

# Annex B City of Raleigh

## B.1 PLANNING PROCESS

The table below lists the HMPC members who represented the City of Raleigh.

**Table B.1 – HMPC Members**

Agency	Representative	Position or Title
Emergency Management and Special Events	Kelly Lindsey*	Emergency Management Coordinator
Emergency Management and Special Events	Whitney Schoenfeld	Special Events Planner
Engineering Services – Stormwater Management	Ben Brown	Stormwater Administrator
Office of Sustainability	Megan Anderson	Sustainability Manager
Office of Sustainability	Nicole Goddard	Sustainability Analyst

\*Note: Vacated position midway through the planning process.

## B.2 COMMUNITY PROFILE

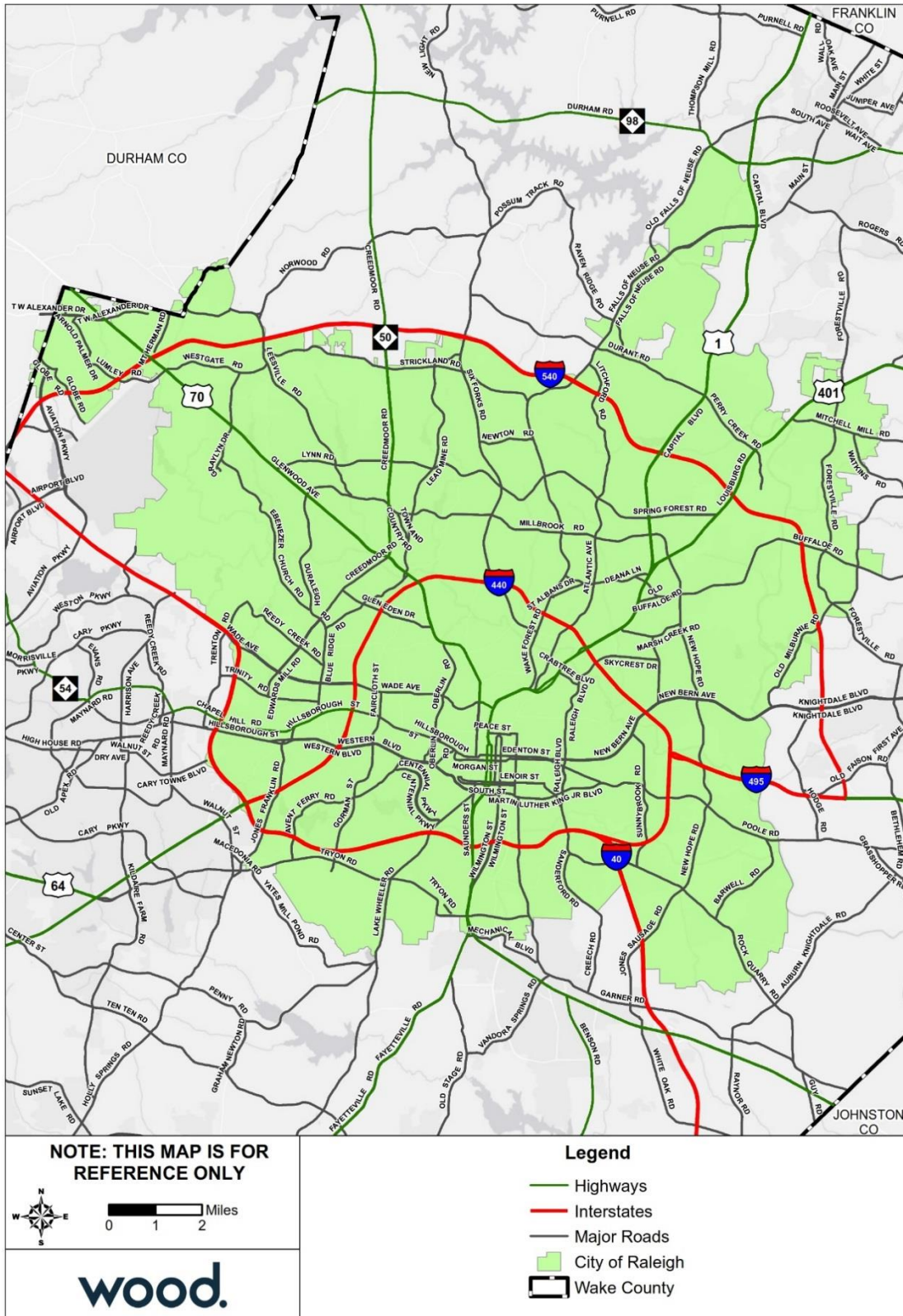
### Geography

The City of Raleigh is located in central Wake County. A very small portion of the city extends west into Durham County, however all data presented here is representative of the entire city. The City is part of the Raleigh, NC Metropolitan Statistical Area, which falls within the larger Raleigh-Durham-Chapel Hill, NC Combined Statistical Area. Raleigh comprises a total land area of 142.9 square miles.

According to data from the U.S. Fish and Wildlife Service’s National Wetlands Inventory, there are approximately 10,298 acres of wetlands in Raleigh.

Figure B.1 shows a base map of major transportation routes in the City of Raleigh.

Figure B.1 – Major Transportation Routes, City of Raleigh



Source: Wake County GIS Open Data

Population and Demographics

Table B.2 provides population counts and growth estimates for the City of Raleigh as compared to the County overall. Table B.3 provides demographic information for Raleigh as compared to the whole County.

**Table B.2 – Population Counts, Raleigh, 2010-2017**

Jurisdiction	2000 Census Population	2010 Census Population	2017 ACS Population Estimate	Total Change 2010-2017	% Change 2010-2017
<b>Wake County total</b>	<b>627,846</b>	<b>900,993</b>	<b>1,023,811</b>	<b>122,818</b>	<b>13.6%</b>
City of Raleigh	276,093	403,892	449,477	45,585	11.3%

Source: US Census Bureau Decennial Census 2000, Decennial Census 2010 American Community Survey 2013-2017 5-Year Estimates  
 Note: The total population of Raleigh includes population residing in adjacent county.

**Table B.3 – Racial Demographics, Raleigh, 2017**

Jurisdiction	White, %	Black, %	Asian, %	Other Race, %	Two or More Races, %	Persons of Hispanic or Latino Origin*, %
<b>Wake County total</b>	<b>66.5%</b>	<b>20.4%</b>	<b>6.5%</b>	<b>3.6%</b>	<b>2.7%</b>	<b>10.0%</b>
City of Raleigh	59.0%	28.9%	4.6%	4.6%	2.6%	11.0%

Source: US Census Bureau, American Community Survey 2013-2017 5-Year Estimates  
 \*Persons of Hispanic origin may be of any race, so also are included in applicable race categories

Asset Inventory

The following tables summarize the asset inventory for Raleigh in order to estimate the total physical exposure to hazards in this area. The locations of critical facilities are shown in Figure B.2 on the following page. Critical facilities are a subset of identified assets from the Critical Infrastructure & Key Resources dataset. Note that the counts are by building; where a critical facility comprises a cluster of buildings, each building is counted and displayed.

**Table B.4 – Critical Infrastructure & Key Resources by Type**

Jurisdiction	Food & Agriculture	Banking & Finance	Chemical	Commercial Facilities	Communications	Manufacturing	Defense	Government	Healthcare	IT	National Monuments	Nuclear	Postal & Shipping	Transportation	Energy	Emergency Services	Water	Other	Total
City of Raleigh	166	164	1	3,653	8	1,678	2	1,643	457	0	0	2	0	739	13	40	12	0	<b>8,578</b>

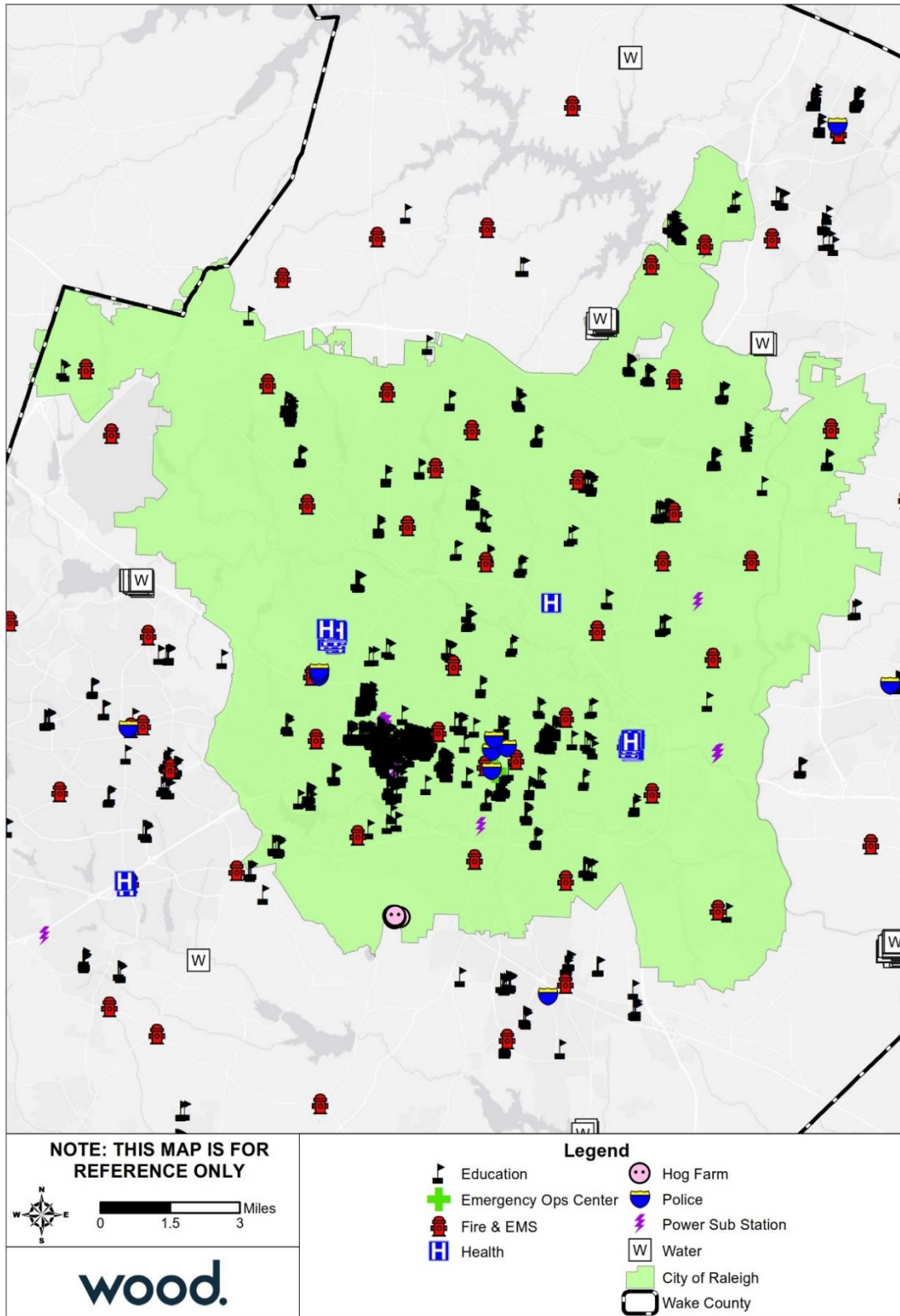
Source: NCEM Risk Management Tool

**Table B.5 – High Potential Loss Facilities by Use**

Jurisdiction	Residential	Commercial	Industrial	Government	Agricultural	Religious	Utilities	Other	Total
City of Raleigh	1,284	1,359	338	505	1	170	13	0	<b>3,670</b>

Source: NCEM Risk Management Tool

Figure B.2 – Critical Facilities, City of Raleigh



Source: NCEM IRISK Database, GIS Analysis

## ANNEX B: CITY OF RALEIGH

To supplement the asset inventory and provide a clearer picture of the current asset exposure in the City of Raleigh, current parcel data was evaluated to identify development since 2010. This information is not incorporated into the risk assessment, which was prepared using NCEM's IRISK database. However, this summary of development since 2010 provides some context to understand the degree to which the IRISK exposure and vulnerability numbers differ from current conditions.

TABLE provides a summary by land class of parcel development from January 2011 to April 2019.

**Table B.6 – Parcels Developed 2011 or Later, City of Raleigh**

Land Class	Number of Parcels	Sum of Building Value
Acres Greater Than 10 With House	2	\$407,892
Agriculture	3	\$639,681
Apartment	113	\$1,607,194,130
Commercial	189	\$956,181,909
Condo Complex	7	-
EXEMPT	148	\$256,148,638
HOA	12	\$1,635,560
Industrial	30	\$43,151,006
Part Exempt	117	\$405,564,987
Residential Less Than 10 Acres	9,226	\$2,507,781,302
Retirement Home	3	\$15,067,239
State Assessed	1	\$4,890,225
<b>Grand Total</b>	<b>9,851</b>	<b>\$5,798,662,569</b>

Source: Wake County Open Data; retrieved April 8, 2019

There are 141 listings on the National Register of Historic Places for the City of Raleigh, including 39 historic districts. These sites are listed in the table below. Four of these sites are also designated as National Historic Landmarks.

**Table B.7 – Historic Properties**

Ref#	Property Name	Status Date	Category	City
70000475	North Carolina Executive Mansion	2/26/1970	Building	Raleigh
70000476	North Carolina State Capitol	2/26/1970	Building	Raleigh
70000479	Yates Mill	2/26/1970	Building	Raleigh
70000474	Mordecai House	7/1/1970	Building	Raleigh
70000478	State Bank of North Carolina	7/1/1970	Building	Raleigh
70000469	Christ Church	7/28/1970	Building	Raleigh
70000470	Haywood Hall	7/28/1970	Building	Raleigh
70000471	Haywood, Richard B., House	7/28/1970	Building	Raleigh
70000472	Lane, Joel, House	7/28/1970	Building	Raleigh
70000477	St. Mary's Chapel	11/20/1970	Building	Raleigh
71000627	White-Holman House	4/16/1971	Building	Raleigh
71000624	Federal Building	5/6/1971	Building	Raleigh
71000626	Seaboard Coast Line Railroad Company Office Building	5/6/1971	Building	Raleigh
71000623	Dodd-Hinsdale House	11/12/1971	Building	Raleigh
71000625	Raleigh Water Tower	12/16/1971	Building	Raleigh

**ANNEX B: CITY OF RALEIGH**

Ref#	Property Name	Status Date	Category	City
72000998	Andrews-Duncan House	1/20/1972	Building	Raleigh
72001000	Heck-Andrews House	1/20/1972	Building	Raleigh
72000999	Hawkins-Hartness House	2/1/1972	Building	Raleigh
72001001	Lewis-Smith House	12/11/1972	Building	Raleigh
73001375	J. S. Dorton Arena	4/11/1973	Building	Raleigh
73001374	Heck-Lee, Heck-Wynne, and Heck-Pool Houses	4/13/1973	Building	Raleigh
73001373	Estey Hall	5/25/1973	Building	Raleigh
73001376	Jones Jr., Nathaniel, House	6/4/1973	Building	Raleigh
73001377	Peace College Main Building	6/19/1973	Building	Raleigh
73001372	Briggs Hardware Building	10/25/1973	Building	Raleigh
74001380	Oakwood Historic District	6/25/1974	District	Raleigh
75001293	Capehart House	1/17/1975	Building	Raleigh
75001297	Tucker Carriage House	2/13/1975	Building	Raleigh
75001295	Jones, Alpheus, House	7/7/1975	Building	Raleigh
75001294	Elmwood	10/29/1975	Building	Raleigh
76001341	Agriculture Building	6/16/1976	Building	Raleigh
76001343	North Carolina School for the Blind and Deaf Dormitory	8/11/1976	Building	Raleigh
76001344	Pullen Park Carousel	9/8/1976	Structure	Raleigh
76001342	Daniels, Josephus, House	12/8/1976	Building	Raleigh
77001012	Polk, Leonidas L., House	4/13/1977	Building	Raleigh
78001979	Montford Hall	3/8/1978	Building	Raleigh
78001978	Capitol Area Historic District	4/15/1978	District	Raleigh
78001980	Raleigh, Sir Walter, Hotel	8/11/1978	Building	Raleigh
78001981	St. Mary's College	12/19/1978	District	Raleigh
79001759	Rogers-Bagley-Daniels-Pegues House	3/21/1979	Building	Raleigh
79003341	Masonic Temple Building	9/17/1979	Building	Raleigh
80002902	Norburn Terrace	2/1/1980	Building	Raleigh
80002903	St. Augustine's College Campus	3/28/1980	District	Raleigh
77001011	Lane-Bennett House	6/30/1983	Building	Raleigh
83001924	Moore Square Historic District	8/3/1983	District	Raleigh
83001923	Lumsden-Boone Building	9/8/1983	Building	Raleigh
83001925	Professional Building	9/8/1983	Building	Raleigh
83004003	Spring Hill	12/29/1983	Building	Raleigh
84002533	Masonic Temple Building	5/3/1984	Building	Raleigh
85001671	Boylan Heights	7/29/1985	District	Raleigh
85001672	Glenwood	7/29/1985	District	Raleigh
85001673	Cameron Park	7/29/1985	District	Raleigh
85003076	Capital Club Building	12/5/1985	Building	Raleigh
86000403	Marshall--Harris--Richardson House	3/5/1986	Building	Raleigh
87000855	North Carolina State Fair Commercial & Education Buildings	6/5/1987	Building	Raleigh
87001787	Oakwood Historic District (Boundary Increase)	10/21/1987	District	Raleigh
80004607	St. Paul A.M.E. Church	11/5/1987	Building	Raleigh
87002597	Christ Episcopal Church	12/23/1987	Building	Raleigh
87002235	Oakwood Historic District (Boundary Increase II)	1/6/1988	District	Raleigh
88003044	Oakwood Historic District (Boundary Increase III)	1/9/1989	District	Raleigh

**ANNEX B: CITY OF RALEIGH**

Ref#	Property Name	Status Date	Category	City
89000441	Pilot Mill	6/5/1989	District	Raleigh
89001049	Henderson, Isabelle Bowen, House and Gardens	8/7/1989	District	Raleigh
90001030	Wyatt, Leonidas R., House	7/5/1990	Building	Raleigh
90001527	East Raleigh--South Park Historic District	10/11/1990	District	Raleigh
90001638	Dix Hill	11/7/1990	District	Raleigh
91000359	Oak View	4/3/1991	District	Raleigh
92001602	Grosvenor Gardens Apartments	11/12/1992	Building	Raleigh
93000440	Fadum House	6/10/1993	Building	Raleigh
93000543	Raleigh Banking and Trust Company Building	6/17/1993	Building	Raleigh
94001085	Small, G. Milton, and Associates, Office Building	9/21/1994	Building	Raleigh
94001086	Small House	9/21/1994	Building	Raleigh
94001087	Ritcher House	9/21/1994	Building	Raleigh
94001088	Paschal House	9/21/1994	Building	Raleigh
94001089	Matsumoto House	9/21/1994	Building	Raleigh
95000783	Crabtree Creek Recreational Demonstration Area	6/30/1995	District	Raleigh
95001440	Haywood, Dr. Hubert Benbury, House	12/13/1995	Building	Raleigh
96000197	Kamphoefner, Henry L., House	3/12/1996	Building	Raleigh
97000022	Raleigh National Cemetery	1/31/1997	Site	Raleigh
97001304	Carolina Power and Light Company Car Barn and Automobile Garage	10/30/1997	Building	Raleigh
97001305	Raleigh Electric Company Power House	10/30/1997	Building	Raleigh
97001498	Odd Fellows Building	12/1/1997	Building	Raleigh
97001499	Pine Street Creamery, (Former)	12/1/1997	Building	Raleigh
97001593	Royal Baking Company	12/30/1997	Building	Raleigh
97001668	Mordecai Place Historic District	2/4/1998	District	Raleigh
99001392	Pope, Dr. M.T., House	11/22/1999	Building	Raleigh
99001452	Raleigh Water Works and E.B. Bain Water Treatment Plant	11/22/1999	Building	Raleigh
00000457	Mahler and Carolina Trust Buildings	11/29/2000	Building	Raleigh
00001570	Mordecai Place Historic District (Boundary Increase)	12/28/2000	Building	Raleigh
01000416	St. Matthews School	4/25/2001	Building	Raleigh
01000421	Panther Branch School	5/8/2001	Building	Raleigh
01000557	Caraleigh Mills	5/25/2001	Building	Raleigh
01001112	North Carolina Agricultural Experiment Station Cottage	10/15/2001	Building	Raleigh
02000058	Glenwood--Brooklyn Historic District (Boundary Increase and Decrease)	2/20/2002	District	Raleigh
02000165	Penny, Jesse, House and Outbuildings	3/13/2002	Building	Raleigh
02000499	Turner, John T. and Mary, House	5/16/2002	Building	Raleigh
02000500	Graves, Willis M., House	5/16/2002	Building	Raleigh
02000501	Hall, Rev. Plummer T., House	5/16/2002	Building	Raleigh
02000502	Latta, Rev. M.L., House	5/16/2002	Building	Raleigh
02000496	Hayes Barton Historic District	5/16/2002	District	Raleigh
02000497	Bloomsbury Historic District	5/16/2002	District	Raleigh
02000946	Depot Historic District	9/6/2002	District	Raleigh
03000389	Roanoke Park Historic District	5/9/2003	District	Raleigh
03000391	Vanguard Park Historic District	5/9/2003	District	Raleigh

**ANNEX B: CITY OF RALEIGH**

Ref#	Property Name	Status Date	Category	City
03000929	Occidental Life Insurance Company Building	9/11/2003	Building	Raleigh
03000930	Green, Herman, House	9/11/2003	Building	Raleigh
03001300	West Raleigh Historic District	12/18/2003	District	Raleigh
04001584	Washington Graded and High School	2/2/2005	Building	Raleigh
05000321	Rothstein, Mae and Philip, House	4/15/2005	Building	Raleigh
05000320	Lawrence, Dr. Elmo N., House	4/20/2005	Building	Raleigh
05001449	Blalock, Dr. Nathan M., House	12/23/2005	Building	Raleigh
06000223	Ivey, Rufus J., House	4/5/2006	Building	Raleigh
06000338	Maiden Lane Historic District	5/3/2006	District	Raleigh
06000790	Raleigh Bonded Warehouse	8/24/2006	Building	Raleigh
06000789	Pine Hall	9/6/2006	Building	Raleigh
06001109	Adams--Edwards House	12/6/2006	Building	Raleigh
07000902	Boylan Apartments	9/5/2007	Building	Raleigh
07001412	Fayetteville Street Historic District	2/27/2008	District	Raleigh
08000888	Free Church of the Good Shepherd	9/10/2008	Building	Raleigh
08000889	City Cemetery	9/12/2008	District	Raleigh
08000939	Curtis, William A., House	9/24/2008	Building	Raleigh
08001292	Mount Hope Cemetery	1/8/2009	District	Raleigh
08001388	Welles, Paul and Ellen, House	1/29/2009	Building	Raleigh
08001415	Mary Elizabeth Hospital	2/5/2009	Building	Raleigh
09000661	Carolina Coach Garage and Shop	8/27/2009	Building	Raleigh
10000632	Madonna Acres Historic District	9/1/2010	District	Raleigh
10001098	Harris, Harwell Hamilton and Jean Bangs, House and Office	12/28/2010	Building	Raleigh
10001111	Battery Heights Historic District	1/3/2011	District	Raleigh
10001112	Capitol Heights Historic District	1/3/2011	District	Raleigh
10001113	Longview Gardens Historic District	1/3/2011	District	Raleigh
11000484	Hi-Mount Historic District	7/29/2011	District	Raleigh
11000892	Arndt, G. Dewey and Elma, House	12/7/2011	Building	Raleigh
11000893	Rochester Heights Historic District	12/7/2011	District	Raleigh
11000956	Cameron Village Historic District	12/22/2011	District	Raleigh
14000523	Merrimon--Wynne House	8/25/2014	Building	Raleigh
14001024	Tucker, Garland Scott and Toler Moore, House	12/10/2014	Building	Raleigh
14001025	Wachovia Building Company Contemporary Ranch House	12/10/2014	Building	Raleigh
16000188	Chavis, John, Memorial Park	4/19/2016	District	Raleigh
100000941	O'Kelly, Berry, Historic District	5/11/2017	District	Raleigh
100001634	Depot Historic District (Boundary Increase)	9/21/2017	District	Raleigh
100002930	Oak Grove Cemetery	9/14/2018	Site	Raleigh
100002931	Oberlin Cemetery	9/14/2018	Site	Raleigh

Source: National Parks Service, National Register of Historic Places, October 2018

### Housing

The table below details key housing statistics for Raleigh as compared to the County overall.

Table B.8 – Housing Statistics, Raleigh, 2010-2017

Jurisdiction	Housing Units (2010)	Housing Units (2017)	Housing Units Percent Change (2010-2017)	Owner-Occupied, % (2017)	Vacant Units, % (2017)	Median Home Value (2017)
Wake County total	371,836	411,632	10.7%	59.5%	7.2%	\$250,700
City of Raleigh	176,124	194,768	10.6%	47.2%	9.2%	\$225,000

Source: U.S. Census Bureau 2010 Decennial Census, American Community Survey 2013-2017 5-Year Estimates  
 Note: Owner-Occupied and vacant-unit measures are reported as a percent of the total number of housing units.

Economy

The following tables present key economic statistics for Raleigh as compared to the County overall.

Table B.9 – Employment Statistics, Raleigh, 2017

Jurisdiction	Population in Labor Force	Percent Employed* (%)	Percent Unemployed* (%)	Percent Not in Labor Force* (%)	Unemployment Rate (%)
Wake County	564,096	67.2	3.5	29.2	4.9
City of Raleigh	257,228	67.5	3.6	28.8	5.0

Source: U.S. Census Bureau, American Community Survey 2013-2017 5-Year Estimates  
 Note: This table reports only the civilian labor force. The labor force in armed services accounted for 0.3% or less of the population 16 and over in all jurisdictions. \*Population employed, population unemployed, and Population not in labor force are reported as a percent of the total population aged 16 years and older.

Table B.10 – Percent of Employed Population by Occupation, Raleigh, 2017

Occupation	Management, business, science and arts (%)	Service (%)	Sales and Office (%)	Natural Resources, Construction, and Maintenance (%)	Production, transportation, and material moving (%)
Wake County	50.1	13.8	23.4	6.0	6.7
City of Raleigh	46.2	15.7	24.6	6.0	7.4

Source: U.S. Census Bureau, American Community Survey 2013-2017 5-Year Estimates

**B.3 RISK ASSESSMENT**

This section contains a hazard profile and vulnerability assessment for those hazards that were rated with a higher priority for the City of Raleigh than for Wake County as a whole. Risk and vulnerability findings are also presented here for those hazards that are spatially defined and have variations in risk that could be evaluated quantitatively on a jurisdictional level. The hazards included in in this section are: Flood and Wildfire.

**B.3.1 Flood**

Table B.11 details the acreage of the City of Raleigh’s total area by flood zone on the effective DFIRM. Per this assessment, about 8 percent of the unincorporated area in the County falls within the mapped 1%-annual-chance floodplains.

Table B.11 – Flood Zone Acreage in the City of Raleigh

Flood Zone	Acreage	Percent of Total (%)
Zone A	101.08	0.09
Zone AE	9265.33	8.03
Zone X (500-year)	1085.68	0.94
Zone X Unshaded	104886.22	90.94
<b>Total</b>	<b>115338.32</b>	<b>--</b>

Source: FEMA Effective DFIRM; Wake County GIS

Figure B.3 reflects the effective mapped flood hazard zones for the City of Raleigh, and Figure B.4 displays the depth of flooding estimated to occur in these areas during the 1%-annual-chance flood.

To supplement the IRISK assessment of property at risk from the 1% annual chance flood event in Section 4 and provide a clearer picture of the current property at risk in the City of Raleigh, current parcel data was evaluated to identify parcels developed since 2010. Using GIS analysis, parcels developed after 2010 were compared to the boundaries of the 1% annual chance floodplain to identify the exposure of newly developed property to the base flood. For parcels where updated building footprints were available, the parcel was considered exposed only if the building intersected the floodplain boundary, otherwise, a parcel was considered exposed to the floodplain if any portion of the parcel was located in the floodplain

This assessment does not evaluate flood impacts or provide damage estimates. However, this summary of development in or near the floodplain since 2010 provides some context to understand the degree to which the IRISK exposure and vulnerability numbers differ from current conditions.

Table B.12 provides a summary by land class of parcel development located in the 1% annual chance floodplain from January 2011 to April 2019.

**Table B.12 – Parcels Developed 2011 or Later and Located in 100-Year Floodplain, City of Raleigh**

Land Class	Number of Parcels	Sum of Building Value
Apartment	9	\$197,174,867
Commercial	12	\$97,896,588
EXEMPT	12	\$58,671,973
Industrial	5	\$5,461,158
Part Exempt	1	\$541,282
Residential Less Than 10 Acres	86	\$31,032,549
<b>Grand Total</b>	<b>125</b>	<b>\$390,778,417</b>

Source: Wake County Open Data; retrieved April 8, 2019; FEMA Effective DFIRM

Table B.13 provides building counts and estimated damages for Critical Infrastructure and Key Resources (CIKR) buildings by sector and flood event in the City of Raleigh. Table B.14 provides counts and estimated damages for High Potential Loss Properties in the City of Raleigh.

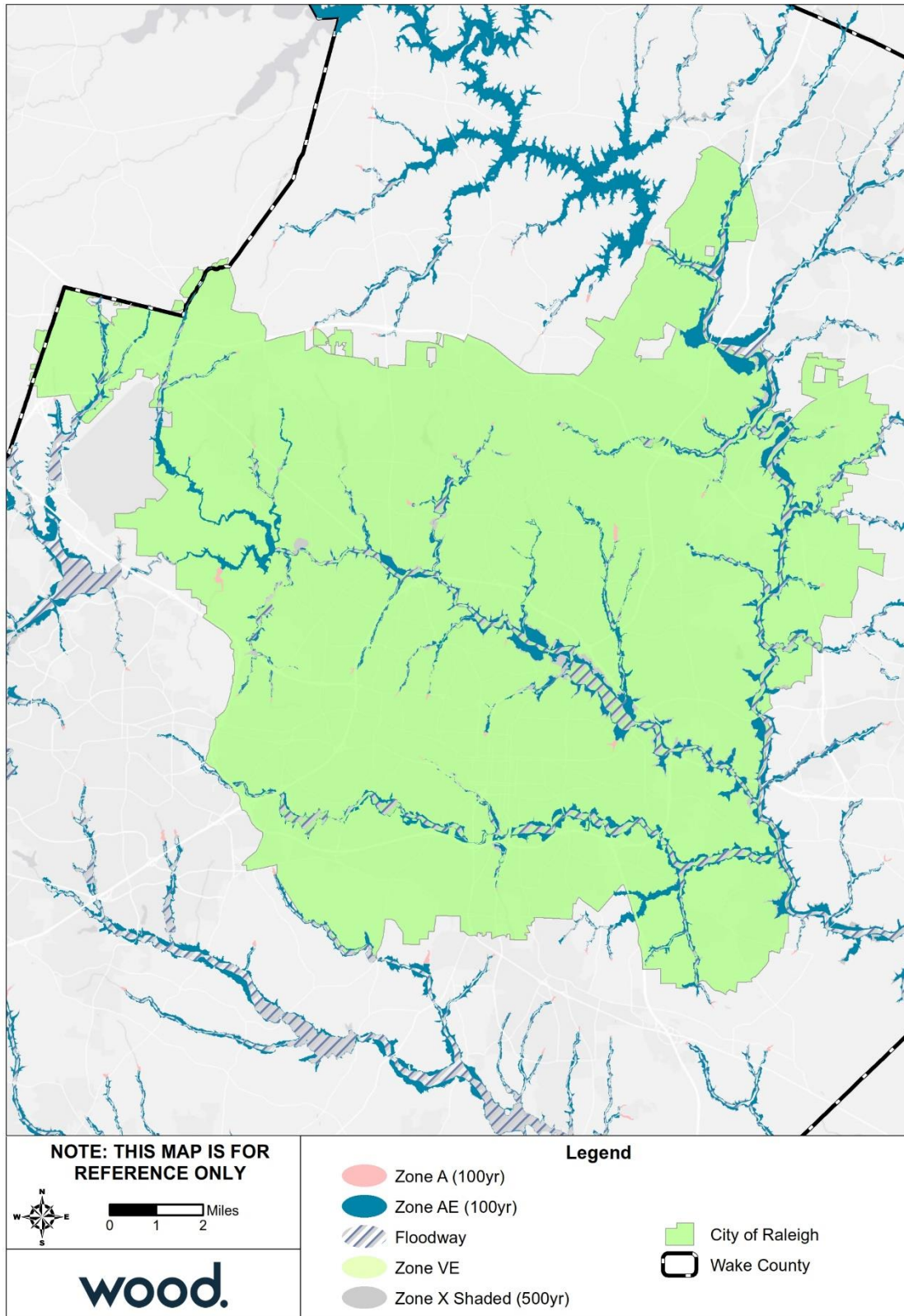
**Table B.13 – Critical Facilities Exposed to Flooding, City of Raleigh**

Sector	Event	Number of Buildings at Risk	Estimated Damages
Banking and Finance	100 Year	4	\$1,433,067
	Floodway	1	\$48,447
Commercial Facilities	100 Year	156	\$156,539,970
	Floodway	45	\$7,918,573
Critical Manufacturing	100 Year	8	\$960,696
	Floodway	3	\$255,246
Government Facilities	100 Year	5	\$259,852
	Floodway	1	\$64,062
Transportation Systems	100 Year	3	\$2,003,605
<b>All Categories</b>	<b>100 Year</b>	<b>176</b>	<b>\$161,197,190</b>
	<b>Floodway</b>	<b>50</b>	<b>\$8,286,328</b>

Table B.14 – High Potential Loss Properties Exposed to Flooding, City of Raleigh

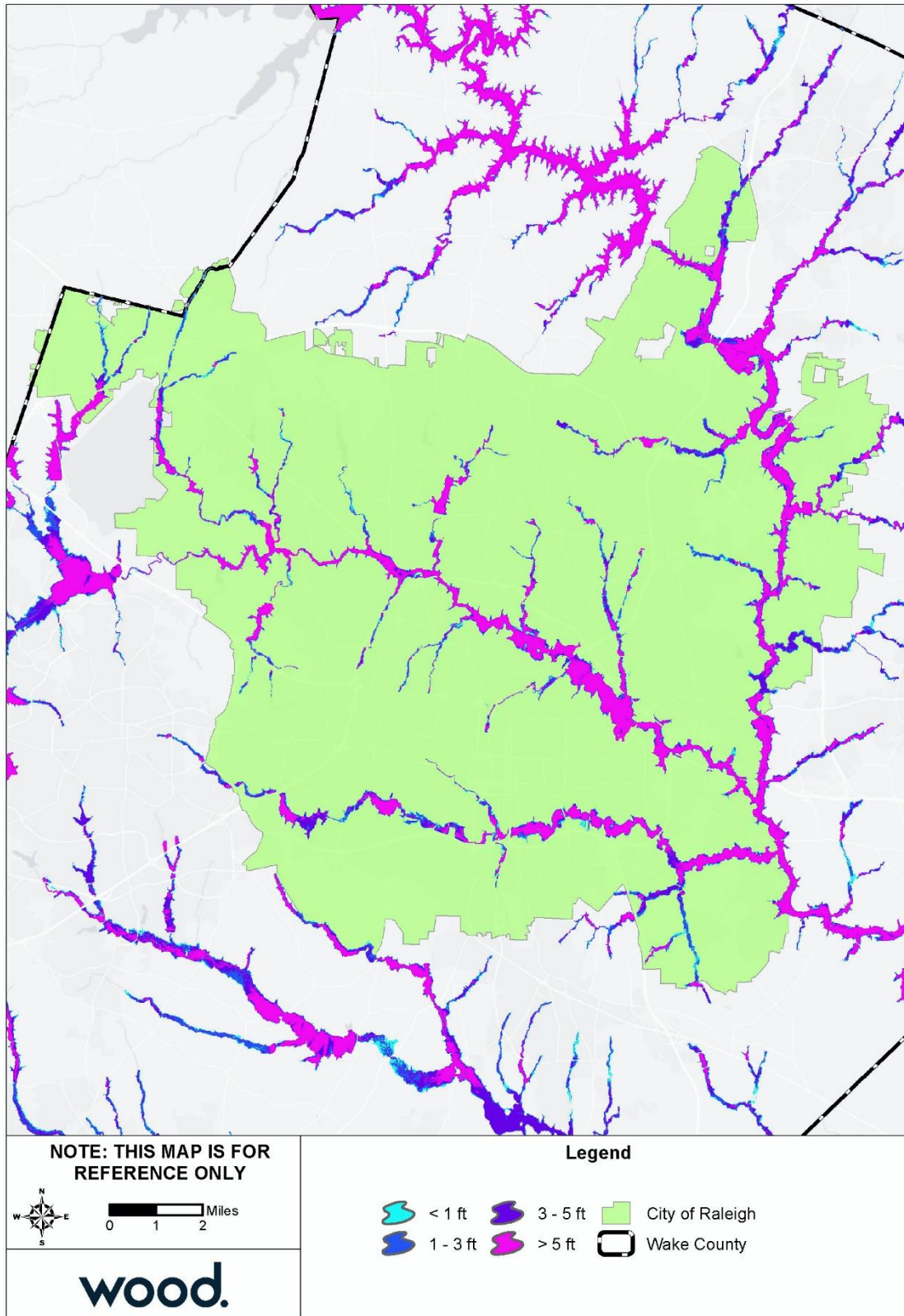
Category	Event	Number of Buildings at Risk	Estimated Damages
Commercial	100 Year	25	\$148,719,520
	Floodway	5	\$2,652,525
Residential	100 Year	11	\$3,331,354
	Floodway	2	\$1,349,353
All Categories	<b>100 Year</b>	<b>36</b>	<b>\$152,050,874</b>
	<b>Floodway</b>	<b>7</b>	<b>\$4,001,878</b>

Figure B.3 – FEMA Flood Hazard Areas, City of Raleigh



Source: FEMA Effective DFIRM

Figure B.4 – Flood Depth, 1%-Annual Chance Floodplain, City of Raleigh



Source: FEMA Effective DFIRM

**B.3.2 Wildfire**

Table B.15 summarizes the acreage in the City of Raleigh that falls within the Wildland Urban Interface (WUI), categorized by housing density. Areas in the WUI are those where development may intermix with flammable vegetation. 18 percent of the City of Raleigh is not included in the WUI.

**Table B.15 – Wildland Urban Interface Acreage, City of Raleigh**

	Housing Density	Total Acreage	Percent of Total Acreage
	<i>Not in WUI</i>	20,688.0	18.0%
	LT 1hs/40ac	4,359.1	3.8%
	1hs/40ac to 1hs/20ac	2,579.8	2.2%
	1hs/20ac to 1hs/10ac	3,549.9	3.1%
	1hs/10ac to 1hs/5ac	4,720.0	4.1%
	1hs/5ac to 1hs/2ac	8,663.3	7.5%
	1hs/2ac to 3hs/1ac	54,281.6	47.2%
	GT 3hs/1ac	16,195.1	14.1%
	<b>Total</b>	115,066.8	

Source: Southern Wildfire Risk Assessment

Figure B.5 depicts the WUI for the City of Raleigh. The WUI is the area where housing development is built near or among areas of vegetation that may be prone to wildfire. Figure B.6 depicts the Fire Intensity Scale, which indicates the potential severity of fire based on fuel loads, topography, and other factors. Figure B.7 depicts Burn Probability based on landscape conditions, percentile weather, historical ignition patterns, and historical prevention and suppression efforts.

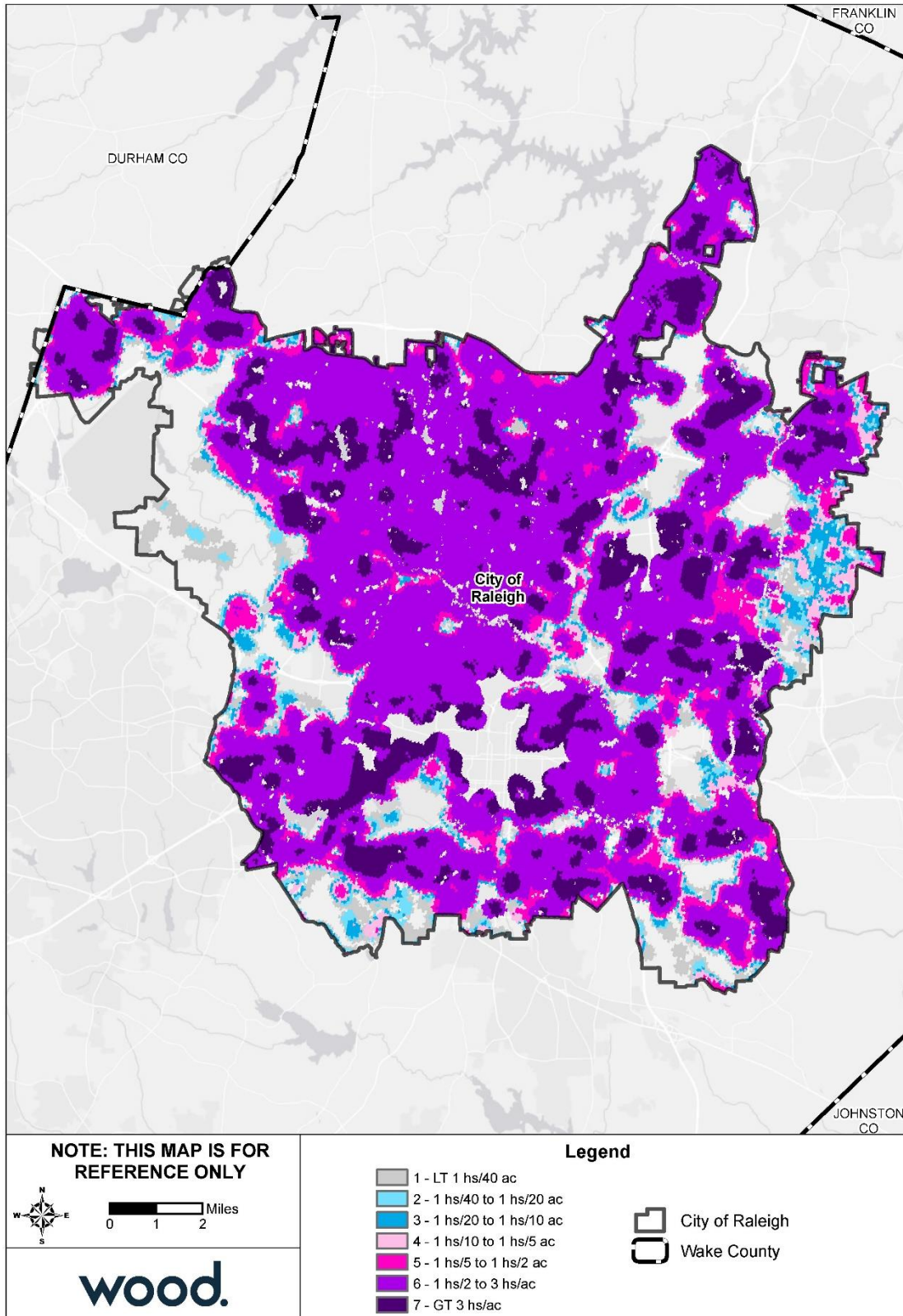
Potential fire intensity is highest on the western border of the City of Raleigh; however, this area has lower burn probability and is largely outside of the WUI, meaning little to no development is at risk. The City of Raleigh overall has relatively low burn probability – the highest being in the southwest, although much of this area is outside of the WUI.

Table B.16 provides building counts and estimated damages for Critical Infrastructure and Key Resources (CIKR) buildings by sector at risk to wildfire hazard.

**Table B.16 – Critical Facilities Exposed to Wildfire, City of Raleigh**

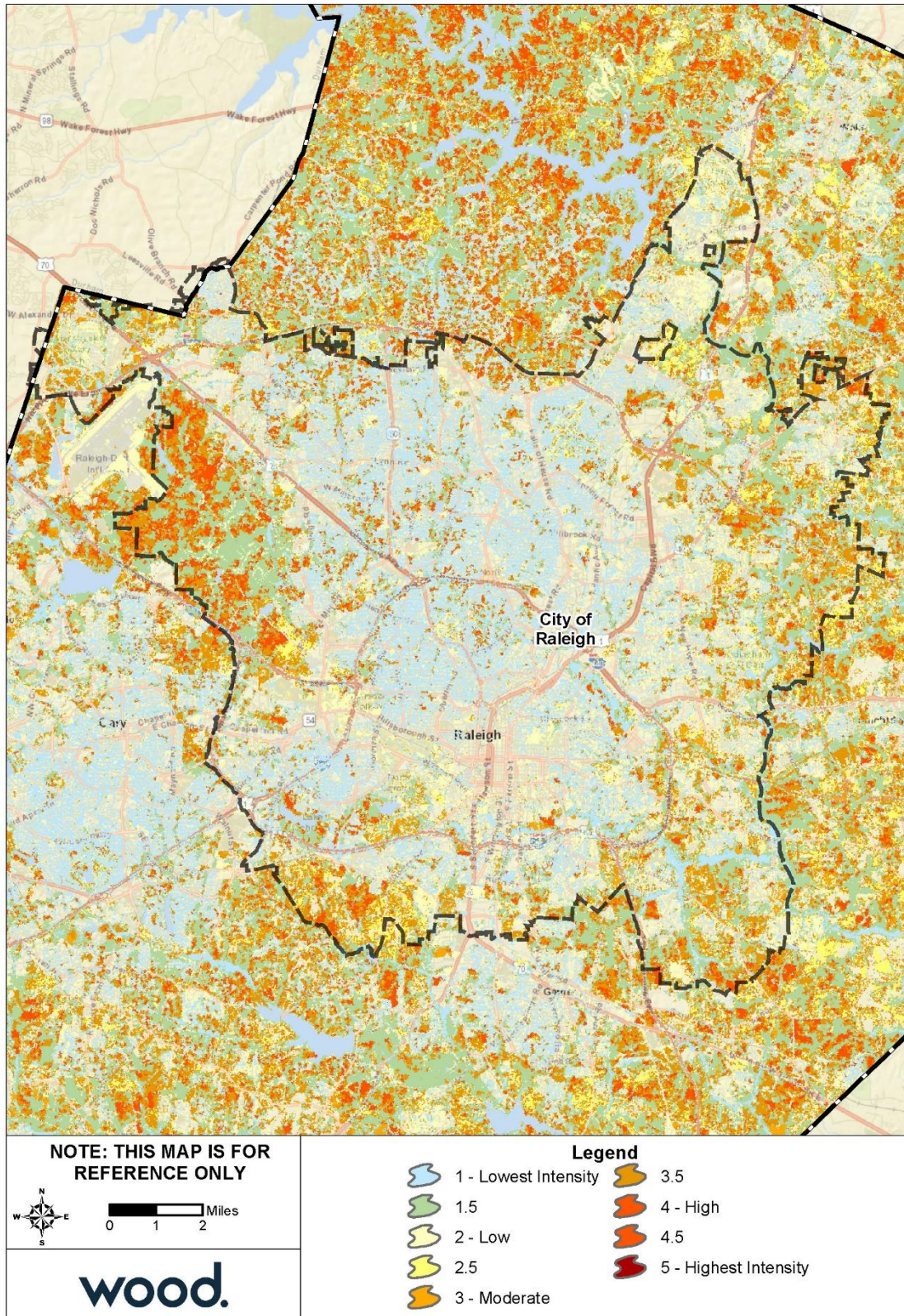
Sector	Event	Number of Buildings at Risk	Estimated Damages
Transportation Systems	Wildfire Hazard	2	\$381,965
<b>All Categories</b>	<b>Wildfire Hazard</b>	<b>2</b>	<b>\$381,965</b>

Figure B.5 – Wildland Urban Interface, City of Raleigh



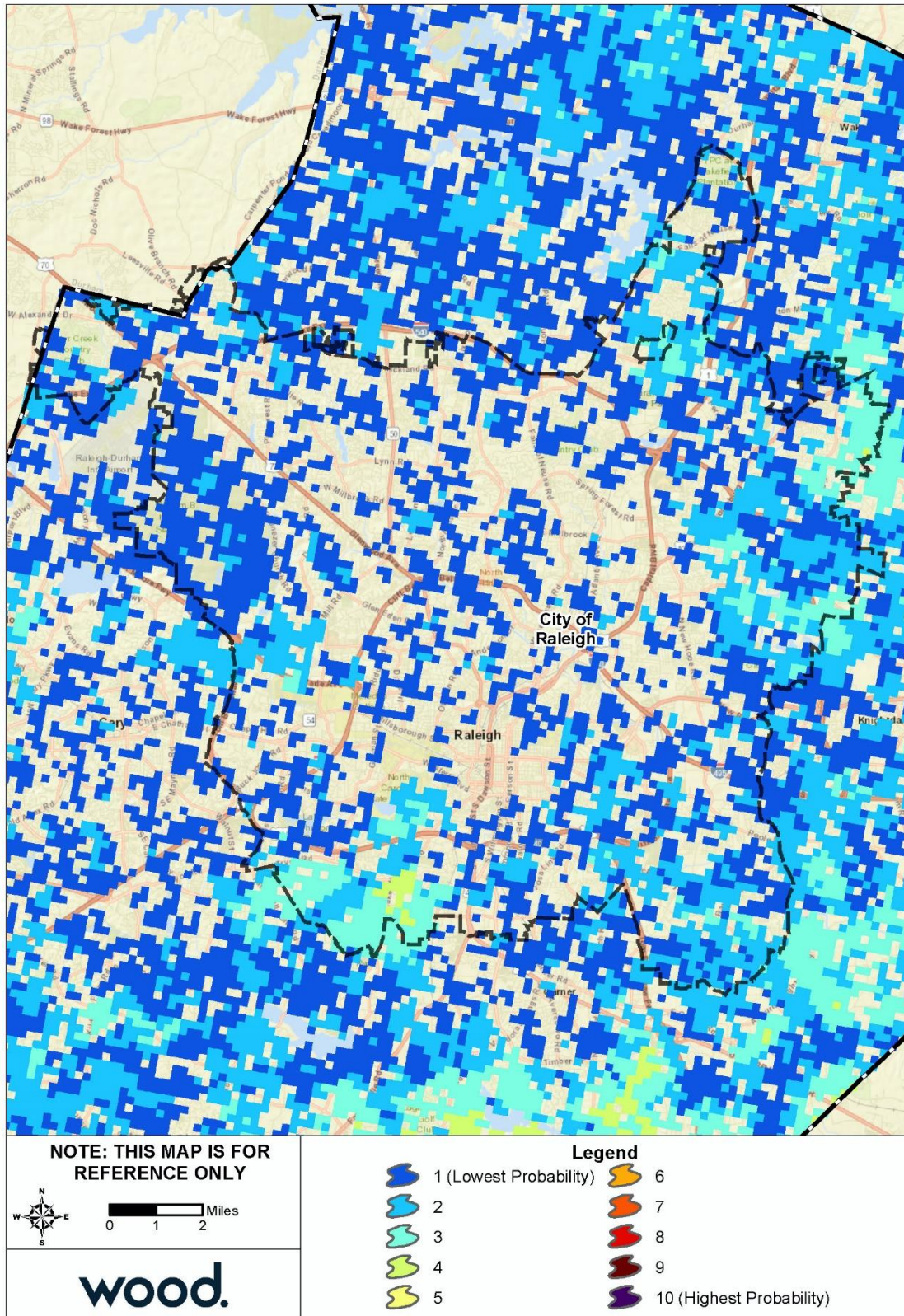
Source: Southern Wildfire Risk Assessment

Figure B.6 – Fire Intensity Scale, City of Raleigh



Source: Southern Wildfire Risk Assessment

Figure B.7 – Burn Probability, City of Raleigh



Source: Southern Wildfire Risk Assessment

**B.4 CAPABILITY ASSESSMENT**

**B.4.1 Overall Capability**

Details on the tools and resources in place and available to the City of Raleigh were provided by the City’s HMPC representatives and are summarized in Section 5 Capability Assessment. Based on that information and using the scoring methodology detailed in that section, Raleigh has an overall capability rating of High. The City’s Self-Assessment of key capability areas is summarized in Table B.17 below.

**Table B.17 – Capability Self-Assessment, Raleigh**

Capability Area	Rating
Plans, Ordinances, Codes and Programs	High
Administrative and Technical Capability	High
Fiscal Capability	High
Education and Outreach Capability	High
Mitigation Capability	High
Political Capability	High
Overall Capability	High

**B.4.2 Floodplain Management**

The City of Raleigh joined the NFIP emergency program in 1973 and has been a regular participant in the NFIP since August 1978. The following tables reflect NFIP policy and claims data for the City categorized by structure type, flood zone, Pre-FIRM and Post-FIRM.

**Table B.18 – NFIP Policy and Claims Data by Structure Type**

Structure Type	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single Family	1,452	\$778,623	\$398,477,500	443	\$5,223,294.75
2-4 Family	78	\$54,834	\$12,871,300	69	\$2,068,949.87
All Other Residential	246	\$336,722	\$68,078,200	97	\$3,804,074.58
Non-Residential	169	\$665,212	\$72,437,400	245	\$12,440,828.93
<b>Total</b>	<b>1,945</b>	<b>\$1,835,391</b>	<b>\$551,864,400</b>	<b>854</b>	<b>\$23,537,148.13</b>

Source: FEMA Community Information System, accessed November 2018

**Table B.19 – NFIP Policy and Claims Data by Flood Zone**

Flood Zone	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	762	\$1,317,146	\$215,609,800	552	\$17,138,041.13
A Zones	14	\$13,926	\$2,421,900	19	\$902,450.88
AO Zones	0	\$0	\$0	0	\$0.00
AH Zones	0	\$0	\$0	0	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00
V Zones	0	\$0	\$0	0	\$0.00
D Zones	0	\$0	\$0	0	\$0.00

**ANNEX B: CITY OF RALEIGH**

Flood Zone	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
B, C & X Zone					
Standard	79	\$97,728	\$17,072,700	110	\$3,994,871.47
Preferred	1,090	\$406,591	\$316,760,000	130	\$1,347,167.04
<b>Total</b>	<b>1,945</b>	<b>\$1,835,391</b>	<b>\$551,864,400</b>	<b>811</b>	<b>\$23,382,530.52</b>

Source: FEMA Community Information System, accessed November 2018

**Table B.20 – NFIP Policy and Claims Data Pre-FIRM**

Flood Zone	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	259	\$911,803	\$70,492,500	452	\$15,857,154.78
A Zones	1	\$1,497	\$250,000	14	\$655,980.79
AO Zones	0	\$0	\$0	0	\$0.00
AH Zones	0	\$0	\$0	0	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00
V Zones	0	\$0	\$0	0	\$0.00
D Zones	0	\$0	\$0	0	\$0.00
B, C & X Zone	342	\$157,915	\$96,763,900	150	\$2,964,790.14
Standard	24	\$34,624	\$4,763,900	62	\$1,964,515.02
Preferred	318	\$123,291	\$92,000,000	88	\$1,000,275.12
<b>Total</b>	<b>602</b>	<b>\$1,071,215</b>	<b>\$167,506,400</b>	<b>616</b>	<b>\$19,477,925.71</b>

Source: FEMA Community Information System, accessed November 2018

**Table B.21 – NFIP Policy and Claims Data Post-FIRM**

Flood Zone	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	503	\$405,343	\$145,117,300	98	\$1,270,586.35
A Zones	13	\$12,429	\$2,171,900	5	\$246,470.09
AO Zones	0	\$0	\$0	0	\$0.00
AH Zones	0	\$0	\$0	0	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00
V Zones	0	\$0	\$0	0	\$0.00
D Zones	0	\$0	\$0	0	\$0.00
B, C & X Zone	827	\$346,404	\$237,068,800	90	\$2,377,248.37
Standard	55	\$63,104	\$12,308,800	48	\$2,030,356.45
Preferred	772	\$283,300	\$224,760,000	42	\$346,891.92
<b>Total</b>	<b>1,343</b>	<b>\$764,176</b>	<b>\$384,358,000</b>	<b>193</b>	<b>\$3,894,304.81</b>

Source: FEMA Community Information System, accessed November 2018

**B.5 MITIGATION STRATEGY**

City of Raleigh											
Action #	Description	Goal	Objective	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	2019 Status	Status Comments/Explanation
<b>Prevention</b>											
P-1	Establish a Lake Preservation Policy that encourages private property owners to preserve existing lakes and ponds, and in certain circumstances provides for public assistance.	4	1	Flood	Moderate	Raleigh Engineering Services	\$100,000 - \$1m	Local	1 year	In-Progress – Carry Forward	City Stormwater has also worked with the Stormwater Management Advisory Commission to develop recommendations to further enhance the lake preservation program. It is anticipated that the revised program will be considered by City Council during calendar year 2019. Enhancements would include the continued ability to restore and upgrade dams and spillways associated with safety improvements as well as removal of dams to protect safety and restore natural conditions
P-2	Develop ongoing multi-year program of detailed basin studies for each watershed in City's jurisdiction. Fifteen basin studies are complete with 10 additional studies budgeted in the capital program. (CRS 410).	2	2	Flood	Moderate	Raleigh Engineering Services	\$100,000 - \$1m	Local	1 year	In-Progress – Carry Forward	City Stormwater is currently working on an Integrated Stormwater Management Master Plan. Basin studies will be reviewed and updated as needed with further improvement needs and opportunities identified and prioritized. Reduction of flooding hazards remains a key priority for improvement projects.
P-3	Planning Commission to consider program to develop future conditions floodplain mapping for all FEMA mapped areas (this is already done for non-FEMA mapped areas). The program would consist of a multi-year capital program for mapping for all FEMA streams in the ETJ and consideration of changes to development regulations in these areas. Future conditions would be based on expected development per the Comprehensive Plan and zoning maps.	4	2	Flood	Moderate	Raleigh Engineering Services	\$100,000 - \$1m	Local	3-5 years	In-Progress – Carry Forward	The preliminary maps that have all FEMA floodplain in the city studied for future conditions. Our ordinance is already set up to enforce these areas. Once the maps are effective this effort will be complete.
P-4	Reallocation of Falls Lake water conservation pool; increased available storage for water supply by 4.1B gallons	2	1	Drought	High	Public Utilities Department	No cost	N/A	Ongoing - Next 5 years	New	N/A
P-5	Implementation of a regional mutual aid contract between local water utilities which would describe how the utilities would provide assistance if a partner utility experienced a water shortage	2	2	Drought	High	Public Utilities Department	Variable - depends on volume of water transferred between systems	Public Utilities Dept	Ongoing - Next 5 years	New	N/A
P-6	Develop a written Resiliency Plan for City of Raleigh operations and services, including infrastructure resilience, community resilience, ecosystem resilience and governance resilience.	4	1	All	High	Office of Sustainability	Less than \$100,000	Unknown	2-3 years	New	N/A
P-7	Water Shortage Response Plan which uses a hydrologic model (OASIS) to establish risk based drought triggers that are designed to reduce water demand before severe drought conditions and also when to exit drought triggers when conditions improve.	2	2	Drought	Moderate	Public Utilities Department	No cost	N/A	Ongoing - Next 5 years	New	N/A
P-8	Update and maintain GIS data of building footprints, parcels, and critical facilities, and use it to regularly identify buildings in need of mitigation.	2	2	All	Moderate	Raleigh Information Technology, GIS staff	Staff time	Local	Ongoing - Next 5 years	New	Updated data will be used in future plan updates and risk assessments and to identify properties that should be prioritized for mitigation.
<b>Property Protection</b>											
PP-1	Develop ongoing program designed to utilize Federal grant resources to assist private property owners in relocating existing structures out of flood hazard zones. (CRS 500/510/520)	3	2	Flood	Moderate	Raleigh Engineering Services	\$100,000 - \$1m	Local, Federal	3-5 years	In-Progress – Carry Forward	The city is cataloging potential candidates for relocation based on our current repetitive loss list. Staff has developed a scoring system based on cost benefit for relocation.

ANNEX B: CITY OF RALEIGH

City of Raleigh											
Action #	Description	Goal	Objective	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	2019 Status	Status Comments/Explanation
PP-2	Develop an ongoing program designed to utilize Federal grant resources to assist private property owners in elevating existing structures located within flood hazard zones. (CRS 510/530)	3	2	Flood	Moderate	Raleigh Engineering Services	\$100,000 - \$1m	Local, Federal	3-5 years	In-Progress – Carry Forward	To further this initiative, the city is cataloging potential candidates for relocation based on our current repetitive loss list. Staff has developed a scoring system based on cost benefit for relocation that would compare the projects to relocation and retrofits.
PP-3	Develop an ongoing program designed to utilize Federal grant resources to assist private property owners in renovating and retrofitting existing structures in flood hazard zones to reduce vulnerability to flooding damage.	3	2	Flood	Moderate	Raleigh Engineering Services	\$100,000 - \$1m	Local, Federal	Ongoing – next 5 years	In-Progress – Carry Forward	City staff evaluates potential candidates and approaches property owners for mitigation help.
PP-4	Program to install emergency electrical generators at all public utility facilities. Current focus on redundant generators at critical facilities, second fuel truck and completion of 100% generator coverage in Garner area.	3	1	All	High	Raleigh Public Utilities	\$100,000 - \$1m	Local	2-3 years	In-Progress – Carry Forward	We now have emergency backup power generators at all our critical facilities except for our South Raleigh Operations Facility. However, we can relocate supplies, material and teams to any of our other facilities per our emergency operational planning. Also, per our Hurricane Florence AAR we are conducting emergency fuel capacity studies for our generators at our largest wastewater treatment plant and both our water treatment plants. A fuel truck is not in the works but we have emergency fuel contracts with Red Star and also exploring dual use of natural gas to power some of our energy resiliency to give us an added layer.
<b>Structural Projects</b>											
SP-1	Install cameras in flood prone areas throughout the City of Raleigh to allow us to view these locations and make informed decisions as it relates to flooding	2	2	Flood, Hurricane	Moderate	City of Raleigh Transportation	\$100,000 to \$1m	Unknown	3-5 years	New	N/A
<b>Emergency Services</b>											
ES-1	Provide and enhance technical rescue capabilities more equitably throughout the City.	2	1	Dam Failure, Flood, Hurricane, Severe Weather, Severe Winter Storm, Tornado, Wildfire	High	Raleigh Fire	\$100,000 - \$1m	Local	2-3 years	In-Progress – Carry Forward	We continually look at our technical rescue capabilities and adjust as needed. The initiative to add 1 Heavy Rescue and 2 Squads has been completed. Additionally, we've added 1 company (12 personnel) to the team, upgraded water rescue equipment, increased water rescue certified personnel from 20 to 60, required 100% of members be Technical Rescuer and Vehicle Extrication certified and are working toward 100% certification for all members in all the other technical rescue disciplines.
ES-2	Provide after-action report of emergency response to severe weather events in order to improve planning for future disasters.	2	2	Hurricane, Severe Weather, Severe Winter Storm, Tornado	High	Raleigh Fire and Emergency Management	\$100,000 - \$1m	Local	Ongoing- Post Event	In-Progress – Carry Forward	After-action report made for Hurricane Florence and will continue to be made for all subsequent weather events.
ES-3	Maintain a standard operating guideline to direct operational planning prior to anticipated weather emergencies.	2	1	All	High	Raleigh Fire and Emergency Management	\$100,000 - \$1m	Local	Ongoing – next 5 years	In-Progress – Carry Forward	The City's Emergency Operation Plan outlines our standard operating guidelines and has been adopted as an official document used prior to and during weather emergencies.
ES-4	Design GIS programming capable of providing real-time data to emergency managers and historic data for future emergency response planning.	2	2	All	High	Raleigh City Manager and Information Technology	\$100,000 - \$1m	Local	3-5 year	In-Progress – Carry Forward	The IT Department led a citywide effort to develop a Situational Analysis Smart Dashboard for the Emergency Operations Center and refined it in real time as new types of data, such as current wind speed, were identified as critical to the safety of the public and city workers during an emergency. The Smart Dashboard was first deployed for Hurricane Florence. The dashboard is cross-departmental, with real-time progress tracking, covering a range of emergency management issues from debris in streets and closures, malfunctioning traffic signals, flood monitoring and 911 call data.

ANNEX B: CITY OF RALEIGH

City of Raleigh											
Action #	Description	Goal	Objective	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	2019 Status	Status Comments/Explanation
ES-5	Continue to conduct disaster tabletop exercise program.	2	1	All	Low	Raleigh Public Utilities, Fire, Police, City Manager, Emergency Management, and Engineering Services	\$100,000 - \$1m	Local	Ongoing – next 5 years	In-Progress – Carry Forward	Tabletop disaster exercises continue to occur with all EOC partners prior to the anticipated peak of hurricane season. These trainings take place each year to ensure staff are comfortable in their EOC roles and to handle staff turnover.
ES-6	Establish cross-functional team to develop Debris Management Plan. Team should work to identify and prepare additional debris management sites.	2	1	Flood, Tornado, Earthquake, Severe Winter Storm, Severe Weather, Hurricane	Moderate	City of Raleigh Transportation	\$100,000	FEMA, City of Raleigh general fund support	1 year	New	N/A
Public Education and Awareness											
PEA-1	Utilize existing Everbridge advisory software to issue Heat Advisory Alerts targeted to vulnerable neighborhoods	1	2	Extreme Heat	High	Communications/ Sustainability	Less than \$100,000	COR Operating Funds	2-3 years	New	N/A