

### 3.3.4 Assessing Vulnerability: Potential Losses

#### I. Estimating Potential Losses:

The following section provides a compilation of potential economic and human losses that could occur because of a natural hazard in the Lincoln Trail Region. To determine this potential loss, the vulnerability (or risk) of a natural hazard must be determined and combined with the value of the assets, both human and economic. The resulting values are to be considered estimates, due to an overall lack of comprehensive and complete data (event data and asset value data) and the limited sophistication of the methodology. While considered restricted in their use, the values do allow for the identification of various scenarios and should be helpful in the relative evaluation and prioritization of any proposed mitigation strategies.

**Vulnerability Methodology:** A review of the profiled hazards and the assets inventory, leads to a need to determine which physical areas are the most vulnerable to risk, to best devise solutions and allocate resources to mitigate potential hazard events. This results in a two-phase approach. The first phase is the determination of the total potential economic and human cost of a particular event. In the second phase, these potential losses are allocated to the geographic areas that are identified with the highest risk for any natural hazard event.

**A. Social Vulnerability:** The published literature regarding natural hazard risk assessment notes that there is a definite social factor associated with each level of vulnerability of any area.<sup>1</sup> To incorporate this factor into the study the following methodology was used.

To establish a geographic area for the data used in this analysis, the basic US Census Bureau *Block* was used since it ensures the finest possible granularity. The statistical information used was available at this level for the entire LTADD region. The block boundaries used were defined by the 2020 Census. Some data is not, however, available at this level. That data is thus compiled at the level of geography indicated. This includes the Block Group and the County level geographies as defined by the US Census.

**Table 3.3.4.1 - Social Vulnerability Source Units**

<b><i>Social Vulnerability Category</i></b>	<b><i>Basic Unit</i></b>	<b><i>Source</i></b>
Under 18 Population (derivative of P0030001)	Block	2020 Census
Over 65 Population, B01001	Block Group	2019 5 Year ACS
Total Population, P0010001	Block	2020 Census
Family Poverty Population*	Block Group	2019 5 Year ACS
Housing Units (Occupied) H0010002	Block	2020 Census
Group Quarters (Institutionalized)**	Block	2020 Census
* B17010, Poverty Status Past 12 Months, presence of children under 18 years.		
**P0050002, Correctional, Juvenile, Nursing Facilities		

---

<sup>1</sup> See Cutter & Odeh.

Source dates also factor into the available data. Due to delays in collection and reporting of the 2020 Decennial Census, the 2019 American Community Survey information was used where available to provide the most current, available data. As an example, the 2019 American Community Survey 5-Year cycle for family units below poverty level by Block Group was used and included an economic standing risk in the calculations. This value was assigned to each Block that makes up the Block Group since the data is not available at a lower level. The values for each block were analyzed, according to its county as a whole, to generate a *Social Vulnerability (SV)* score<sup>2</sup>. For example, the total population score for an individual block is determined as follows:

$$SV(\text{total pop}) = \left( \frac{\text{total pop in block}}{\text{total pop in county}} \right) / \left( \frac{\text{total pop in block}^{[max\ value]}}{\text{total pop in county}} \right) \quad \text{This}$$

calculation resulted in an SV score for each value in each block. The sum of these scores yields the *Total Social Vulnerability (TSV)* score for the block as a whole.

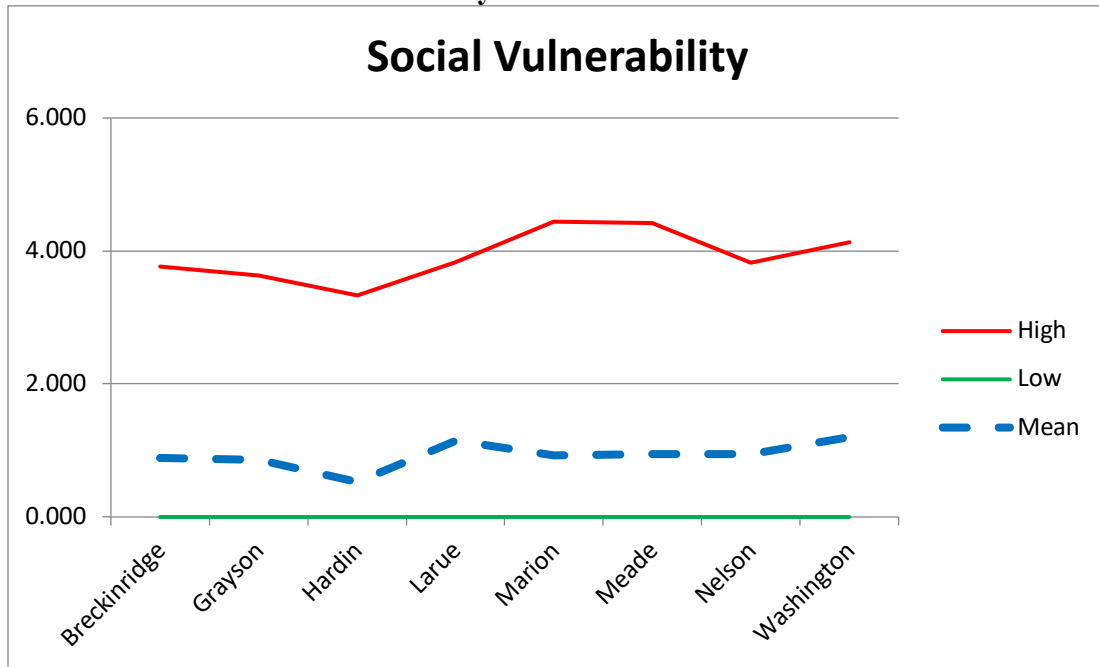
Below is a table that reflects the range and mean of the block scores for each county and for the region as a whole. A similar method is used for the Block Group and County level geographies as necessary based on data availability.

**Table 3.3.4.2 - Social Vulnerability Scores**

<b>Geography</b>	<b>High</b>	<b>Low</b>	<b>Mean</b>
<b>Breckinridge</b>	3.763	0.000	0.892
<b>Grayson</b>	3.636	0.000	0.862
<b>Hardin</b>	3.331	0.000	0.526
<b>Larue</b>	3.832	0.000	1.152
<b>Marion</b>	4.441	0.000	0.927
<b>Meade</b>	4.422	0.000	0.943
<b>Nelson</b>	3.818	0.000	0.942
<b>Washington</b>	4.130	0.000	1.202
<b>Lincoln Trail</b>	4.441	0.000	0.821
Note: Zero values are generally the result of no population in a block. This is typical for areas of open water but may occur in other areas of unused land.			

<sup>2</sup> Each block's score was determined on a county basis and not as regional value to better reflect the highest risk areas in the individual county. The following maps of the vulnerability are scaled based on region-wide values.

**Chart 3.3.4.1 - Social Vulnerability**



## **B. Geographic Vulnerability**

Several of the natural hazard events determined to be a significant threat (section 3.3, table 3.3.1.1) to the Lincoln Trail Region, are not typically bound by geography. The risk potential is therefore assumed to be the same throughout the Region for all natural hazards except for ones that generally have a specific geographic component such as karst (sinkholes), landslides / subsidence, earthquakes and especially flooding. Flooding (except for some flash flooding and Dam failure related flooding) is considered to be confined to the predetermined flood zones as defined by the FEMA DFIRM mapping data.

Because of its significant threat to the region, flooding is used for mapping and analysis. This version also includes a value score for data that is available for karst terrain, earthquakes, and landslides.

To determine the *Geographic Vulnerability (GV)* score, the US Census block polygons from the 2010 Census were used. The historic frequencies for each county from the “Hazard Frequency Table” 3.3.2.1 were assigned to the individual blocks for non-geographic specific events. For events that are geographically based blocks, values were assigned based on the referenced geographic type as a percentage of each block area, for karst and landslide (slopes greater than 5%.) For earthquakes it was based on the Peak Ground Acceleration zone the centroid of the block was located in. For flooding it was allocated based on the presence of a 100 or 500-year flood zones in each block.

**Table 3.3.4.3 - Geographic Vulnerability Source Units**

Geographic Vulnerability Category	Basic Unit	Range	Source
Hail	Block	county wide	NEIC, NCDC & SHELDUS Cumulative as reported in tables in previous sections.
Lightning	Block	county wide	
Snow / Ice	Block	county wide	
Tornado	Block	county wide	
Thunderstorm	Block	county wide	
Flooding	Block	100 & 500 Year Flood Plains	FEMA DFIRM 2007 - 2011
Karst	Block	Mapped Karst based on 1:24K USGS Topographic Maps	KY Geological Survey, 2003
Landslide / Subsidence	Block	Areas of Slope Greater than 5% based on 30ft Digital Elevation Models	US Geological Survey, 2000
Earthquake	Block	Peak Ground Acceleration - 2% probability of exceedance in 50 years.	US Geological Survey, 2014

**Table 3.3.4.4 – Geographic Specific Event Factors**

	County Wide				
	Hail	Lightning	Snow_Ice	Tornado	Thunderstorm
Breckinridge	1.4701	0.429752	0.747967	0.276423	4.380165
Grayson	1.513	0.528926	0.796748	0.256	3.584
Hardin	1.9316	0.561983	0.878049	0.422764	5.674419
Larue	1.0076	0.545455	0.715447	0.172662	3.586777
Marion	1.0579	0.585366	0.601626	0.211382	3.53719
Meade	1.1128	0.46281	0.764228	0.227642	3.804878
Nelson	1.405	0.682927	0.780488	0.227642	4.892562
Washington	0.9091	0.585366	0.764228	0.178862	3.305785

**Table 3.3.4.4 – Geographic Specific Event Factors (cont.)**

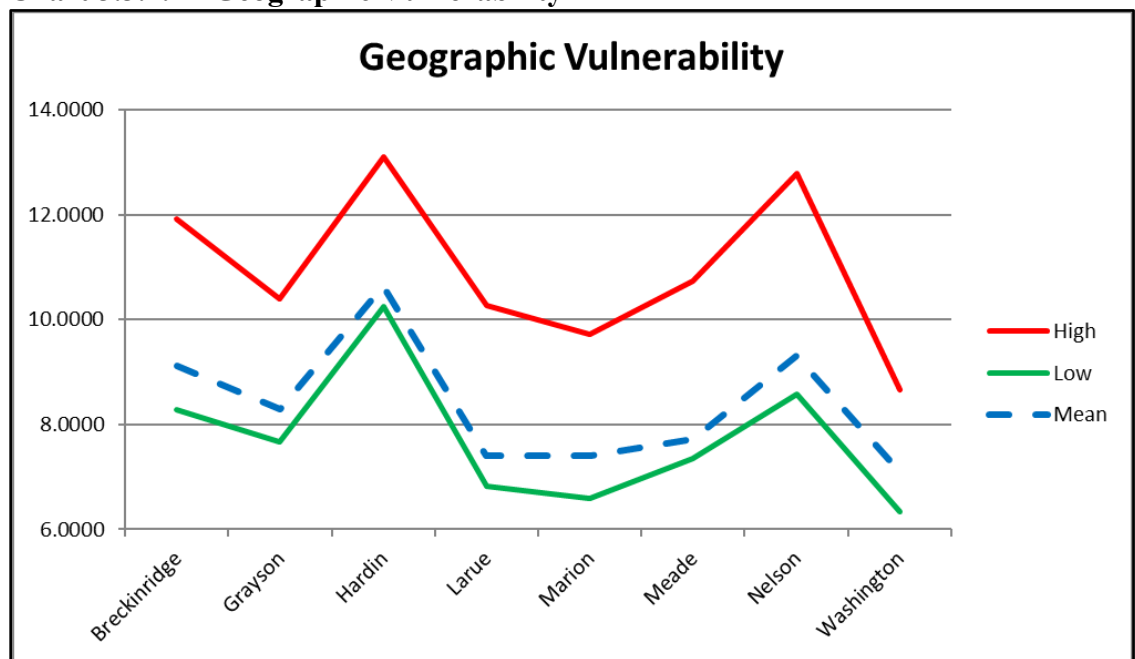
	Geographic Specific			
	Flooding	Karst	Landslide/Subsidence	Earthquake
Breckinridge	1 for 100 year, 0.2 for 500 year	County-wide score value calced against Karst acres per block as a %	County-wide score value calced against Slope acres per block as a %	PGA Value from USGS:
Grayson				
Hardin				
Larue				6% *g = 0.589
Marion				8% *g = 0.785
Meade				10% *g = 0.981
Nelson				12% *g = 1.177
Washington				14% *g = 1.373

The total GV score (*TGV*) is determined by the sum of the GV score for each of the hazard event types used.

**Table 3.3.4.5 - Geographic Vulnerability Scores**

<b>Geographic Vulnerability Scores</b>	<b>High</b>	<b>Low</b>	<b>Mean</b>
<b>Breckinridge</b>	11.9120	8.2854	9.1195
<b>Grayson</b>	10.3964	7.6597	8.2928
<b>Hardin</b>	13.1060	10.2536	10.6314
<b>Larue</b>	10.2624	6.8127	7.4014
<b>Marion</b>	9.7166	6.5821	7.3995
<b>Meade</b>	10.7311	7.3534	7.7260
<b>Nelson</b>	12.7734	8.577219	9.3005
<b>Washington</b>	8.6651	6.3319	7.1049
<b>Lincoln Trail</b>	13.1060	6.3319	9.0095

**Chart 3.3.4.2 - Geographic Vulnerability**



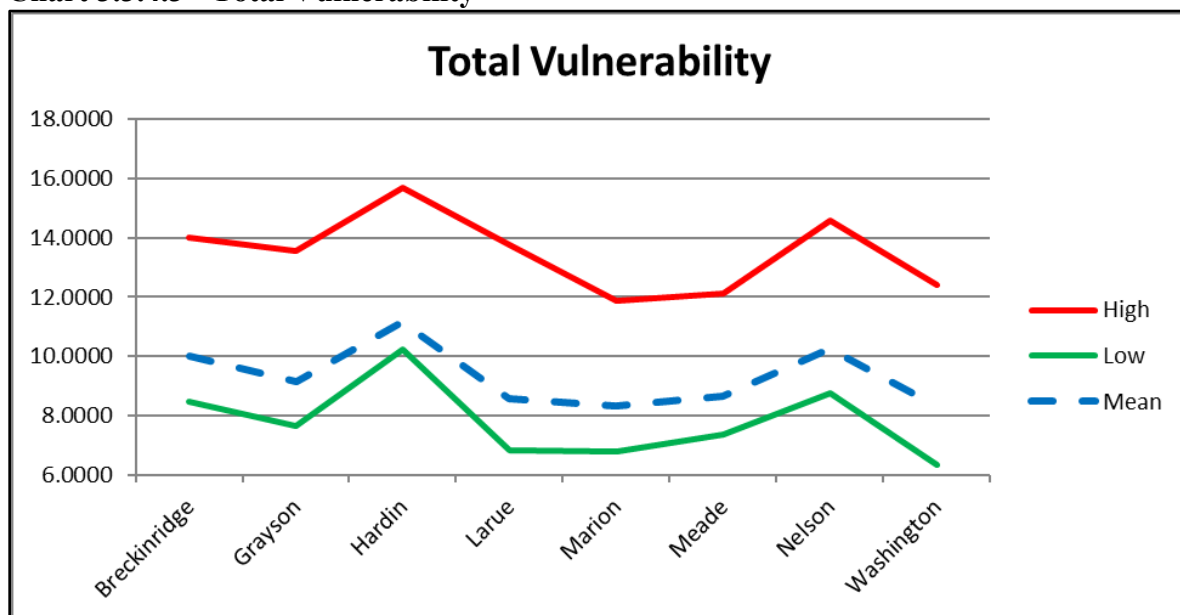
### **C. Total Vulnerability Score**

The factor of the SV and GV yields the *Total Vulnerability (TV)* score for each Census block.

**Table 3.3.4.6 - Total vulnerability Scores**

<b>Total Vulnerability Scores</b>	<b>High</b>	<b>Low</b>	<b>Mean</b>
<b>Breckinridge</b>	13.9971	8.4816	10.0112
<b>Grayson</b>	13.5766	7.6597	9.1543
<b>Hardin</b>	15.6802	10.2536	11.1577
<b>Larue</b>	13.7499	6.8127	8.5533
<b>Marion</b>	11.8854	6.7783	8.3267
<b>Meade</b>	12.1072	7.3534	8.6692
<b>Nelson</b>	14.5919	8.7734	10.2428
<b>Washington</b>	12.3903	6.3319	8.3071
<b>Lincoln Trail</b>	15.6802	6.331941	9.8308

**Chart 3.3.4.3 - Total Vulnerability**



This score allows a determination of the relative vulnerability of each block to a hazard event. The scores were classified using an equal interval method of four categories. The classification ranges are as follows:

Low	6.331941 - 8.669011
Moderate	8.669012 - 11.006080
High	11.006081 - 13.343150
Extreme	13.343151 - 15.680219 (maximum value)

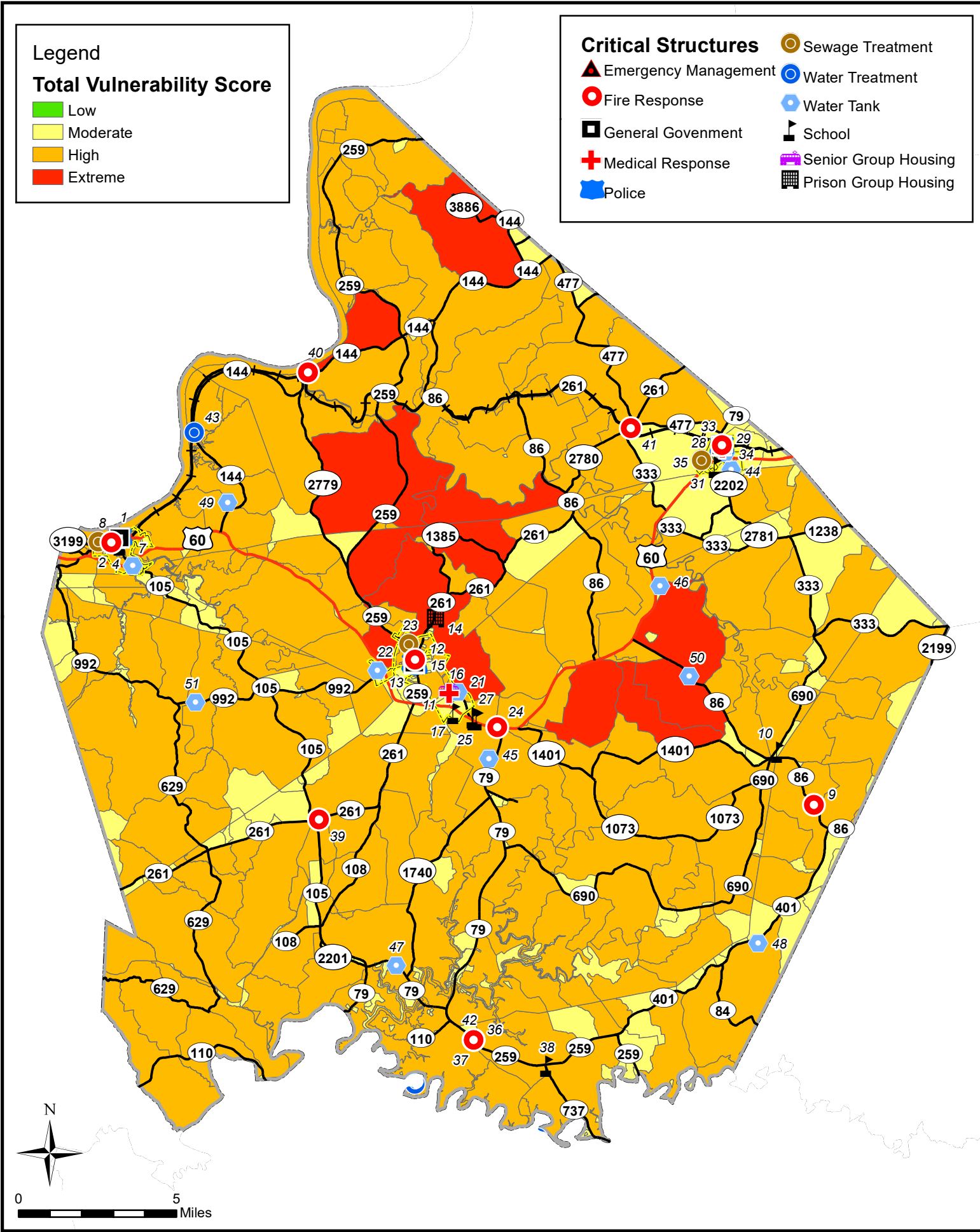
The results of this analysis aids in providing focus areas for the evaluation of current mitigation strategies and implementation of future strategies. The following table and individual entity maps illustrate the block vulnerability for each county and plot, and the critical structures that currently fall within the extreme or high zones.

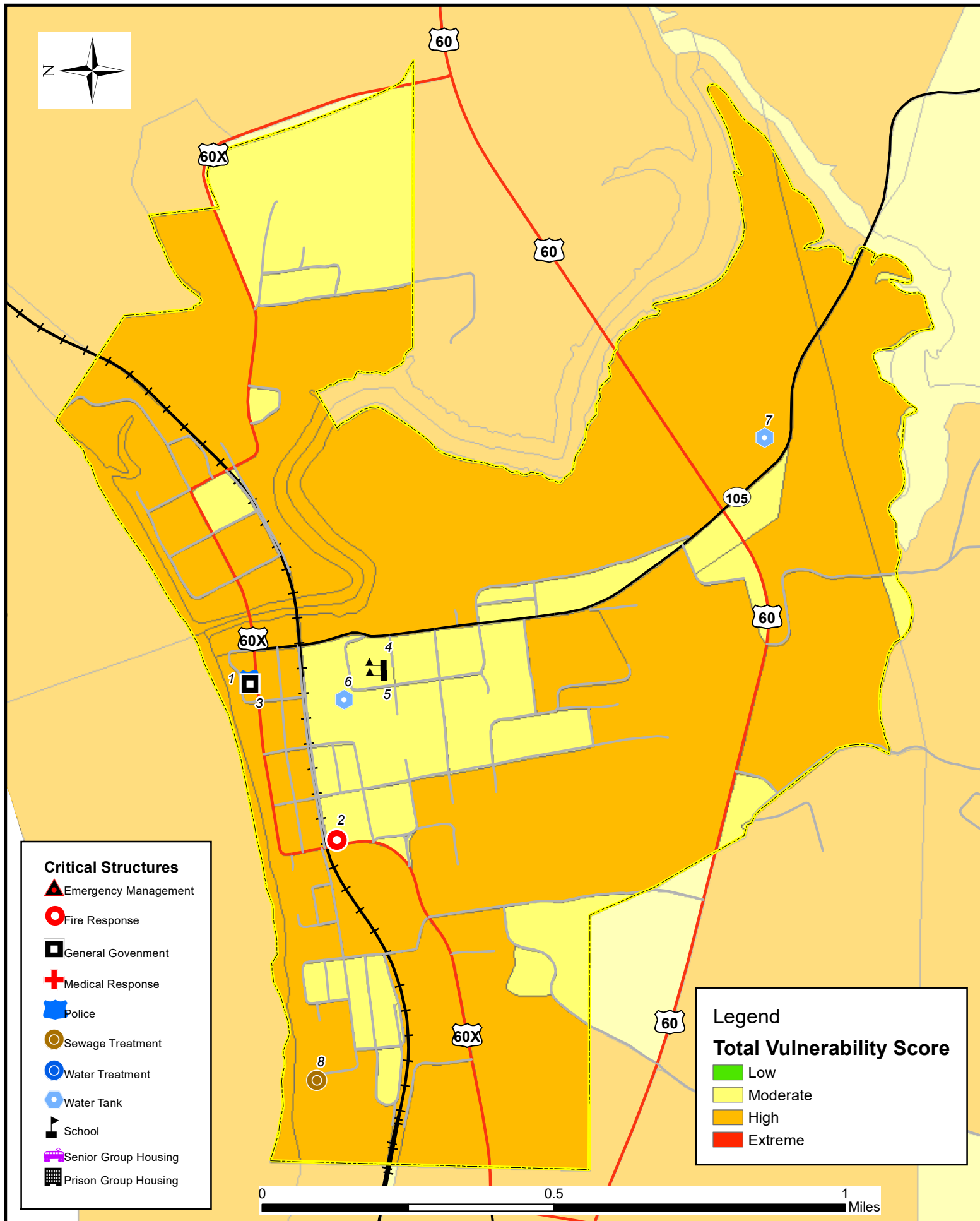
**Table 3.3.4.7 - Critical Facilities located in combined Socially and Geographically Vulnerable Area by County.**

**Breckinridge County**

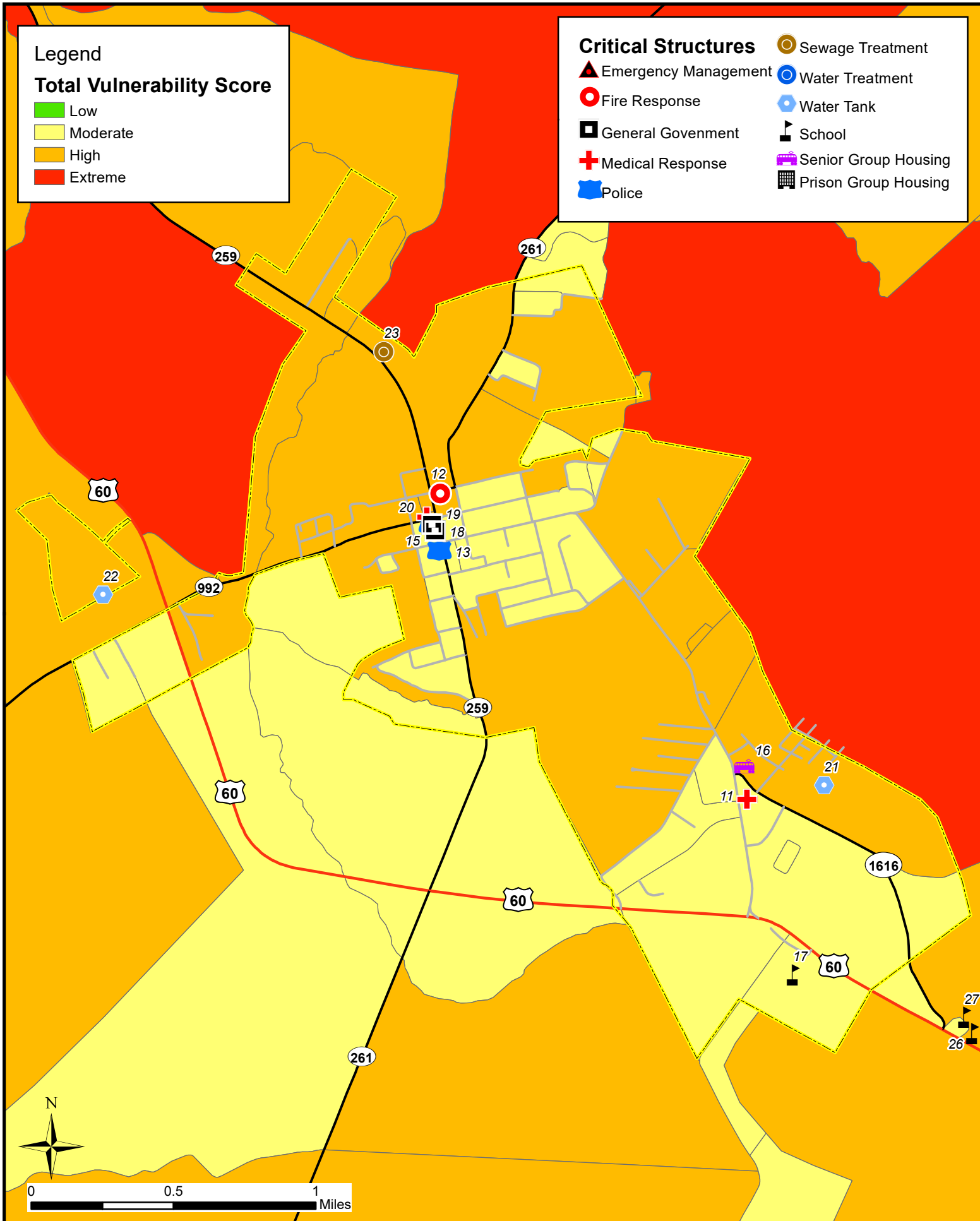
Map #	Facility	Function	Vulnerability Zone
1	Cloverport Police	Police	Moderate
2	Cloverport VFD	Fire Response	Moderate
3	Cloverport City Hall	General Government	Moderate
4	Frederick Fraize High School	School	Moderate
5	William H Natcher Elementary School	School	Moderate
6	Elevated Tank	WT	Moderate
7	Standpipe Tank	WT	Moderate
8	Cloverport STP	STP	Moderate
9	Custer Fire Dept	Fire Response	High
10	Custer Elementary School	School	Moderate
11	Breckinridge Memorial Hospital	Medical Response	Moderate
12	Hardinsburg VFD	Fire Response	Moderate
13	Hardinsburg Police	Police	Moderate
14	Breckinridge County Jail	Prison Group Housing	High
15	Breckinridge County Sheriff	Police	Moderate
16	Medco Center	Senior Group Housing	Moderate
17	Hardinsburg Elementary School	School	Moderate
18	Hardinsburg City Hall	General Government	Moderate
19	Breckinridge County Courthouse	General Government	Moderate
20	Breckinridge County Health Department	Medical Response	Moderate
21	Fairgrounds Rd.	WT	High
22	Industrial Park	WT	Moderate
23	Hardinsburg STP	STP	High
24	Harned VFD	Fire Response	Low
25	Breckinridge County High School	School	Moderate
26	Breckinridge County Area Technology Center	School	Moderate
27	Breckinridge County MIDDLE SCHOOL	School	Moderate
28	Irvington Police	Police	Moderate
29	Irvington Area Emergency Medical HQ	Medical Response	Moderate
30	Irvington Area Ambulance Service	Medical Response	Moderate
31	Irvington Elementary School	School	Moderate
32	Irvington City Hall	General Government	Moderate
33	Irvington VFD	Fire Response	Moderate

34	Irvington Water Tank	WT	Moderate
35	Irvington WWTP	STP	Moderate
36	Mcdaniels Ems Fire & Rescue Service	Medical Response	Moderate
37	Mcdaniels Fire-Rescue, Inc.	Fire Response	Moderate
38	Ben Johnson Elementary School	School	High
39	Mcquady VFD	Fire Response	Moderate
40	Stephensport VFD	Fire Response	Moderate
41	Webster VFD	Fire Response	Moderate
42	Mcdaniels VFD	Fire Response	Moderate
43	Hardinsburg WTP	WTP	Moderate
44	Sam Dowell Rd	WT	Moderate
45	Ben Wright	WT	Moderate
46	Irvington	WT	Moderate
47	Axtel	WT	High
48	Hudson	WT	Moderate
49	Persimmon Flats Tank	WT	Moderate
50	Stinnettsville Tank	WT	High
51	Balltown	WT	Moderate





172c

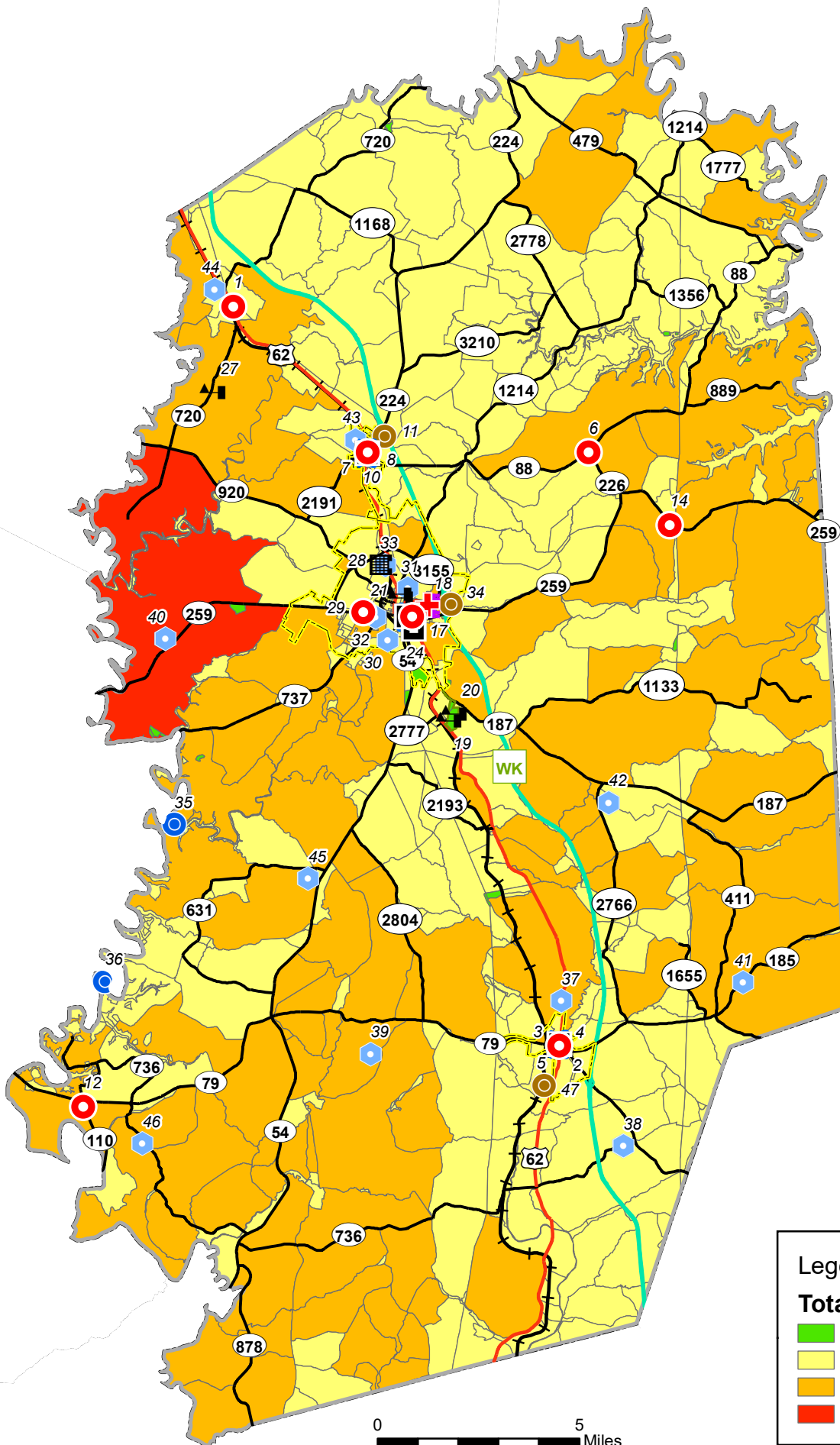




## Grayson County

Map #	Facility	Function	Vulnerability Zone
1	East Grayson County Fire Dept	Fire Response	Low
2	Caneyville VFD	Fire Response	Moderate
3	Caneyville Police	Police	Moderate
4	Caneyville City Hall	General Government	Moderate
5	Caneyville Elementary School	School	Moderate
6	Wax Fire Dept	Fire Response	Moderate
7	Clarkson Police	Police	Low
8	Clarkson VFD	Fire Response	Low
9	Clarkson Elementary School	School	Low
10	Clarkson City Hall	General Government	Low
11	Clarkson WWTP	STP	Low
12	Falls Of Rough VFD	Fire Response	Moderate
13	Leitchfield Pd	Police	Moderate
14	Aneta Fire Dept	Fire Response	Moderate
15	Grayson County Sheriff	Police	Low
16	Grayson County Jail	Prison Group Housing	Moderate
17	Leitchfield VFD	Fire Response	Moderate
18	Twin Lakes Regional Medical Center	Medical Response	High
19	Oran P Lawler Elementary School	School	Low
20	Grayson County High School	School	Low
21	H W Wilkey Elementary School	School	Moderate
22	Grayson County Middle School	School	Moderate
23	Grayson County Courthouse	General Government	Moderate
24	Leitchfield City Hall	General Government	Low
25	Grayson County Health Department	Medical Response	Moderate
26	Grayson Manor Nursing Home	Senior Group Housing	High
27	St. Paul Elementary School	School	High
28	Grayson County Correctional Facility	Prison Group Housing	Moderate
29	Leitchfield VFD	Fire Response	Low
30	Sunbeam Rd.	WT	Moderate
31	School St.	WT	Moderate
32	Orchard St.	WT	High
33	Detention Center	WT	Moderate
34	Leitchfield WWTP	STP	Moderate
35	Leitchfield	WTP	Moderate

36	Grayson County	WTP	Low
37	Hwy 62 East	WT	Moderate
38	Windy Ridge	WT	Moderate
39	Post Tousey	WT	Moderate
40	Conklin School	WT	Extreme
41	Hwy 185	WT	High
42	Shrewsbury (Out of Service)	WT	Moderate
43	Clarkson	WT	Moderate
44	Big Clifty	WT	Moderate
45	Duff Rd	WT	Moderate
46	Lone Hill	WT	Moderate
47	Caneyville WWTP	STP	Moderate



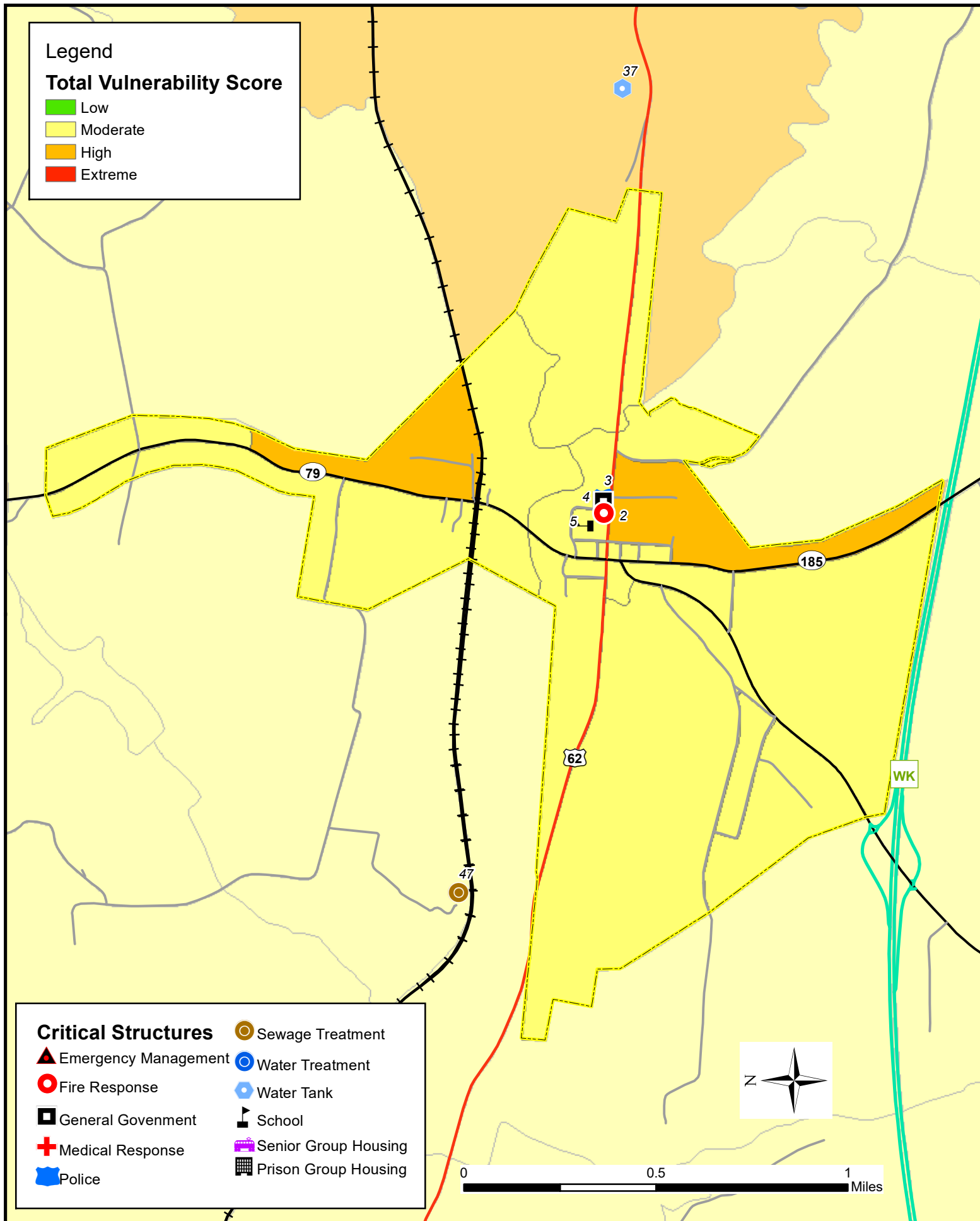
### Critical Structures

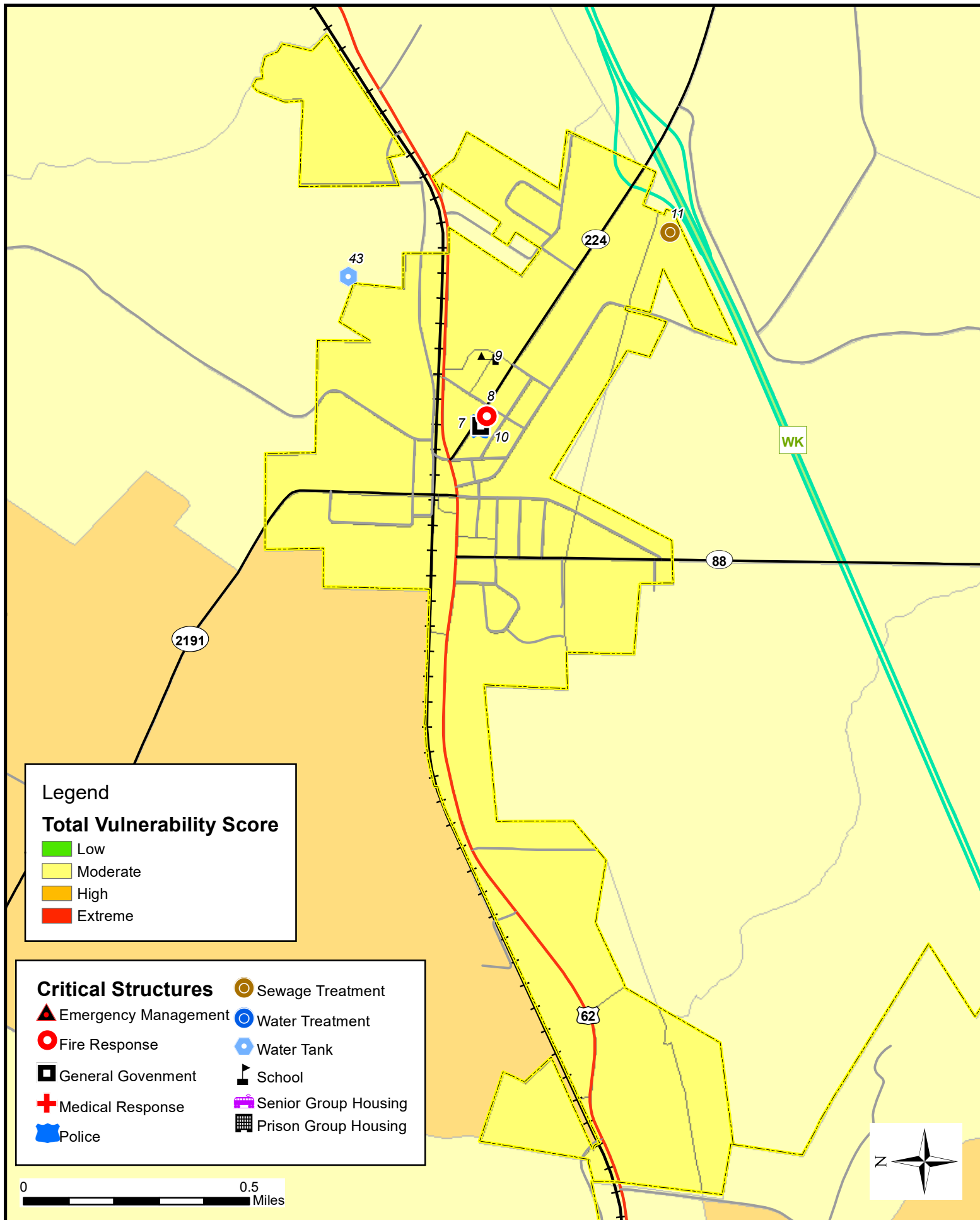
- Emergency Management
- Fire Response
- General Government
- Medical Response
- Police
- Sewage Treatment
- Water Treatment
- Water Tank
- School
- Senior Group Housing
- Prison Group Housing

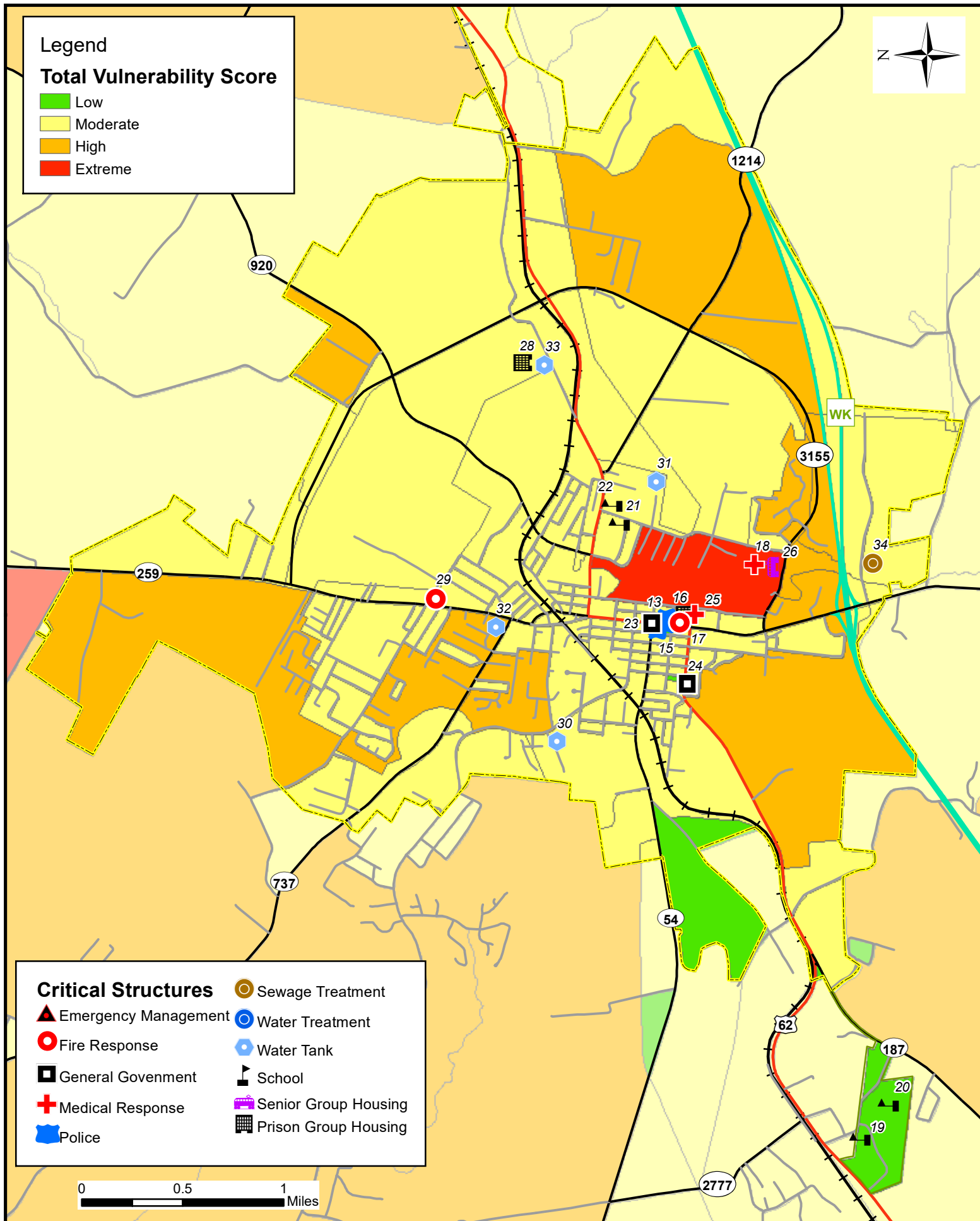
### Legend

#### Total Vulnerability Score

- Low
- Moderate
- High
- Extreme







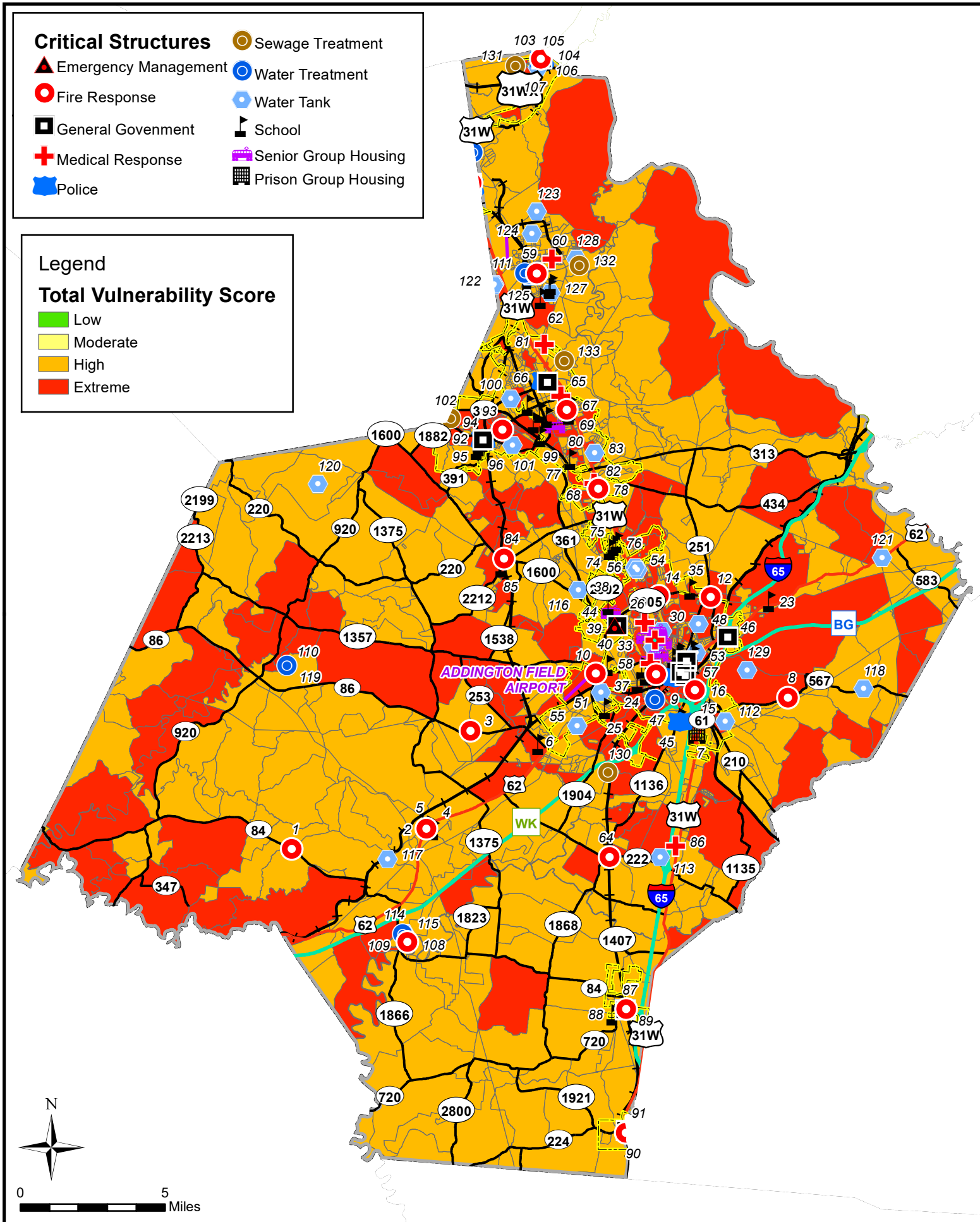
## Hardin County

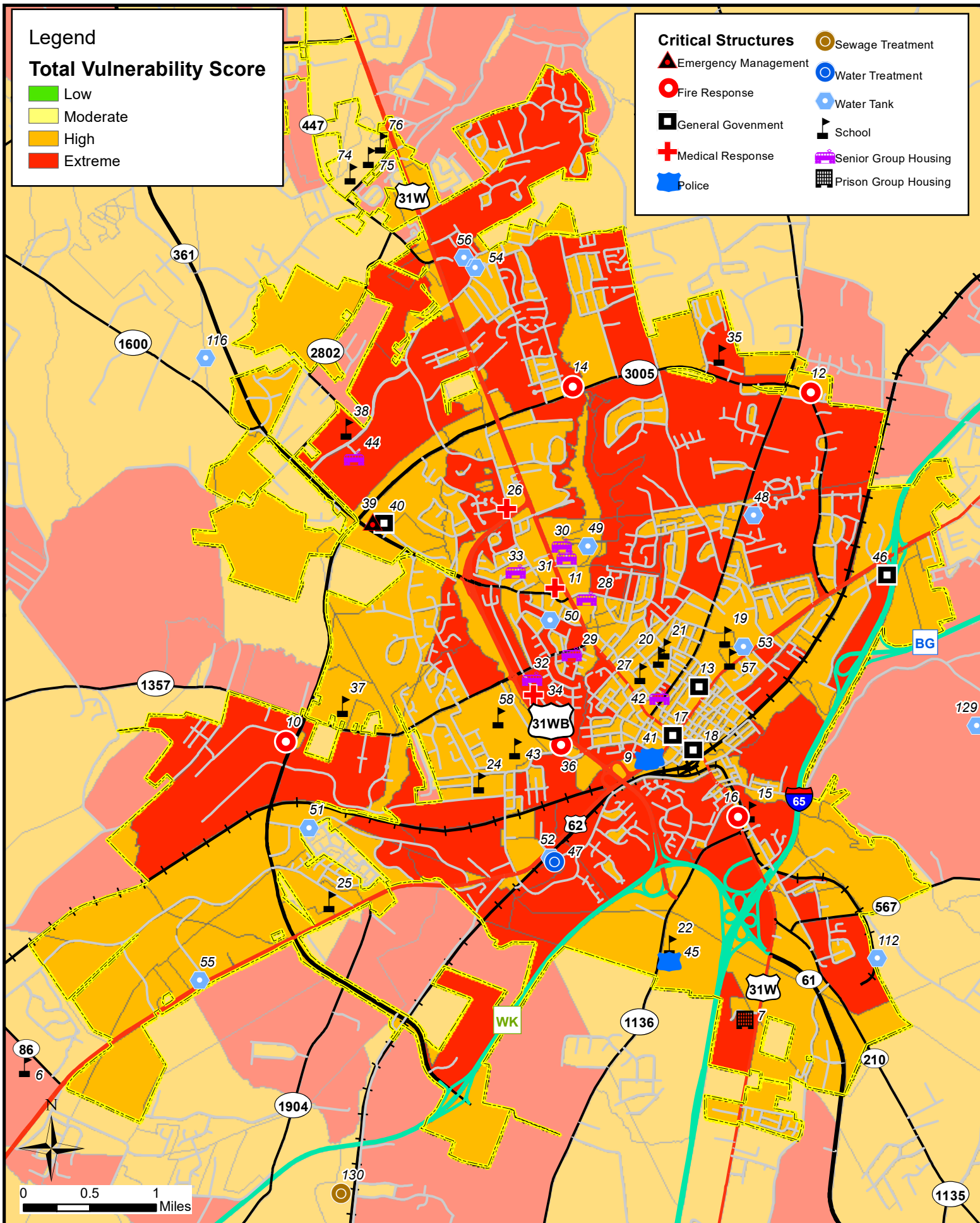
Map #	Facility	Function	Vulnerability Zone
1	West 84 Fire Dept	Fire Response	Moderate
2	Stephensburg VFD	Fire Response	High
3	Kentucky 86 Fire Dept	Fire Response	High
4	Lakewood Elementary School	School	High
5	West Hardin Middle School	School	Moderate
6	Cecilia Valley Elementary School	School	High
7	Hardin County Jail	Prison Group Housing	High
8	Valley Creek Fire Dept	Fire Response	Moderate
9	Elizabethtown Police	Police	High
10	Elizabethtown Fire Station #1	Fire Response	High
11	Hardin Memorial Hospital	Medical Response	Moderate
12	Central Hardin County Fire Dept	Fire Response	High
13	National Guard Armory	General Government	High
14	Elizabethtown Fire Station #3	Fire Response	High
15	Valley View Education Center	School	High
16	Elizabethtown Fire Station #2	Fire Response	High
17	Elizabethtown City Hall	General Government	Moderate
18	Hardin County Justice Center	General Government	High
19	Elizabethtown High School	School	High
20	Morningside Elementary School	School	Moderate
21	T. K. Stone Middle School	School	Moderate
22	East Hardin Middle School	School	High
23	Lincoln Trail Elementary School	School	High
24	Hardin Alternative School	School	High
25	Central Hardin High School	School	High
26	Lincoln Trail District Health Department	Medical Response	High
27	Elizabethtown Christian Academy	School	High
28	Helmwood Healthcare Center	Senior Group Housing	Moderate
29	Kennington Manor	Senior Group Housing	High
30	Healthsouth Rehab Center	Senior Group Housing	High
31	Atria Assisted Living	Senior Group Housing	High
32	Morningside Gardens Assisted Living	Senior Group Housing	High
33	Taylor Made Assisted Living	Senior Group Housing	High
34	Hardin Co. Health Center	Medical Response	High
35	Heartland Elementary	School	High

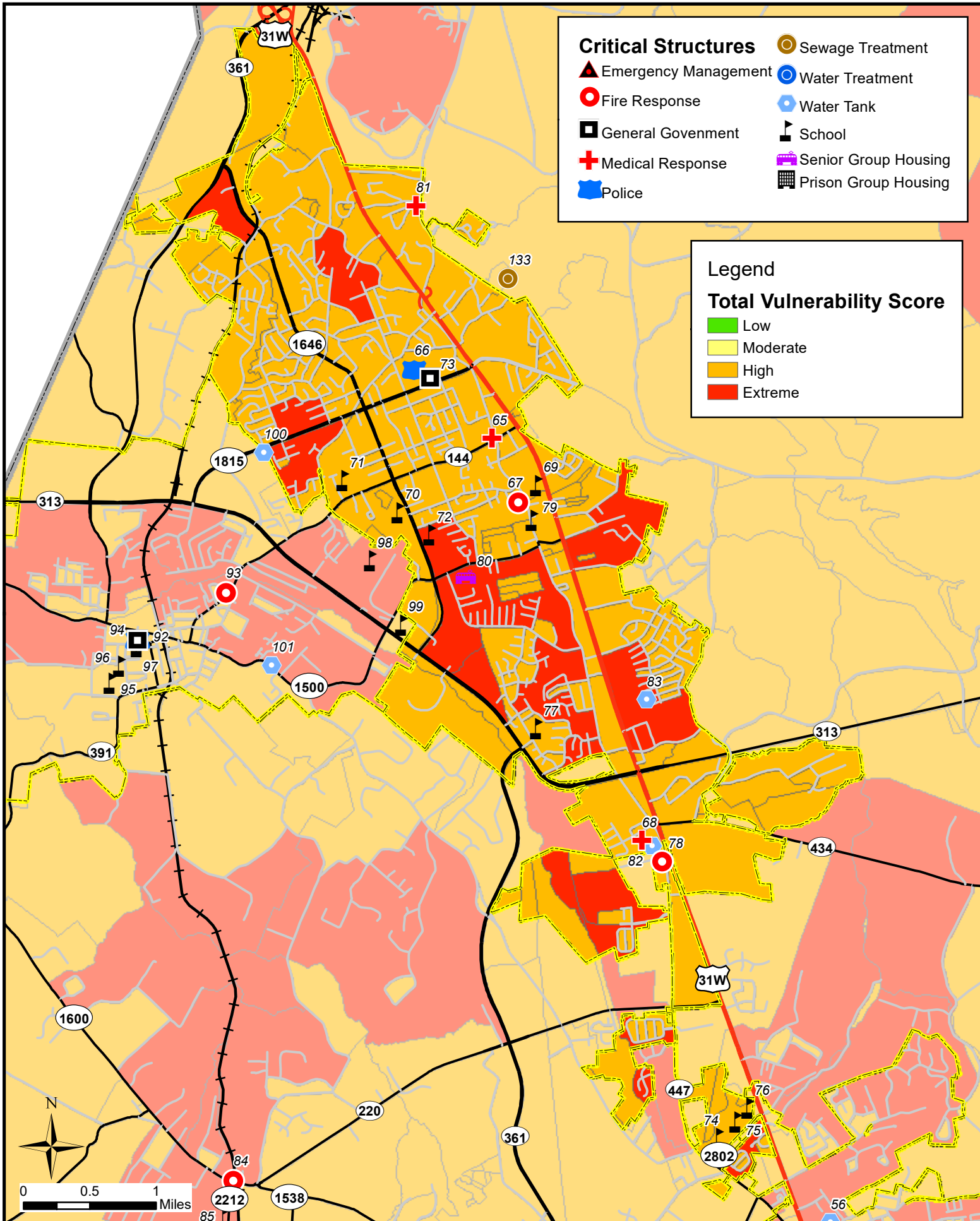
36	Central Kentucky Fire Training Center	Fire Response	High
37	G C Burkhead Elementary School	School	High
38	St James Elementary School	School	Extreme
39	Hardin County Emergency Management	Emergency Management	High
40	Hardin County Government Center	General Government	High
41	Elizabethtown Police Dept	Police	High
42	Communicare Assisted Living	Senior Group Housing	High
43	Elizabethtown Community & Technical College	School	High
44	Robin Brooke Assisted Living	Senior Group Housing	High
45	KSP Post 4	Police	High
46	State Driver's License Office	General Government	High
47	City Springs	WTP	High
48	Pear Orchard	WT	Extreme
49	Freeman Lake WTP	WT	High
50	Helmwood Tank	WT	High
51	Peterson Drive Tower	WT	High
52	City Springs Water Plant Clearwell	WT	High
53	Mulberry Tank	WT	High
54	Oaklawn	WT	High
55	Cecilia Tank	WT	Moderate
56	Pear Orchard Tank	WT	High
57	Panther Academy	School	High
58	Early College and Career Center	School	High
59	Fort Knox Fire Dept	Fire Response	Moderate
60	Ireland Army Hospital	Medical Response	Moderate
61	Scott Middle School	School	Moderate
62	Macdonald Intermediate School	School	High
63	Fort Knox High School	School	Moderate
64	Glendale Fire Dept	Fire Response	Moderate
65	Hardin County Ambulance Service, North Hardin	Medical Response	High
66	Radcliff Police	Police	High
67	Radcliff FD #1	Fire Response	High
68	Lincoln Trail Hospital	Medical Response	High
69	Radcliff Middle School	School	Moderate

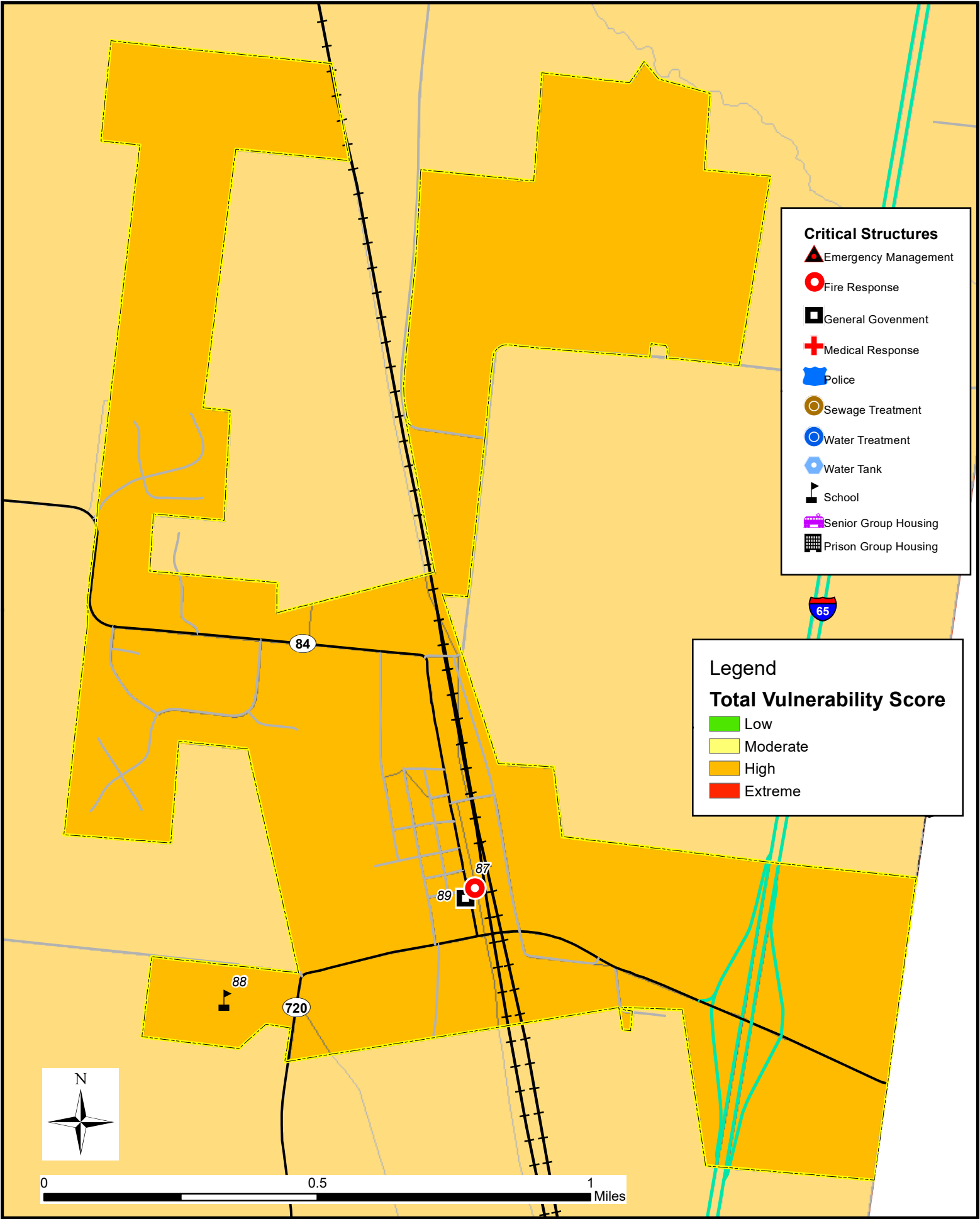
70	North Hardin High School	School	High
71	Meadow View Elementary School	School	High
72	Parkway Elementary School	School	High
73	Radcliff City Hall	General Government	High
74	John Hardin High School	School	Moderate
75	Bluegrass Middle School	School	Moderate
76	New Highland Elementary School	School	Moderate
77	Woodland Elementary School	School	High
78	Radcliff FD #2	Fire Response	High
79	St. Christopher Elementary School	School	Moderate
80	North Hardin Health & Rehab Center	Senior Group Housing	Extreme
81	Hardin County Health Department	Medical Response	High
82	Longview	WT	High
83	Whispering Hills	WT	High
84	Rineyville Fire Dept	Fire Response	High
85	Rineyville Elementary School	School	High
86	Hardin County Ambulance Service, South Hardin	Medical Response	High
87	Sonora Fire Dept	Fire Response	Moderate
88	Creekside Elementary School	School	Moderate
89	Sonora City Hall	General Government	Moderate
90	Upton Fire Dept	Fire Response	Moderate
91	Upton City Hall	General Government	Moderate
92	Vine Grove Police	Police	Moderate
93	Vine Grove Fire Dept	Fire Response	Moderate
94	Vine Grove City Hall	General Government	Moderate
95	James T. Alton Middle School	School	Moderate
96	Vine Grove Elementary School	School	Moderate
97	Brown Street Center	School	Moderate
98	North Middle School	School	High
99	North Hardin Christian School	School	Moderate
100	Lincoln Trail	WT	High
101	Elevated Tank	WT	High
102	Vine Grove WWTP	STP	High
103	West Point Fire Dept	Fire Response	High
104	West Point Police	Police	High
105	West Point City Hall	General Government	High
106	West Point	WTP	High
107	West Point Water Storage Tank	WT	High

108	White Mills Fire Dept	Fire Response	High
109	White Mills	WTP	High
110	Pirtle Springs	WTP	High
111	Fort Knox/Central WTP	WTP	Moderate
112	South End Tank	WT	Moderate
113	Glendale Tank	WT	High
114	Clearwell #1	WT	High
115	Clearwell #2	WT	High
116	Rineyville Tank	WT	High
117	Eastview Tank	WT	High
118	Valley Creek Tank	WT	Moderate
119	Pirtle Springs Clear Well	WT	High
120	Brizendine	WT	High
121	Hardin County Tank	WT	High
122	Pritchard Tank	WT	High
123	Frazier Tank	WT	Moderate
124	Old Ironsides Tank	WT	Moderate
125	Ed Center #1	WT	Moderate
126	Ed Center #2	WT	Moderate
127	Ft Knox High School	WT	Moderate
128	WWTP Tank	WT	Moderate
129	Springfield Rd Tank	WT	High
130	Valley Creek WWTP	STP	High
131	West Point WWTP	STP	High
132	Ft Knox WWTP	STP	High
133	Radcliff WWTF	STP	High

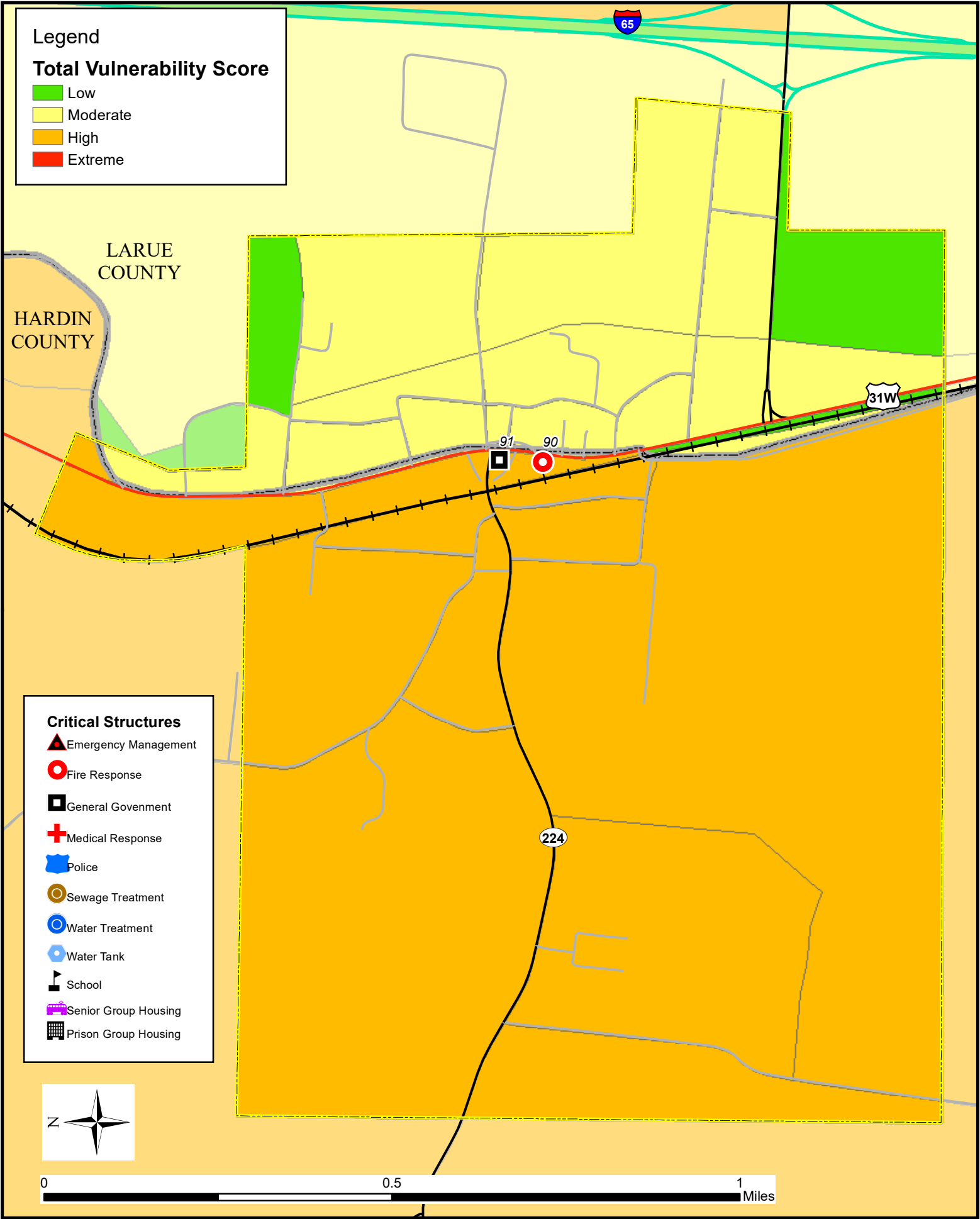


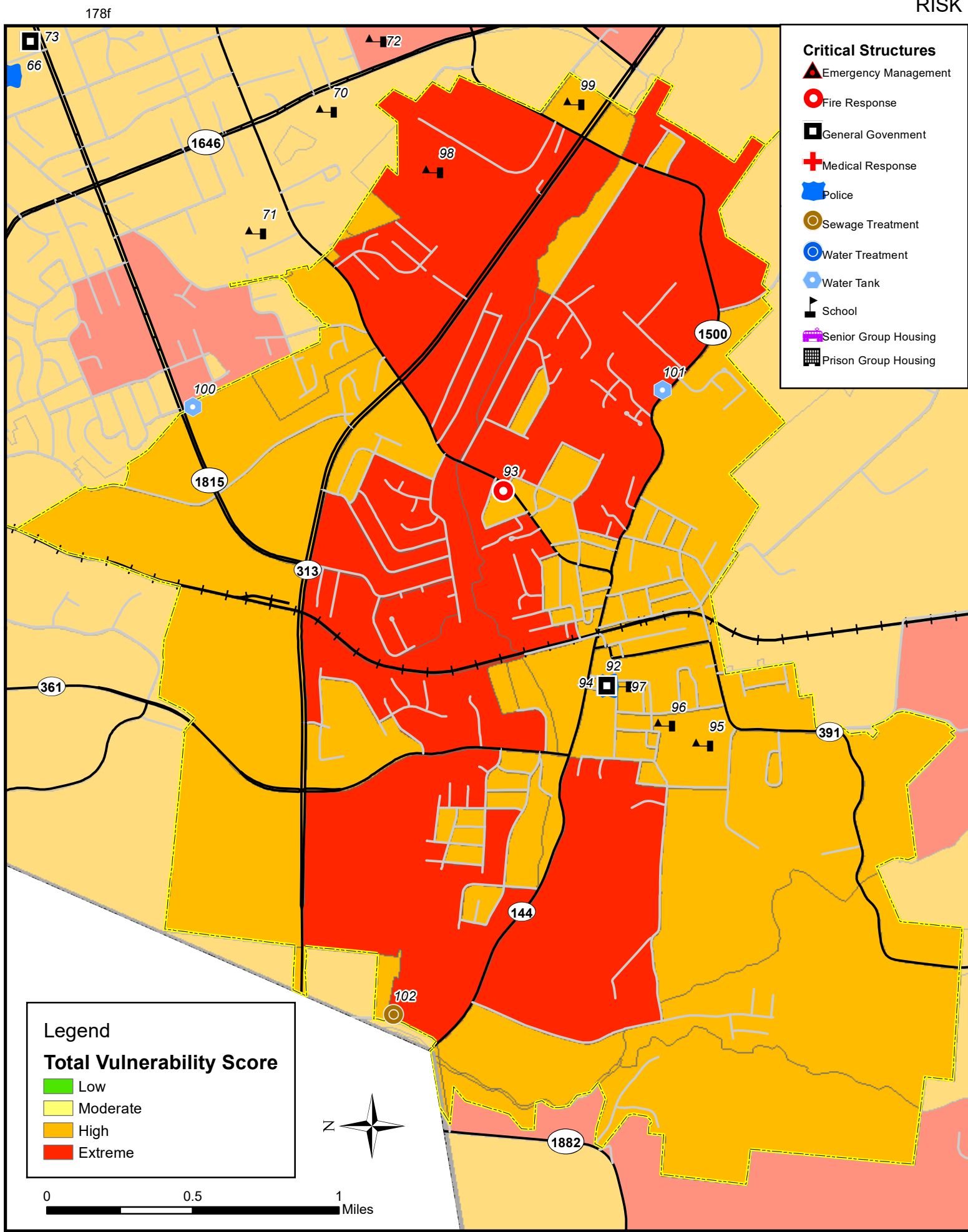




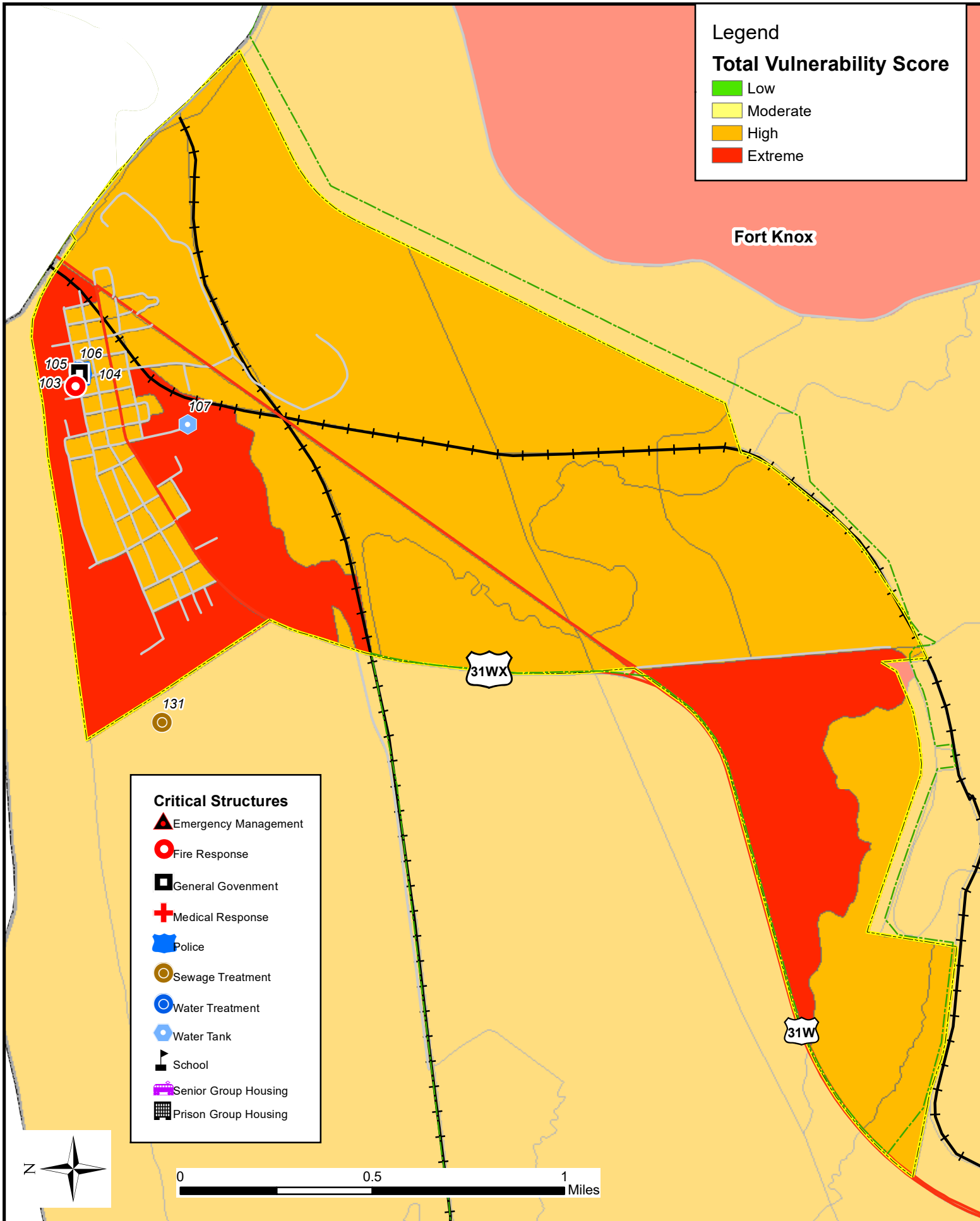


178e





178g

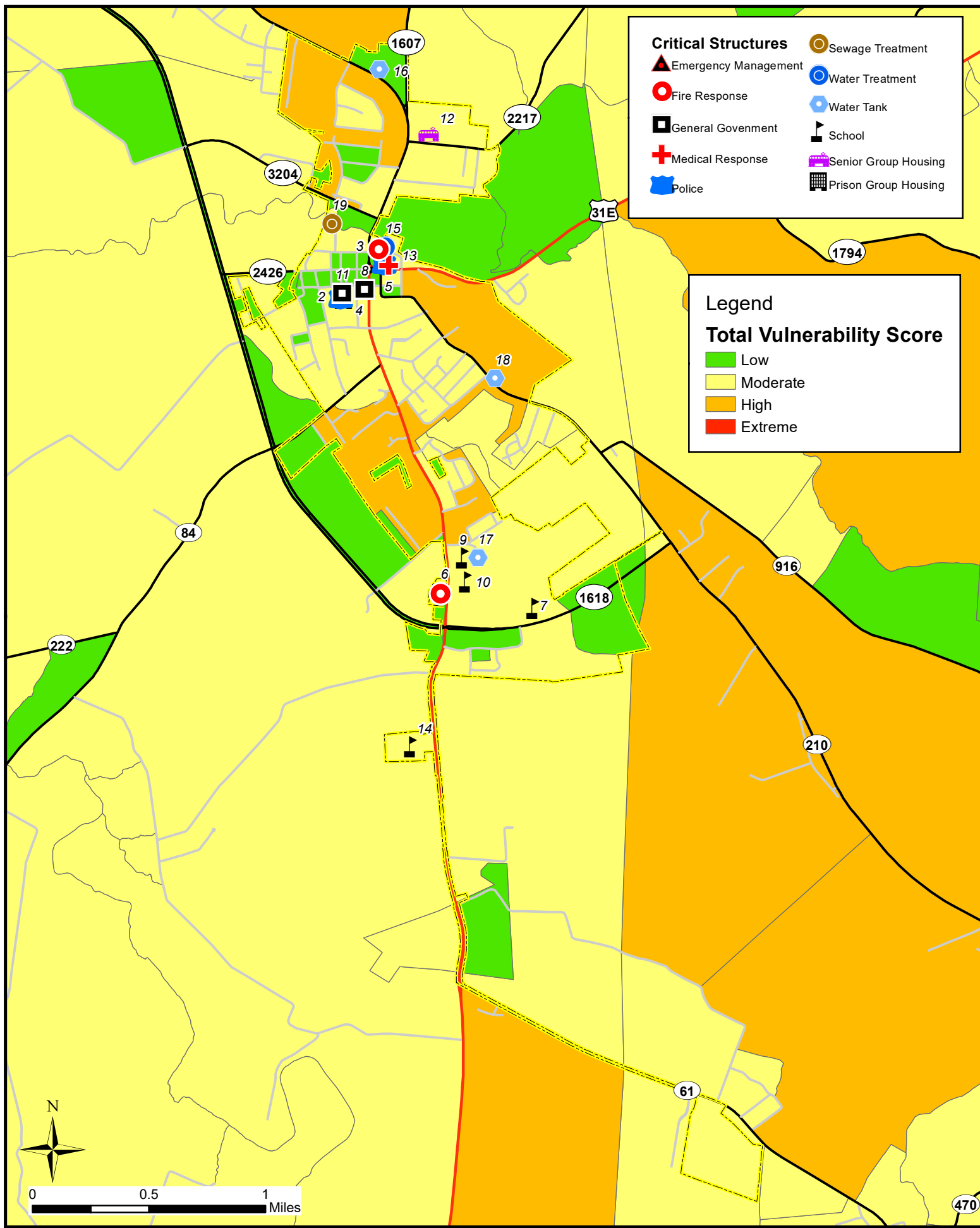


## Larue County

Map #	Facility	Function	Vulnerability Zone
1	Buffalo Fire Dept	Fire Response	Moderate
2	Larue County Sheriff	Police	Moderate
3	Hodgenville Fire Dept	Fire Response	Low
4	Larue County Jail	Prison Group Housing	Moderate
5	Hodgenville Police	Police	Moderate
6	Larue County Fire Dept	Fire Response	Low
7	Hodgenville Elementary School	School	Moderate
8	Hodgenville City Hall	General Government	Low
9	Larue County Middle School	School	Moderate
10	Larue County High School	School	Moderate
11	Larue County Courthouse	General Government	Moderate
12	Sunrise Manor	Senior Group Housing	Moderate
13	Larue County Health Department	Medical Response	Moderate
14	Abraham Lincoln Elementary School	School	Moderate
15	Hodgenville	WTP	Low
16	North Tank	WT	Low
17	High School Tank	WT	Moderate
18	Fairgrounds Tank	WT	Moderate
19	Hodgenville WWTP	STP	Moderate
20	Magnolia Fire Dept	Fire Response	Low
21	Sonora Tank	WT	Moderate
22	Industrial Tank	WT	Low
23	East Leafdale	WT	High
24	Buffalo Water Tower	WT	Moderate
25	Wonderland Water Tower	WT	Moderate
26	Roanoke Water Tower	WT	Moderate
27	White City Water Tower	WT	Moderate
28	Tennison Rd Tank	WT	Moderate
29	Attilla Tank	WT	Moderate



179b



## Marion County

Map #	Facility	Function	Vulnerability Zone
1	Bradfordsville Fire Dept	Fire Response	Low
2	Bradfordsville City Hall	General Government	Low
3	Bradfordsville	WT	Low
4	Gravel Switch Fire Dept	Fire Response	Low
5	Marion County Sheriff	Police	Low
6	Marion County Jail	Prison Group Housing	Moderate
7	Norton Spring View Hospital	Medical Response	Moderate
8	Lebanon Fire Dept	Fire Response	Low
9	Marion County Fire & Rescue	Fire Response	Low
10	Life First Emergency Service	Medical Response	High
11	Norton Rest Home	Senior Group Housing	Moderate
12	Lebanon City Police Station	Police	Low
13	Marion County Court House	General Government	Low
14	Marion County Disaster & Emergency Services	Emergency Management	Low
15	Marion County Health Department	Medical Response	Moderate
16	Lebanon Elementary School	School	Moderate
17	St Augustine Elementary School	School	Low
18	Lebanon City Hall	General Government	Low
19	Marion County Knight Academy	School	Low
20	Marion County Area Tech Center	School	Low
21	Marion County High School	School	Low
22	Glasscock Elementary School	School	Low
23	Marion County Board of Education	School	Low
24	Cedars Of Lebanon Nursing Home	Senior Group Housing	Moderate
25	Justice Center	General Government	Low
26	Marion County Middle School	School	Low
27	Calvary Elementary School	School	Moderate
28	Springfield Rd	WT	Moderate
29	Lebanon WWTP	STP	Moderate
30	Loretto Fire Dept	Fire Response	Low
31	Loretto City Hall	General Government	Low
32	West Marion Elementary School	School	Moderate
33	Loretto	WT	Low
34	Raywick Fire Dept	Fire Response	Low
35	Raywick City Hall	General Government	Low

36	Lebanon	WTP	Moderate
37	Old Calvary Rd #2	WT	Moderate
38	Old Calvary Rd #1	WT	Moderate
39	Holy Cross	WT	Low
40	Hwy 84 (Gap Knob)	WT	Moderate
41	Hwy 49 (Narrows)	WT	Moderate
42	St. Rose Tank	WT	Moderate
43	St. Charles	WT	Low
44	Riley	WT	Moderate
45	Bradfordsville WWTP	STP	Low

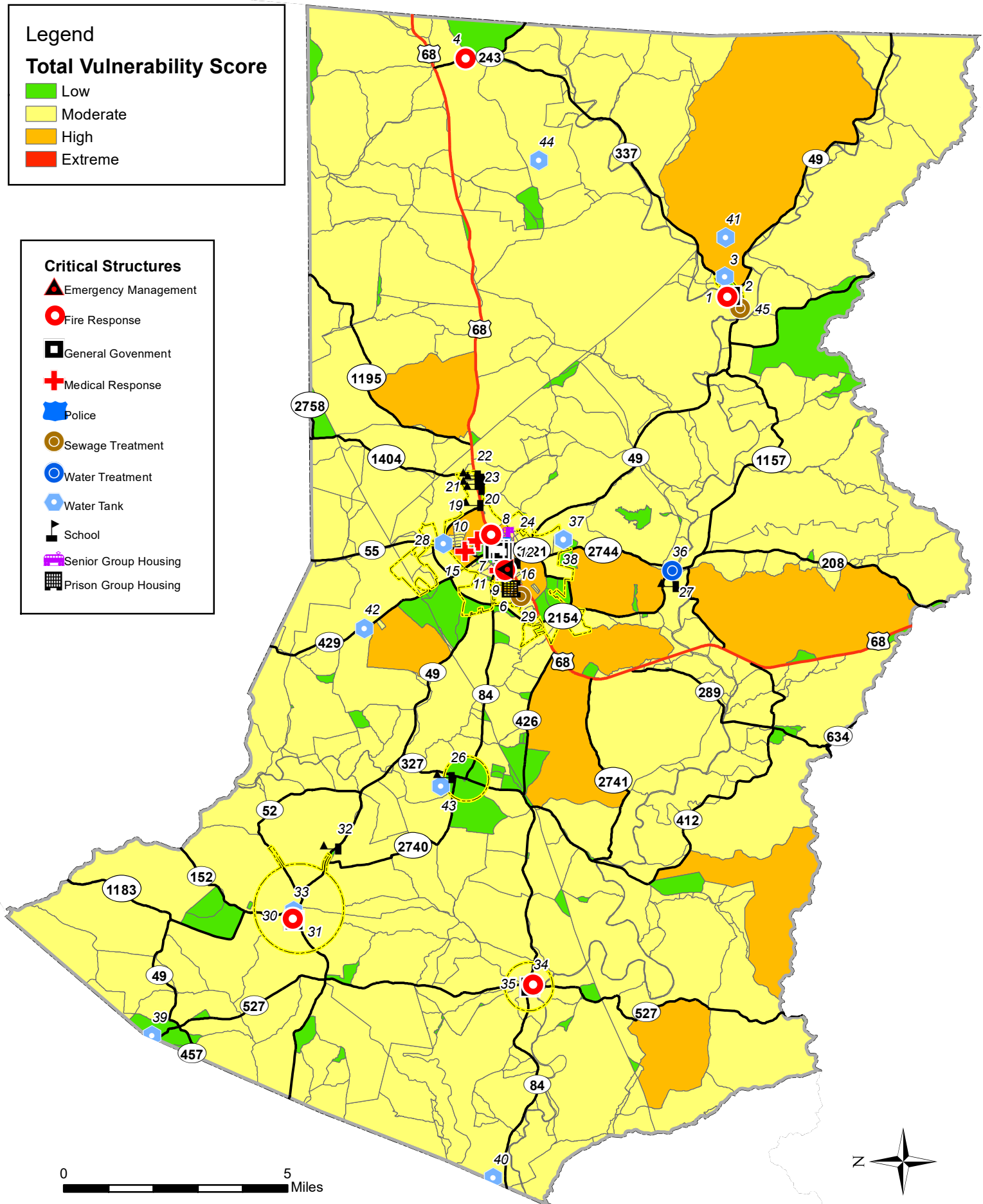
## Legend

### Total Vulnerability Score

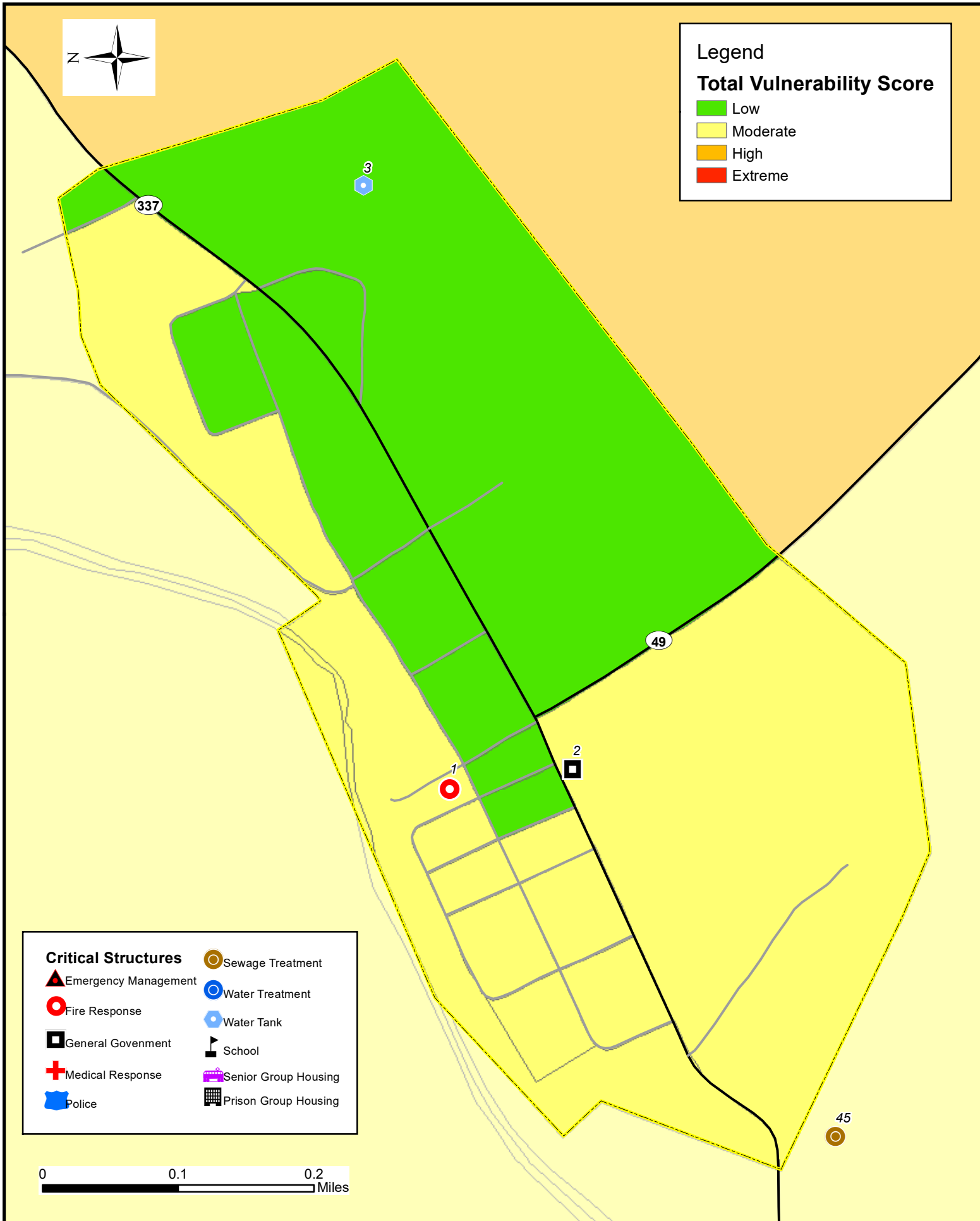
- Low
- Moderate
- High
- Extreme

### Critical Structures

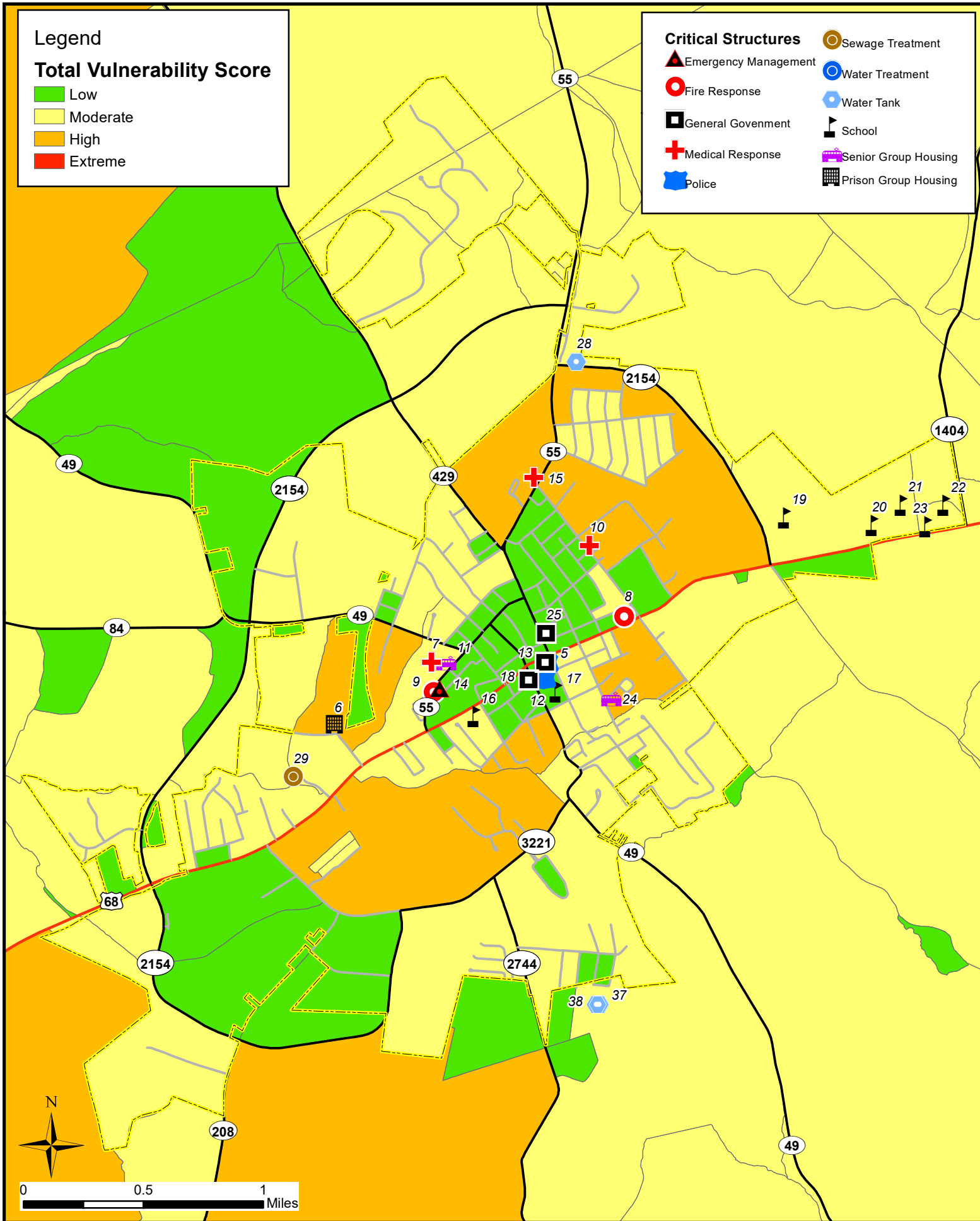
- ▲ Emergency Management
- Fire Response
- General Government
- + Medical Response
- Police
- Sewage Treatment
- Water Treatment
- Water Tank
- ▲ School
- Senior Group Housing
- Prison Group Housing



181b



181c



181d

Legend

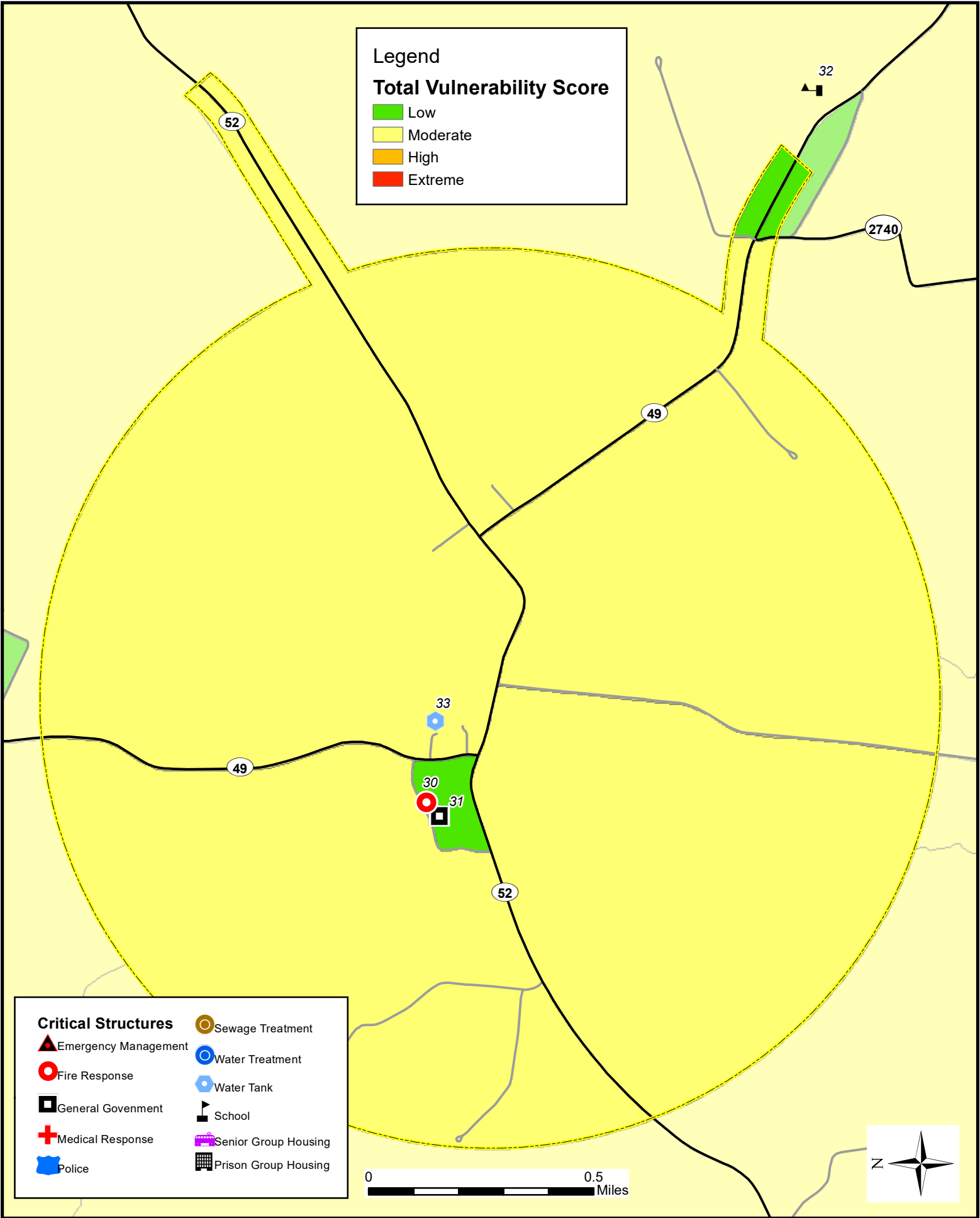
**Total Vulnerability Score**

Low

Moderate

High

Extreme



**Critical Structures**

Emergency Management

Fire Response

General Government

Medical Response

Police

Sewage Treatment

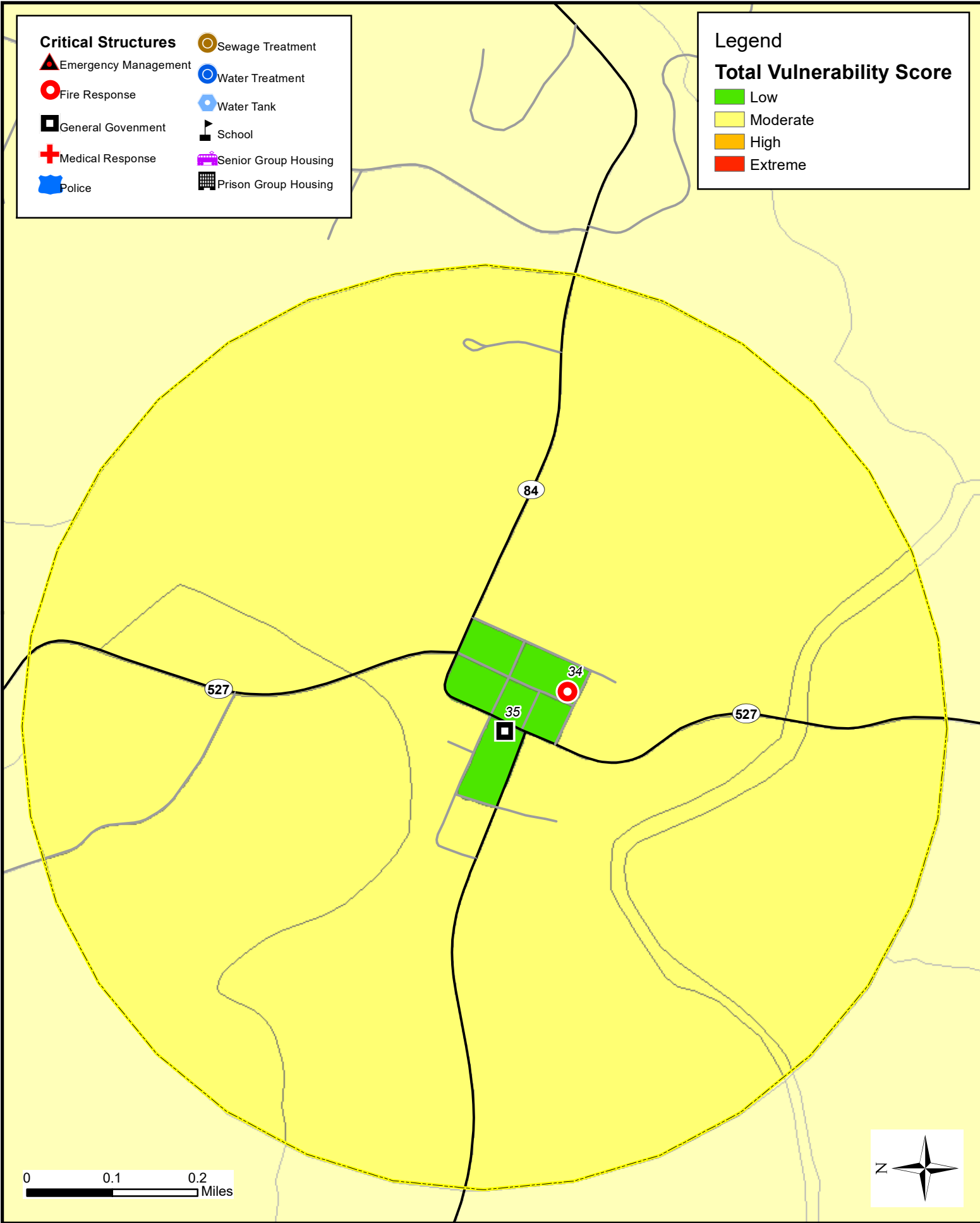
Water Treatment

Water Tank

School

Senior Group Housing

Prison Group Housing

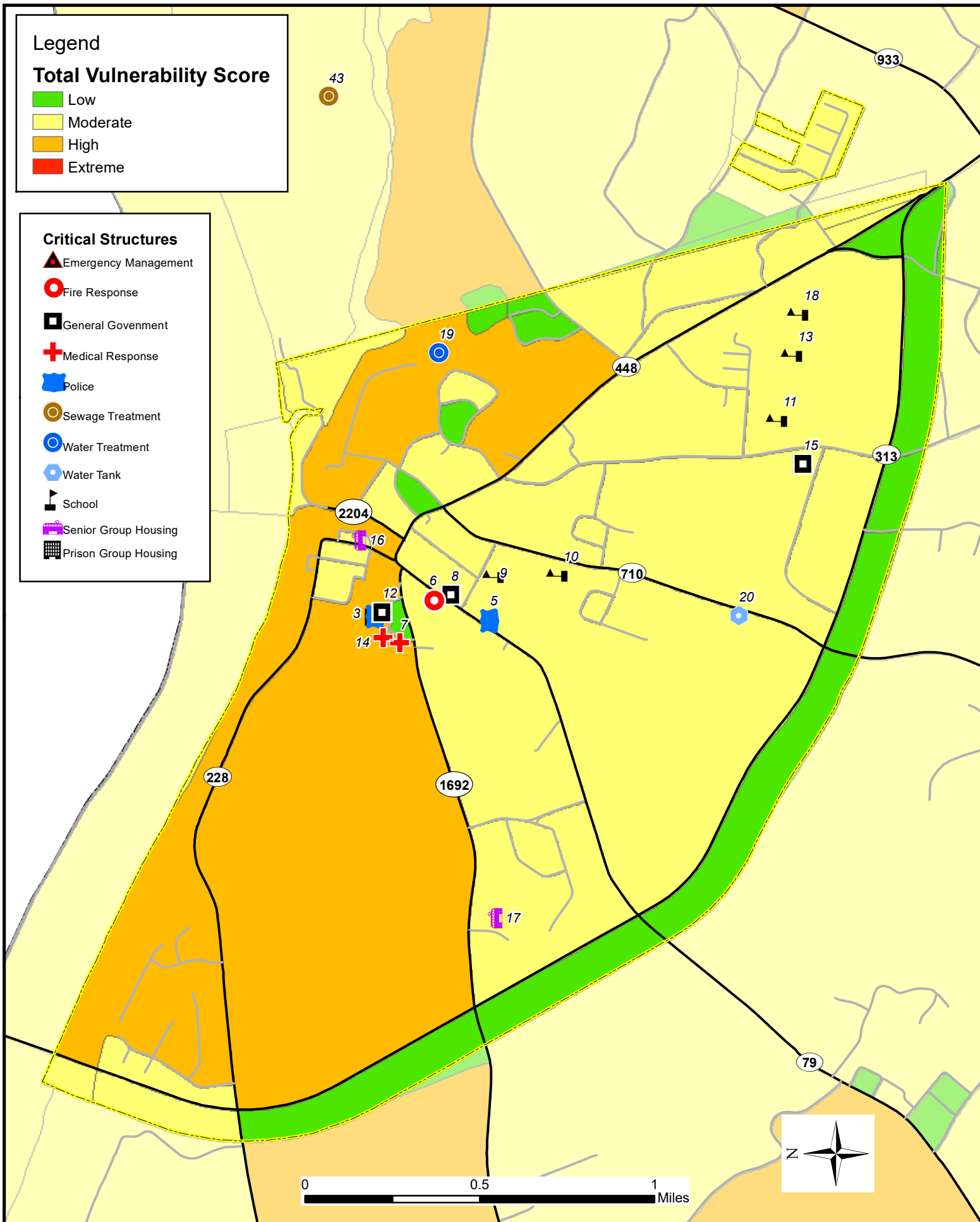


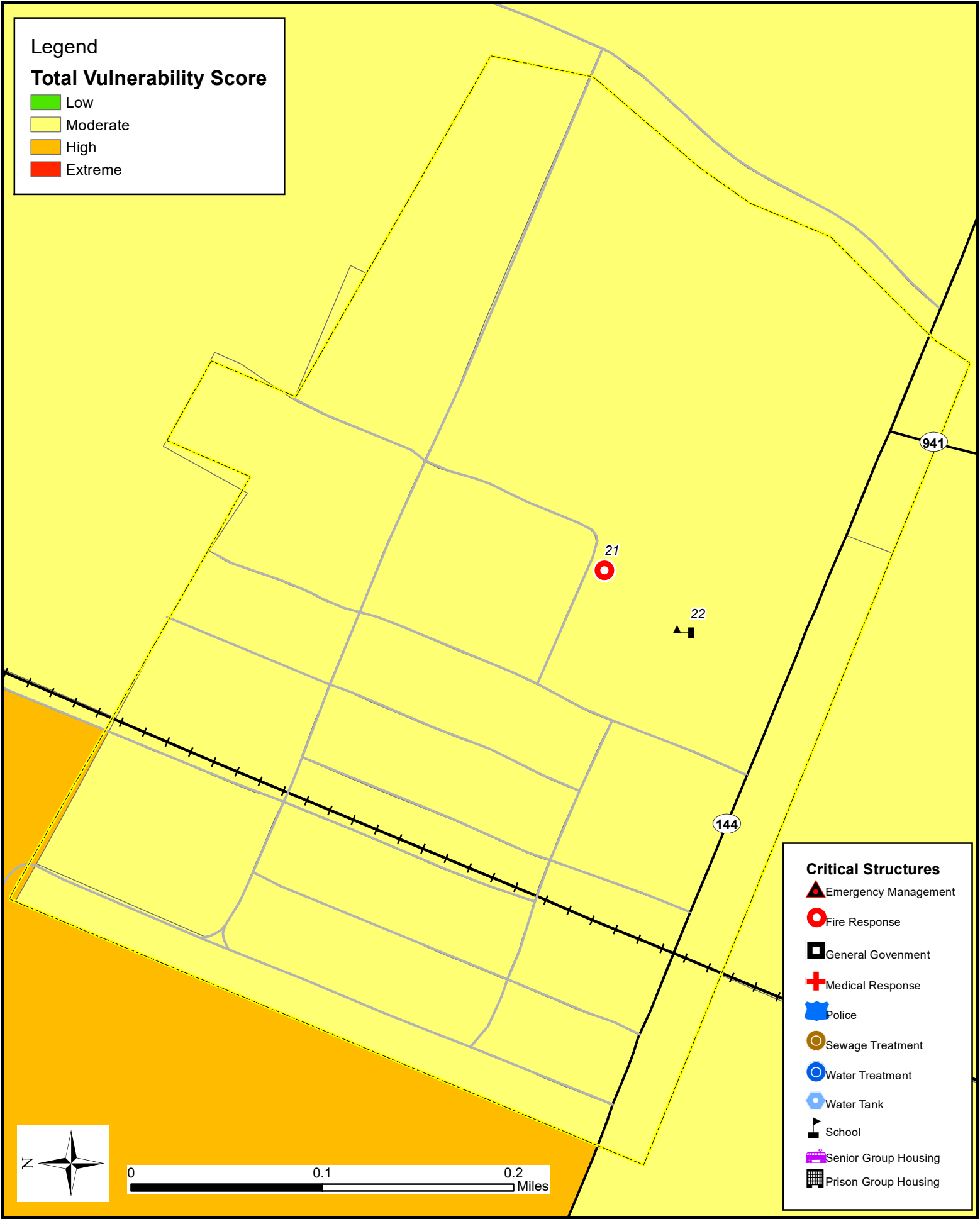
## Meade County

Map #	Facility	Function	Vulnerability Zone
1	Battletown Fire Dept	Fire Response	High
2	Wolf Creek Fire Dept	Fire Response	Moderate
3	Meade County Sheriff	Police	Moderate
4	Meade County Jail	Prison Group Housing	Moderate
5	Brandenburg Police	Police	Moderate
6	Meade County Fire Dept	Fire Response	Moderate
7	Meade County Ems	Medical Response	Moderate
8	Brandenburg City Hall	General Government	Moderate
9	Meade County Area Tech Center	School	Moderate
10	Meade County High School	School	Moderate
11	Stuart Pepper Middle School	School	Moderate
12	Meade County Courthouse	General Government	Moderate
13	David T. Wilson Elementary School	School	Moderate
14	Meade County Health Department	Medical Response	Moderate
15	National Guard Armory	General Government	Moderate
16	All About Home Assisted Living	Senior Group Housing	Moderate
17	Beehive Assisted Living	Senior Group Housing	Moderate
18	Barry Hahn Ps	School	Moderate
19	Barney Johnson	WTP	Moderate
20	High Pressure Tank	WT	Moderate
21	Ekron Fire Dept	Fire Response	Low
22	Ekron Elementary School	School	Low
23	Flaherty Elementary School	School	Moderate
24	Flaherty Ps	School	Moderate
25	Van Voorhis Elementary School	School	Low
26	Muldraugh Fire Dept	Fire Response	Low
27	Muldraugh Police	Police	Low
28	Muldraugh Storm Shelter	General Government	Low
29	Muldraugh City Hall	General Government	Low
30	Payneville Fire Dept	Fire Response	Low
31	Payneville Elementary School	School	Low
32	Rhodelia Fire Dept	Fire Response	Low
33	Flaherty Fire Dept	Fire Response	Moderate
34	Muldraugh Plant	WTP	Low
35	Pritchard	WT	Low

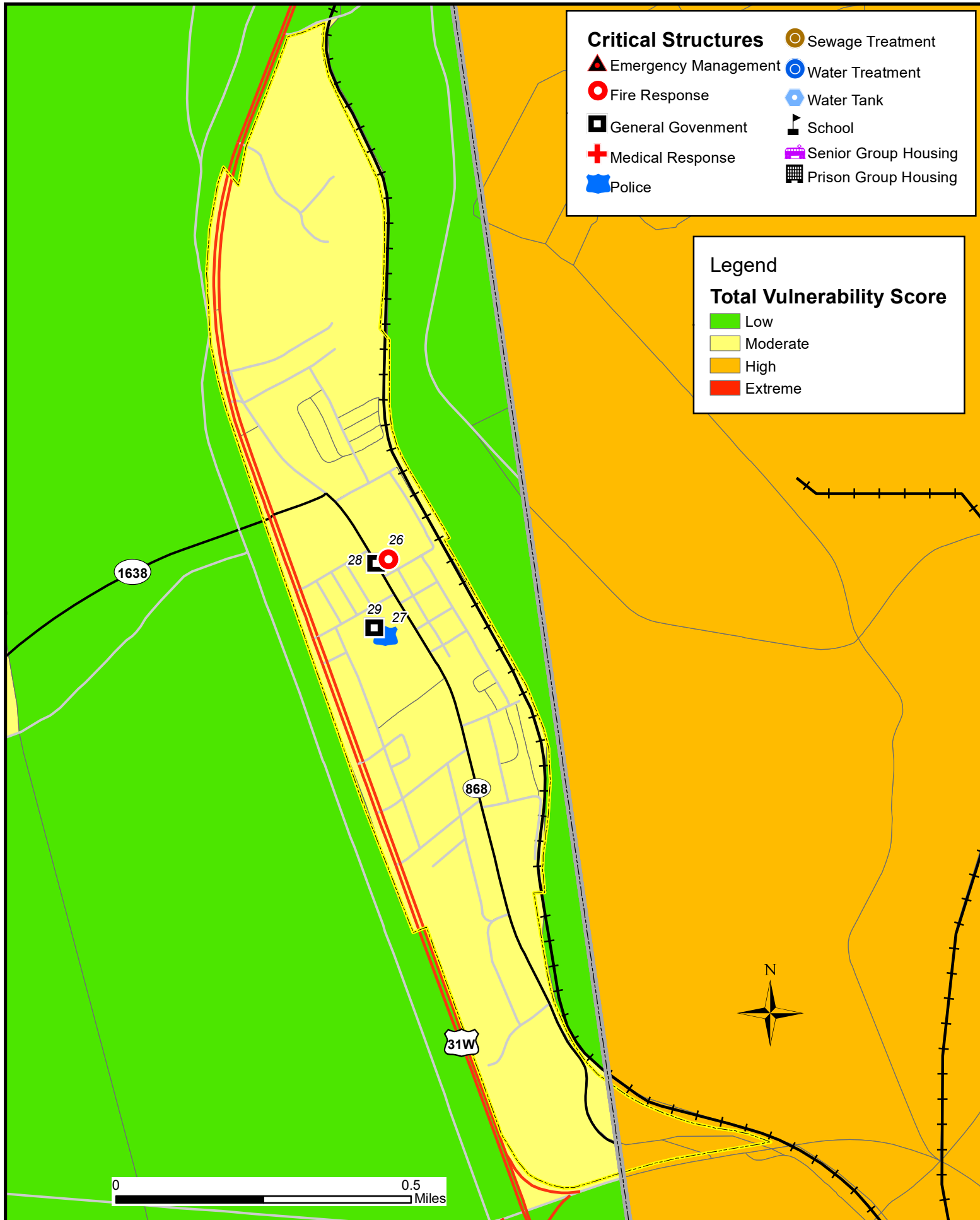
36	Garrett	WT	Moderate
37	Payneville	WT	Low
38	Flaherty Tank	WT	Moderate
39	Standpipe Tank	WT	Moderate
40	Water Tank #2	WT	Moderate
41	Water Tank #1	WT	Moderate
42	Van Voorhis Neighborhood	WT	Low
43	Brandenburg WWTP	STP	Low







183d

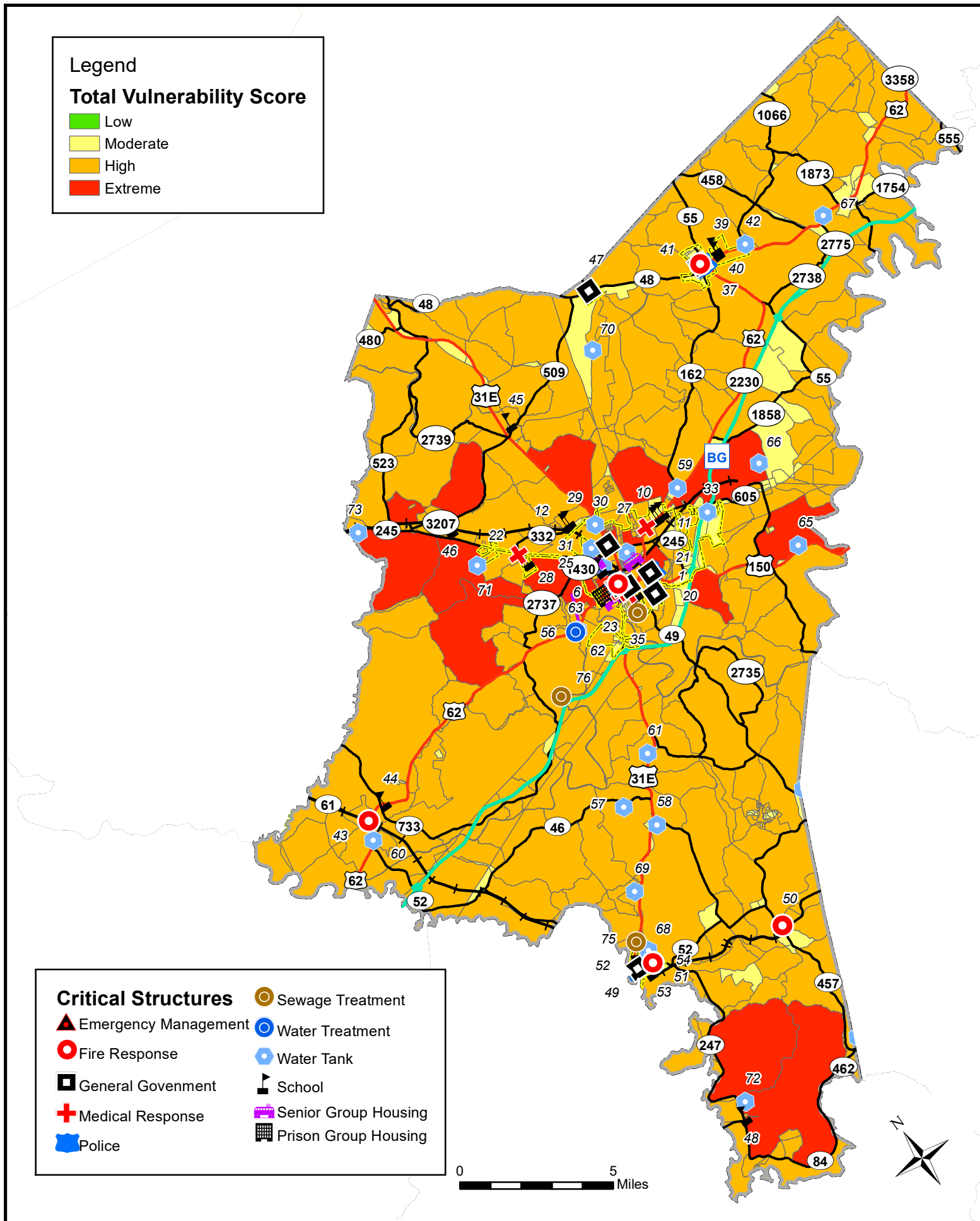


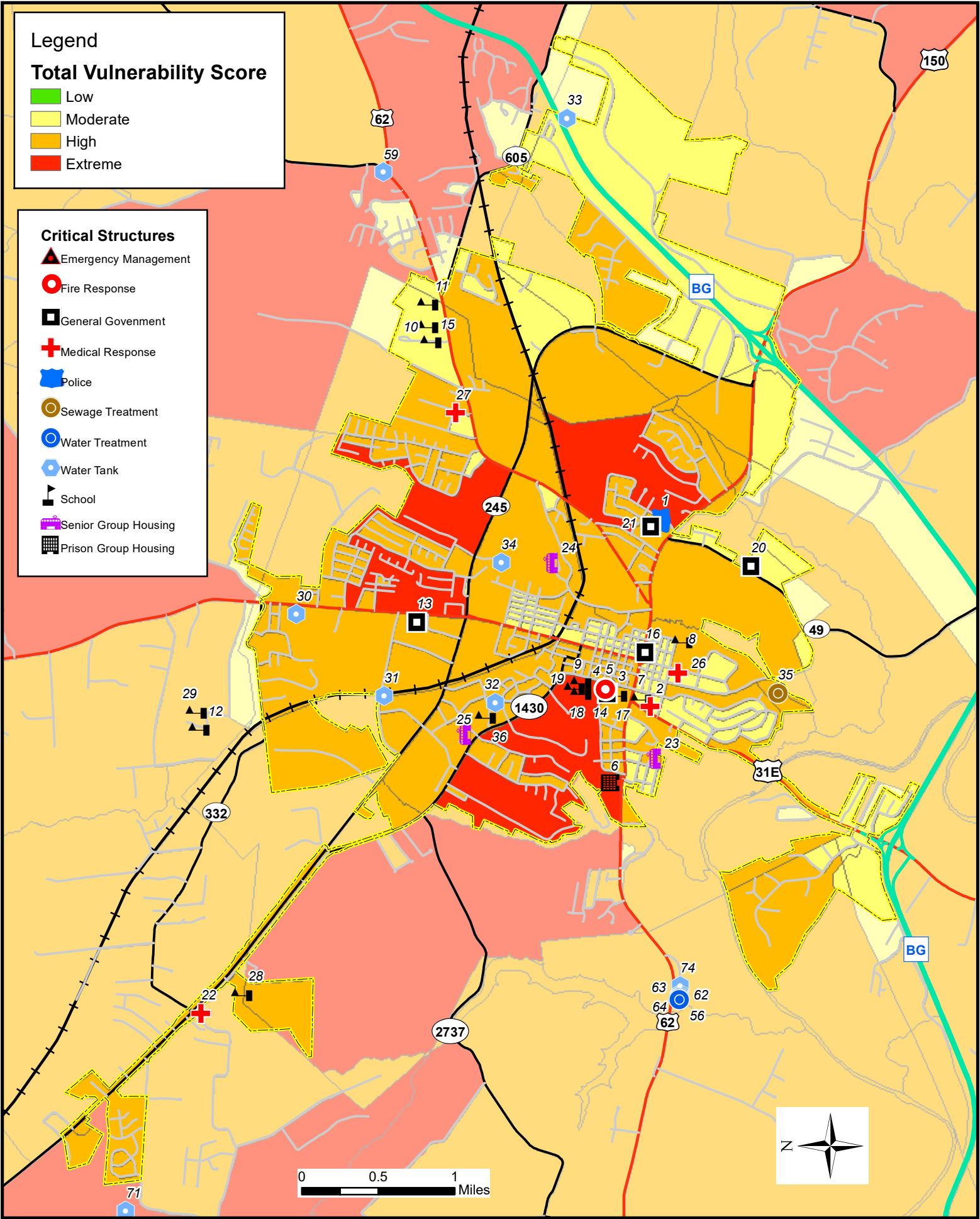
## Nelson County

Map #	Facility	Function	Vulnerability Zone
1	Nelson County Sheriff	Police	Moderate
2	Flaget Memorial Hospital	Medical Response	Moderate
3	Bardstown Police	Police	Moderate
4	Bardstown VFD	Fire Response	Moderate
5	Bardstown-Nelson County Fire Dept	Fire Response	Moderate
6	Nelson County Jail	Prison Group Housing	High
7	Bethlehem High School	School	Moderate
8	Foster Heights Elementary School	School	Moderate
9	Bardstown High School	School	High
10	Nelson County Area Tech Center	School	Moderate
11	Nelson County High School	School	Moderate
12	Spalding College Extension Center	School	Moderate
13	National Guard Armory	General Government	Moderate
14	Bardstown City Hall	General Government	Moderate
15	Old Kentucky Home Middle School	School	Moderate
16	Nelson County Government	General Government	Moderate
17	St Joseph Elementary School	School	Moderate
18	Bardstown Elementary School	School	High
19	Bardstown Middle School	School	High
20	Nelson County National Guard	General Government	Moderate
21	Nelson County Justice Center	General Government	Moderate
22	Flaget Memorial Hospital	Medical Response	High
23	Colonial House Nursing Home	Senior Group Housing	High
24	Federal Hill Manor Nursing Home	Senior Group Housing	High
25	Windsor Gardens Assisted Living	Senior Group Housing	High
26	Nelson County Health Department	Medical Response	Moderate
27	Nelson County Ems	Medical Response	Moderate
28	Thomas Nelson High School	School	Moderate
29	St Joseph Montessori Children's Center	School	Moderate
30	Fairgrounds Tank	WT	High
31	Withrow Tank Industrial Park	WT	Moderate
32	Hurstland Tank	WT	Moderate
33	Woodlawn / Nc Industrial	WT	Moderate
34	245 Tanks	WT	High

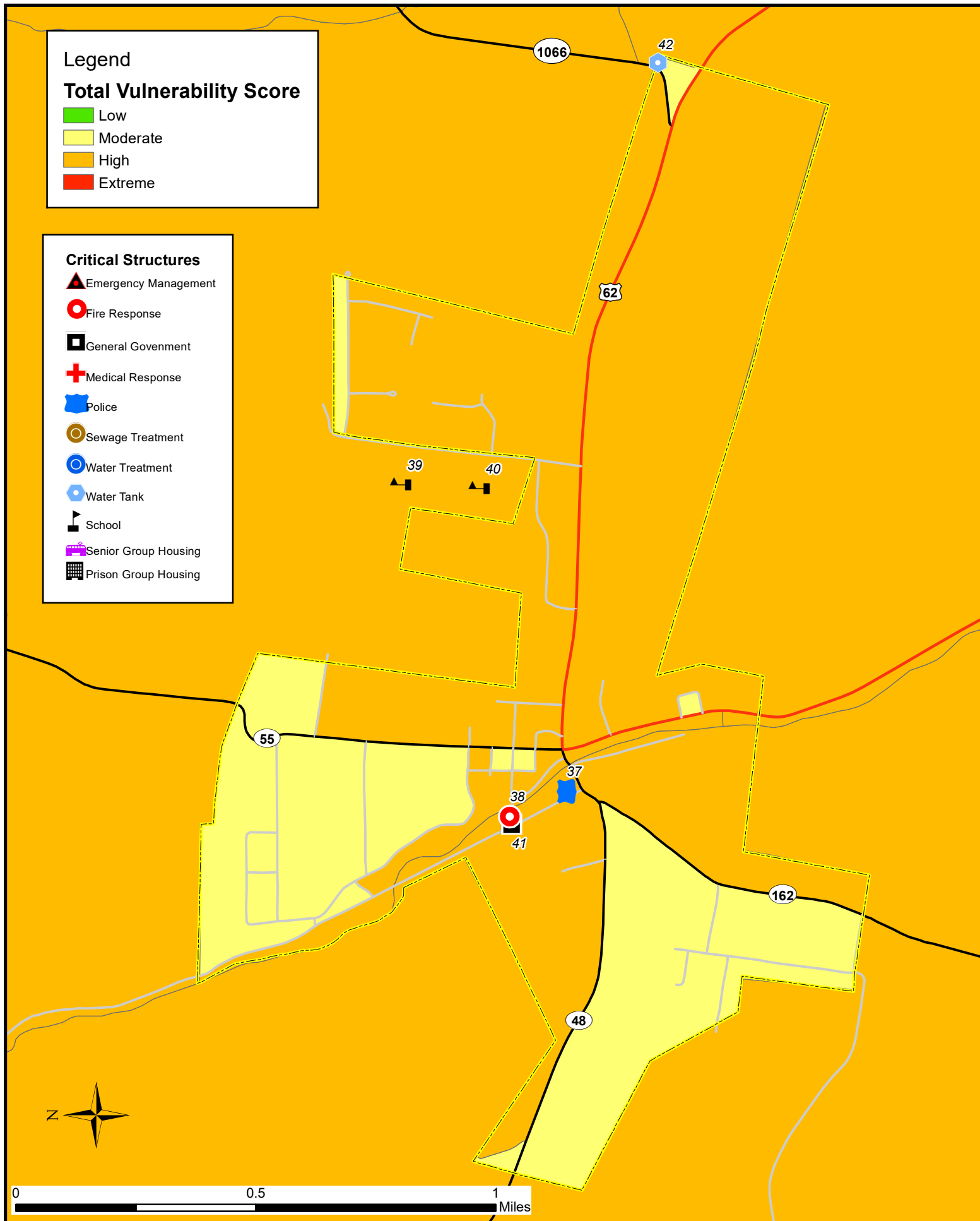
35	Bardstown WWTP	STP	Moderate
36	Bardstown Ps	School	Moderate
37	Bloomfield Police	Police	Moderate
38	Northeast Nelson VFD	Fire Response	Moderate
39	Bloomfield Elementary School	School	Moderate
40	Bloomfield Middle School	School	Moderate
41	Bloomfield City Hall	General Government	Moderate
42	Bloomfield	WT	Moderate
43	Boston VFD	Fire Response	Moderate
44	Boston Elementary School	School	High
45	Cox's Creek Elementary School	School	Moderate
46	St Gregory Elementary School	School	Moderate
47	Fairfield City Hall	General Government	Moderate
48	St Ann Elementary School	School	Moderate
49	New Haven Police	Police	Moderate
50	New Hope Fire Dept	Fire Response	Moderate
51	Rolling Fork Fire Dept	Fire Response	Moderate
52	New Haven City Hall	General Government	Moderate
53	New Haven School	School	Moderate
54	New Haven Fire Department	Fire Response	Moderate
55	St Catherine Academy	School	Moderate
56	Sympson Lake	WTP	Moderate
57	Nat Rodgers	WT	High
58	Culvertown	WT	High
59	East Bardstown Tank	WT	High
60	Boston Tank	WT	Moderate
61	Balltown Tank	WT	High
62	Clearwell Tank	WT	Moderate
63	Clearwell Tank	WT	Moderate
64	Clearwell Tank	WT	Moderate
65	Botland Tank	WT	High
66	Wire Ln	WT	High
67	Chaplin	WT	Moderate
68	Indian Hills	WT	High
69	Vittitow	WT	Moderate
70	Murray's Run	WT	Moderate
71	Lutheran Church Rd	WT	High
72	Howardstown Tank	WT	High
73	Weller Loop	WT	High

74	Glass Clearwell Tank	WT	Moderate
75	New Haven WWTP	STP	Moderate
76	Jerry L Riley WWTP	STP	Moderate

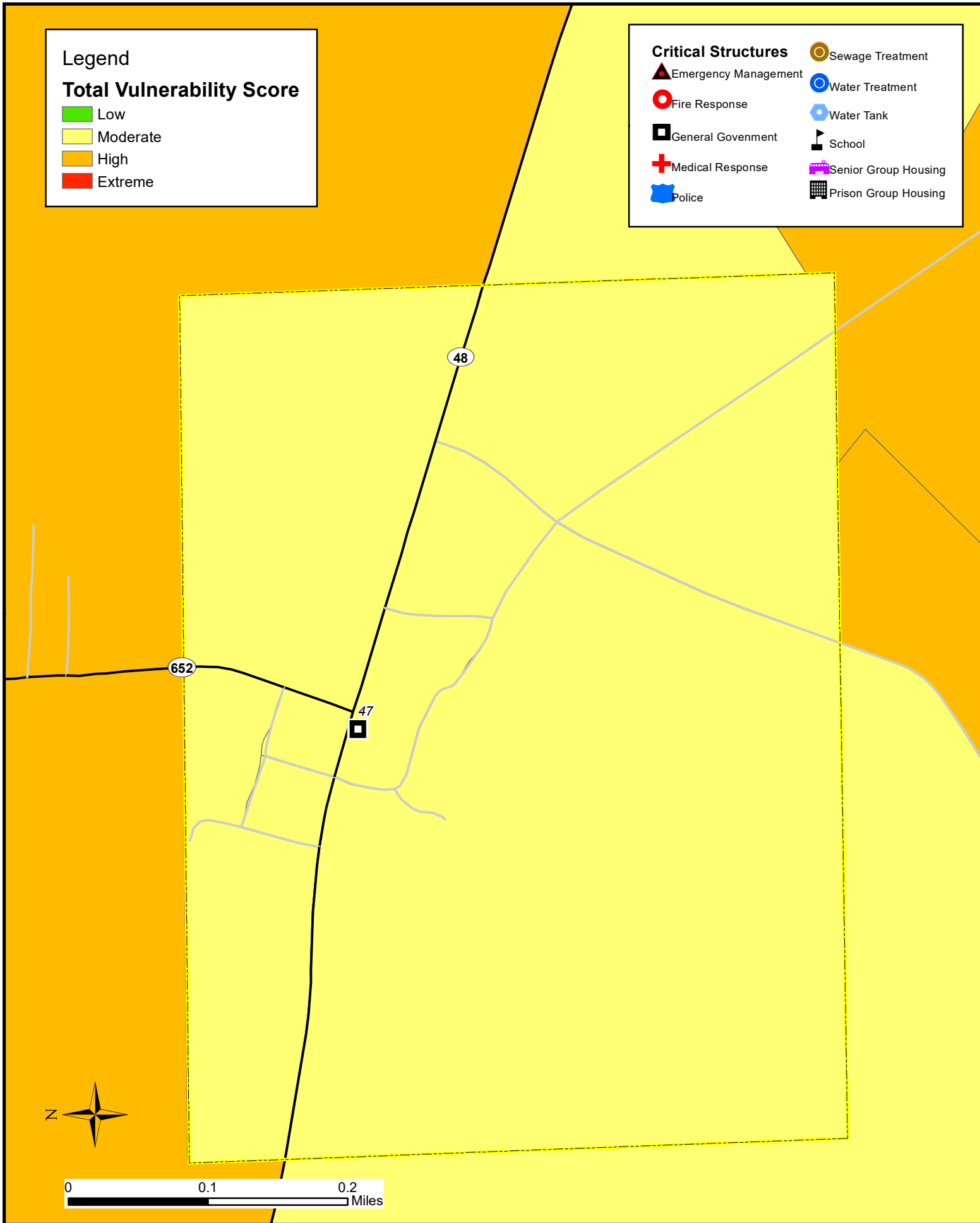




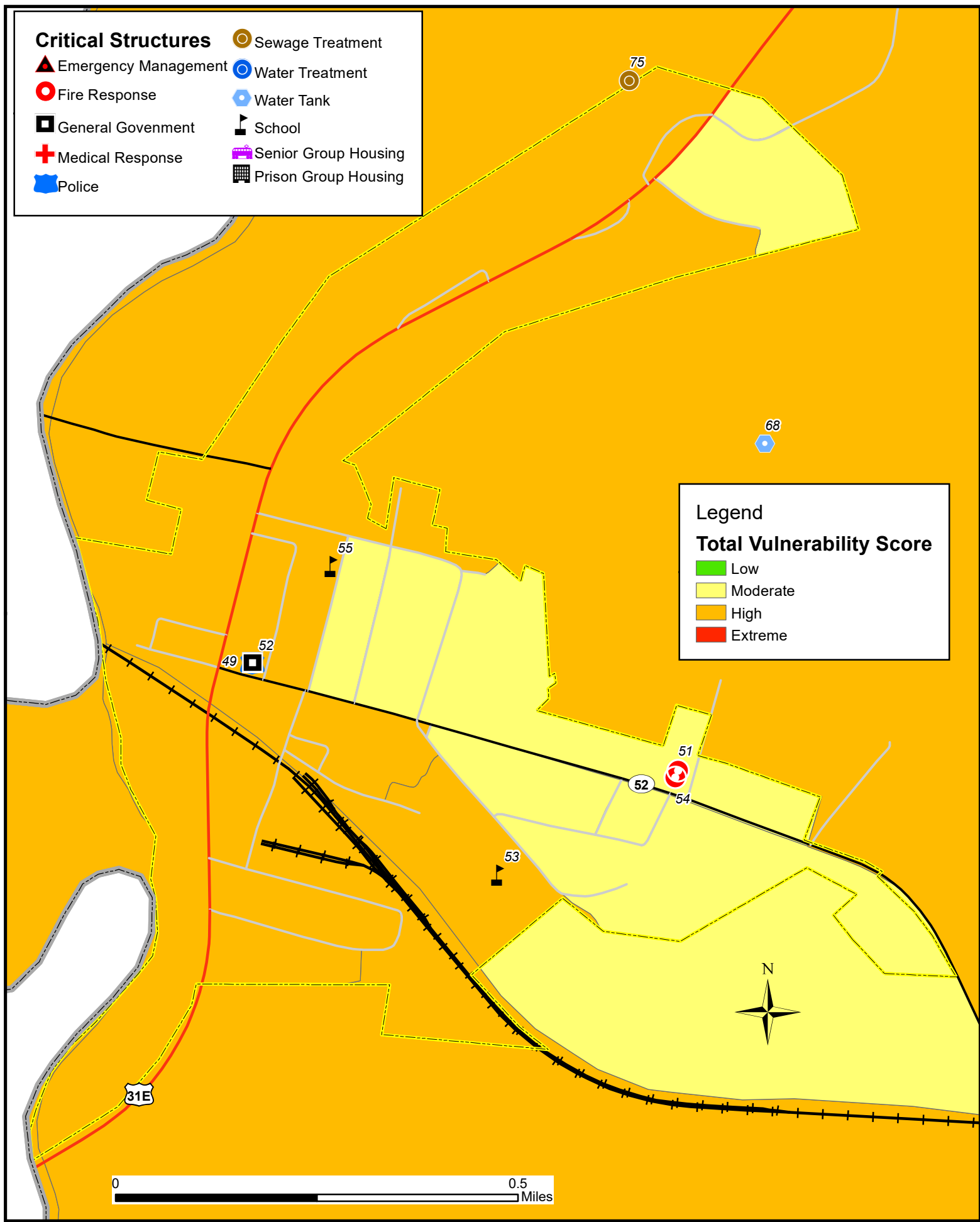
186c



186d



186e

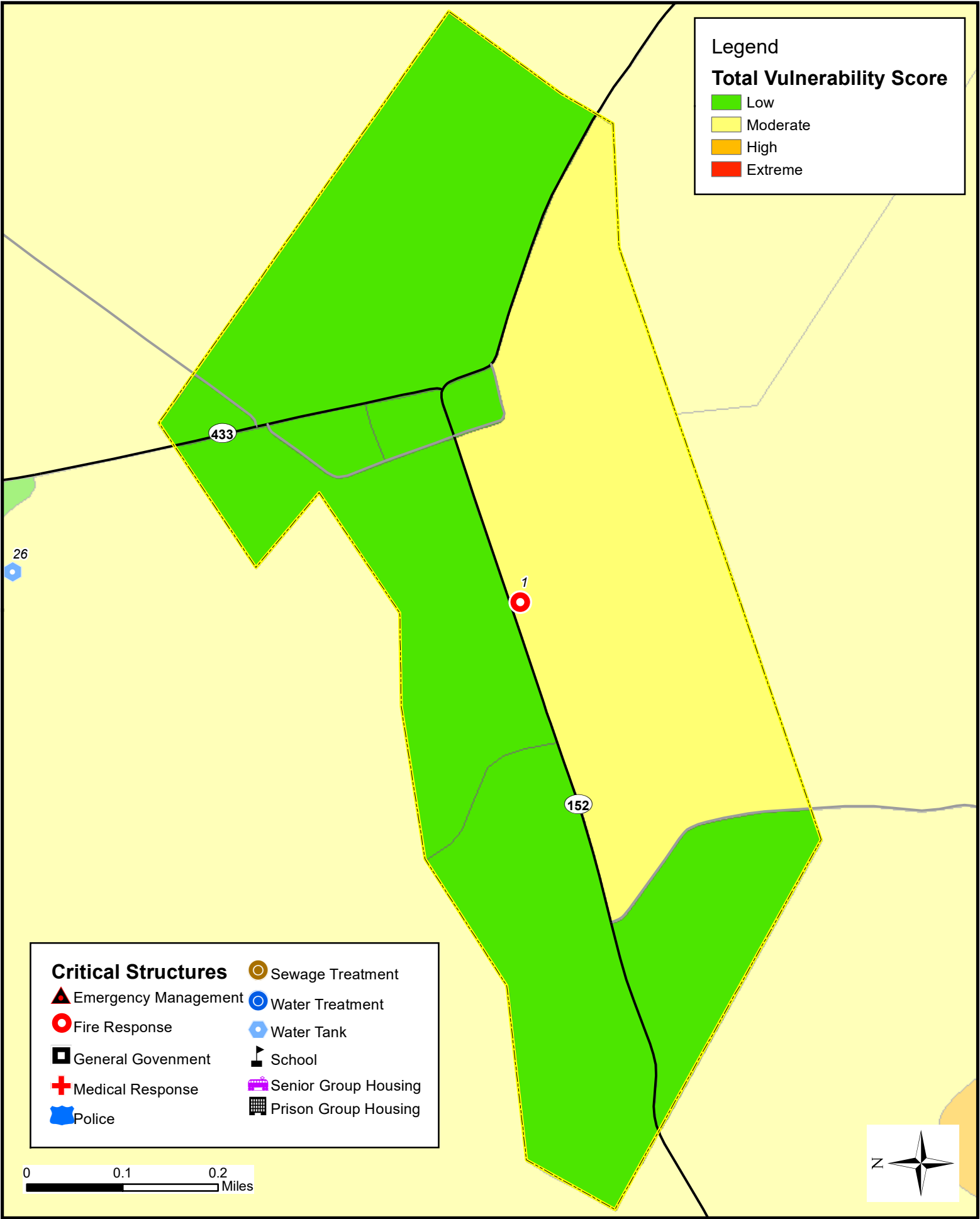


## Washington County

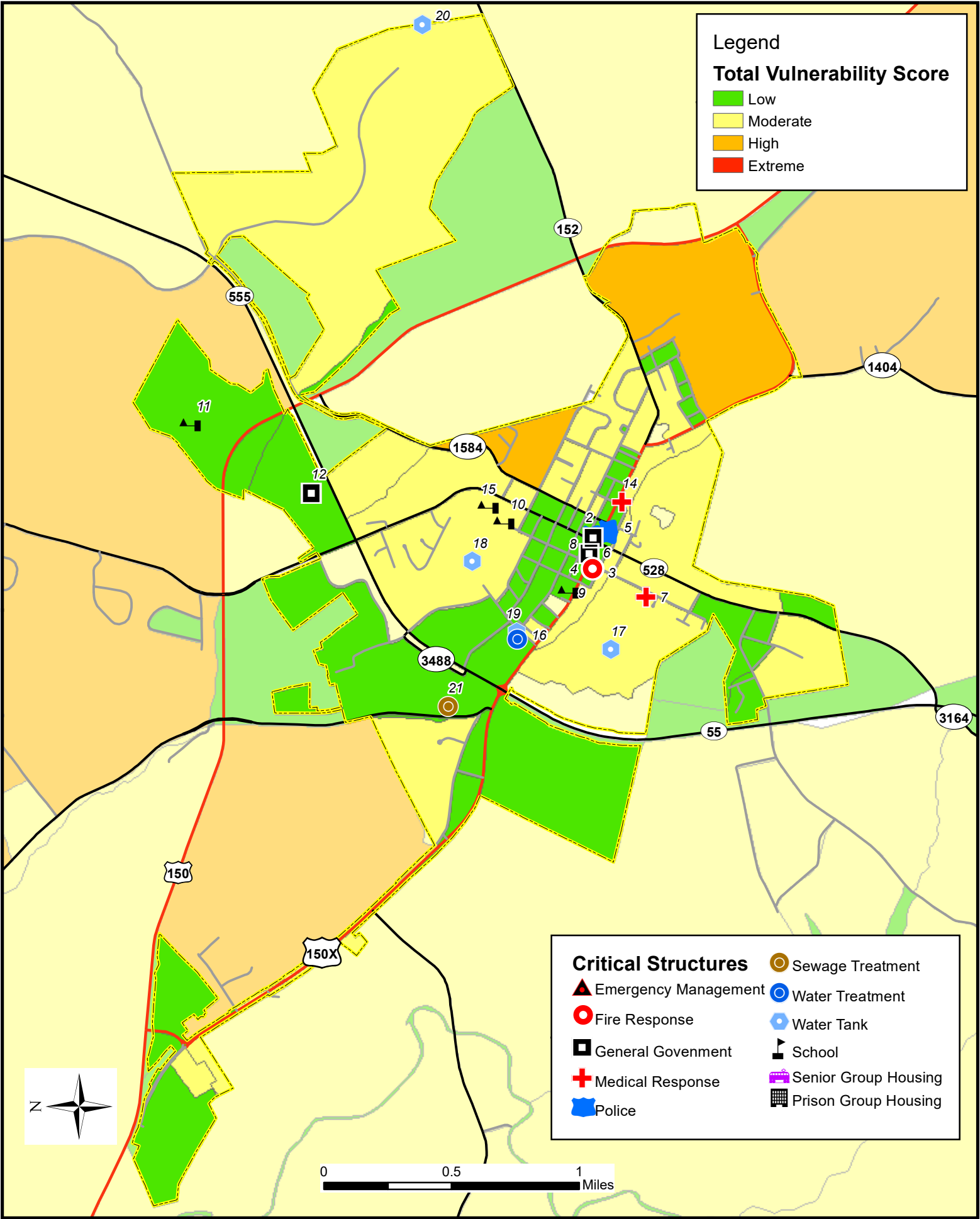
Map #	Facility	Function	Vulnerability Zone
1	Mackville Fire Dept	Fire Response	Low
2	Washington County Sheriff	Police	Low
3	Springfield Fire Dept	Fire Response	Low
4	Washington County Fire Dept	Fire Response	Low
5	Springfield Police	Police	Low
6	Washington County Jail	Prison Group Housing	Low
7	Washington County Ems	Medical Response	Moderate
8	Springfield City Hall	General Government	Low
9	St Dominic Elementary School	School	Low
10	Washington County Elementary School	School	Moderate
11	Washington County High School	School	Low
12	National Guard Armory	General Government	Low
13	Washington County Courthouse	General Government	Low
14	Washington County Health Office	Medical Response	Moderate
15	Washington County Middle School	School	Moderate
16	Springfield	WTP	Low
17	Armory Hill	WT	Moderate
18	High School	WT	Moderate
19	WTP Tank	WT	Low
20	Industrial Park	WT	Moderate
21	Springfield STP	STP	Low
22	Willisburg Fire Dept	Fire Response	Low
23	Central Kentucky Youth Academy	School	Low
24	North Washington Elementary School	School	Moderate
25	Willisburg City Hall	General Government	Low
26	Mackville	WT	Moderate
27	Old Elizabethtown Rd	WT	Moderate
28	Wesley Chapel	WT	Low
29	Simmstown	WT	Moderate
30	Willisburg	WT	Moderate

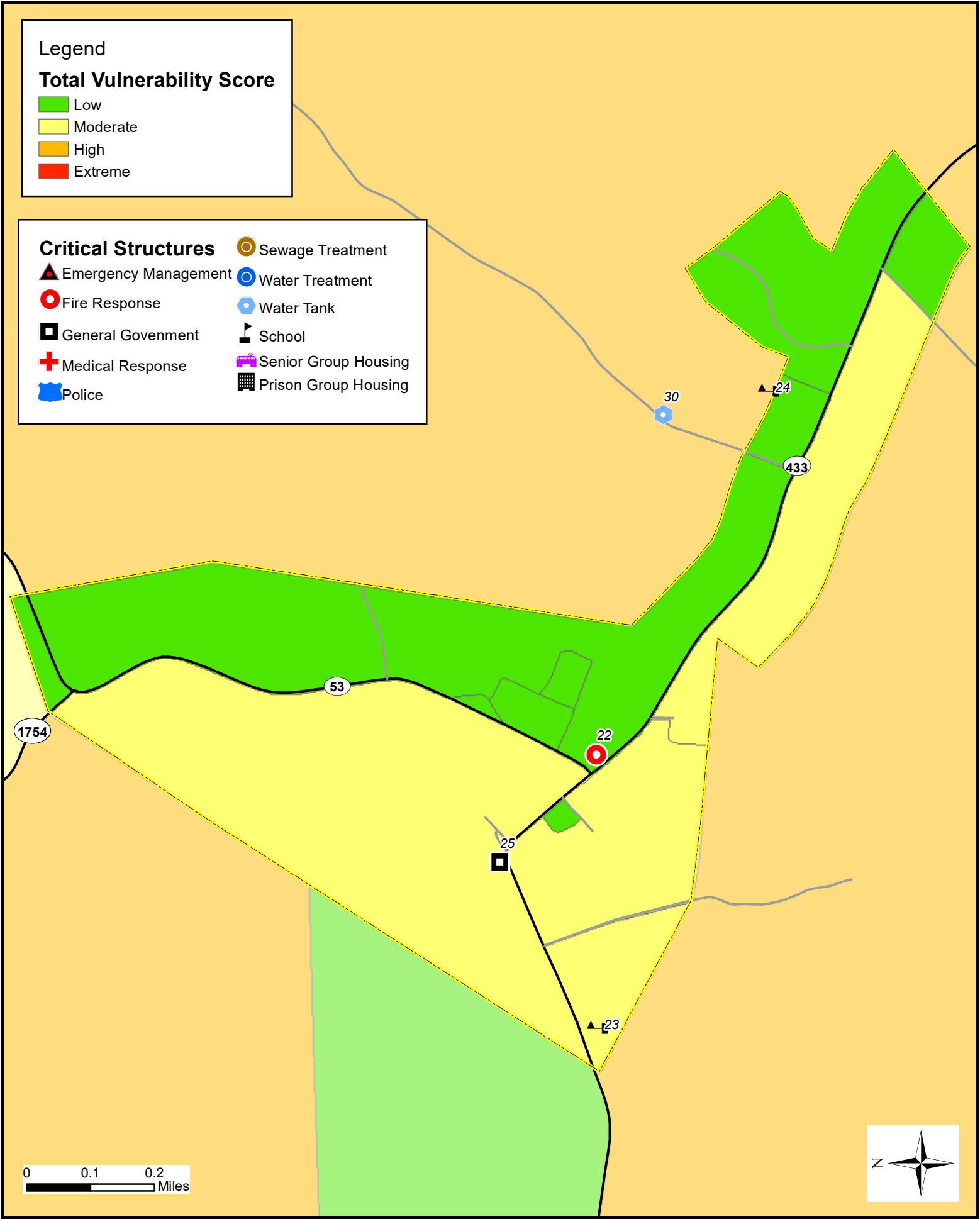


187b



187c





## II. Loss Estimation: Potential and Actual Losses

Losses can be reviewed and evaluated in terms of actual past losses and potential future losses. They can include not only human life, physical structures, crops, etc. but also many other economic factors such as lost rents, wages, and production. The overall lack of data pertaining to structures/assets and their values does not allow us to generate a comprehensive loss analysis. To evaluate and run scenarios on a “typical” disaster for a specific area and review the data on a micro level, this information would have to be converted into block or zip code level data.

Therefore, the loss estimation will be based on past event losses and compiled at a higher level than might be desired. The economic and human costs are given for each of the six primary focus hazards and broken out by county with a regional summary. The averages for any event or year are assumed to be the estimated loss. The factor of population and economic growth over time, would cause the loss estimates to continue to rise without implementation of any mitigation measures. A review of the data available is contained in the following tables.

Potential losses consider estimated values of structures and their vulnerability to type and extent of a specific event.

The data in the tables below is gathered from numerous sources and defined as follows:

The structure sources for each county vary. LTADD maintains a critical structure GIS layer of various facilities including, EOC's, Police & Fire Stations, Government Buildings, Hospitals, Water and Wastewater Utility infrastructure, Schools, Airports, and many other miscellaneous buildings. In addition, LTADD has access to point structure data from many of the individual county's 911 systems as described in the following table.

COUNTY	DATA CURRENCY
BRECKINRIDGE	APR - 2019
GRAYSON	N/A
HARDIN	JAN - 2020
LARUE	OCT - 2018
MARION	SE[T - 2019
MEADE	OCT - 2020
NELSON	SEPT - 2020
WASHINGTON	AUG - 2019

The LTADD staff also used GPS to map structures located in floodplains for Grayson, Hardin, Meade, and Nelson Counties in 2010. All this data was compared against the calculated landslide and FEMA DFIRM flood plain polygon datasets in a GIS program to generate an approximate count of residences within each of the county's landslide and flood plain hazard areas. This data is used for estimate purposes only and should not be considered definitive or complete counts.

For consistency, Residential and Mobile Home facilities counts are based on US Census, American Community Survey 2019 5-year estimates for Total Housing Units. Data represents the total Housing Unit count minus the percentage figure of Mobile Homes to reach the values for each.

Replacement value for homes is from the US Census “Median value of owner-occupied housing units” and the “Median Value for Mobile Homes”, both 2019 5-year ACS data

Replacement value for other specific data types is based on FEMA’s HAZUS data. The Kentucky statewide data layer was accessed for this information. FEMA parameters for this data are as follows:

*The November 2019 release has made significant updates to the below datasets. Essential Facility, Transportation and Utility data have been updated using the latest versions (as of November 1, 2019) of the HIFLD Open datasets. All valuations have been updated to RSMeans 2018 values and reflect Census 2010 data. Sourced from: <https://msc.fema.gov/portal/resources/hazus>*

The individual data valuation in the following tables was taken from the following sources:

Residential	US Census, 2019 5-year ACS, Median value of owner-occupied housing units. B25077 MEDIAN VALUE (DOLLARS)
Mobile Homes	US Census, 2019 5-year ACS, Tot Mobile Home ACSDP5Y2019, B25083 MEDIAN VALUE (DOLLARS) FOR MOBILE HOMES
Emergency Operations Center	Hazus 5.1, KY HFLD Data, Download Jan. 2022.
Broadcast Facility	Hazus 5.1, KY HFLD Data, Download Jan. 2022.
Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	Hazus 5.1, KY HFLD Data, Download Jan. 2022.
Hospital	Hazus 5.1, KY HFLD Data, Download Jan. 2022.
Sewage Treatment Plant	Hazus Inventory Technical Manual, Hazus 4.2 Service Pack 3, Feb. 2021, p. 10-2, Table 10-2
Water Treatment Plant	Hazus Inventory Technical Manual, Hazus 4.2 Service Pack 3, Feb. 2021, p. 10-5, Table 10-3
Pumping Stations (Large, >10 MGD)	Hazus Inventory Technical Manual, Hazus 4.2 Service Pack 3, Feb. 2021, p. 10-4, Table 10-3
Pumping Stations (Small, < 10 MGD)	Hazus Inventory Technical Manual, Hazus 4.2 Service Pack 3, Feb. 2021, p. 10-4, Table 10-3
Wells	Hazus Inventory Technical Manual, Hazus 4.2 Service Pack 3, Feb. 2021, p. 10-5, Table 10-3
Storage Tanks (Concrete)	Hazus Inventory Technical Manual, Hazus 4.2 Service Pack 3, Feb. 2021, p. 10-5, Table 10-3
Storage Tanks (Steel)	p. 10-5, Table 10-3
Schools (Elementary & Secondary)	Hazus 5.1, KY HFLD Data, Download Jan. 2022.
Airport Facilities (excluding runway cost)	Hazus Inventory Technical Manual, Hazus 4.2 Service Pack 3, Feb. 2021, p. 9-3, Table 9-2, 2019
Natural Gas Facilities	Hazus 5.1, KY HFLD Data, Download Jan. 2022.
Power Plants/Oil Refineries	Hazus 5.1, KY HFLD Data, Download Jan. 2022.

**Table 3.3.4.8 - Current inventory of existing structures and their potential loss estimate by County/City**

Jurisdiction	Type of Facility	# of Existing Structures	Estimated Replacement Value Per Unit	Total Potential Loss	# of Existing Structures in Floodplain	Potential Loss in Floodplain	# of Existing Structures in Landslide Prone Area	Potential Loss in Landslide Prone Area
<b>Breckinridge County</b>	Residential	7,927	\$102,900	\$815,688,300	302	\$31,075,800	230	\$23,667,000
<b>Cloverport Hardinsburg Irvington</b>	Mobile Homes	2,902	\$55,900	\$162,221,800	9	\$503,100	52	\$2,906,800
	Emergency Operations Center	1	n/a	\$2,460,950				
	Broadcast Facility	4	98,000	\$392,000				
	Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	23	Hazus data is aggregated for total value.	\$14,964,000	3	Unable to determine due to Hazus data aggregation methods.		
	Hospital	1	n/a	\$2,993,000				
	Sewage Treatment Plant	3	111,000,000	\$333,000,000				
	Water Treatment Plant	1	30,000,000	\$30,000,000				
	Pumping Stations (Large, >10 MGD)	0	525,000	\$0				
	Pumping Stations (Small, < 10 MGD)	7	150,000	\$1,050,000				
	Wells	3	400,000	\$1,200,000				
	Storage Tanks (Concrete)	0	1,500,000	\$0				
	Storage Tanks (Steel)	13	800,000	\$10,400,000				
	Schools (Elementary & Secondary)	9	Hazus data is aggregated for total value.	\$48,312,853				
	Airport Facilities (excluding runway cost)	1	5,000,000	\$5,000,000				
	Natural Gas Facilities	1	1,548,460	\$1,548,460				
	Power Plants/Oil Refineries	0	98,000	\$0				
<b>County Total</b>		<b>10,895</b>	<b>\$151,278,260</b>	<b>\$1,429,231,363</b>	<b>314</b>	<b>\$31,578,900</b>	<b>282</b>	<b>\$26,573,800</b>

Jurisdiction	Type of Facility	# of Existing Structures	Estimated Replacement Value Per Unit	Total Potential Loss	# of Existing Structures in Floodplain	Potential Loss in Floodplain	# of Existing Structures in Landslide Prone Area	Potential Loss in Landslide Prone Area
Grayson County	Residential <sup>1</sup>	10,706	\$113,900	\$1,219,413,400	65	\$7,403,500	1	\$113,900
Caneyville Clarkson Leitchfield	Mobile Homes	2,961	\$36,800	\$108,964,800				
	Emergency Operations Center	1	n/a	\$2,405,020				
	Broadcast Facility	2	98,000	\$196,000				
	Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	19	Hazus data is aggregated for total value.	\$11,083,000				
	Hospital	1	n/a	\$8,775,709				
	Sewage Treatment Plant	3	111,000,000	\$333,000,000				
	Water Treatment Plant	2	30,000,000	\$60,000,000				
	Pumping Stations (Large, >10 MGD)	0	525,000	\$0				
	Pumping Stations (Small, < 10 MGD)	11	150,000	\$1,650,000	1	\$150,000		
	Wells	0	400,000	\$0				
	Storage Tanks (Concrete)	0	1,500,000	\$0				
	Storage Tanks (Steel)	14	800,000	\$11,200,000				
	Schools (Elementary & Secondary)	7	Hazus data is aggregated for total value.	\$58,461,181				
	Airport Facilities (excluding runway cost)	2	5,000,000	\$10,000,000				
	Natural Gas Facilities	0	1,548,460	\$0				
	Power Plants/Oil Refineries	0	98,000	\$0				
County Totals		13,729	\$151,270,160	\$1,825,149,110	66	\$7,553,500	1	\$113,900

Jurisdiction	Type of Facility	# of Existing Structures	Estimated Replacement Value Per Unit	Total Potential Loss	# of Existing Structures in Floodplain	Potential Loss in Floodplain	# of Existing Structures in Landslide Prone Area	Potential Loss in Landslide Prone Area
Hardin County	Residential <sup>1</sup>	42,037	\$156,600	\$6,582,994,200	863	\$135,145,800	22	\$3,445,200
Elizabethtown Radcliff Sonora Upton Vine Grove West Point	Mobile Homes <sup>2</sup>	4,640	\$46,200	\$214,368,000	101	\$4,666,200		
	Emergency Operations Center	2	n/a	\$4,810,040				
	Broadcast Facility	7	98,000	\$686,000	2	\$196,000		
	Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	42	Hazus data is aggregated for total value.	\$75,080,000	5	Unable to determine due to Hazus data aggregation methods.		
	Hospital	3	Hazus data is aggregated for total value.	\$54,409,396				
	Sewage Treatment Plant	5	111,000,000	\$555,000,000	2	\$222,000,000		
	Water Treatment Plant	5	30,000,000	\$150,000,000	2	\$60,000,000		
	Pumping Stations (Large, >10 MGD)	1	525,000	\$525,000	1	\$525,000		
	Pumping Stations (Small, < 10 MGD)	19	150,000	\$2,850,000	3	\$450,000		
	Wells	18	400,000	\$7,200,000	18	\$7,200,000		
	Storage Tanks (Concrete)	4	1,500,000	\$6,000,000				
	Storage Tanks (Steel)	28	800,000	\$22,400,000	1	\$800,000		
	Schools (Elementary & Secondary)	38	Hazus data is aggregated for total value.	\$237,634,789				
	Airport Facilities (excluding runway cost)	2	5,000,000	\$10,000,000				
	Natural Gas Facilities	0	1,548,460	\$0				
	Power Plants/Oil Refineries	1	98,000	\$98,000				
County Total		46,852	\$151,322,260	\$7,924,055,425	998	\$430,983,000	22	\$3,445,200

Jurisdiction	Type of Facility	# of Existing Structures	Estimated Replacement Value Per Unit	Total Potential Loss	# of Existing Structures in Floodplain	Potential Loss in Floodplain	# of Existing Structures in Landslide Prone Area	Potential Loss in Landslide Prone Area
<b>LaRue County</b>	Residential	5,483	\$115,600	\$633,834,800	78	\$9,016,800	7	\$809,200
<b>Hodgenville</b>	Mobile Homes <sup>1</sup>	899	\$50,900	\$45,759,100				
	Emergency Operations Center	1	n/a	\$2,377,050				
	Broadcast Facility	1	98,000	\$98,000				
	Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	10	Hazus data is aggregated for total value.	\$10,482,000	1	Unable to determine due to Hazus data aggregation methods.		
	Hospital	0	n/a	n/a				
	Sewage Treatment Plant	1	111,000,000	\$111,000,000	1	\$111,000,000		
	Water Treatment Plant	1	30,000,000	\$30,000,000	1	\$30,000,000		
	Pumping Stations (Large, >10 MGD)	0	525,000	\$0				
	Pumping Stations (Small, < 10 MGD)	7	150,000	\$1,050,000				
	Wells	0	400,000	\$0				
	Storage Tanks (Concrete)	0	1,500,000	\$0				
	Storage Tanks (Steel)	11	800,000	\$8,800,000				
	Schools (Elementary & Secondary)	4	Hazus data is aggregated for total value.	\$30,506,621				
	Airport Facilities (excluding runway cost)	0	5,000,000	\$0				
	Natural Gas Facilities	0	1,548,460	\$0				
	Power Plants/Oil Refineries	0	98,000	\$0				
<b>County Totals</b>		<b>6,418</b>	<b>\$151,285,960</b>	<b>\$873,907,571</b>	<b>81</b>	<b>\$150,016,800</b>	<b>7</b>	<b>\$809,200</b>

Jurisdiction	Type of Facility	# of Existing Structures	Estimated Replacement Value	Total Potential Loss	# of Existing Structures in Floodplain	Potential Loss in Floodplain	# of Existing Structures in Landslide Prone Area	Potential Loss in Landslide Prone Area
Marion County	Residential	7,230	\$105,400	\$762,042,000	185	0	19	\$2,002,600
Bradfordsville	Mobile Homes	1,078	\$31,200	\$33,633,600			1	\$31,200
Lebanon	Emergency Operations Center	1	n/a	\$2,460,950				
Loretto	Broadcast Facility	3	98,000	\$294,000			1	\$98,000
Raywick	Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	18	Hazus data is aggregated for total value.	\$14,021,000				
	Hospital	1	n/a	\$8,979,795				
	Sewage Treatment Plant	2	111,000,000	\$222,000,000	1	\$111,000,000		
	Water Treatment Plant	1	30,000,000	\$30,000,000	1	\$30,000,000		
	Pumping Stations (Large, >10 MGD)	0	525,000	\$0				
	Pumping Stations (Small, < 10 MGD)	4	150,000	\$600,000				
	Wells	0	400,000	\$0				
	Storage Tanks (Concrete)	0	1,500,000	\$0				
	Storage Tanks (Steel)	11	800,000	\$8,800,000				
	Schools (Elementary & Secondary)	9	Hazus data is aggregated for total value.	\$45,461,229				
	Airport Facilities (excluding runway cost)	0	5,000,000	\$0				
	Natural Gas Facilities	0	1,548,460	\$0				
	Power Plants/Oil Refineries	0	98,000	\$0				
County Total		8,358	\$151,256,060	\$1,128,292,574	187	\$141,000,000	0	\$2,131,800

Jurisdiction	Type of Facility	# of Existing Structures	Estimated Replacement Value Per Unit	Total Potential Loss	# of Existing Structures in Floodplain	Potential Loss in Floodplain	# of Existing Structures in Landslide Prone Area	Potential Loss in Landslide Prone Area
Meade County	Residential	10,244	\$153,500	\$1,572,454,000	141	\$21,643,500	39	\$5,986,500
Brandenburg Ekron Muldraugh	Mobile Homes	2,198	\$74,200	\$163,091,600	3	\$222,600	1	\$74,200
	Emergency Operations Center	1	n/a	\$2,460,950				
	Broadcast Facility	2	98,000	\$196,000				
	Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	19	Hazus data is aggregated for total value.	\$13,901,000	1	Unable to determine due to Hazus data aggregation methods.		
	Hospital	0	n/a	n/a				
	Sewage Treatment Plant	1	111,000,000	\$111,000,000				
	Water Treatment Plant	2	30,000,000	\$60,000,000				
	Pumping Stations (Large, >10 MGD)	0	525,000	\$0				
	Pumping Stations (Small, < 10 MGD)	9	150,000	\$1,350,000				
	Wells	3	400,000	\$1,200,000	3	\$1,200,000		
	Storage Tanks (Concrete)	1	1,500,000	\$1,500,000				
	Storage Tanks (Steel)	8	800,000	\$6,400,000				
	Schools (Elementary & Secondary)	10	Hazus data is aggregated for total value.	\$74,142,233				
	Airport Facilities (excluding runway cost)	0	5,000,000	\$0				
	Natural Gas Facilities	0	1,548,460	\$0				
	Power Plants/Oil Refineries	0	98,000	\$0				
County Total		12,498	\$151,347,160	\$2,007,695,783	148	\$23,066,100	40	\$6,060,700

Jurisdiction	Type of Facility	# of Existing Structures	Estimated Replacement Value Per Unit	Total Potential Loss	# of Existing Structures in Floodplain	Potential Loss in Floodplain	# of Existing Structures in Landslide Prone Area	Potential Loss in Landslide Prone Area
Nelson County	Residential <sup>1</sup>	17,543	\$154,700	\$2,713,902,100	92	\$14,232,400	0	0
Bardstown Bloomfield Fairfield New Haven	Mobile Homes	1,508	\$40,400	\$60,923,200				
	Emergency Operations Center	1	n/a	\$2,460,950				
	Broadcast Facility	2	98,000	\$196,000				
	Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	22	Hazus data is aggregated for total value.	\$19,365,000	4	Unable to determine due to Hazus data aggregation methods.		
	Hospital	1	n/a	\$4,789,224				
	Sewage Treatment Plant	3	111,000,000	\$333,000,000	1	\$111,000,000		
	Water Treatment Plant	1	30,000,000	\$30,000,000				
	Pumping Stations (Large, >10 MGD)	1	525,000	\$525,000				
	Pumping Stations (Small, < 10 MGD)	13	150,000	\$1,950,000	1	\$150,000		
	Wells	0	400,000	\$0				
	Storage Tanks (Concrete)	0	1,500,000	\$0				
	Storage Tanks (Steel)	24	800,000	\$19,200,000			2	\$1,600,000
	Schools (Elementary & Secondary)	20	Hazus data is aggregated for total value.	\$107,347,817				
	Airport Facilities (excluding runway cost)	1	5,000,000	\$5,000,000				
	Natural Gas Facilities	0	1,548,460	\$0				
	Power Plants/Oil Refineries	0	98,000	\$0				
County Total		19,140	\$151,314,560	\$3,298,659,291	98	\$125,382,400	2	\$1,600,000

Jurisdiction	Type of Facility	# of Existing Structures	Estimated Replacement Value Per Unit	Total Potential Loss	# of Existing Structures in Floodplain	Potential Loss in Floodplain	# of Existing Structures in Landslide Prone Area	Potential Loss in Landslide Prone Area
Washington County	Residential	4,475	\$128,300	\$574,142,500	87	\$11,162,100	10	\$1,283,000
Mackville Springfield Willisburg	Mobile Homes	710	\$45,700	\$32,447,000	19	\$868,300	3	\$137,100
	Emergency Operations Center	1	n/a	\$2,460,950				
	Broadcast Facility	1	98,000	\$98,000				
	Government Building (Includes County & Municipal Government Structures, Fire & Police Stations, etal)	13	Hazus data is aggregated for total value.	\$10,407,000				
	Hospital	0	n/a	n/a				
	Sewage Treatment Plant	1	111,000,000	\$111,000,000				
	Water Treatment Plant	1	30,000,000	\$30,000,000				
	Pumping Stations (Large, >10 MGD)	0	525,000	\$0				
	Pumping Stations (Small, < 10 MGD)	5	150,000	\$750,000	1	\$150,000		
	Wells	0	400,000	\$0				
	Storage Tanks (Concrete)	0	1,500,000	\$0				
	Storage Tanks (Steel)	9	800,000	\$7,200,000				
	Schools (Elementary & Secondary)	6	Hazus data is aggregated for total value.	\$25,525,207				
	Airport Facilities (excluding runway cost)	1	5,000,000	\$5,000,000				
	Natural Gas Facilities	0	1,548,460	\$0				
	Power Plants/Oil Refineries	0	98,000	\$0				
County Total		5,223	\$151,293,460	\$799,030,657	107	\$12,180,400	13	\$1,420,100

**Table 3.3.4.9 - Actual Losses Based on Past Events**

Thunderstorm/Wind	Total Cost	Number Events	Number Years	Total Loss of Life	Total Injuries	Average Cost Per Year	Average Cost Per Event	Average Loss of Life Per Year	Average Loss of Life Per Event	Average Injuries Per Year	Average Injuries Per Event
Breckinridge	\$1,761,803	265	60.5	0.25	4.21	\$29,121	\$6,648	0.00	0.00	0.07	0.02
Grayson	\$1,740,288	224	62.5	0.25	6.62	\$27,845	\$7,769	0.00	0.00	0.11	0.03
Hardin	\$65,915,949	366	64.5	4.45	133.17	\$1,021,953	\$180,098	0.07	0.01	2.06	0.36
LaRue	\$1,869,787	217	60.5	1.32	11.6	\$30,906	\$8,617	0.02	0.01	0.19	0.05
Marion	\$1,547,735	214	60.5	0.24	1.63	\$25,582	\$7,232	0.00	0.00	0.03	0.01
Meade	\$1,959,733	234	61.5	3.45	46.26	\$31,866	\$8,375	0.06	0.01	0.75	0.20
Nelson	\$1,794,130	294	60.5	0.3	12.58	\$29,655	\$6,102	0.00	0.00	0.21	0.04
Washington	\$1,668,572	200	60.5	0.22	3.58	\$27,580	\$8,343	0.00	0.00	0.06	0.02
LTADD	\$78,257,999	2014	64.5	10.48	219.65	\$1,213,302	\$38,857	0.16	0.01	3.41	0.11

Floods	Total Cost	Number Events	Number Years	Total Loss of Life	Total Injuries	Average Cost Per Year	Average Cost Per Event	Average Loss of Life Per Year	Average Loss of Life Per Event	Average Injuries Per Year	Average Injuries Per Event
Breckinridge	\$7,811,684	60	54.5	2.09	0.11	\$143,334	\$130,195	0.04	0.03	0.00	0.00
Grayson	\$8,490,065	56	54.5	0.04	0.11	\$155,781	\$151,608	0.00	0.00	0.00	0.00
Hardin	49261888.78	88	54.5	2.17	0.11	\$903,888	\$559,794	0.04	0.02	0.00	0.00
LaRue	\$8,067,971	47	54.5	0.17	0.11	\$148,036	\$171,659	0.00	0.00	0.00	0.00
Marion	\$9,800,835	58	54.5	0.31	2.54	\$179,832	\$168,980	0.01	0.01	0.05	0.04
Meade	\$7,284,005	47	54.5	1.14	0.11	\$133,651	\$154,979	0.02	0.02	0.00	0.00
Nelson	35033005.07	104	54.5	3.17	2.11	\$642,807	\$336,856	0.06	0.03	0.04	0.02
Washington	\$9,124,658	50	54.5	1.17	1.11	\$167,425	\$182,493	0.02	0.02	0.02	0.02
LTADD	\$134,874,112	510	54.5	10.26	6.31	\$2,474,754	\$264,459	0.19	0.02	0.12	0.01

Hail	Total Cost	Number Events	Number Years	Total Loss of Life	Total Injuries	Average Cost Per Year	Average Cost Per Event	Average Loss of Life Per Year	Average Loss of Life Per Event	Average Injuries Per Year	Average Injuries Per Event
Breckinridge	\$4,925,750	86	58.5	0.01	0.52	\$84,201	\$57,276	0.00	0.00	0.01	0.01
Grayson	\$2,438,935	87	57.5	0.01	0.5	\$42,416	\$28,034	0.00	0.00	0.01	0.01
Hardin	\$26,768,252	113	58.5	0.01	0.52	\$457,577	\$236,887	0.00	0.00	0.01	0.00
LaRue	\$1,969,355	66	65.5	0.06	0.56	\$30,066	\$29,839	0.00	0.00	0.01	0.01
Marion	\$35,497,179	64	60.5	0.06	2.56	\$586,730	\$554,643	0.00	0.00	0.04	0.04
Meade	\$25,032,572	74	66.5	0.01	2.52	\$376,430	\$338,278	0.00	0.00	0.04	0.03
Nelson	22857556	85	60.5	0.06	1.56	\$377,811	\$268,912	0.00	0.00	0.03	0.02
Washington	\$11,037,640	55	60.5	0.06	3.56	\$182,440	\$200,684	0.00	0.00	0.06	0.06
LTADD	\$130,527,238	630	66.5	0.28	12.3	\$1,962,816	\$207,186	0.00	0.00	0.18	0.02

Lightning	Total Cost	Number Events	Number Years	Total Loss of Life	Total Injuries	Average Cost Per Year	Average Cost Per Event	Average Loss of Life Per Year	Average Loss of Life Per Event	Average Injuries Per Year	Average Injuries Per Event
Breckinridge	\$489,925	26	60.5	0.04	0.36	\$8,098	\$18,843	0.00	0.00	0.01	0.01
Grayson	\$423,574	32	60.5	0.04	4.36	\$7,001	\$13,237	0.00	0.00	0.07	0.14
Hardin	\$869,962	34	60.5	1.11	2.36	\$14,380	\$25,587	0.02	0.03	0.04	0.07
LaRue	\$61,022	33	60.5	0	0	\$1,009	\$1,849	0.00	0.00	0.00	0.00
Marion	\$404,253	36	61.5	0.14	0.39	\$6,573	\$11,229	0.00	0.00	0.01	0.01
Meade	\$129,715	28	60.5	0	0	\$2,144	\$4,633	0.00	0.00	0.00	0.00
Nelson	\$932,717	42	61.5	2.12	2.34	\$15,166	\$22,208	0.03	0.05	0.04	0.06
Washington	\$223,179	36	61.5	0.12	0.34	\$3,629	\$6,199	0.00	0.00	0.01	0.01
LTADD	\$4,265,847	276	60.5	5.57	13.15	\$70,510	\$15,456	0.09	0.02	0.22	0.05

**Table 3.3.4.9 - Actual Losses Based on Past Events (cont.)**

Snow & Ice	Total Cost	Number Events	Number Years	Total Loss of Life	Total Injuries	Average Cost Per Year	Average Cost Per Event	Average Loss of Life Per Year	Average Loss of Life Per Event	Average Injuries Per Year	Average Injuries Per Event
Breckinridge	\$1,411,082	46	61.5	0.31	1.83	\$22,944	\$30,676	0.01	0.01	0.03	0.04
Grayson	\$1,981,398	49	61.5	0.29	3.41	\$32,218	\$40,437	0.00	0.01	0.06	0.07
Hardin	\$2,792,155	54	61.5	0.29	3.47	\$45,401	\$51,707	0.00	0.01	0.06	0.06
LaRue	\$1,050,662	44	61.5	0.29	3.36	\$17,084	\$23,879	0.00	0.01	0.05	0.08
Marion	\$2,681,555	37	61.5	0.29	3.36	\$43,603	\$72,474	0.00	0.01	0.05	0.09
Meade	\$1,420,840	47	61.5	0.29	1.81	\$23,103	\$30,231	0.00	0.01	0.03	0.04
Nelson	\$2,307,155	48	61.5	1.29	3.47	\$37,515	\$48,066	0.02	0.03	0.06	0.07
Washington	\$2,697,743	47	61.5	0.37	3.48	\$43,866	\$57,399	0.01	0.01	0.06	0.07
LTADD	\$16,342,589	372	61.5	3.42	24.19	\$265,733	\$43,932	0.06	0.01	0.39	0.07

Tornados	Total Cost	Number Events	Number Years	Total Loss of Life	Total Injuries	Average Cost Per Year	Average Cost Per Event	Average Loss of Life Per Year	Average Loss of Life Per Event	Average Injuries Per Year	Average Injuries Per Event
Breckinridge	\$5,285,260	17	61.5	1.09	20.00	\$85,939	\$310,898	0.02	0.06	0.33	1.18
Grayson	\$56,783,213	16	62.5	3.00	23.09	\$908,531	\$3,548,951	0.05	0.19	0.37	1.44
Hardin	\$16,643,723	26	61.5	2.00	73.09	\$270,630	\$640,143	0.03	0.08	1.19	2.81
LaRue	\$5,210,111	12	69.5	0.00	19.12	\$74,966	\$434,176	0.00	0.00	0.28	1.59
Marion	\$920,833	13	61.5	0.00	4.15	\$14,973	\$70,833	0.00	0.00	0.07	0.32
Meade	\$6,342,324	14	61.5	31.00	268.07	\$103,127	\$453,023	0.50	2.21	4.36	19.15
Nelson	\$2,233,978	14	61.5	1.00	28.15	\$36,325	\$159,570	0.02	0.07	0.46	2.01
Washington	\$1,840,007	11	61.5	0.00	5.15	\$29,919	\$167,273	0.00	0.00	0.08	0.47
LTADD	\$95,259,449	123	63	38.09	440.82	\$1,521,109	\$774,467	0.61	0.31	7.04	3.58

*NOTE: The historic frequency of a hazard event over a given period of time determines the historic recurrence interval.*

*For example: If there have been 10 Thunderstorm events in the County in the past 5 years, statistically you could expect that there will be 2 events a year.*

*Realize that from a statistical standpoint, there are several variables to consider. 1) Accurate hazard history data and collection are crucial to an accurate recurrence interval and frequency. 2) Data collection and accuracy has been much better in the past 10-20 years (NCDC weather records). 3) It is important to include all significant recorded hazard events which will include periodic updates to this table.*

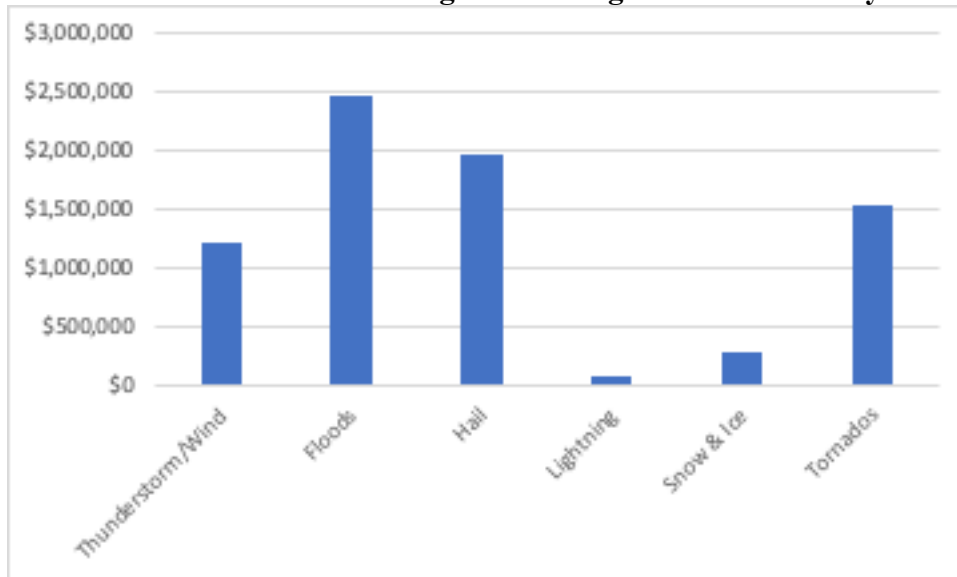
*By updating and reviewing this table over time, it may be possible to see if certain types of hazard events are increasing in the past 10-20 years.*

*These values should be considered low. More events that have occurred than are documented by the sources used in this table.*

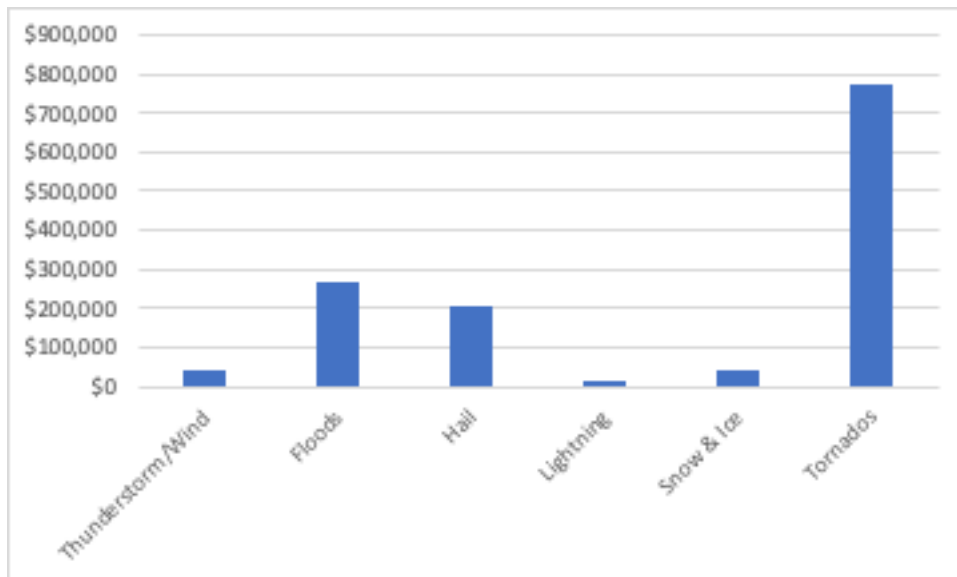
*All data is compiled at the county level due to extremely limited city specific data, therefore all data and analysis represents incorporated and unincorporated areas inclusively.*

*Compilation of SHEL DUS, NCDC & NCEI. 1967- June 30, 2015.*

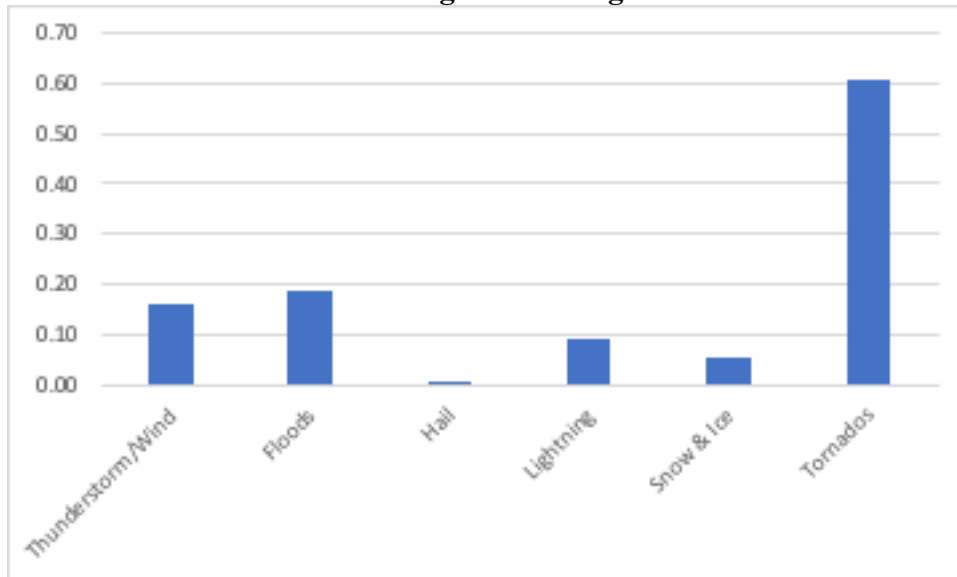
**Chart 3.3.4.4 - Lincoln Trail Region - Average Cost Per Year by Event**



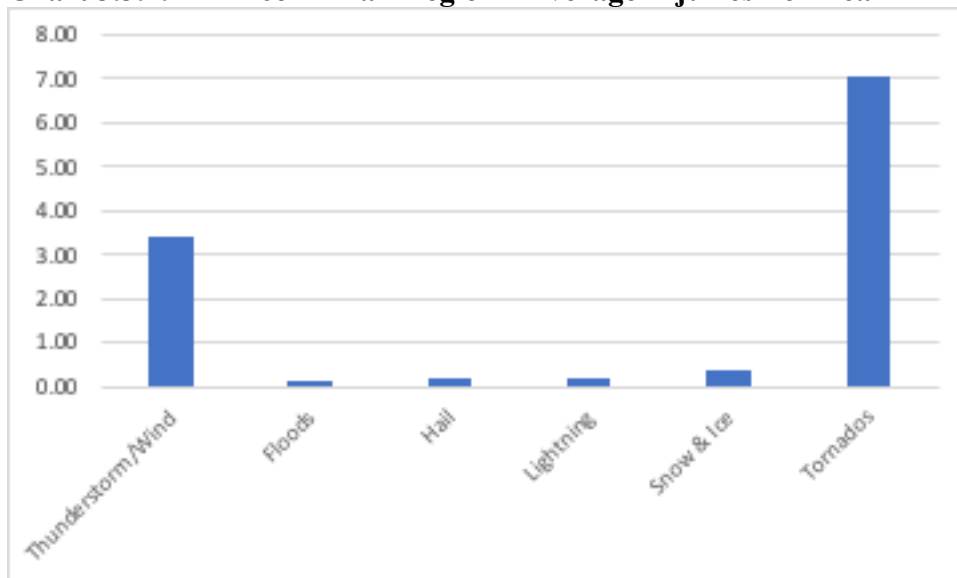
**Chart 3.3.4.5 - Lincoln Trail Region - Average Cost Per Event**



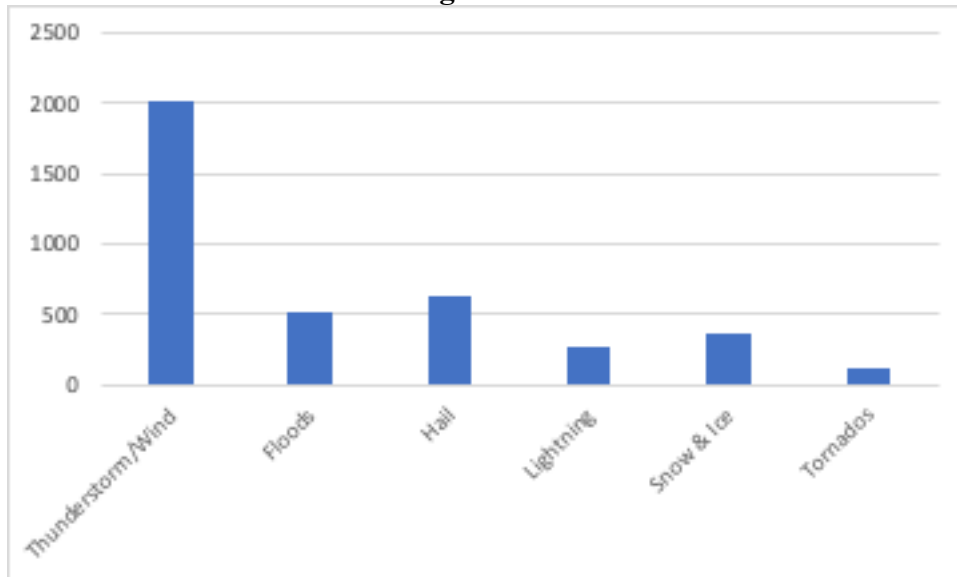
**Chart 3.3.4.6 - Lincoln Trail Region - Average Loss of Life Per Year**



**Chart 3.3.4.7 - Lincoln Trail Region - Average Injuries Per Year**



**Chart 3.3.4.8 - Lincoln Trail Region – Total Events of Documented Period**



**Chart 3.3.4.9 - Lincoln Trail Region – Average Events Per Year**

