Public Confidence in Governance**	Flooding can drastically affect public confidence in government. Past events in the state of Tennessee mean that many members of the public have memories of previous incidents. If flooding occurs in repeat areas, or if members of the public believe that more preventative measures could have been taken, dissatisfaction and frustration will be likely. Recovery from a flood event can be costly and time consuming, and the public will become frustrated if action seems delayed or incorrect.

Hazard	**Category**	**Impact Description**

Geologic	**Public**	There are several different geological threats that may impact the health and safety of Tennessee residents. Sinkholes may develop at any time , threatening lives and trapping people within the holes. While infrequent, landslides are more likely to occur, and bring with them their own hazards. Because they may happen without warning, landslides may kill and/or trap people suddenly. They may also damage utility lines and gas mains, putting residents at risk of electrical fires, carbon monoxide poisoning, and explosions. Geologic events vary in degree of severity. Regarding sinkholes, once an incident has occurred, barring any injury or death that requires intervention, the known collapse site is avoided. Landslides, however, may require a different approach, as both the potential and risk for injury and/or death is greater. Educating the public on these hazards, including potential warning signs may limit the devastation. In addition, such education will provide individuals with an understanding of how to respond once a sinkhole or landslide has occurred.
Geologic	**Responders**	The hazards faced by personnel will depend on the event they are responding to. The most likely hazards encountered when responding to a geologic event would be sub-surface or sub-strata instability. Sinkholes may continue to grow in both depth and circumference after the initial collapse, threatening the safety of those responding. Roadways may become blocked by landslides, making it difficult for first responders to reach the injured and trapped. Personnel responding to the incident may become injured themselves on any debris found in the area. In addition, any chemicals that may have leaked and/or gas pipes that may have broken can produce toxic fumes and possible explosions.
Geologic	**Continuity of Operations**	During a geologic event, critical infrastructure, essential functions, and other areas necessary for the state and its various departments to function and respond efficiently may become compromised. Additionally, cascading events, such as power outages and water shortages, may develop, putting added pressure on the state to address the needs of its citizens. Most often, geologic events have resulted in alternate routing or the succession of state provided services. It is possible that geologic events may cause damage to water, sewage, and gas lines. Such damage would make it difficult to provide individuals with safe drinking water. Power lines might also be damaged, temporarily putting communities without power and making it difficult to maintain public services.

Geologic	**Property, Facilities, Infrastructure**	Geologic events may pose a threat to property, facilities, and infrastructure within the State of Tennessee. Sinkholes may occur beneath property, demolishing all or part of the building; they may also appear in the middle of a roadway, cutting off transportation routes. They may be caused by human modifications of land, and can cause significant damage to roadways. The foundation of buildings may weaken. In addition, water may become contaminated, gas may leak, and power lines may break. Expansive soils may over time damage the foundations and weaken the overall stability of a structure. Expansive soils, almost exclusively clay formations, exist sparingly throughout the state, but not in large areas. It takes many years or even decades for expansive soils to damage a structure to the point where it is not safe to inhabit. Additionally, when such a situation occurs the damage is physically obvious and easily identifiable.
Geologic	**Environment**	Geologic events can result in profound impacts, both lasting and temporary, on the environment. Landslides can alter the paths of rivers and streams creating serious impacts on water tables. They may grow in size as they travel, pulling down trees and boulders along the way. Damaged ground and land erosion can alter the topography in such a way that flood plains are altered.
Geologic	**Economic Condition**	The economic and financial impacts of geologic events are largely based on the conditions of the impacted area and the magnitude of the event. Costly damage, such as cracked or destroyed foundations may also be done to business establishments and private homes. Costly repairs to utility lines and power lines may also impact the state.
Geologic	**Public Confidence in Governance**	Depending upon the scope of a geologic event, public confidence in governance could be affected, especially at more local levels. Since the majority of geologic events have impacts that do not affect the entire state, local jurisdictions will need to respond quickly in order to return the area to normalcy. Geologic events that impact roads, personal property, or businesses, can lead to frustration towards the government if the public perception is that necessary action is not taken or is too slow.

Hazard	**Category**	**Impact Description**

Severe Storm	**Public**	The health and safety of persons affected by severe storms will vary. Historical data suggests that severe storms have the potential of causing minimal to devastating damage to an area, as well as hundreds of injuries and even death. Populations affected by severe storms are dependent on its mass and strength at the time of impact. Severe storms can bring heavy rain, strong winds, hail, lightning, heavy snow accumulation, ice, ice storms, and flash flooding. Gas leaks, water and sewage leaks, and broken power lines are also hazards associated with severe storms, causing the potential for carbon monoxide poisoning, electric shock, fires, explosions, and contaminated water supplies.
Severe Storm	**Responders**	Physical hazards include debris covered areas, streets, and roadways, as well as construction hardware. Responders may be shocked by downed power lines that may still be active but not visible. In the event of a winter storm, transportation is likely to become hazardous making reaching victims a risk of its own.
Severe Storm	**Continuity of Operations**	During severe storms, critical infrastructure, essential functions, and other areas necessary for the state and its various departments to function and respond efficiently may become compromised. Additionally, cascading events, such as gas leaks, power outages, and water shortages, may accompany severe storms, putting added pressure on the state to address the needs of its citizens. Severe storms may greatly impact public service(s). Business, infrastructure, vehicles, roadways, railways, water transportation, and communications may be significantly degraded or devastated as a result. Damage done to these areas may affect the delivery of services in several ways. As transportation routes become impassable, alternate routing will be necessary for the movement of resources and services, including emergency responders. Depending upon the severity of the storm, such a route may not be immediately available. In addition, if a severe storm produces flooding, water transportation may be completely halted. It is possible that severe storm events may cause damage to water, sewage, and gas lines. Such damage would make it difficult to provide individuals with safe drinking water and food. Power lines might also be damaged, temporarily putting communities without power and making it difficult to maintain public services, including communication with emergency personnel.

Severe Storm	**Property, Facilities, Infrastructure**	Roadways may become impassable due to debris, heavy rainfall, etc. High winds can blow down utility poles causing brownouts and or blackouts to develop throughout the affected areas. In addition, hail may cause windows to shatter, spreading glass everywhere. Although damage to property, facilities, and infrastructure can be severe, there are plans to minimize and recover from the impact.
Severe Storm	**Environment**	Depending on the type and magnitude, severe storms may have a marginal to a devastating impact on the environment. Ice storms for instance, may envelop square miles of area and result in major damage to trees and foliage. The lightning from severe storms has the potential to start fires, which compromise the air quality and may have a lasting effect on surrounding trees, plants, and local wild life. High winds may also bring devastation to wooded areas, bringing down large trees. Tennessee also has numerous chemical industries or storage locations; the repercussions from one being destroyed could, and probably would, be environmentally devastating for both the immediate area and surroundings.
Severe Storm	**Economic Condition**	The economic and financial impacts of severe storms vary based on the affected areas and magnitude of the event. Tennessee has many large industries, including nuclear power, chemical plants, livestock farms, and pipeline infrastructure that would greatly impact the economic and financial condition of the state if destroyed. Nuclear power and chemical plants could pose significant economic threats to large areas if damaged. Pipelines would prove costly to repair, especially if tap water has been contaminated. Hail can be especially damaging to crops,.
Severe Storm	**Public Confidence in Governance**	Severe storms can affect public confidence in governance in a number of ways depending upon the extent of the impact. If severe storms affect large businesses and livestock, there can be major impacts on local and statewide economies that can greatly shift public confidence. Recovery from severe storms can be costly and time consuming, and this can greatly impact public confidence, especially if there is a delay in rebuilding or returning survivors to their homes.

Hazard	**Category**	**Impact Description**

Tornado	**Public**	Populations affected by severe storms are dependent on several factors. These include the tornado's mass and strength at the time of impact, location of impact, and ability to respond to warnings. Tornadoes may strike quickly, with little to no warning, and can bring heavy rain and hail. Historical data suggests that tornadoes have the potential of causing minimal to devastating damage to an area, as well as hundreds of injuries, and even death. Most fatalities and injuries associated with tornadoes are caused by flying debris. Those in the affected area may also become trapped by a collapsing structure. Tornadoes may also damage power lines and cause gas leaks, making individuals susceptible to fires, electrocution, explosions, and exposure to harmful gases. It is also important to remember that tornadoes often accompany severe storms, and bring with them additional dangers of lightning and flash floods.
Tornado	**Responders**	Responders may be injured or impeded by debris-covered areas, including streets and roadways. Downed power lines that may still be active and not visible to the responder may result in shock and or small fires. Gas leaks may disperse harmful and odorless carbon monoxide or other gases into the area. Any hazardous chemicals that may have leaked can also pose a risk to responders. Basements, unstable structures, and multilevel buildings will make search and rescue difficult.
Tornado	**Continuity of Operations**	During a tornado, critical infrastructure, essential functions, and other areas necessary for the state and its various departments to function and respond efficiently may become compromised. Additionally, cascading events, such as floods , power outages, and water shortages, may accompany tornadoes, putting added pressure on the state to address the needs of its citizens. Tornadoes could greatly impact public services at the local level. Business may have difficulties remaining open and or providing services to customers depending upon the damages done to both the buildings used and merchandise offered. Infrastructure, including transportation and communication, may break down temporarily. This can affect services provided to individuals, such as public transit. Damages to the transportation infrastructure may limit emergency responder efforts to reach individuals; blocked roadways, railways, and water routes may also make it difficult for relocation efforts, as well as providing sanitary food and water. Communication failures, including brownouts and or blackouts, will make it difficult for individuals to request assistance, hinder responders' efforts, and slow the state's ability to access information and provide response and recovery resources/efforts.

Tornado	**Property, Facilities, Infrastructure**	Property, facilities, and infrastructure can be severely damaged as a result of tornadoes. Buildings may collapse or become structurally compromised. There may be large power outages, as power lines may be down in areas in and around the impact zone. Gas lines and water mains may also sustain damage. Roadways have the potential to become impassable due to debris, making it difficult for emergency personnel to respond to injuries.
Tornado	**Environment**	Tornadoes could have a marginal to a significant impact on the environment, uprooting trees and destroying vegetation. Wildlife habitats and food sources may be completely demolished, leaving the animals weak and vulnerable. However, the collateral events associated with tornadoes may cause the larger impact. Tennessee has a large chemical industry. Damages to such facilities could be environmentally devastating for both the immediate vicinity and for several miles around them. Air quality may also be affected by such damages, putting individuals at risk of respiratory problems.
Tornado	**Economic Condition**	The economic and financial impacts of tornadoes are largely based on the affected areas and the level of damage. Tennessee has many large industries, such as, nuclear power, chemical plants, livestock farms, and pipeline infrastructure that would greatly impact the economic and financial condition of the state if destroyed. Agricultural crops could be severely damaged or completely destroyed by a tornado. High winds and/or a tornado could severely damage or destroy nuclear power and chemical plants, causing massive power failures and placing nearby communities at risk of radiation and exposure to harmful chemicals. The water supply may also become compromised. Private businesses may be hurt as well if buildings and merchandise are damaged, resulting in some degree of revenue loss.
Tornado	**Public Confidence in Governance**	Public confidence can be greatly affected by a tornado event, especially if widespread across the state. The number of injuries and amount of damage can influence public confidence if there is a perception that more preventative measures or mitigation could have been achieved before hand. An impact across the state could take a large amount of resources and time for an effective recovery to be completed. Delays in recovery times and scarcity of resources can lead to dissatisfaction with the government.

Hazard	**Category**	**Impact Description**

Wildfire	**Public**	Home wildfires, wildfires, and forest wildfires can impact large populations if intensified. The specific impacts they have can vary, but there are some similarities. Individuals may be exposed to smoke inhalation. In home wildfires, smoke may fill a room quickly, making it difficult for an individual to breathe and find a safe exit. The smoke from wildfires and forest wildfires can affect overall air quality in the area, proving especially dangerous for those with asthma or other lung related health concerns. Food may become exposed to heat, smoke, or soot, putting individuals at risk for food poisoning. In addition, each type of event may impact an individual's general safety, placing them at risk for burns and carbon monoxide poisoning. Wildfires may cause entire communities to go without power, making it difficult for individuals to stay cool and compromising the food supply. Water can become contaminated, and unable to be used without risking sickness. Wildfires produce an extreme amount of heat, which can severely burn an individual's hands and feet even after the blaze is extinguished, and may also reignite the flames. The wildfire may also have caused chemicals to explode or leak, placing those exposed to the potential health risks of hazardous materials. Wildfires may result in cascading events, such as future flooding, which may further impact citizens. Rapid response to wildfires is necessary to prevent them from developing into forest wildfires. Although forest wildfires typically occur in heavily forested areas, more people have begun to populate these areas. The increase in population leads to an increase in the possibility of impact from forest wildfires on citizens.
Wildfire	**Responders**	Changes in the speed and direction of the wildfire and smoke may threaten responders' ability to control the blaze as well as remain at a safe distance. The most likely hazards encountered when responding to a wildfire situation could be heat exhaustion, smoke inhalation, structural instability, as well as other exposure-related illnesses. Chemicals and other combustible material may have leaked, and fuel sources may be open, increasing the potential for explosions and exposure to poisonous gases. Downed power lines may expose responders to live electricity. Emergency personnel may have difficulties responding to some residents, as not all roads may be accessible to wildfire vehicles. Unstable trees may ignite or fall upon already damaged structures, making rescue more difficult and potentially trapping emergency personnel.

Wildfire	**Continuity of Operations**	During a wildfire, critical infrastructure, essential functions, and other areas necessary for the state and its various departments to function and respond efficiently may become compromised. Additionally, cascading events, such as power outages and water shortages, may accompany wildfires, putting added pressure on the state to address the needs of its citizens. Historically, wildfires in the State of Tennessee have not affected the long term delivery of services to any impacted area. However, given the scope and magnitude of an event, it is possible that public services may be compromised. While urban wildfires would probably impact little, if any, of these services, the same cannot be said for wildfires and forest wildfires. With a majority of the manpower fighting the blazes, few will be left to assist with less severe emergencies. Wildfires of any category can cause blackouts, taking days or weeks for full power to be restored. This can pose a serious threat to hospitals treating patients. The public housing department may become overwhelmed attempting to provide shelter to individuals forced out of their homes, and/or with no home to return to.
Wildfire	**Property, Facilities, Infrastructure**	Wildfires spread quickly, and pose a threat to any homes and buildings in the vicinity. Residential areas can ignite and spread wildfires quickly, especially if they are surrounded by brush and trees, or have woodpiles and furniture nearby. Power lines left covered in branches or ivy may ignite, and/or fall, causing blackouts. Wildfires result in massive structural damage to residential, commercial, and industrial buildings, often rendering them destroyed. Property and facilities may remain at risk from hot spots, even after the wildfires are extinguished. Drinking water can become contaminated, hindering the state's ability to provide safe water.
Wildfire	**Environment**	Depending on the magnitude, wildfires have a marginal to devastating impact on the environment. Wildfires in urban areas will most likely have little to no permanent impact on the physical environment. In the case of wildfires however, hundreds to thousands of acres could be charred resulting in possible disruptions to the delicate ecosystem. Wildfires and forest wildfires result in barren soils, unable to absorb water and maintain vegetation. These conditions may follow a wildfire and create conditions perfect for flash floods and mud slides, resulting in further damage to the surrounding wildlife and ecosystem.

Wildfire	**Economic Condition**	The economic and financial impacts of wildfires are largely based on the impacted areas and the magnitude of the event. Wildfires in Tennessee are generally restricted to relatively small woodland or grassland areas. The impact of such wildfire events is negligible to the economy and financial institutions. However the Wildland/Urban Interface continues to expand in rural areas, dramatically increasing the potential values lost to wildfires. In some cases, crops can be partially or wholly damaged, impacting crop yield, revenue, and consumer prices. Tourism in some areas could also be impacted.
Wildfire	**Public Confidence in Governance**	Wildfires can have different impacts on public confidence depending upon the scope of the event. For the most part, there will not be a perception that more could have been done to prevent a wildfire. However, frustration could increase if subduing a fire takes an extended period of time, or if initial response to the event is delayed. Recovery from a wildfire event can be extremely costly and time consuming, which can affect public confidence in governance. Additionally, if areas cannot be restored to their pre-disaster state, there may be public dissatisfaction.

Hazard	**Category**	**Impact Description**
Communicable Disease	**Public**	The communicable disease events categorized by the CDC and the US Department of Labor as the most likely to adversely affect human performance are any and all strains of influenza. In a typical flu season, between 5% and 20% of the public contract influenza resulting in an average of 36,000 deaths. Pandemic flu viruses may cause illness in 20% to 40% of the population and cause more severe illness and deaths than ordinary seasonal influenza. A pandemic virus vaccine could take 6 to 8 months to produce in conjunction with CDC labs in Atlanta, limiting mitigation success in initial months of an outbreak. In 2012, Tennessee was listed by the CDC as one of the highest influenza burdened states in the nation. On average, 20% of the nation's population will contract the seasonal influenza every year. Tennessee carries a higher than average mortality and morbidity rate for influenza and associated pneumonia, with 20.9 per 100,000 compared with the national average of 16.2 per 100,000.
Communicable Disease	**Responders**	The most impactful risk for responders to a communicable disease event would be the risk of contracting the disease themselves. Proper protective equipment and training can help to protect responders, but risks still remain and can be potentially harmful if a large number of responders were to become unable to work due to disease.

Communicable Disease	**Continuity of Operations**	The State of Tennessee maintains the Continuity of Operations Plan, and Continuity of Government plans to efficiently and effectively respond to incidents that may temporarily interrupt the State of Tennessee's operations and responses. Some COOP plans may require activation if enough personnel are unable to work due to disease. Additionally, some service could be impacted for the same reason.
Communicable Disease	**Property, Facilities, Infrastructure**	While communicable disease and biologic events may have limited effects on property, facilities, and infrastructure, the demands on this infrastructure must be taken into accounted in economic impact analyses. If members of the public are affected by a communicable disease for a long period of time, maintenance of property, facilities, and infrastructure can suffer. Additionally, if resources are devoted to communicable disease impacts, it may take away from resources that would have alternatively been utilized on infrastructure.
Communicable Disease	**Environment**	Environmental impact from communicable disease is dependent upon the scope of the event. Animals and livestock affected can have an environmental impact. For the most part, communicable diseases affecting people will have little impact on the environment.
Communicable Disease	**Economic Condition**	Economic impact analyses from communicable disease events of any scale must take into account medical response, state and private resources, loss of production hours, and human resource drains. According to the Critical Infrastructure Assurance Office (CIAO), the Nation's Healthcare and Public Health (HPH) sector is an industry critical to maintaining resiliency during any major event. The HPH Sector constitutes 17% of the Gross National Product and protects all sectors of the economy from hazards such as terrorism, infectious disease outbreaks, and natural disasters. Because the vast majority of the sector's assets are privately owned and operated, collaboration and information sharing between the public and private sectors is essential to increasing resilience of the nation's HPH critical infrastructure. In addition to agriculturally significant communicable diseases, Tennessee's unique horse industry makes it particularly susceptible along with bordering states like Virginia and Kentucky to the economic impact of WNV and EHV1 (Equine Herpes Virus), which are also human health threats.

Communicable Disease	**Public Confidence in Governance**	Public confidence in governance can be greatly impacted by a communicable disease outbreak. Slow response times and recovery resource mismanagement can lead to a decrease in public confidence and an increase in frustration. Public confidence will also be largely tied to the scope of the event.

Hazard	**Category**	**Impact Description**
Dam and Levee Failure	**Public**	The primary concern with any dam or levee compromise or full breech is loss of life due to flooding or infrastructure damage. While the public assumption is that heavy rains and surface water are prime instigators of dam failure, the most common causes are structural failures including slope instability and damage from earthquakes, mechanical malfunctions of gates, or obstruction from sediment in conduits and valves, and hydrologic design insufficiency, e.g. overtopping because of spillway blockage or settling of dam crest. While any dam release can have devastating effects, those with long term repercussions typically include the release of toxic waste slurries secondary to coal power production or those that involve municipal waste water treatment facilities. Radiologic contamination is an acknowledged risk with dams linked to nuclear power facilities, as well as those facilities that are located in inundation zones; in particular, those located in proximity to large suburban or residential areas require faster response plans and more refined ERPs as asphalt and concrete infrastructure accelerate water and fluid speeds over terrain lacking trees, grassland and other topologic barriers.
Dam and Levee Failure	**Responders**	The initial assessment of heavy metal toxicity, and other contaminants may not be accurate in the first hours of response, as some will precipitate out of slurries, some will chelate, and additional contaminants will be picked up and carried with moving surface waters. The simple sediment that often precipitates mechanical failure in a dam or levee is itself toxic in many cases. Decades of upstream source contaminant accretion without leachate release can lead to levels of hydrogen sulfide, arsenic and copper, and Polycyclic Aromatic Hydrocarbons. These can have particularly severe results for first responders, but also for livestock and cropland downstream from the release or floodway.

Dam and Levee Failure	**Continuity of Operations**	Of primary concern for services impacted by dam or levee failure are electric delivery and water supply. In the event of grid disruption, municipal regulators and the consolidated districts are responsible for coordinating with TVA, grid technicians and local emergency responders to assess where electricity supply can be safely delivered, but is also most urgently needed.
Dam and Levee Failure	**Property, Facilities, Infrastructure**	Dam and levy failures can greatly affect property, facilities, and infrastructure if the scope of the event is significant. Farmland and businesses can be damaged and greatly affect local, regional, or state economies. Damages to personal homes can be extensive, and some homeowners may be caught by surprise by water damages. The repairs to dams and levees themselves can be extremely costly and time consuming to repair.
Dam and Levee Failure	**Environment**	The chemical content of sediment released from dam or levee failures can have particularly severe results for livestock and cropland downstream from the release or floodway. Dams themselves constitute unique ecosystems with microclimates which support a myriad of domestic and migratory populations. Dam events have the potential to significantly disrupt surrounding ecosystems by disturbing or displacing populations that have established themselves around those water bodies. Fish populations in particular must be dealt with carefully, as migration and spawning are directly affected by planned and emergency releases, with locks enabling fish to swim to spawning grounds and cross dam barriers with relative ease.
Dam and Levee Failure	**Economic Condition**	As sources of hydroelectric power, water reservoirs, mechanisms for flood control and public recreation land, the repercussions of failure or compromise can be fiscally devastating. The impact can extend to property values depreciating and entities such as the TVA needing to purchase unusable homes and farm land. The economic exposure of dam production value is significant.
Dam and Levee Failure	**Public Confidence in Governance**	Infrastructure failures can greatly impact public confidence because of their public nature and the assumption of government maintenance responsibility. Collectively, government agencies only own 3,225 dams in the United States, many more are owned, partially owned or operated by private corporations or entities. 11,000 are owned by local or municipal watershed districts. Comprehensive programs where the TVA or other agencies have purchased homes damaged by an event, or SRL properties that have a high likelihood of being damaged in the future, improve public confidence in response and mitigation activities.

Hazard	**Category**	**Impact Description**

Hazardous Materials	**Public**	HAZMAT incidents vary widely in their effects on exposure. Most of the common chemicals can quickly cause death or permanent injury in high concentrations with relatively little exposure time, but some toxins cause injury only with repeated exposures, or are carcinogenic. Emphysema or other chronic lung diseases can result from toxic gas inhalation. Caustics, acids, and some other compounds cause immediate burns. Clothing, vehicles, and personal effects can be contaminated by most hazardous materials, often regardless of their chemical state (gas or liquid). Even properly-contained limited impact HAZMAT incidents can swiftly harm those in the affected area before first responders arrive, and leave chemical residues that persist for months or years. A few injuries and deaths occurring at a large chemical plant or oil refinery fire can lead to many casualties from smoke exposure or residential area contamination if the incident is inadequately contained. Winds, flooding, ground elevation, and accessible terrain might increase exposure. Fires and explosions may cause structural damage. Nuclear power plant incidents put anyone nearby at elevated risk of radiation poisoning and/or long-term contamination.
Hazardous Materials	**Responders**	All HAZMAT incidents potentially endanger personnel responding to the scene. If unprepared or encountering a large-scale disaster, personnel risk death and serious injury from the hazardous materials themselves or from secondary events like chemical fires. Immediate safety risks may come from toxic chemicals, burns, heat or smoke-related injuries, skin, visual, or respiratory injuries, among other common problems caused by chemical exposure. Without proper physical protection, respiratory support, and decontamination, the risk is high. Additionally, exposure to carcinogens may endanger personnel over time by increasing their risk of developing certain cancers. First responders face many of the same hazards as persons in the area at the time of the accident. This is especially problematic before an incident's chemical has been identified.
Hazardous Materials	**Continuity of Operations**	Operating under the assumption that all but the gravest HAZMAT spills or other incidents will impact a limited area, continuity of operations is a relatively secure parameter. If a spill directly impacts an agency, operational continuity may be disrupted until a temporary or permanent new operating location is operational. If the HAZMAT event is such that an area must be closed for a lengthy period of time or if a transportation incident blocks roads necessary for delivery, then for services to be maintained, new routing or a new method of delivery must be implemented; in the interim, delivery of some services might be interrupted.

Hazardous Materials	**Property, Facilities, Infrastructure**	Property, facilities, and the infrastructure may all be damaged by different hazardous material events, especially spills and fires. Hazardous material spills may contaminate a facility so that it must undergo extensive cleaning or be abandoned permanently. They may ignite or explode, destroying anything nearby; these occurrences at a chemical plant or a factory storing other hazardous materials may cause dangerous chemical fires that can release toxic smoke into the surrounding air. A destructive HAZMAT incident at an oil refinery or a natural gas facility or a pipeline could disrupt part of Tennessee's supply chain. If a nuclear plant accident occurs, or if radioactive waste is spilled during transport or processing, the location may be rendered permanently dangerous and would have to be abandoned. Even without fire, HAZMATs may corrode facilities or infrastructure, leaving it in need of replacement, and react with other chemicals, necessitating the replacement of many costly industrial components.
Hazardous Materials	**Environment**	Environmental impacts range from minor contamination of already urban land to regionally catastrophic loss of habitats and endangering wildlife populations, pollution of water, and destruction of wild and cultivated land to the extent it is no longer capable of normal plant growth. Repeated contamination from long-term chemical plants, particularly in the eastern third of the state, could be exacerbated by a HAZMAT incident. An incident involving radioactive hazardous materials could cause environmental consequences for centuries if surrounding flora, fauna, and land were exposed to high enough levels of radioactivity.

Hazardous Materials	**Economic Condition**	The economic consequences of large hazardous material spills can be wide ranging and can last for years or decades. Smaller events can impair or even bankrupt small or midcap company, but are unlikely to affect the state's economy as a whole. A town where a chemical plant or factory is the main employer, however, could be seriously harmed by a disruptive HAZMAT event at such facility. The economic exposure depends on the chemical released; the size of the spill or extent of the fires, if any; the number and size of the businesses impacted; the number of homes damaged, contaminated or destroyed; and if critical roads/railways/infrastructure are disrupted. As with environmental impact, typically, only a radioactive event causes permanent economic loss, but the closure of a large-cap corporation's plant in Tennessee can potentially lead to extensive layoffs or the need for a corporation to assist in the closure of a facility, limiting its ability to rehire employees. A widespread chemical incident that destroys homes or multiple businesses or the land's agricultural potential can be devastating from an actuarial perspective. .
Hazardous Materials	**Public Confidence in Governance**	Minor events will be unlikely to affect public confidence in governance, though a large scale event would have a high chance of impacting public confidence. A large scale event could affect a large population and require a number of resources to be refocused. Evacuations, damages to property, and injuries can all lead to frustration. Additionally, long recovery times can cause complaints and concerns from the public.

Hazard	**Category**	**Impact Description**
Infrastructure Incident	**Public**	Heavy equipment, high voltage, auditory, and ocular shock are all inherent risks of individuals in proximity to an infrastructure event. Often standing water and the unknown condition of the infrastructure puts persons in the area at increased risk due to the inability to assess whether lines are live, structures are sound, or roadways passable. Contaminated water from floodways that intersect known hazardous materials or waste water treatment areas are often difficult to quantify or identify.
Infrastructure Incident	**Responders**	These disasters often involve heavy equipment, high voltage, large volumes of water, hazardous materials, and the risk of auditory or other sensory damage. Additionally, responders entering damaged infrastructure will be at the same level of risk as those already inside, and extreme caution is necessary to avoid injury.

Infrastructure Incident	**Continuity of Operations**	Infrastructure that is compromised inherently jeopardizes the continued delivery of services. Infrastructure incidents can also often lead to communication disruptions, which can necessitate a change in operations. Services may require rerouting and become understaffed due to the incident.
Infrastructure Incident	**Property, Facilities, Infrastructure**	Infrastructure incidents inherently affect property, facilities, and infrastructure becoming impacting in some way. Damage or destruction can be extremely costly to repair and can take months or years. Depending upon the scope of the impact, a return to a pre-event state may be impossible. Impact can also have cascading effects by limiting communications or access for extended periods of time.
Infrastructure Incident	**Environment**	Impact on the environment can be significant depending upon the scope of the event. Debris and cascading effects from an infrastructure incident can have long lasting repercussions on the environment and can be costly to repair. The environment may also be affected during the recovery phase if heavy equipment and large numbers of personnel are required in an area.
Infrastructure Incident	**Economic Condition**	The economic impact from an infrastructure event varies greatly by the type of infrastructure affected. Highway closures and landslides impairing commercial transit carry real per diem costs in terms of work hours lost or business dollars that are not recovered. When combined with other collateral losses, this impairment of business operation or man hours worked makes efficient restoration of public infrastructure a priority. These closures are often complicated by environmental or structural assessments, which themselves require dedicated funds and can slow recovery time.
Infrastructure Incident	**Public Confidence in Governance**	Infrastructure disasters pose one of the most visible and high profile event risks within the scope of public relations. Roadways, rail, and airports often have large numbers of the public involved or at least witnessing the event, making management of communications and press releases imperative. Cellular, data, and telephone failures result in fear and the perception that the event is not under control because of lack of communications with the public. While small scale electrical service interruptions are handled at the corporate or cooperative level, any large scale disruption often requires municipal response, especially in the event the disruption takes place in underserved or rural communities where access to medical equipment services or supplementary aid may not be readily available.

Hazard	**Category**	**Impact Description**

Terrorism	**Public**	A statistical majority of previous terrorism incidents in the United States have involved bombs as the primary weapon. Bomb statistics are calculated from past incidents. Initial blasts, building damage and possible collapse, secondary fires, and release of hazardous or toxic structural materials together endanger anybody proximate to the explosion site. Death tolls from a conventional bomb, therefore, can run from zero to over 10,000, contingent upon the size and location of the blast and the nature of the surrounding environment. Population density increases the risk to health and safety. Incendiary bombs or blasts coordinated with poisonous or highly flammable gas release will have higher M&M figures in most urban areas than a will single conventional explosive. Injuries in excess of 20,000 or more are possible in major urban centers, but in midsize cities such as those in Tennessee, the count would likely be lower than 15,000. The exception with higher injuries and fatalities is the use of an explosive devised detonated in a crowded stadium, racetrack, or convention center, where the density converges with projectile and shrapnel damage, possible crowd crushing, etc. Tennessee has enough of these venues to consider the risk.
Terrorism	**Responders**	First responders to conventional terrorist attacks face health risks from fires, damaged or impaired structures, un-detonated bombs and other explosives, toxic chemicals released by blasts or building materials. Bombs can be employed covertly, and could remain undetected near the scene of an already detonated device. This endangers first responders without trained personnel and explosive detection equipment. Secondary explosive devices may also be used as weapons against responders or timed to detonate after emergency teams have arrived at the scene of an earlier blast. Other diversionary attacks could also be aimed at responders, including chemical releases. The regular risks to EMTS, firefighters, volunteers, and the like can be compounded by the size of a disaster. Damage on the scale of a city block in a downtown area could mean longer than average initial response. Fatigue and discomfort from wearing protective/fire turnout gear can be expected in that situation. In a less populated setting, attacks near oil or petrochemical storage facilities can present very similar challenges to stamina and responder agility of personnel. First responders also are at risk for serious fatigue and stress, including long-term psychological impairment that interferes with future work. PTSD is a possibility for responders, as well as victims, of a terrorist event.

Terrorism	**Continuity of Operations**	Continuity of operations can be partly or completely interrupted by terrorism. The basic evaluation of risk sees the loss of operational continuity as much likelier in the case of chemical, biological, nuclear, or radiological incidents in the vicinity of core facilities, offices, and transport routes. In instances of small scale attacks without damage to infrastructure, communications, or loss of key personnel, no disruption may occur. Either Tennessee state agency operations or federal agency operations will likely continue in the case of a regional attack barring WMDs or loss of core capabilities. Within the state, an attack on the capital or central agency headquarters in Nashville could disrupt operations, though regional FEMA and TN county facilities cover certain law enforcement and health capabilities. Regional facilities are dependent on receiving centralized commands from designated centers, most of them in the Mid Atlantic. Tennessee has limited designated continuity of operations facilities, but many decentralized responders would be able to continue operations without such facilities in the event of a conventional terror attack. Conversely, disruption of the federal chain and/or Internet, satellite, and conventional telephone could impede this. Bioterrorist planned outbreaks of a broadly lethal infectious disease may affect continuity of operations at the state level even if the release occurs in another state.
Terrorism	**Property, Facilities, Infrastructure**	The weapons used and the scale of a terrorist attack will determine the extent of impact on property, facilities, and infrastructure. Property damage is nearly inevitable in a terror attack. Firearms and small explosives will likely cause scene-of-attack only damage, which can range in costs but typically does not exceed the low millions (less than $10 million). Larger bombings, especially of major residential or commercial urban spaces, can cost upwards of $10 billion. Infrastructure can be affected if electrical, plumbing, or gas lines experience breaks or physical destruction. Demolition within a metropolitan area will likely impact many critical infrastructure assets and commercial spaces, diminishing output capabilities and essential infrastructure. Attacks on chemical and energy plants and/or storage facilities can destroy surrounding structures, farms, and wilderness with fires; subsequent air pollution can range over hundreds or more miles and deposit toxic substances on nearby facilities.

Terrorism	**Environment**	Conventional urban terrorism has less of an impact on the overall environment than the use of WMDS or attacks on chemical, energy, or agricultural facilities. Air pollution and water pollution are concerns from conventional terrorism, particularly attacks on combustible assets located near waterways. Tennessee's abundant water supply and central location enhance the risk of spillover from such events into neighboring states. The presence of many cave systems underneath much of the state increases the risk of aquifer contamination, as well as land collapse or sinkhole formation in the event of a seismically significant explosion or synchronous explosions. Bioterrorism has many of the same environmental effects as a naturally occurring communicable disease outbreak, but a distinguishing characteristic is the ability of bioterrorists to target agriculture. Engineered or targeted zoonotic diseases risk destabilizing domestic, wild, and human populations. Many animals, particularly mammals, can become vectors for diseases released into the human population; many biological agents, like anthrax, infect multiple species.
Terrorism	**Economic Condition**	Conventional terror attacks that detonate explosives in a medium sized urban center might cause damage of around $10-30 billion; in a major urban center, particularly with disruption of transportation and business, this figure could easily rise to above $100 billion. By comparison, several federal departmental estimates of the direct costs of 9/11 average $49 billion; when consequent clean-up and loss economic and social functions are calculated, the cost rises to between $80 and $100 billion, excluding overall market effects like the loss of equity values, decline in aviation industries, and mild recession. The low end of industrial sabotage could cost $100 to $200 million; the higher end, such as a successful attack on a power plant, is estimated to cost over $1.5 billion. Blackouts increase costs disproportionately. If terrorists strike at the power supply of a large city, the economic damage could range from $2.8 billion to $20 billion depending on the resilience of the city and state's disaster response and the scale of the blackout caused.

Terrorism	**Public Confidence in Governance**	Public confidence will diminish after a successful terrorist attack to some degree. The extent to which this loss of faith will affect the economy and regional society is a function of the quality of the aftermath and response as much as it is of the severity of the attack itself. A poorly planned or executed first response and an extended, unresolved investigation of the terrorists will reflect badly, respectively, on the state and federal governance. The psychological aftermath needs to be considered. For this reason, mental health preparedness planning needs to be incorporated into any threat mitigation scenario. A basic goal of terrorism is to instill fear into a large population. This is easiest to accomplish with unconventional weapons, like biological WMDs, where the uncertainty of the threat causes widespread fear to the point of irrationality. Counseling of the population, reassurances, and having psychiatric treatments ready needs to be considered part of the state's readiness planning. Public confidence will be undermined by extended trauma, even with government reassurance, if everyday patterns or delivery of goods and services are interrupted for an extended period.

Appendix 7 – Reference Sources

Geographic Data Sources

BOLDplanning Inc.
ESRI
Federal Emergency Management Agency – *HAZUS – MH 4.0*
Federal Emergency Management Agency – *National Flood Hazard Layer*
Global Terrorism Database
National Oceanic and Atmospheric Administration, National Climatic Data Center
National Oceanic and Atmospheric Administration, National Weather Service – *Storm Prediction Center*
Tennessee Bureau of Economic Analysis
Tennessee Department of Health
Tennessee Department of Safety
Tennessee Department of Transportation
Tennessee Department of Treasury
Tennessee Division of Geology
Tennessee Emergency Management Agency
Tennessee Valley Authority
Texas Department of Health
United States Army Corps. of Engineers
United States Census Bureau
United States Department of Agriculture
United States Department of Agriculture, Natural Resources Conservation Service – *Soil Survey Geographic Database v2.2*
United States Geological Survey
University of Tennessee, Knoxville
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United States Geological Survey
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University of Vermont

Appendix 8 – Federal Grant Records

Table 119 – HMGP Awards, Tennessee (1990 – 2017)				
Disaster #	**Federal Share**	**State Share**	**Local Share**	**Total Cost**
858	$61,425.00	$30,712.50	$30,712.50	$122,850.00
889	$357,617.00	$178,808.50	$178,808.50	$715,234.00
910	$290,293.00	$149,534.00	$172,782.00	$612,609.00
1010	$7,695,859.00	$1,389,422.20	$1,225,514.20	$10,310,795.40
1022	$744,597.00	$125,986.00	$122,213.00	$992,796.00
1057	$266,464.00	$59,727.00	$29,094.00	$355,285.00
1167	$1,295,891.00	$263,647.00	$218,969.00	$1,778,507.00
1171	$317,680.00	$56,811.00	$49,083.00	$423,574.00
1197	$2,956,964.00	$511,277.50	$474,375.50	$3,942,617.00
1215	$2,713,548.00	$467,868.50	$436,647.50	$3,618,064.00
1235	$566,592.00	$94,432.00	$94,432.00	$755,456.00
1260	$1,802,405.00	$159,477.06	$813,382.16	$2,775,264.22
1262	$1,430,282.00	$242,643.85	$234,116.85	$1,907,042.70
1275	$814,058.00	$139,046.16	$132,305.77	$1,085,409.93
1331	$427,610.00	$8,337.00	$134,201.31	$570,148.31
1387	$629,051.00	$21,628.87	$190,420.00	$841,099.87
1408	$1,198,466.00	$16,296.23	$383,195.00	$1,597,957.23
1441	$571,265.00	$25,480.43	$164,943.00	$761,688.43
1456	$158,053.00	$10,295.00	$42,389.00	$210,737.00
1464	$5,051,903.00	$32,651.00	$1,560,065.24	$6,644,619.24
1482	$4,195,433.00	$12,751.00	$1,195,997.00	$5,404,181.00
1568	$215,442.00	$4,833.02	$66,981.00	$287,256.02
1634	$721,253.00	$170,366.00	$552,247.00	$1,443,866.00
1745	$3,147,356.00	$549,004.50	$500,114.50	$4,196,475.00
1821	$1,034,693.00	$164,409.00	$164,409.00	$1,363,511.00
1839	$735,110.00	$116,806.50	$116,806.50	$968,723.00
1851	$1,447,061.00	$229,933.00	$229,933.00	$1,906,927.00
1856	$386,169.00	$61,361.00	$61,361.00	$508,891.00
1909	$85,546,517.00	$13,593,052.50	$13,593,052.50	$112,732,622.00
1937	$666,616.00	$105,923.00	$105,923.00	$878,462.00
1965	$1,214,209.00	$192,933.50	$192,933.50	$1,600,076.00
1974	$9,684,522.00	$1,538,838.00	$1,538,838.00	$12,762,198.00
1978	$1,352,803.00	$214,956.00	$214,956.00	$1,782,715.00
1979	$5,726,845.00	$909,976.50	$909,976.50	$7,546,798.00
4005	$1,003,172.00	$159,400.50	$159,400.50	$1,321,973.00
4060	$154,505.00	$19,313.13	$19,313.13	$193,131.26
4171	$1,202,516.00	$192,499.50	$192,499.50	$1,587,515.00
4189	$321,285.00	$80,193.50	$80,193.50	$481,672.00
4211	$3,252,355.00	$586,699.50	$586,699.50	$4,425,754.00
4293	$327,766.00	$54,627.50	$54,627.50	$437,021.00
4320	Awaiting Approval	Awaiting Approval	Awaiting Approval	Awaiting Approval
Total =	**$151,685,651.00**	**$22,933,621.95**	**$27,223,911.66**	**$201,851,521.61**

**The data are from TEMA and FEMA*

Table 120 – PDM Grant Program Awards, Tennessee (2002 – 2017)				
Year	**Federal Share**	**State Share**	**Local Share**	**Total Cost**
2002	$223,974.64	$16,667.00	$58,835.88	$299,477.52
2003	$162,489.66	$12,325.00	$40,691.37	$215,506.03
2003C	$484,526.00	$156,008.00	$55,007.00	$695,541.00
2003 DRU	$103,356.00	$3,333.00	$30,785.33	$137,474.33
2005C	$3,876,604.34	$25,000.00	$1,266,202.00	$5,167,806.34
2006C	$2,053,200.00	$0.00	$684,400.00	$2,737,600.00
2007C	$82,500.00	$27,500.00	$0.00	$110,000.00
2008C	$4,143,392.58	$121,190.50	$1,067,806.76	$5,332,389.84
2009C	$71,541.00	$2,167.75	$21,679.25	$95,388.00
2009L	$501,601.50	$0.00	$55,733.50	$557,335.00
2010C	$1,485,000.00	$45,000.00	$450,000.00	$1,980,000.00
2011C	$11,128,915.00	$337,239.85	$3,372,398.49	$14,838,553.34
2012C	$0.00	$0.00	$0.00	$0.00
2013	$121,125.00	$0.00	$44,228.69	$165,353.69
2014	$68,235.00	$0.00	$22,744.42	$90.979.42
2015	$187,438.29	$0.00	$62,557.00	$249,995.29
2016	$30,000.00	$0.00	$10,000.00	$40,000.00
2017	$49,434.00	$0.00	$16,478.00	$65,912.00
Total =	**$24,773,333.01**	**$746,431.10**	**$7,259,547.69**	**$32,779,311.80**

**The data are from TEMA & FEMA*
**C = competitive grant; DRU = Disaster Resistant University, L = legislative*

Table 121 – FMA Grant Program Awards, Tennessee (1997 – 2017)				
Year	**Federal Share**	**State Share**	**Local Share**	**Total Cost**
1997	$137,300.00	$22,883.00	$22,883.00	$183,066.00
1998	$152,326.15	$25,388.03	$25,388.03	$203,102.21
1999	$27,185.00	$2,530.50	$2,530.50	$32,246.00
2000	$157,508.71	$26,666.50	$25,836.07	$210,011.28
2001	$136,076.57	$0.00	$45,358.19	$181,434.76
2002	$88,366.40	$0.00	$29,454.80	$117,821.20
2003	$107,893.94	$0.00	$35,964.98	$143,858.92
2004	$167,130.00	$0.00	$55,710.00	$222,840.00
2005	$132,412.50	$0.00	$44,137.50	$176,550.00
2006	$0.00	$0.00	$0.00	$0.00
2007	$146,940.00	$0.00	$48,890.00	$195,830.00
2008	$0.00	$0.00	$0.00	$0.00
2008	$0.00	$0.00	$0.00	$0.00
2009	$0.00	$0.00	$0.00	$0.00
2010	$0.00	$0.00	$0.00	$0.00
2011	$0.00	$0.00	$0.00	$0.00
2012	$0.00	$0.00	$0.00	$0.00
2013	$242,325.00	$0.00	26,925.00	269,250.00
2014	$359,420.00	$0.00	$0.00	$359,420.00
2015	$953,260.00	$0.00	$0.00	$953,260.00
2016*	$428,640.00	$0.00	$0.00	$428,640.00
2017*	$0.00	$0.00	$0.00	$0.00
Total =	**$3,236,784.27**	**$77,468.03**	**$363,078.07**	**$3,677,330.37**

**The data are from TEMA & FEMA*
**2016 and 2017 are still ongoing*

Appendix 9 – FEMA Approval Letter

U.S. Department of Homeland Security
FEMA Region IV
3003 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

October 17, 2013

Mr. James H. Bassham, Director
Tennessee Emergency Management Agency
3041 Sidco Drive
Nashville, Tennessee 37204

Reference: Approval of the 2013 Updated Tennessee Standard State Mitigation Plan

Dear Mr. Bassham:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region IV has approved the updated 2013 Tennessee Standard State Mitigation Plan. This approval modifies the previous 2010 Standard Plan, which was approved on October 18, 2010. The Standard Plan designation becomes valid effective October 18, 2013 through October 17, 2016 at which time an updated plan must be approved to maintain program eligibility, per §201.4 Code of Federal Regulations (44CFR).

We commend the State of Tennessee for developing a solid, workable plan that demonstrates commitment to reduce risks from natural hazards and that will guide mitigation activities over the coming years. We acknowledge and support the State's intention to review and update the plan annually and after each presidential disaster declaration as needed.

We look forward to receiving the 2016 Standard Plan update for review, which will capture the experiences gained over the subsequent three years. A formal plan update is required at least once every three (3) years. If the Plan is amended or revised, it must be resubmitted to FEMA Region IV for formal review and approval.

In summary, the 2013 Standard Plan update continues to show that the State has a comprehensive mitigation program and is meeting expectations with not only FEMA programs but also state programs. Additional comments were provided by Region IV Program specialists for your information and continued use for plan documentation. The Mitigation office will continue to provide technical support through our Grants and Planning programs to the State. A draft of the next Standard State Plan update must be submitted to Region IV by April 2016, or no later than three months prior to the end of the three-year approval period of the existing plan.

We look forward to continuing a productive relationship between FEMA Region IV and the Tennessee Emergency Management Agency. If this office can be of further assistance, please do not hesitate to contact me or Mr. Brad Loar, Mitigation Division Director, at 770-220-5416.

Sincerely,

Major P. May
Regional Administrator