Annex C City of Lincoln

C.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Lincoln, a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to Lincoln, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

C.2 Planning Process

As described above, Lincoln followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table C-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table C-1 City of Lincoln – Planning Team

Name	Position/Title	How Participated
Steve Prosser	Community Development Director	Annex Update information
Roland Neufeld	Senior Engineer	Annex Update information
Ray Leftwich	City Engineer	Mitigation Action Worksheets
Tolan Dworak	Battalion Chief	Wildfire data and hazard mitigation planning

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table C-2.

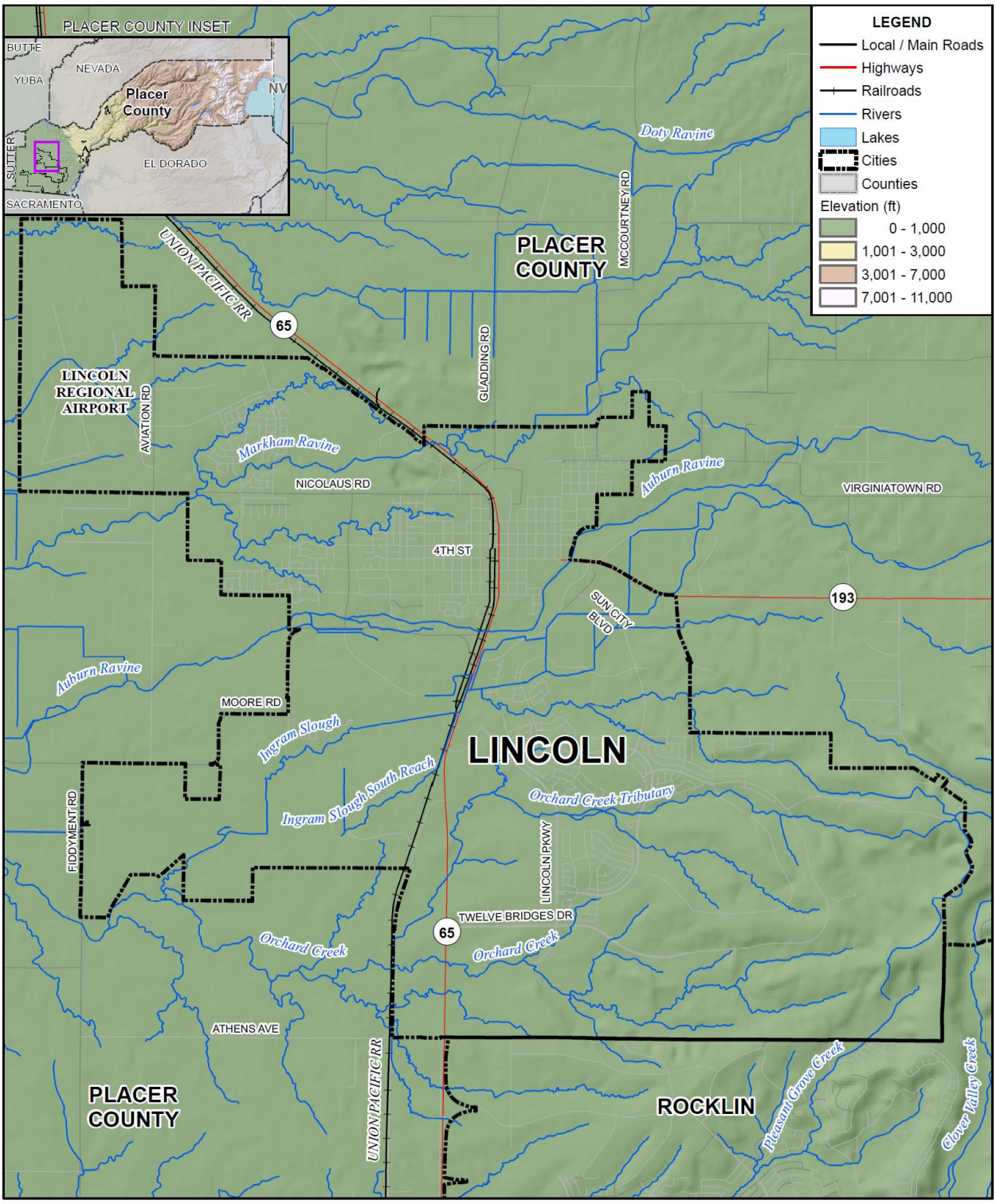
Table C-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
Safety Element of the General Plan	The LHMP was incorporated by reference into the Safety Element of the General Plan in Compliance with AB 2140.

C.3 Community Profile

The community profile for the City of Lincoln is detailed in the following sections. Figure C-1 displays a City map and the location of Lincoln within Placer County.

Figure C-1 City of Lincoln



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

C.3.1. Geography and Climate

The City of Lincoln is one of five cities in Placer County and is located on the eastern edge of the Sacramento Valley floor at the base of the Sierra Nevada foothills. The City is located just east of State Route 65 (SR 65), which connects to Interstate 80 (I-80) approximately ten miles east of the City and south of SR 193. Lincoln encompasses 19.3 square miles and is at a general elevation of 164 feet above sea level. The City is traversed by a number of waterways, including Markham Ravine, Auburn Ravine, Ingram Slough, Orchard and Rock Creek, Raccoon Creek and Doty Ravine.

Average temperatures range from the high 80°F to high 90°F during the summer to the mid 30°F to high 50°F during the winter. Lincoln receives an average of 22.3 inches of rain and 0.2 inches of snow annually.

C.3.2. History

The City of Lincoln was named after Charles Lincoln Wilson, a real estate magnate who is largely credited with bringing the railroad to the area in 1861. The City was incorporated in 1890. Lincoln is the home of one of the County's oldest businesses, the Gladding McBean terra cotta clay manufacturing plant, which was established in 1875 when rich clay deposits of the Ione Formation were discovered nearby.

C.3.3. Economy

US Census estimates show economic characteristics for the City of Lincoln. These are shown in Table C-3 and Table C-4. Mean household income in the City was $107,734. Median household income in the City was $88,734.

Table C-3 City of Lincoln – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	76	0.4%
Construction	1,202	6.2%
Manufacturing	1,309	6.8%
Wholesale trade	357	1.8%
Retail trade	2,726	14.1%
Transportation and warehousing, and utilities	975	5.0%
Information	318	1.6%
Finance and insurance, and real estate and rental and leasing	1,642	8.5%
Professional, scientific, and management, and administrative and waste management services	2,356	12.2%
Educational services, and health care and social assistance	4,082	21.1%
Arts, entertainment, and recreation, and accommodation and food services	2,004	10.4%
Other services, except public administration	782	4.0%
Public administration	1,516	7.8%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Table C-4 City of Lincoln – Income and Benefits

Income Bracket	Percent
<$10,000	3.2%
$10,000 – $14,999	3.5%
$15,000 - $24,9999	6.2%
$25,000 – $34,999	5.9%
$35,000 – $49,999	8.3%
$50,000 – $74,999	15.5%
$75,000 – $99,999	14.2%
$100,000 – $149,999	22.3%
$150,000 – $199,999	10.1%
$200,000 or more	10.9%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Major employers in the City include:

- Entrussed, LLC
- Gulfstream California
- Robb-Jack Corporation
- Gladding McBean
- Gc Products, Inc.
- Far West Equipment Rentals
- Sierra Pacific Industries
- SF Bay Coffee Co
- TransPak

C.3.4. Population

The California Department of Finance estimated the January 1, 2020 total population for the City of Lincoln was 49,317.

C.4 Hazard Identification

Lincoln identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to Lincoln (see Table C-5).

Table C-5 City of Lincoln—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Negligible	Medium	-
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Limited	High	High
Earthquake	Extensive	Occasional	Limited	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Negligible	Medium	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Occasional	Critical	Medium	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Critical	Medium	High
Severe Weather: Freeze and Snow	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	Limited	Unlikely	Limited	Low	Low
Tree Mortality	Significant	Highly Likely	Limited	Low	High
Wildfire	Significant	Highly Likely	Limited	Medium	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths.
Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability.
Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability.
Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid.

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Climate Change Influence
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

C.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Lincoln's hazards and assess the City's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City (as identified in the Significance column of Table C-5) and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

C.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section C.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

C.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Lincoln's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Placer County Assessor's Office is based on the 2020 Assessor's data. The methodology used to derive property values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitations are created by Proposition 13 and the Williamson Act as detailed in the Base Plan. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table C-6 shows the 2020 Assessor's values and content replacement values (e.g., the values at risk) broken down by property type for the City.

Table C-6 City of Lincoln – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	21	5	$9,384,647	$375,206	$375,206	$10,135,059
Commercial	288	203	$143,376,538	$266,254,988	$266,254,988	$675,886,514
Industrial	122	58	$64,845,215	$161,152,269	$241,728,402	$467,725,886
Institutional	89	28	$7,685,637	$75,184,622	$75,184,622	$158,054,881
Miscellaneous	854	9	$66,676,662	$4,863,897	$4,863,897	$76,404,456
Natural / Open Space	835	11	$19,940,971	$6,661,582	$6,661,582	$33,264,135
Residential	19,612	18,392	$2,119,293,054	$5,929,988,881	$2,964,994,442	$11,014,276,377
Lincoln Total	**21,821**	**18,706**	**$2,431,202,724**	**$6,444,481,445**	**$3,560,063,139**	**$12,435,747,308**

Source: Placer County 2020 Parcel/Assessor's Data

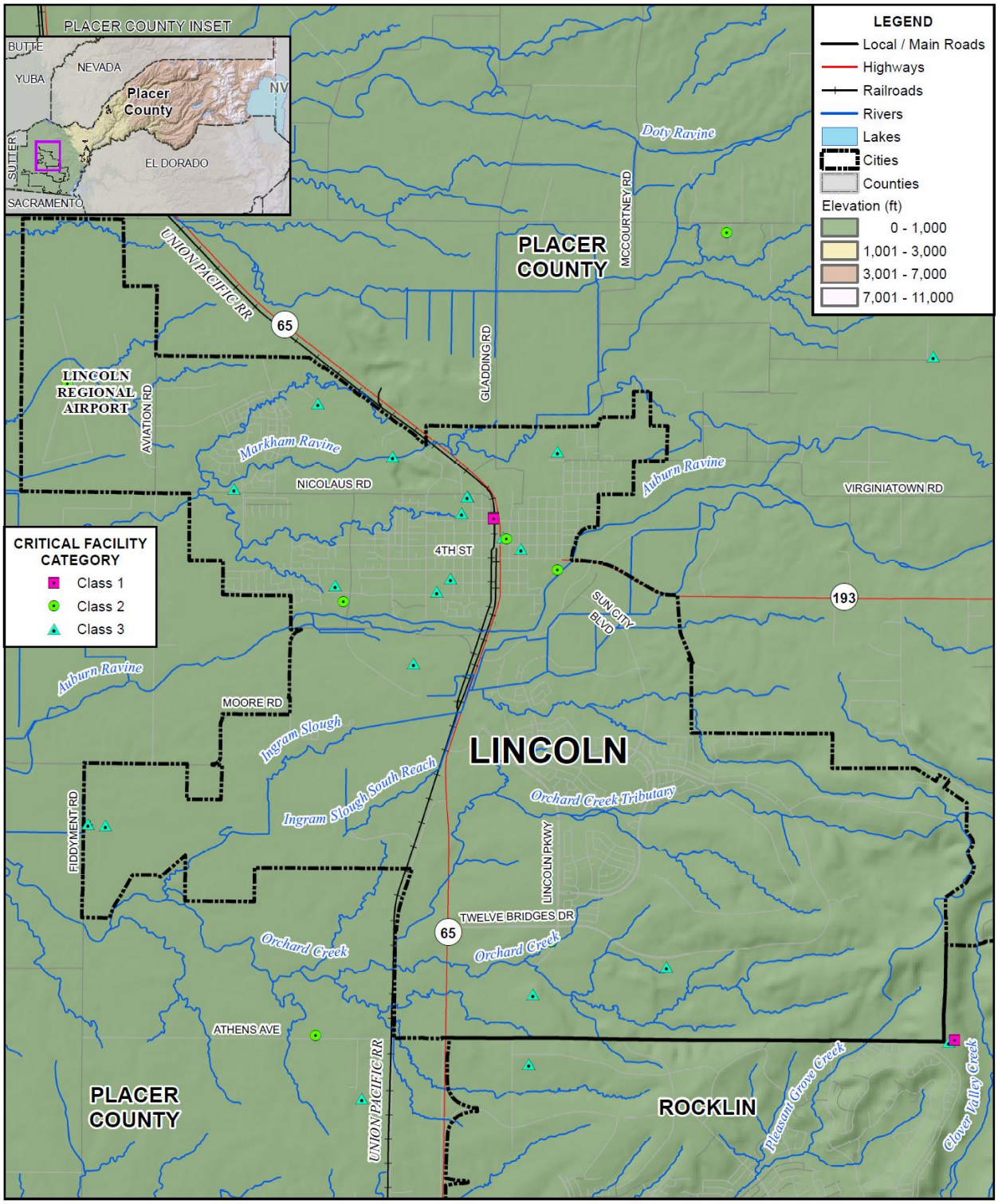
Critical Facilities and Infrastructure

Critical facilities and infrastructure are those buildings and infrastructure that are crucial to a community. Should these be damaged, it makes it more difficult for the community to respond to and recover from a disaster. For purposes of this plan, a critical facility is defined as:

> *Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.*

This definition was refined by separating out three classes of critical facilities as further described in Section 4.3.1 of the base plan. An inventory of critical facilities in the City of Lincoln from Placer County GIS is shown on Figure C-2 and detailed in Table C-7. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure C-2 City of Lincoln – Critical Facilities



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-7 City of Lincoln – Critical Facilities

Critical Facility Class	Critical Facility Type	Facility Count
Class 1	Dispatch Center	1
	Emergency Operation Center	1
Class 2	Airport	1
	Fire Station	3
	Police Station	1
Class 3	Hall	3
	Hazardous Materials Facility	1
	School	12
	Water Treatment Plant	1
Lincoln Total		**24**

Source: Placer County GIS

Natural Resources

Natural resources are unique to each area and are difficult to replace. Should a natural disaster occur, these species and locations are at risk. The City of Lincoln has a variety of natural resources of value to the community as identified in the Background Report to the General Plan, 2006:

- Two sensitive biological resources: Northern Hardpan Vernal Pools occurring in the western portion of the City and Foothill Riparian Woodland found along several of the larger watercourses (e.g., Auburn Ravine and Markham Ravine);
- Five special status plant species known to occur: the California Linderiella, Dwarf Downingia, Ahart's Dwarf Rush, Big-Scale Balsamroot, and Bogg's Lake Hedge-hyssop;
- One special status animal species known to occur: the Vernal Pool Fairy Shrimp;
- Twenty-four special status plant species with the potential to occur; and
- Fifty-five special status animal species with the potential to occur.

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk.

The City of Lincoln has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.3.1 of the Base Plan. Table C-8 lists the historical buildings in the City.

Table C-8 City of Lincoln – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Lincoln Public Library (N1660)	X			12/10/1990	Lincoln
Woman's Club of Lincoln (N2134)	X			5/30/2001	Lincoln

Source: California Department of Parks and Recreation Office of Historic Preservation, http://ohp.parks.ca.gov/

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. Information from the City of Lincoln General Plan Housing Element, the California Department of Finance, the US Census Bureau form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. Lincoln has generally seen moderate to large growth. Lincoln has seen growth rates as shown in Table C-9.

Table C-9 City of Lincoln – Population Changes Since 1950

Year	Population	Change	% Change
1950	2,410	–	–
1960	3,197	787	32.7%
1970	3,176	-21	-0.7%
1980	4,132	956	30.1%
1990	7,248	4,016	75.4%
2000	11,205	3,957	54.6%
2010[1]	42,819	31,604	282.1%
2020[2]	49,317	6,498	15.2%

Source: [1]US Census Bureau, [2]California Department of Finance

Special Populations and Disadvantaged Communities

The City noted groups of special populations in the City that may need additional help during a disaster.

Senior Populations: Approximately 27 percent of the Lincoln population is seniors aged 65 and older. A majority of the senior population is located within Sun City Lincoln Hills, which is an active adult community. Sun City is age restricted to require that at least one resident of each dwelling unit be 55 years of age or older, and no one under 45 years of age may be a resident in any dwelling unit. As of 2020, this community had approximately 11,100 residents and a total of 6,783 homes, including 6,703 single-family units and 80 condominiums.

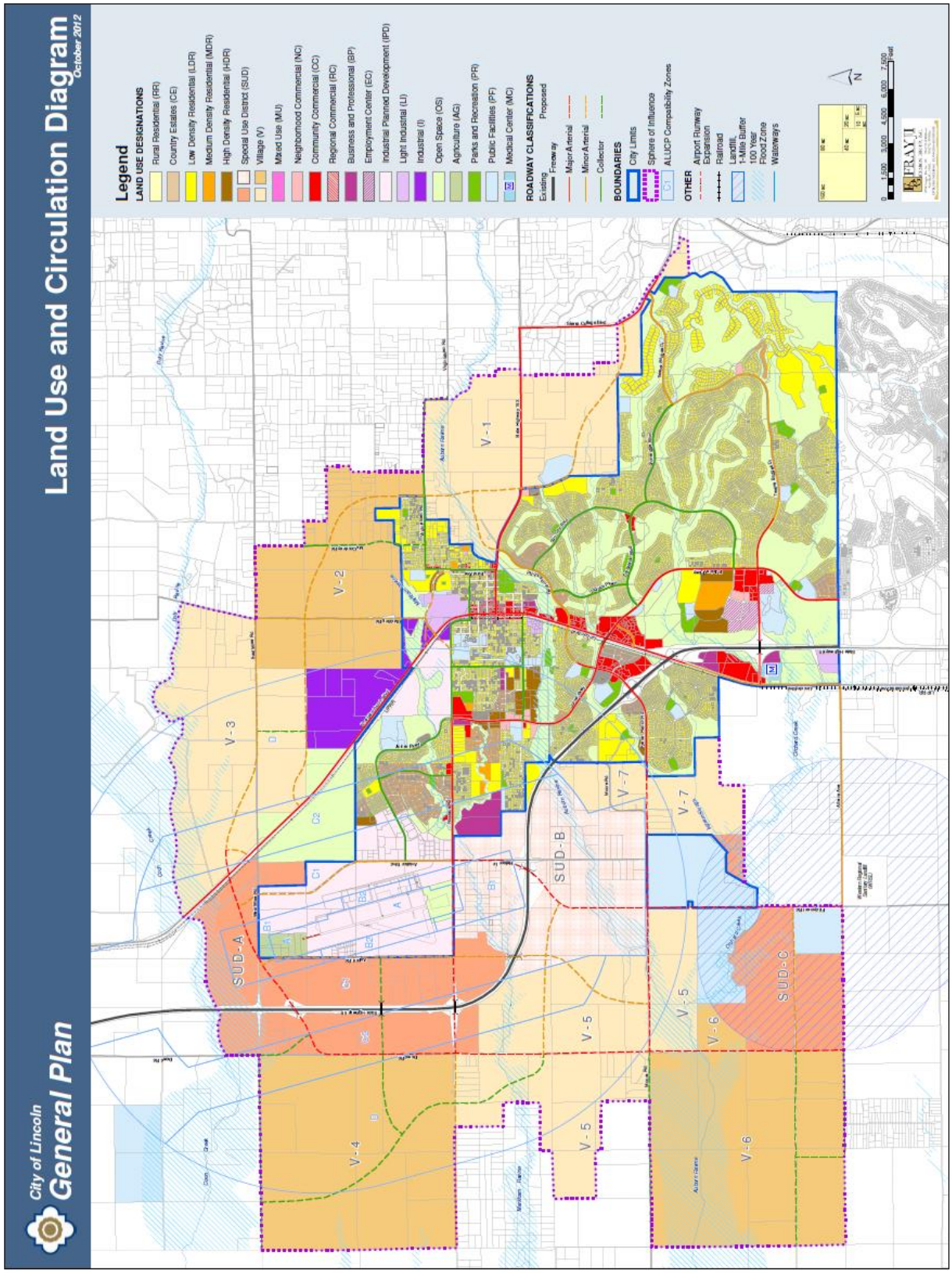
Poverty: Approximately 7 percent of the city's population 18 to 64 years of age earned an income below the poverty level. Additionally, for Lincoln's female-headed households, approximately 14 percent live below the poverty level. Many of these citizens reside primarily in the area of 1st – 3rd street.

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City's land use designations are generally described below and mapped on the Land Use Diagram (Figure C-3). The Lincoln Municipal Code provides detailed land use and development standards for development.

With this General Plan, a variety of new land use designations have been established to reflect the more mixed and, in some cases, more intense land uses envisioned for Lincoln. New mixed-use designations provide the opportunity for a combination of residential, commercial, and office uses on a single site, depending on the designation. Future land use for the City of Lincoln from the City of Lincoln General Plan Land Use Element is shown on Figure C-3.

Figure C-3 City of Lincoln – Land Use Diagram



Source: City of Lincoln General Plan 2012 Land Use Element

Development since 2016 Plan

As discussed in Section 4.3.1 of the Base Plan, future development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Building Department tracked total building permits issued since 2016 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table C-10 and Table C-11.

Table C-10 City of Lincoln – Total Development Since 2016

Property Use	2016	2017	2018	2019	2020
Agricultural	0	0	0	0	0
Commercial	146	132	119	115	122
Industrial	0	0	0	0	0
Residential	188	227	45	65	613
Unknown	0	0	0	0	0
Total	**334**	**359**	**164**	**180**	**735**

Source: City of Lincoln Building Department

Table C-11 City of Lincoln – Development in Hazard Areas since 2016

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area[1]	Other
Agricultural	0	0	0	
Commercial	0	0	0	
Industrial	0	0	0	
Residential	0	0	0	
Unknown	0	0	0	
Total	**0**	**0**	**0**	

Source: City of Lincoln Building Department

[1]Moderate or higher wildfire risk area

Future Development

The City of Lincoln 2013-2021 Housing Element Background Report contained an estimate for future population of the City. SACOG projected continued population growth through 2035. Expected population of the City in 2035 is 92,350. These projections were done in 2007 and have not been updated to reflect the economic slowdown and recent decline in population growth. Development in the City is expected to continue. The City provided the zoning map, shown above in Figure C-3, and made note that development is occurring in Village 1, 5, and 7.

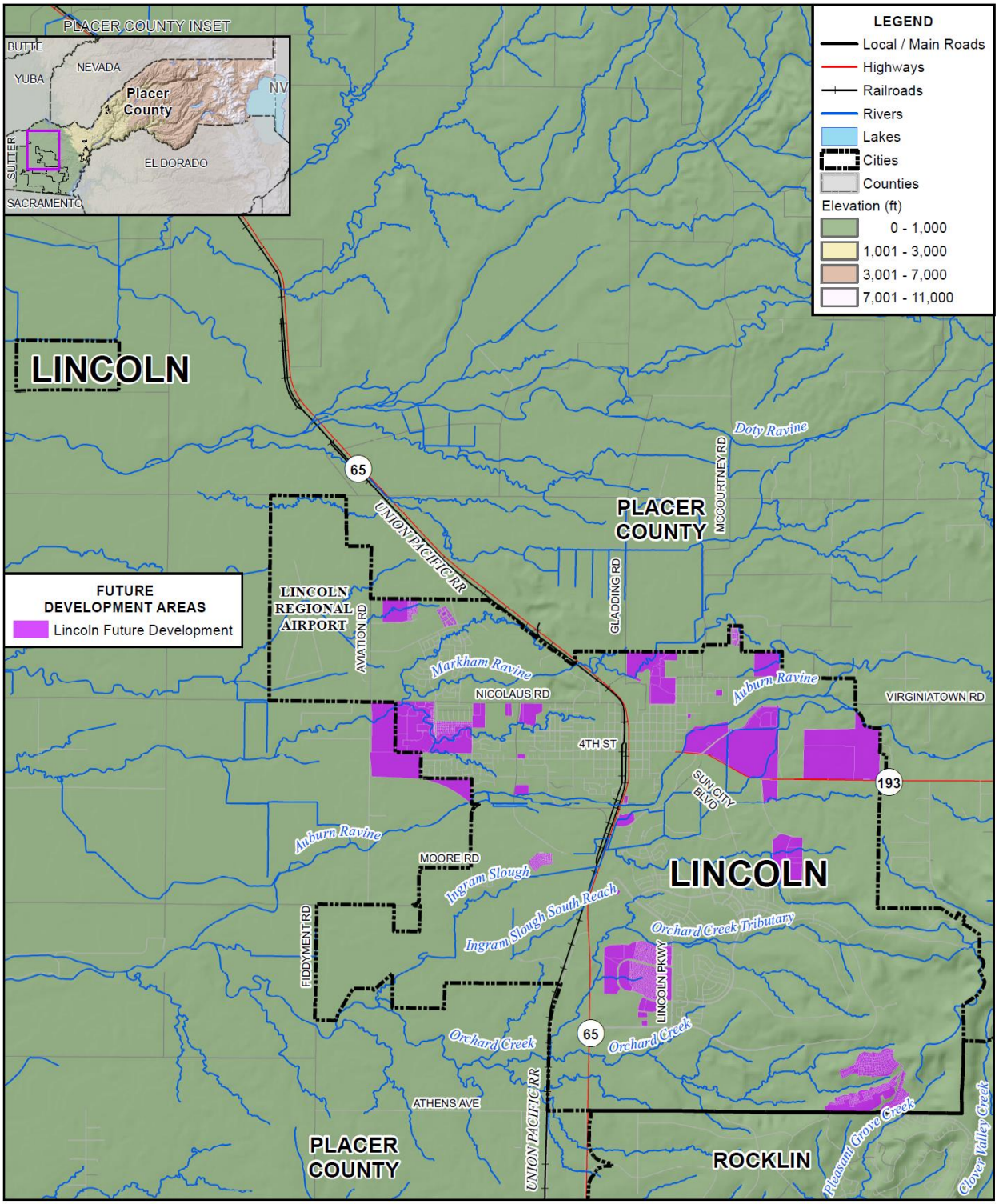
More general information on growth and development in Placer County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

GIS Analysis

Using GIS, the following methodology was used in determining parcel counts and acreages with future development projects in the City of Lincoln. Future development areas in the City were provided in mapped format by the Lincoln.

Using the GIS parcel spatial file for each of these areas, the 35 areas associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure C-4 shows the locations of future development areas the City is planning to develop. Table C-12 shows the parcels and acreages of each future development area in the City.

Figure C-4 City of Lincoln – Future Development Areas



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-12 City of Lincoln – Future Development Parcels and Acreages

Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
219 E 8th Street	1	1	0.8
871 Sterling Parkway	1	1	0.9
Auburn Ravine Center	1	0	1.9
Carefield Lincoln	3	0	14.7
Cypress Meadows	67	0	12.3
East 10th Street Time Extension	1	0	2.4
Education Foundation	78	0	28.6
Esplanade at Turkey Creek	12	1	262.5
Ferrari Pavilion	1	0	11.4
Fullerton Ranch	2	0	19.0
Greyson at Twelve Bridges	2	0	29.6
Hidden Hills	4	2	84.8
Independence at Lincoln	150	0	196.7
Joiner Ranch	2	0	25.3
La Quinta	1	0	3.1
Lakeside 6 Phase 2	53	40	10.9
Lakeside 6 Phase 7 & 8	93	0	47.2
Lincoln Crossing Village 11	198	0	18.8
Lincoln Meadows	1	0	39.7
Lincoln Place	2	2	5.1
Magnolia Village	1	0	2.4
Meadowlands	14	0	106.0
Piamonte at Twelve Bridges	108	30	39.9
Riverwalk Villas	1	0	8.6
Special Use District B Northeast Quadrant	3	0	184.0
Terra Cotta Village Phase 2	1	0	2.0
The Waterfront	2	1	19.4
Tramonte at Twelve Bridges	98	30	34.6
Turkey Creek Estates	2	0	249.2
Twelve Bridges Village 10	121	0	77.2
Twelve Bridges Village 2	386	86	58.3
Twelve Bridges Village 27	1	0	29.3
Twelve Bridges Village 3	1	0	18.1
Twelve Bridges Village 4	1	0	26.4

Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Ventana	152	18	47.3
Grand Total	**1,565**	**212**	**1,718.4**

Source: City of Lincoln GIS

C.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table C-5 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, populations at risk, critical facilities and infrastructure, and future development.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased

average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

In Placer County and the City, the HMPC noted that each year it seems to get a bit warmer each year.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the City, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the City noted that climate change is of concern, no specific impacts of climate change could be recalled. The City and HMPC members noted that the strength and intensity of storms does seem to be increasing and the temperatures are getting hotter. It is believed that climate change has contributed to the loss and degradation of City infrastructure such as greenery in the parks and medians, and other common areas.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the City and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Future Development

The City could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the City, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the City and the County are shown in Section 4.2.11 of the Base Plan.

Past Occurrences

There have been two state and one federal disaster declaration from drought. This can be seen in Table C-13.

Table C-13 Placer County – State and Federal Drought Disaster Declarations 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the City are the same as those for the County and includes 4 multi-year droughts since 1950. Details on past drought occurrences can be found in Section 4.2.11 of the Base Plan.

In the most recent drought starting in 2014, mandatory conservation measures were followed; grass, trees, and other greenery in parks, medians and other common areas maintained by the City were significantly degraded. No wells failures were reported. The City was able to mitigate some of the local impacts associated with drought through an increase in the use of reclaimed water. In fact, the recent drought was the precipitous for the City to further develop their reclaimed water use program throughout the City.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The City relies on surface water for its water supply, but does have backup wells it can use.

The City has been developing their new Urban Water Master Plan which is currently in draft form. This plan mirrors the County's Urban Water Master Plan with respect to conservation measures. The plan also confirms that, even during periods of extended drought, the City has sufficient water resources for the near future.

Impacts

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservation measures during extended droughts. During these times, the costs of water can also increase. The increased dry fuels and fuel loads associated with drought conditions can also result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts.

Other qualitative impacts associated with drought in the planning area are those related to water intensive activities such as, municipal usage, commerce, tourism, recreation and agricultural use. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

While the City will continue to experience drought conditions from time to time, water supply issues are not an immediate concern, while short term impacts include a degradation of natural resources including those within City parks and common areas.

Future Development

As the population in the area continues to grow, so will the demand for water. Water shortages in the future may be worsened by drought, as the City relies on surface water for its water source. Increased planning will be needed to account for population growth and increased water demands. The City does also have access to wells as a backup water supply.

Earthquake

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. Lincoln and the surrounding area are at lower risk from significant seismic and geologic hazards. Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. Several active faults are located within the vicinity of Placer County and the City of Lincoln. The Cleveland Hills Fault is the closest active fault to the City, located over 40 miles north. The nearest mapped fault trace to the City is the Willow Fault. The northwest-southeast trending pre-Quaternary Willows fault zone is located approximately 15 miles southwest of Lincoln; however, it is considered inactive for planning purposes.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.2.12 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show Placer County and the City fall within a low shake risk.

Past Occurrences

Throughout recorded history, no major earthquakes have been recorded within the Placer County Planning Area. The greatest ground shaking in the immediate area occurred on April 21, 1892. The epicenter was between Winters and Vacaville in Yolo County. No fatalities occurred in the City and only minor structural damages resulted from the earthquake. No other earthquake events have affected the City in any notable way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County's mountainous terrain lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. The City noted some seismically vulnerable buildings within their downtown area.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The City of Lincoln is within the less hazardous Zone 3. However, the City of Lincoln General Plan Background Reported noted that located 70 miles west of the City, the San Francisco Bay Area is located within Zone 4 and is at the highest risk of experiencing maximum magnitudes and damage from an earthquake.

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable.

Impacts from earthquake in the City will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Earthquake Analysis

Due to the regional effects of an earthquake, a Hazus earthquake analysis was performed on a countywide basis. This can be found in Section 4.3.11 of the Base Plan. While these runs were not done specific to the City, maps showing damage in the County show greater areas of damage near the cities in the County. This is because earthquake damages are generally related to the level of development, with more developed areas seeing more damages.

Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur. The City enforces the state building code and recently adopted the 2019 code, which mandates construction techniques that minimize seismic hazards. Future development in the City is subject to these building codes.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional/Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the City, and have caused damages in the past. Flooding is a significant problem in Placer County and the City. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas.

Lincoln is traversed by several stream systems that collect and convey storm runoff to the west towards the Cross Canal collection system, ultimately discharging into the Sacramento River near its confluence with the Feather River in Sutter County. The primary stream systems in the City include: Auburn Ravine (including Orchard Creek and Ingram Slough tributaries); Markham Ravine (including Clay Creek and Markham Ravine South, and Markham Ravine Central tributaries); and Racoon Creek.

The City of Lincoln is at risk to both the 100-year flood as well as to localized stormwater flooding.

Location and Extent

According to the Safety Element of Lincoln's 2012 General Plan, rainy season floods most commonly occur from November through April. Periods of prolonged, heavy rainfall create large runoff volumes and high peak stream flows. Flooding is more severe when previous rainfall has saturated the ground surface and subsurface. This is due to clay nature of the soils as well as the prevalence of an impermeable subsurface throughout most of the Lincoln area, which can result in some areas of standing water and localized flooding. Other localized flooding hazards are caused by obstacles to natural drainage flows, such as the railroad and highway bridges along SR 65 at the Auburn Ravine. During periods of high runoff, these structures tend to act as barriers, causing water to back up east of the highway into natural depressions and south between the railroad tracks and SR 65.

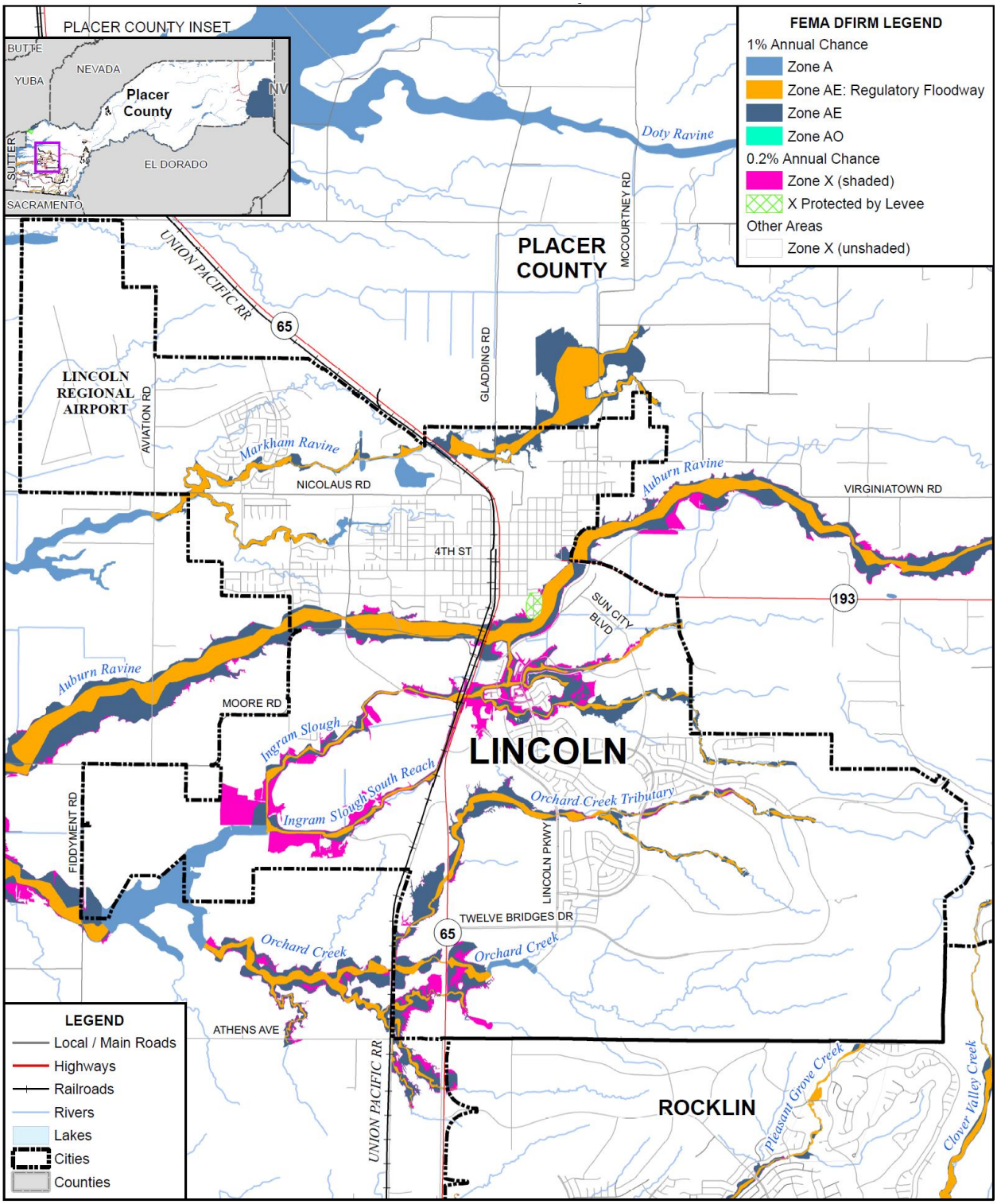
Cloudburst storms, sometimes lasting as long as three hours, can occur any time from the late fall to early spring, and may occur as an extremely severe sequence within a general winter rainstorm. These are high intensity storms that can produce peak flows equal or somewhat greater that those of general rainstorms in parts of the City. Flooding from cloudburst is characterized by high peak flow, short duration of flood flow, and a small volume of runoff.

A general lack of curbs and gutters in parts of the City and locally inadequate or incomplete storm drains results in standing water that is both a nuisance and a potential hazard. Areas with the most significant flood hazards are the natural drainage channels of Auburn and Markham Ravines and their tributaries and localized areas due to inadequate surface flow. The City of Lincoln 2012 General Plan Background Report identifies the locations of flooding in the City:

- Auburn Ravine
- Markum Ravine
- Coon Creek

The City of Lincoln has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure C-5.

Figure C-5 City of Lincoln – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-14 details the DFIRM mapped flood zones located within the City.

Table C-14 City of Lincoln– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in City of Lincoln
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.	X
X (unshaded)	No flood hazard	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table C-15.

Table C-15 City of Lincoln – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance	1,282	8.4%	118	2.3%	1,164	11.5%
0.2% Annual Chance	336	2.2%	47	0.9%	289	2.8%
Other Areas	13,648	89.4%	4,940	96.8%	8,708	85.7%
Total	**15,267**	**100.0%**	**5,106**	**100.0%**	**10,161**	**100.0%**

Source: FEMA DFIRM 11/2/2018

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table C-16. These events also likely affected the City to some degree.

Table C-16 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

The City of Lincoln 2012 General Plan Background Report includes the following flood history for the City of Lincoln:

Auburn Ravine: The City has recorded several flooding events in the recent past involving structures along the Auburn Ravine corridor and its tributaries in the City of Lincoln. In 1986, 1995, and 1997, the Auburn Ravine bridge structures at State Route 65 and State Route 193 were overtopped. The existing bridge at the Joiner Parkway crossing of Auburn Ravine did not flood in these events and would not be expected to flood in an event less than the 500-year. Downstream from the City of Lincoln, flooding was also noted at the Moore Road and Nelson Lane crossings. Several smaller private crossings overtop frequently. Along the south bank of Auburn Ravine, west of State Route 65, Moore Road parallels the creek and is known to flood often. This road was abandoned with the South Lincoln Master Drainage Plan (SLMP) improvements east of Joiner Parkway, and culvert improvements were made west of Joiner Parkway to improve conveyance capacity. Flooding of the roadway is still expected west of Joiner Parkway as a result of flood stages in Auburn Ravine greater than the 10-year event.

In 1995, 2.63 inches of rain fell in the City of Lincoln, causing riverine and localized flooding. Several shops were flooded, and many roads were washed out.

The New Year's Eve event of 2005/2006 did not result in overtopping of any of the main bridge structures along the ravine (SR 193, SR 65, and Joiner Parkway). Moore Road along the south bank was flooded both east and west of Joiner Parkway. The Moore Road and Nelson Lane crossings were reported as overtopped. The biggest incident occurred at the east end of Moore Road. Prior to 9 a.m. Saturday, an American Medical Response paramedics crew requested assistance there. The Auburn Ravine overflowed its banks in the area and flooded across Moore Road, stranding the ambulance, preventing it from getting back to Joiner Parkway. Nobody was in the ambulance. Two paramedics were just parked on the dead-end section of Moore Road waiting for any calls. The floodwaters then rose too high before the paramedics drove out. When they tried, the ambulance stalled in the high water. The storm was estimated to be a 10-year event for Auburn Ravine and a lesser event in the tributaries.

Events in December of 2016 caused high water in the Auburn Ravine area. The Auburn River gaging station is shown on Figure C-6.

Figure C-6 City of Lincoln – Flooding Lincoln Gaging Station on December 10, 2016

Source: Friends of Auburn Ravine

Flooding also occurred in January and February of 2019. The photo of the Union Pacific Railroad Bridge in Lincoln shown on Figure C-7 shows how high flows combined with waterborne debris can endanger bridges that do not have enough height, nor enough width of span, to avoid serious risk to their structural integrity.

Figure C-7 City of Lincoln – Flooding at Railroad Bridge on January 17, 2019

Source: Friends of Auburn Ravine

In **Orchard Creek**, flooding of Fiddyment Road is expected in greater than the 5-year event. Flooding of private drives and agricultural fields is also noted in the SLMP floodplain analysis. Flooding at the Fiddyment Road crossing was not reported in the New Year's Eve 2005/2006 event.

At **Ingram Slough**, significant flooding of the field areas on each side of the slough was noted prior to the construction of the SLMP improvements. Also, reports from local residents indicated that in 1986 and 1995, flows from Auburn Ravine overtopped the southern bank and flowed via overland release into Ingram Slough. The SLMP designed for this issue included constructing a control weir at the south bank of Auburn Ravine, upstream of State Route 65, and an interconnection channel to convey the spillway flows safely to Ingram Slough. Downstream improvements in the SLMP increase conveyance capacity to accommodate the combined flows from Ingram Slough and the Auburn Ravine spills. Flooding has not been experienced in the Slough since the construction of the SLMP improvements began in 1988.

Markham Ravine: Flooding within Markham Ravine is known to occur mostly in the rural areas of the City, where culvert and bridge crossings do not provide adequate capacity. East of State Route 65, flooding occurs at Gladding Road and McCourtney Roads annually. West of State Route 65, flooding has occurred at the low areas of Nicolaus Road (not at the bridge location). At Nelson Lane flooding is expected annually.

The SR 65 Bridge is expected to overtop in storm events greater than the 10-year, and the Union Pacific Railroad Bridge is only expected to be overtopped in a 50-year or greater event. These estimates were supported by the New Year's Eve 2005/2006 event. Other private crossings of the Ravine are expected to overtop annually.

At the north tributary, Clay Creek, shallow flooding in the remaining natural areas of the creek is still expected. The developed areas of the Creek are protected from flooding in the 100-year event. At the southern tributary, 100-year protection is provided from Joiner Park, downstream to the City Limits. Shallow flooding beyond the stream banks is expected in flood events, in the natural stream areas downstream of Joiner Parkway. Upstream of Joiner Park, the existing channel and storm drain systems may not provide 100-year protection to the existing residential areas in the 5th-8th Street Corridor between H Street and Q Street.

Raccoon Creek: Very little is known about the flooding conditions of Raccoon Creek at this time. No detailed study of the watershed hydrology has been performed since the "Cross Canal Watershed Study" was performed by CH2MHILL in 1988. As part of an effort on the North Lincoln Master Drainage Plan (NLMDP), shed boundaries for the Raccoon Creek watershed were verified. Many issues with the watershed assumptions of the Cross Canal Study of 1988 were found. It was recommended that the City try to obtain County participation in producing a rectified hydrology study for the watershed, as part of the NLMDP efforts.

Vulnerability to and Impacts from Flood

Floods have been a part of the City's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what

to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

The City noted that they currently have 13 structures in the 1% annual chance flood zone. Two of these structures are located on Main Street, Lincoln Boulevard downtown in the Auburn Ravine floodplain and 11 other structures located near the Auburn Ravine Bridge in the same floodplain. The City is currently in process of raising and extending the Auburn Ravine Bridge which will remove 11 of these 13 properties out of the floodplain.

Assets at Risk

Based on the vulnerability of Lincoln to the flood hazard, the sections that follow describes significant assets at risk in the City of Lincoln. This section includes the values at risk, flooded acres, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Lincoln. The methodology described in Section 4.3.12 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table C-17 is a summary table for the City of Lincoln. Parcel counts, values, estimated contents, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table C-18 breaks down Table C-17 and shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in FEMA flood zones in the City.

Table C-17 City of Lincoln – Count and Value of Parcels at Risk in Summary DFIRM Flood Zones

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	126	12	$8,276,991	$13,364,910	$18,493,118	$40,135,019
0.2% Annual Chance Flood Hazard	191	110	$23,320,645	$43,414,916	$25,929,214	$92,664,775
Other Areas	21,504	18,584	$2,399,605,088	$6,387,701,619	$3,515,640,807	$12,302,947,514
Lincoln Total	**21,821**	**18,706**	**$2,431,202,724**	**$6,444,481,445**	**$3,560,063,139**	**$12,435,747,308**

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table C-18 City of Lincoln – Count and Values of Parcels at Risk by Detailed Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Zone A						
Industrial	1	0	$0	$0	$0	$0
Natural / Open Space	3	0	$0	$0	$0	$0
Residential	1	0	$0	$0	$0	$0
Zone A Total	**5**	**0**	**$0**	**$0**	**$0**	**$0**
Zone AE Floodway						
Agricultural	2	1	$382,440	$10,612	$10,612	$403,664
Commercial	1	1	$275,557	$241,112	$241,112	$757,781
Industrial	1	1	$3,772,268	$9,618,335	$14,427,502	$27,818,105
Miscellaneous	12	0	$19,682	$0	$0	$19,682
Natural / Open Space	48	0	$1,331,309	$0	$0	$1,331,309
Residential	1	0	$0	$0	$0	$0
Zone AE Floodway Total	**65**	**3**	**$5,781,256**	**$9,870,059**	**$14,679,226**	**$30,330,541**
Zone AE						
Agricultural	4	1	$434,183	$57,932	$57,932	$550,047
Commercial	6	2	$937,372	$1,556,884	$1,556,884	$4,051,140
Industrial	4	2	$610,116	$1,213,121	$1,819,682	$3,642,919
Miscellaneous	14	0	$223,080	$0	$0	$223,080
Natural / Open Space	24	1	$134,743	$91,874	$91,874	$318,491
Residential	4	3	$156,241	$575,040	$287,520	$1,018,801
Zone AE Total	**56**	**9**	**$2,495,735**	**$3,494,851**	**$3,813,892**	**$9,804,478**
1% Annual Chance Flood Hazard Total	**126**	**12**	**$8,276,991**	**$13,364,910**	**$18,493,118**	**$40,135,019**
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Commercial	9	5	$8,329,697	$8,102,407	$8,102,407	$24,534,511
Institutional	1	0	$0	$0	$0	$0
Miscellaneous	11	1	$95,196	$341,100	$341,100	$777,396
Natural / Open Space	29	0	$251,127	$0	$0	$251,127

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Residential	90	56	$11,029,159	$25,854,354	$12,927,181	$49,810,694
Zone X (shaded) Total	**140**	**62**	**$19,705,179**	**$34,297,861**	**$21,370,688**	**$75,373,728**
X Protected by Levee						
Miscellaneous	3	0	$58,700	$0	$0	$58,700
Residential	48	48	$3,556,766	$9,117,055	$4,558,526	$17,232,347
X Protected by Levee Total	**51**	**48**	**$3,615,466**	**$9,117,055**	**$4,558,526**	**$17,291,047**
0.2% Annual Chance Flood Hazard Total	**191**	**110**	**$23,320,645**	**$43,414,916**	**$25,929,214**	**$92,664,775**
Other Areas						
Zone X (unshaded)						
Agricultural	15	3	$8,568,024	$306,662	$306,662	$9,181,348
Commercial	272	195	$133,833,912	$256,354,585	$256,354,585	$646,543,082
Industrial	116	55	$60,462,831	$150,320,813	$225,481,218	$436,264,862
Institutional	88	28	$7,685,637	$75,184,622	$75,184,622	$158,054,881
Miscellaneous	814	8	$66,280,004	$4,522,797	$4,522,797	$75,325,598
Natural / Open Space	731	10	$18,223,792	$6,569,708	$6,569,708	$31,363,208
Residential	19,468	18,285	$2,104,550,888	$5,894,442,432	$2,947,221,215	$10,946,214,535
Zone X (unshaded) Total	**21,504**	**18,584**	**$2,399,605,088**	**$6,387,701,619**	**$3,515,640,807**	**$12,302,947,514**
Other Areas Total	**21,504**	**18,584**	**$2,399,605,088**	**$6,387,701,619**	**$3,515,640,807**	**$12,302,947,514**
Lincoln Grand Total	**21,821**	**18,706**	**$2,431,202,724**	**$6,444,481,445**	**$3,560,063,139**	**$12,435,747,308**

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table C-19 summarizes Table C-18 above and shows City of Lincoln loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table C-19 City of Lincoln – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	126	12	$13,364,910	$18,493,118	$31,858,028	$6,371,606	0.011%
0.2% Annual Chance Flood Hazard	191	110	$43,414,916	$25,929,214	$69,344,130	$13,868,826	0.024%
Grand Total	**317**	**122**	**$56,779,826**	**$44,422,332**	**$101,202,158**	**$20,240,432**	**0.04%**

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to Table C-18 and Table C-19, the City of Lincoln has 12 parcels and $31.8 million of structure and contents values or values in the 1% annual chance flood zone, and 110 improved parcels and $69.3 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.10 of the Base Plan, there is a 1% chance in any given year of a flood event causing $6.4 million in damage and a 0.2% chance in any given year of a flood event causing $13.9 million in damage in the City of Lincoln. The loss ratio of 0.011% and 0.024% indicates that flood losses for 1% and 0.2% annual chance flooding, respectively, would be minor and the City would be able to recover.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.12 of the Base Plan, was used for the City of Lincoln as well as for the County as a whole. Table C-20 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the City.

Table C-20 City of Lincoln – Flooded Acres by Flood Zone

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	0	0.00%	0	0.00%	0	0.00%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	29	0.003%	24	0.013%	6	0.001%
Institutional	1	0.000%	0	0.00%	1	0.000%
Miscellaneous	60	0.007%	0	0.00%	60	0.008%
Natural / Open Space	6	0.001%	0	0.00%	6	0.001%
Residential	17	0.002%	0	0.000%	17	0.002%
Zone A Total	**113**	**0.013%**	**24**	**0.013%**	**88**	**0.012%**
Zone AE Floodway						
Agricultural	61	0.007%	16	0.009%	45	0.006%
Commercial	3	0.000%	2	0.001%	1	0.000%
Industrial	7	0.001%	6	0.003%	1	0.000%
Institutional	0	0.000%	0	0.00%	0	0.000%
Miscellaneous	112	0.012%	0	0.00%	112	0.016%
Natural / Open Space	357	0.040%	10	0.006%	347	0.048%
Residential	20	0.002%	4	0.002%	16	0.002%
Zone AE Floodway Total	**560**	**0.062%**	**38**	**0.021%**	**522**	**0.073%**
Zone AE						
Agricultural	34	0.004%	11	0.006%	23	0.003%
Commercial	37	0.004%	1	0.001%	36	0.005%
Industrial	13	0.001%	7	0.004%	5	0.001%
Institutional	3	0.000%	0	0.00%	3	0.000%
Miscellaneous	111	0.012%	0	0.000%	111	0.015%
Natural / Open Space	374	0.042%	28	0.015%	347	0.048%
Residential	36	0.004%	9	0.005%	27	0.004%
Zone AE Total	**609**	**0.068%**	**56**	**0.031%**	**553**	**0.077%**
Zone AO						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	0	0.00%	0	0.00%	0	0.00%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Residential	0	0.00%	0	0.00%	0	0.00%
Zone AO Total	**0**	**0.00%**	**0**	**0.00%**	**0**	**0.00%**
1% Annual Chance Flood Hazard Total	**1,282**	**0.143%**	**118**	**0.066%**	**1,164**	**0.162%**
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Agricultural	13	0.001%	6	0.003%	8	0.001%
Commercial	20	0.002%	14	0.008%	6	0.001%
Industrial	2	0.000%	0	0.000%	2	0.000%
Institutional	11	0.001%	0	0.00%	11	0.001%
Miscellaneous	121	0.013%	0	0.000%	120	0.017%
Natural / Open Space	124	0.014%	6	0.003%	118	0.016%
Residential	34	0.004%	14	0.008%	20	0.003%
Zone X (shaded) Total	**324**	**0.036%**	**39**	**0.022%**	**285**	**0.040%**
X Protected by Levee						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	4	0.000%	0	0.00%	4	0.001%
Natural / Open Space	0	0.000%	0	0.00%	0	0.000%
Residential	8	0.001%	8	0.005%	0	0.00%
X Protected by Levee Total	**13**	**0.001%**	**8**	**0.005%**	**4**	**0.001%**
0.2% Annual Chance Flood Hazard Total	**336**	**0.037%**	**47**	**0.026%**	**289**	**0.040%**
Other Areas						
Zone X (unshaded)						
Agricultural	685	0.076%	160	0.089%	525	0.073%
Commercial	383	0.043%	186	0.103%	198	0.027%
Industrial	929	0.103%	380	0.211%	549	0.076%
Institutional	990	0.110%	60	0.033%	930	0.129%
Miscellaneous	3,595	0.400%	14	0.008%	3,581	0.498%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Natural / Open Space	2,591	0.288%	544	0.302%	2,047	0.285%
Residential	4,475	0.498%	3,596	1.997%	878	0.122%
Zone X (unshaded) Total	**13,648**	**1.518%**	**4,940**	**2.743%**	**8,708**	**1.211%**
Other Areas Total	**13,648**	**1.518%**	**4,940**	**2.743%**	**8,708**	**1.211%**
Lincoln Total	**15,267**	**1.698%**	**5,106**	**2.835%**	**10,161**	**1.413%**

Source: FEMA 11/2/2018 DFIRM

Population at Risk

The DFIRM flood zones were overlayed on the parcel layer. Those residential parcel centroids that intersect the flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Lincoln – 2.57. According to this analysis, there is a total population of 8 and 267 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table C-21.

Table C-21 City of Lincoln – Count of Improved Residential Parcels and Population by Flood Zone

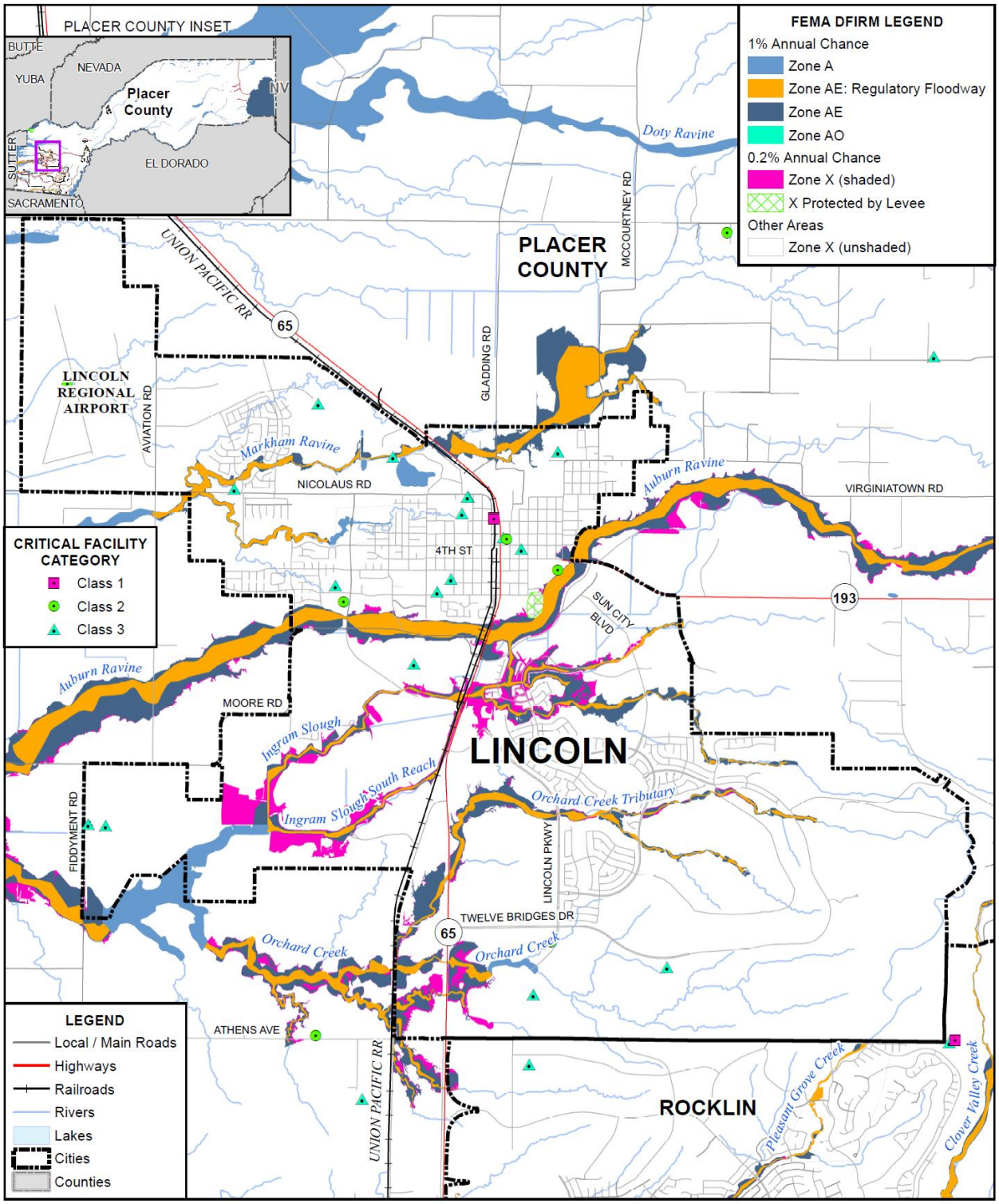
Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Lincoln	3	8	104	267

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data, US Census Bureau

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Lincoln in identified DFIRM flood zones. Critical facilities in a FHSZ in the City of Lincoln are shown in Figure C-12 and detailed in Table C-33. As shown, no critical facilities fall in any mapped DFIRM flood zone. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure C-8 City of Lincoln – Critical Facilities in DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-22 City of Lincoln – Critical Facilities by DFIRM Flood Zone

Flood Zone	Critical Facility Class	Critical Facility Type	Facility Count
Other Areas			
Zone X (unshaded)	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Airport	1
		Fire Station	3
		Police Station	1
	Class 3	Hall	3
		Hazardous Materials Facility	1
		School	12
		Water Treatment Plant	1
Zone X (unshaded) Total			**24**
Other Areas Total			**24**
Lincoln Total			**24**

Source: CAL FIRE, Placer County

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Lincoln joined the National Flood Insurance Program (NFIP) on February 3, 1983. The City does not participate in the Community Rating System (CRS). NFIP Insurance data indicates that as of August 21, 2020, there were 80 flood insurance policies in force in the City with $27,429,600 of coverage. Of the 80 policies, 77 were residential and 3 were nonresidential; 2 of the policies was in A zones (the remaining 78 were in B, C, and X zones). There have been 8 historical claims for flood losses totaling $65,571; 2 were in A zones and 6 were standard policies located in B, C or X zones. NFIP data further indicates that there are two repetitive loss (RL) buildings in the community. There are no severe repetitive loss (SRL) building in the City. There have been a total of 5 RL losses. One of the RL buildings is located in the A zone. It is zoned Business Professional and has an office use. The site has development restrictions in place; the building cannot be enlarged, and any outdoor uses have to comply with the City's floodplain requirements. The other RL building is located outside of the 100- and 500-year floodplain in the B, C, or X zones, with most of its damage occurring as a result of heavy rains. This building is zoned commercial and is in commercial use. There has been 1 substantial damage claim in the City since 1978.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 12 improved parcels within the 1% annual chance flood zone, none of those parcels maintain flood insurance. This can be seen on Table C-23.

Table C-23 City of Lincoln – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Lincoln	12	0	0.0%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data

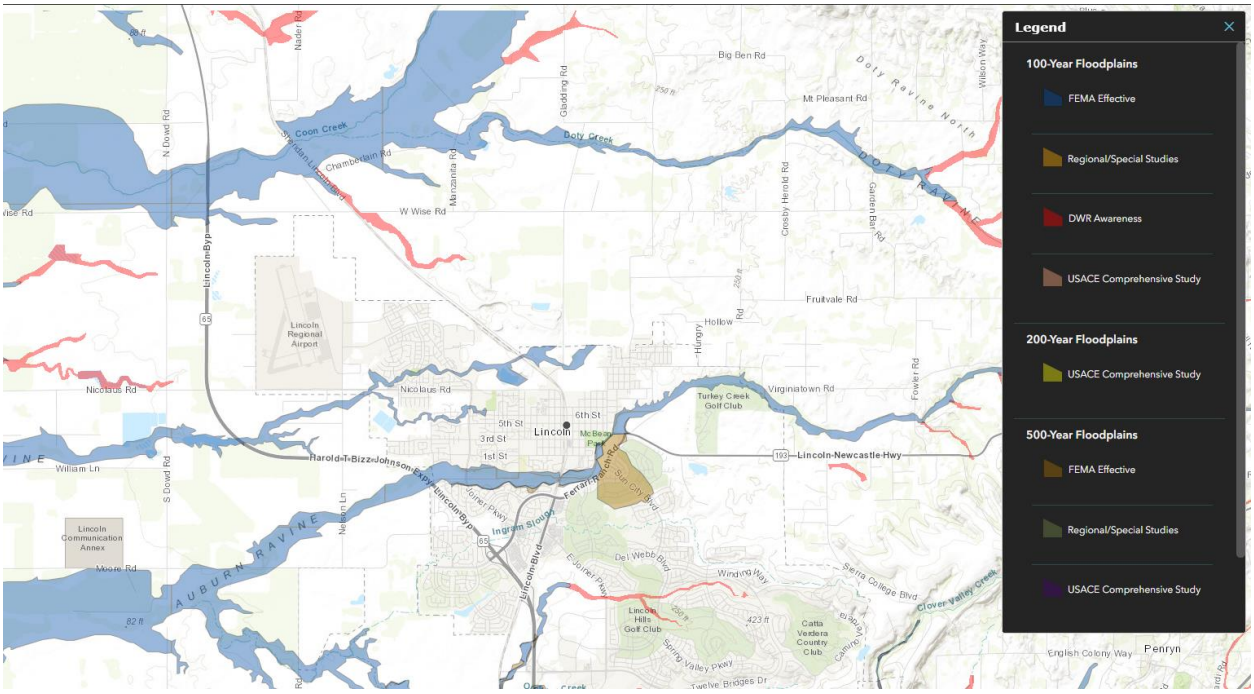
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Placer County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for Lincoln is shown in Figure C-9.

Figure C-9 City of Lincoln – Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1%r (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2% (2002 Sac and San Joaquin River Basins Comp Study).

Future Development

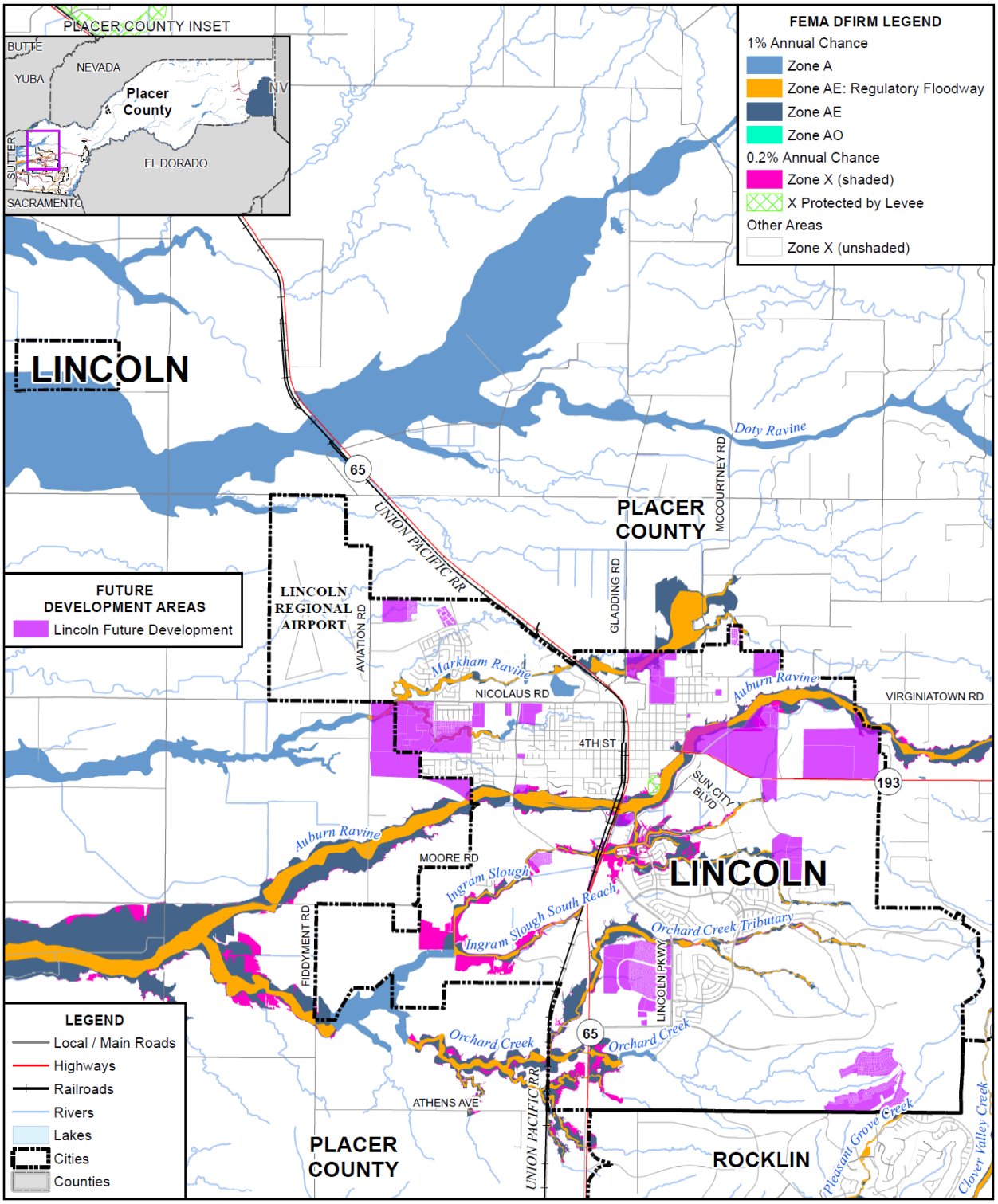
The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on build out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

The City noted that development may occur in the flood zone, so long as it is built to the standards of both the 2019 state building code and the floodplain ordinance.

GIS Analysis

The City provided 35 Future Development Areas were used as the basis for the inventory of future development areas for the City. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure C-8 shows the locations of future development areas the City is planning to develop on the FEMA DFIRM. Table C-24 shows the parcels and acreages of each future development area in the City in each FEMA DFIRM.

Figure C-10 City of Lincoln – Future Development Areas in DFIRM Flood Zones



FOSTER MORRISON CONSULTING

0 1 2 Miles

COUNTY OF Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-24 City of Lincoln – Future Development Parcels and Acres in FEMA DFIRM Flood Zones

Flood Zone / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
1% Annual Chance Flood Hazard			
Zone AE			
Esplanade at Turkey Creek	2	0	12.7
Meadowlands	1	0	0.7
Zone AE Total	**3**	**0**	**13.4**
Zone AE Floodway			
Cypress Meadows	1	0	1.3
Independence at Lincoln	3	0	35.7
Meadowlands	1	0	45.1
Ventana	1	0	1.9
Zone AE Floodway Total	**6**	**0**	**84.0**
1% Annual Chance Flood Hazard Total	**9**	**0**	**97.5**
0.2% Annual Chance Flood Hazard			
Zone X (shaded)			
Auburn Ravine Center	1	0	1.9
Esplanade at Turkey Creek	1	0	1.8
Ferrari Pavilion	1	0	11.4
Lincoln Crossing Village 11	38	0	3.1
Zone X (shaded) Total	**41**	**0**	**18.3**
0.2% Annual Chance Flood Hazard Total	**41**	**0**	**18.3**
Other Areas			
Zone X (unshaded)			
219 E 8th Street	1	1	0.8
871 Sterling Parkway	1	1	0.9
Carefield Lincoln	3	0	14.7
Cypress Meadows	66	0	11.0
East 10th Street Time Extension	1	0	2.4
Education Foundation	78		28.6
Esplanade at Turkey Creek	9	1	248.0
Fullerton Ranch	2	0	19.0
Greyson at Twelve Bridges	2	0	29.6
Hidden Hills	4	2	84.8
Independence at Lincoln	147	0	161.0
Joiner Ranch	2	0	25.3
La Quinta	1	0	3.1

Flood Zone / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Lakeside 6 Phase 2	53	40	10.9
Lakeside 6 Phase 7 & 8	93	0	47.2
Lincoln Crossing Village 11	160	0	15.7
Lincoln Meadows	1	0	39.7
Lincoln Place	2	2	5.1
Magnolia Village	1	0	2.4
Meadowlands	12	0	60.2
Piamonte at Twelve Bridges	108	30	39.9
Riverwalk Villas	1	0	8.6
Special Use District B Northeast Quadrant	3	0	184.0
Terra Cotta Village Phase 2	1	0	2.0
The Waterfront	2	1	19.4
Tramonte at Twelve Bridges	98	30	34.6
Turkey Creek Estates	2	0	249.2
Twelve Bridges Village 10	121	0	77.2
Twelve Bridges Village 2	386	86	58.3
Twelve Bridges Village 27	1	0	29.3
Twelve Bridges Village 3	1	0	18.1
Twelve Bridges Village 4	1	0	26.4
Ventana	151	18	45.4
Zone X (unshaded) Total	**1,515**	**212**	**1,602.7**
Other Areas Total	**1,515**	**212**	**1,602.7**
Grand Total	**1,565**	**212**	**1,718.4**

Source: City of Lincoln GIS, FEMA 11/2/2018 DFIRM

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Lincoln is subject to localized flooding throughout the City. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

The City noted the following past occurrences of localized flooding:

- December 2005/January 2006 – Heavy rains that fell over a period of time caused localized flooding in the City. Among them were Gladding Road from Highway 65 to Wise Road, Moore Road both east and west of Joiner Parkway, Nelson Road from Moore Road to Nicolaus Road, and Industrial Way from Twelve Bridges Drive north to its junction with Highway 65. There also was some localized flooding, as noted by City Public Works. The 700 block of I Street experienced some pooling of water and there was a little pooling on Third Street.
- In December of 2014, heavy rain fell in Lincoln. Localized flooding of many streets resulted from the flooding. Some of these streets closed until they drained. Schools released students early due to the street closures.
- In January, February and March of 2019, heavy rain fell in Lincoln. Localized flooding of several streets resulted from the rainfall. Some of these streets closed until they drained.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the City and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Lincoln are summarized in Table C-25.

Table C-25 City of Lincoln – List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Gladding Road	X	X		X			
Moore Road	X	X		X			
McCourtney Road	X	X		X			

Source: City of Lincoln

Impacts

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability,

collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Future Development

Future development in the City will add more impervious surfaces causing an increase in stormwater runoff and the continued need to drain these waters. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Pandemic

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity. It is important to realize that this LHMP Update does not examine pandemic contingency plans, but instead focuses on examining the risk of a normal hazard occurrence.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe a pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the City, County, and surrounding region is at risk, as pandemic is a regional, national, or international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table C-26.

Table C-26 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1)**
- The **February 1957-1958 Influenza Pandemic (H2N2)**
- The **1968 Influenza Pandemic (H3N2)**

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1**)
- **2019/2020 COVID 19**

During both occurrences, maintaining adequate police and fire staffing, became a significant concern due to the City's lack of staff and the mandatory quarantine requirements upon a positive test on an employee. The City implemented action plans including PPE's and prioritizing of calls for service to minimize potential work exposure for non-emergency operations. Non-safety personnel were encouraged to work from home as public access to staff was significantly restricted. Additionally, the mandatory stay at home orders along with business closures significantly impacted the local economy increasing the stress on the residential population from loss of wages and isolation from others overburdening the city's public assistance resources.

Vulnerability to Pandemic

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat pandemic flu. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of pandemic flu by staying home, or "self-quarantining," if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the City. Pandemic can have varying levels of impact to the citizens of the City and greater County, depending on the nature of the pandemic.

Impacts

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) an unemployment rose

significantly. Supply chains for food can be interrupted. Prisons may need to release prisoners to comply with social distance standards.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the City could increase exposure to a pandemic, and increase the ability of each disease to be transmitted among the population of the City. If the median age of City residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause Public Safety Power Shutdown (PSPS) events, creating significant issues in the City. However, PSPS events in the City have been declining with PG&E's refined system for shutting power off in high wildfire risk areas.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.2.2 of the Base Plan.

Past Occurrences

The City Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.2.

There were three PSPS heat related events were the City opened cooling centers for those in need. Additionally, the City waived permit requirements for portable generators during PSPS events so that individual power needs could be satisfied.

Vulnerability to and Impacts from Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-115°F in rather extreme situations. During these times, drought conditions may worsen, and the City may see an increase in dry fuels. Also, PSPS events may occur during these times as well. Health issues are the primary concern with this hazard, although economic impacts can also be an issue, especially if severe heat events result in power outages or PSPS events.

Impacts

The elderly and individuals below the poverty level are the most vulnerable to extreme temperatures. Nursing homes and elder care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable. This is especially true of homeless people and the transient population.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

Future Development

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population in each City shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS, winter snowstorms can include heavy snow, ice, and freezing conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Freezing temperatures and ice can also cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire City is at risk to cold weather and freeze events. Snow events are rare in the City. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, snow amounts are limited and melts relatively quickly.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table C-27.

Table C-27 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The City noted that cold and freeze is a regional phenomenon; events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.3.3.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The City experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the City. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

Future Development

Future development built to code should be able to withstand issues associated with extreme cold and freeze events. Pipes at risk of freezing should be buried or insulated from freeze as new facilities are improved or added. Vulnerability to extreme cold will increase as the average age of the population in the City shifts and homelessness becomes more of an issue.

Wildfire

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

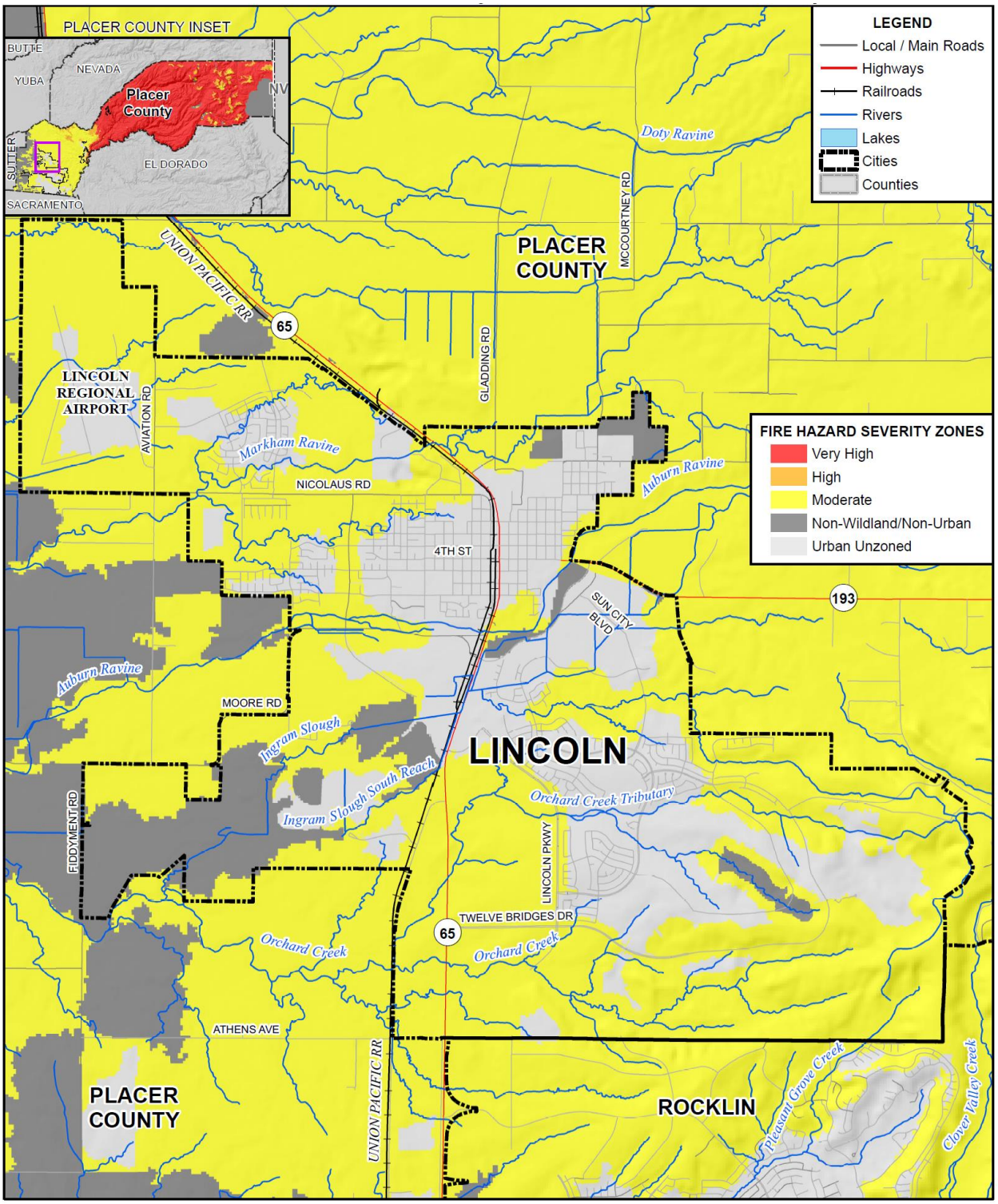
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Lincoln. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These high winds can result in red flag days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the City of Lincoln were created. Figure C-11 shows the CAL FIRE FHSZ in the City. As shown on the maps, fire hazard severity zones within the City range from Urban Unzoned to Moderate.

Figure C-11 City of Lincoln – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Lincoln has a significant amount of dry range grass that is susceptible to wildland fires that can move quickly if accompanied by a stiff breeze. In addition, there is a great potential for wildland fires in the more open hillside areas in the eastern part of the City.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more. Geographical FHSZ extent from CAL FIRE is shown in Table C-28.

Table C-28 City of Lincoln – Geographical FHSZ Extents

Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	0	0.00%	0	0.00%	0	0.00%
High	0	0.00%	0	0.00%	0	0.00%
Moderate	9,879	64.7%	2,581	50.6%	7,297	71.8%
Non-Wildland/non-Urban	1,113	7.3%	105	2.0%	1,008	9.9%
Urban Unzoned	4,275	28.0%	2,420	47.4%	1,855	18.3%
Total	**15,267**	**100.0%**	**5,106**	**100.0%**	**10,161**	**100.0%**

Source: CAL FIRE

Past Occurrences

There has been six state and five federal disaster declaration due to wildfire, as shown in Table C-29.

Table C-29 Placer County – State and Federal Wildfire Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Vulnerability to and Impacts from Wildfire

The wildfire hazard is one of the highest priority hazards in the County and City, and is the hazard with the greatest potential for catastrophic loss. High fuel loads in the County and Cities, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. The more urbanized areas within the County are not immune from fire. The dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to

quickly become a large, out-of-control fire. As development continues throughout the County and City, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Lincoln is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and rangeland. The natural fuels available in or near the City vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels. The rural areas along the City's jurisdictional boundary that are adjacent to new development are vulnerable to a large wildfire, but the City maintains a proactive fuel reduction program with fire breaks and the grazing of sheep to reduce fuel loads.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Assets at Risk

Based on the vulnerability of Lincoln to the wildfire hazard, the sections that follow describes significant assets at risk in the City of Lincoln. This section includes the values at risk, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of wildfire within the City of Lincoln. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in fire hazard severity zones. Summary analysis results for Lincoln are shown in Table C-30, which summarizes total parcel counts, improved parcel counts and their structure values by fire hazard severity zone.

Table C-30 City of Lincoln – Count and Value of Parcels by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Moderate	10,035	8,008	$1,183,203,408	$3,019,599,769	$1,651,154,114	$5,853,957,291
Non-Wildland/Non-Urban	985	638	$107,063,552	$204,238,966	$122,079,620	$433,382,138
Urban Unzoned	10,801	10,060	$1,140,935,764	$3,220,642,710	$1,786,829,405	$6,148,407,879
Lincoln Total	**21,821**	**18,706**	**$2,431,202,724**	**$6,444,481,445**	**$3,560,063,139**	**$12,435,747,308**

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Table C-31 breaks out the Table C-30 by adding the property use details by fire hazard severity zone for the City.

Table C-31 City of Lincoln – Count and Value of Parcels by Fire Hazard Severity Zone and Property Use

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Moderate						
Agricultural	21	5	$9,384,647	$375,206	$375,206	$10,135,059
Commercial	82	40	$64,972,304	$81,641,175	$81,641,175	$228,254,654
Industrial	86	28	$42,918,733	$85,561,083	$128,341,624	$256,821,440
Institutional	26	5	$3,063,030	$23,464,785	$23,464,785	$49,992,600
Miscellaneous	477	5	$48,330,079	$3,866,298	$3,866,298	$56,062,675
Natural / Open Space	434	2	$8,724,125	$2,238,831	$2,238,831	$13,201,787
Residential	8,909	7,923	$1,005,810,490	$2,822,452,391	$1,411,226,195	$5,239,489,076
Moderate Total	**10,035**	**8,008**	**$1,183,203,408**	**$3,019,599,769**	**$1,651,154,114**	**$5,853,957,291**
Non-Wildland/Non-Urban						
Agricultural	0	0	$0	$0	$0	$0
Commercial	15	8	$20,137,100	$39,920,258	$39,920,258	$99,977,616
Industrial	0	0	$0	$0	$0	$0
Institutional	1	0	$0	$0	$0	$0
Miscellaneous	39	0	$12,765,869	$0	$0	$12,765,869
Natural / Open Space	119	0	$367,515	$0	$0	$367,515
Residential	811	630	$73,793,068	$164,318,708	$82,159,362	$320,271,138
Non-Wildland/Non-Urban Total	**985**	**638**	**$107,063,552**	**$204,238,966**	**$122,079,620**	**$433,382,138**

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Urban Unzoned						
Agricultural	0	0	$0	$0	$0	$0
Commercial	191	155	$58,267,134	$144,693,555	$144,693,555	$347,654,244
Industrial	36	30	$21,926,482	$75,591,186	$113,386,778	$210,904,446
Institutional	62	23	$4,622,607	$51,719,837	$51,719,837	$108,062,281
Miscellaneous	338	4	$5,580,714	$997,599	$997,599	$7,575,912
Natural / Open Space	282	9	$10,849,331	$4,422,751	$4,422,751	$19,694,833
Residential	9,892	9,839	$1,039,689,496	$2,943,217,782	$1,471,608,885	$5,454,516,163
Urban Unzoned Total	**10,801**	**10,060**	**$1,140,935,764**	**$3,220,642,710**	**$1,786,829,405**	**$6,148,407,879**
Lincoln Total	**21,821**	**18,706**	**$2,431,202,724**	**$6,444,481,445**	**$3,560,063,139**	**$12,435,747,308**

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The FHSZ dataset was overlayed on the parcel layer. Those residential parcel centroids that intersect the FHSZs were counted and multiplied by the 2010 Census Bureau average household factors for the City of Lincoln – 2.57. According to this analysis, there is a total population of 20,362 residents of Lincoln at risk to moderate or higher FHSZs. This is shown in Table C-32.

Table C-32 City of Lincoln – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone

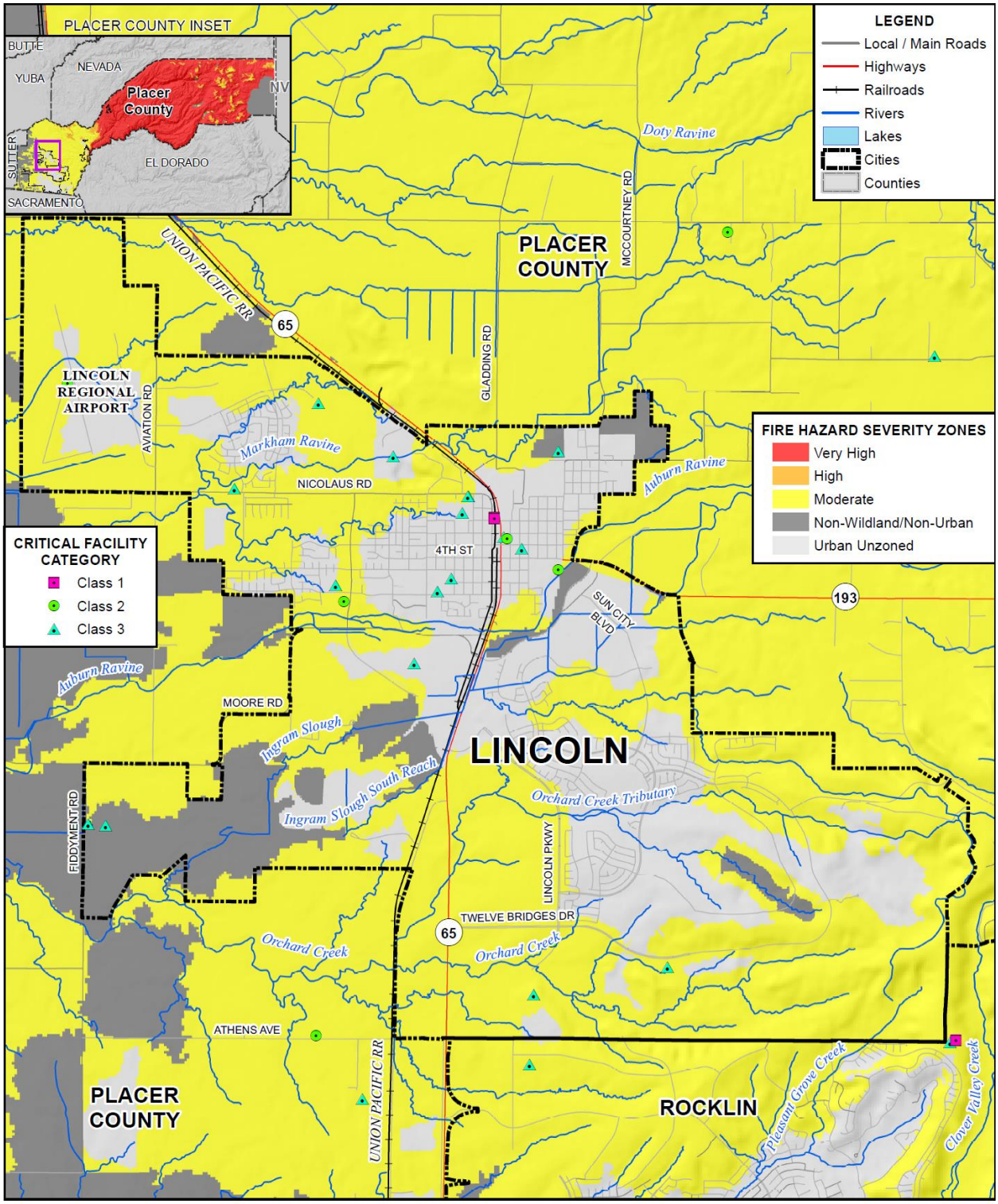
Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Lincoln	0	0	0	0	7,923	20,362

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Lincoln in identified FHSZs. Critical facilities in a FHSZ in the City of Lincoln are shown in Figure C-12 and detailed in Table C-33. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure C-12 City of Lincoln – Critical Facilities in Fire Hazard Severity Zones



FOSTER MORRISON CONSULTING

COUNTY OF Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-33 City of Lincoln – Critical Facilities by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Critical Facility Class	Critical Facility Type	Facility Count
Moderate	Class 2	Airport	1
	Class 3	Fire Station	2
		School	6
Moderate Total			**9**
Non-Wildland/Non-Urban	Class 3	Hall	1
		School	1
		Water Treatment Plant	1
Non-Wildland/Non-Urban Total			**3**
Urban Unzoned	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Fire Station	1
		Police Station	1
	Class 3	Hall	2
		Hazardous Materials Facility	1
		School	5
Urban Unzoned Total			**12**
Lincoln Total			**24**

Source: CAL FIRE, Placer County

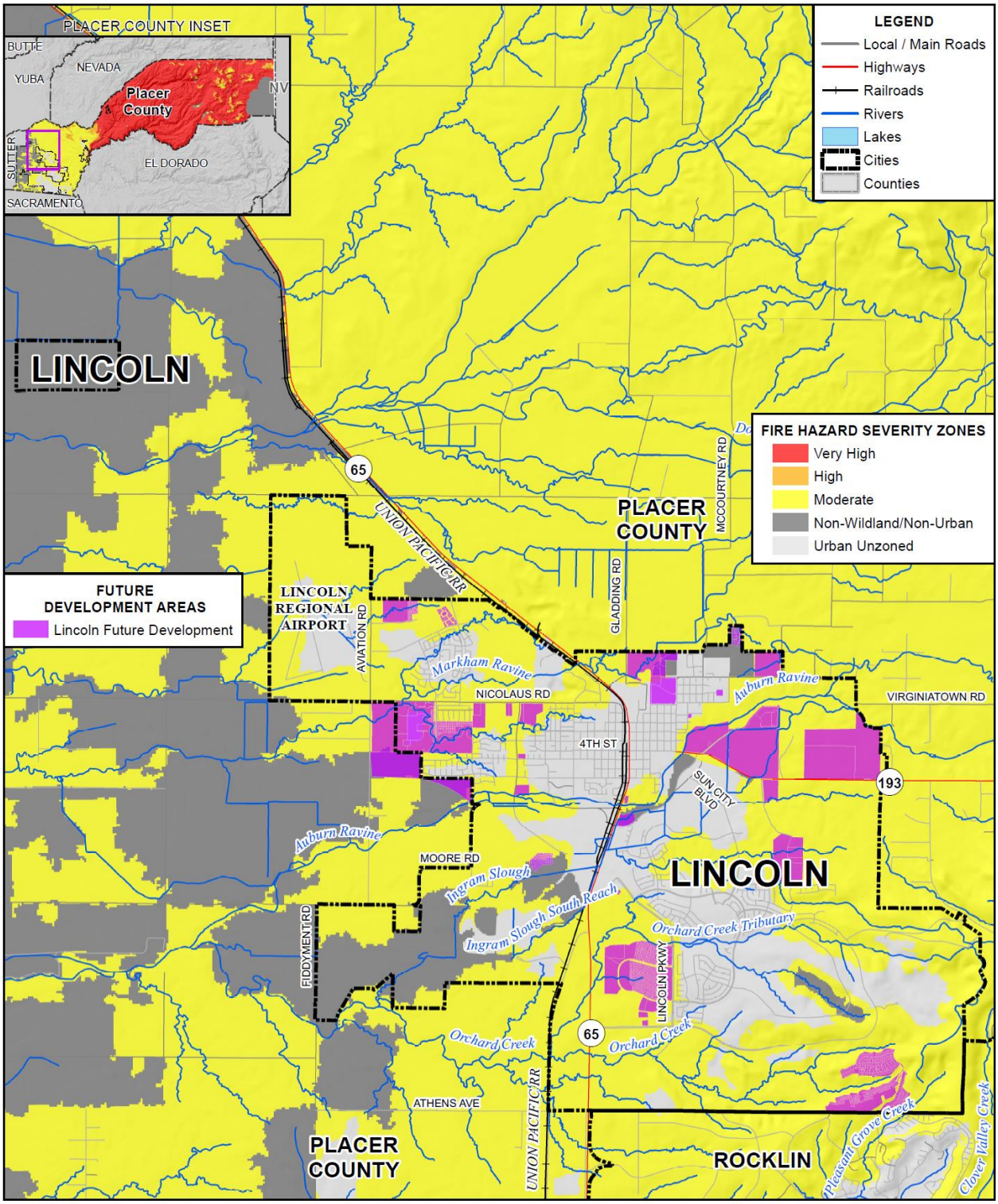
Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. City building codes are in effect and should continue to be updated as appropriate to reduce this risk.

GIS Analysis

The City provided 35 future development areas that were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure C-13 shows the locations of future development areas the City is planning to develop on the FHSZs. Table C-34 shows the parcels and acreages of each future development area in the City in each FHSZ.

Figure C-13 City of Lincoln – Future Development Areas in FHSZs



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-34 City of Lincoln – Future Development Acres and Parcels in FHSZs

Fire Hazard Severity Zone / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Moderate			
871 Sterling Parkway	1	1	0.9
Auburn Ravine Center	1	0	1.9
Carefield Lincoln	3	0	14.7
Cypress Meadows	3	0	0.4
Education Foundation	78	0	28.6
Esplanade at Turkey Creek	12	1	262.5
Fullerton Ranch	2	0	19.0
Greyson at Twelve Bridges	2	0	29.6
Hidden Hills	4	2	84.8
Independence at Lincoln	149	0	175.1
Joiner Ranch	2	0	25.3
La Quinta	1	0	3.1
Lakeside 6 Phase 2	53	40	10.9
Lakeside 6 Phase 7 & 8	93	0	47.2
Lincoln Crossing Village 11	82	0	7.1
Lincoln Meadows	1	0	39.7
Lincoln Place	2	2	5.1
Magnolia Village	1	0	2.4
Meadowlands	2	0	51.3
Piamonte at Twelve Bridges	108	30	39.9
Riverwalk Villas	1	0	8.6
Special Use District B Northeast Quadrant	1	0	73.5
Terra Cotta Village Phase 2	1	0	2.0
The Waterfront	2	1	19.4
Tramonte at Twelve Bridges	98	30	34.6
Turkey Creek Estates	2	0	249.2
Twelve Bridges Village 10	121	0	77.2
Twelve Bridges Village 2	385	86	56.7
Twelve Bridges Village 27	1	0	29.3
Twelve Bridges Village 3	1	0	18.1
Twelve Bridges Village 4	1	0	26.4
Ventana	152	18	47.3

Fire Hazard Severity Zone / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Moderate Total	**1,366**	**211**	**1,491.8**
Non-Wildland/Non-Urban			
Cypress Meadows	64	0	11.9
Ferrari Pavilion	1	0	11.4
Lincoln Crossing Village 11	115	0	10.1
Meadowlands	5	0	17.1
Special Use District B Northeast Quadrant	2	0	110.5
Non-Wildland/Non-Urban Total	**187**	**0**	**161.1**
Urban Unzoned			
219 E 8th Street	1	1	0.8
East 10th Street Time Extension	1	0	2.4
Independence at Lincoln	1	0	21.6
Lincoln Crossing Village 11	1	0	1.6
Meadowlands	7	0	37.5
Twelve Bridges Village 2	1	0	1.6
Urban Unzoned Total	**12**	**1**	**65.5**
Grand Total	**1,565**	**212**	**1,718.4**

Source: City of Lincoln GIS, CAL FIRE

C.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

C.6.1. Regulatory Mitigation Capabilities

Table C-35 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Lincoln.

Table C-35 City of Lincoln Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y	
Capital Improvements Plan	Y	
Economic Development Plan	Y	
Local Emergency Operations Plan	Y	
Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	Y	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	Y	Version/Year: 2019 CBC
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	Y	Rating: 4
Site plan review requirements	Y	
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	
Subdivision ordinance	Y	
Floodplain ordinance	Y	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	Y	
Elevation Certificates	Y	
Acquisition of land for open space and public recreation uses	Y	
Erosion or sediment control program	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional personnel. Continual updates to address new and priority issues affecting community		

Source: City of Lincoln

The City of Lincoln General Plan, 2008

The City of Lincoln General Plan serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The general plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Lincoln Planning Area. Identified hazards include geologic/seismic, air quality, human-made, flooding, fires, public safety, and noise. Applicable mitigation-related goals, policies, and actions are presented below in Table C-36.

Table C-36 Lincoln General Plan Mitigation Related Goals and Policies

Goal/Policy Number	Explanation
General	
General - Goal HS-1:	To minimize the danger of natural and Human-Made hazards and to protect residents and visitors from the dangers of earthquake, fire, flood other natural disasters, and man-made dangers.
Policy HS-1.1:	Engineering Analysis of Potential Hazards: The City shall require engineering analysis of new development proposals in areas with possible soil instability, flooding, earthquake faults, or other hazards, and to prohibit development in high danger areas.
Geologic	
Geologic and Seismic Hazards Goal HS-2:	To minimize exposure of persons and property to damage resulting from geologic and seismic hazards.
Policy HS-2.1:	Seismic Safety of Structures: The City shall require that new structures intended for human occupancy are designed and constructed to minimize risk to the safety of occupants due to ground shaking.
Policy HS-2.2:	Limit Hillside Development: To limit development in areas with severe slopes.
Policy HS-2.3:	Development in Areas Subject to Geologic Hazards: The City shall discourage incompatible land uses from being located in areas subject to geologic or seismic hazards
Policy HS-2.4:	California Building Standard Code: The City shall continue to require that alterations to existing buildings and all new buildings be built according to the seismic requirements of the California Building Standard Code.
Flood	
Flood Hazards Goal HS- 6:	To minimize the risk of life and property of the City's residents from flood hazards.
Policy HS-6.1:	Flood Protection: The City shall ensure that adequate flood protection is provided throughout the community.
Policy HS-6.2:	Drainage and Flood Control Facilities: The City will continue to cooperate and coordinate efforts with the Placer County Flood Control and Water Conservation District for the construction, operation, and maintenance of drainage and flood control facilities and where feasible provide for their joint use. This includes cooperation with Placer County, cities within Placer County, and Sutter County and special districts to provide regional flood control protection.
Policy HS-6.3:	Master Drainage Plans: The City shall require master drainage plans as a condition of approval for large development projects.

Goal/Policy Number	Explanation
Policy HS-6.4:	New Residential Construction: The City shall require new residential construction to have its lowest habitable floor elevated above the base flood level elevation, determined by FEMA standards
Policy HS-6.5:	Stream Channels: The City shall prohibit development along stream channels that would reduce the stream capacity, increase erosion, or cause deterioration of the channel.
Policy HS-6.6:	Flood Insurance Program: The City shall continue to participate in the National Flood Insurance Program.
Urban and Wildland Fire Hazards	
Goal HS-7	To minimize the risk of life and property to from urban and wildland fires.
Policy HS-7.1:	Enforce Code/Ordinances: The City shall enforce the City building code, fire code, and ordinances in regard to fire safety and fire protection.
Policy HS-7.2:	Educate Residents of Fire Hazards: The City shall educate residents of urban and wildland fire hazards and safety measures.
Policy HS-7.3:	Wildland Fire Management Plans: The City shall require the development of wildland fire management plans for projects adjoining significant areas of open space that may have high fuel loads.
Policy HS-7.4:	Buffer Zones for Fire Protection: The City shall require new development to incorporate additional greenbelts, fuel breaks, fuel reduction and buffer zones around communities to minimize potential fire loses.
Policy HS-7.5:	Weed Abatement: The City shall maintain a weed abatement program to ensure clearing of dry brush areas. Weed abatement activities shall be conducted in a manner consistent with all applicable environmental regulations.
Emergency Response	
Goal HS-9	To ensure the maintenance of the Emergency Response Plan in order to maintain its effectiveness in preparing and responding to a natural or human-made disaster.
Policy HS-9.1	Emergency Response Plan: The City shall ensure that the Emergency Response Plan meets current federal, state, and local emergency requirements.
Policy HS-9.2	Coordinate Emergency Response Services with Local Agencies: The City shall continue to coordinate emergency response services with Placer County, other cities within Placer County, special districts, service agencies, voluntary organizations, and state and federal agencies.
Policy HS-9.3	Educate Public on Emergency Response: The City shall conduct training programs for staff in disaster preparedness.
Policy HS-9.4	Coordinate with Placer County: The City will strive to work with other local agencies including Placer County and cities within the County to develop coordinated geographical information systems (GIS) planning for emergency response services.
Policy HS-9.5	Siting of Critical Emergency Responses: The City shall ensure that the siting of critical emergency response facilities such as hospitals, fire stations, police offices, substations, emergency operations centers, and other emergency service facilities and utilities have minimal exposure to flooding, seismic and geological effects, fire, and explosions.

General Plan, Appendix H: Drainage and Surface Water Impacts and Constraints

As part of the General Plan Update process, Lincoln performed a detailed review of the proposed land use scenario as well as an impact analysis of the development expansion areas to the local and regional drainage

systems. Appendix H of the General Plan contains a list of drainage related constraint issues, identifies hydraulically sensitive areas, and provides proposed guidelines for developing within and around those areas.

South Lincoln Master Drainage Plan/North Lincoln Master Drainage Plan

Regional master plans identify the needs of a watershed or portion thereof and formulate plans, programs, and policies for effective stormwater management. The plans coordinate facilities and policies, and help assure that all effects of watershed changes are identified, including especially the cumulative effects of many small-scale changes. These plans play an important role in a developing region by providing critical information and criteria for the coordinated planning and design of development projects in the watershed. In addition, appropriate on-site flood control facilities may be required, and offsite facilities are identified for which developers may be charged shares.

City of Lincoln Water Management Plan (2017)

The City of Lincoln commissioned a Water Master Plan (WMP) in October of 2014 in order to analyze the City's water supply reliability and water management efforts. Accordingly, this WMP is a thorough assessment of the City's organizational structure, water demand, water supplies, water governance, and infrastructure. The WMP culminates in a set of recommended actions that advance the detailed analysis provided in the document.

C.6.2. Administrative/Technical Mitigation Capabilities

Table C-37 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Lincoln.

Table C-37 City of Lincoln's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	
Mutual aid agreements	Y	
Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	
Floodplain Administrator	Y	
Emergency Manager	Y	
Community Planner	Y	

Civil Engineer	Y
GIS Coordinator	Y
Other	
Technical	
Warning systems/services (Reverse 911, outdoor warning signals)	Y
Hazard data and information	N
Grant writing	Y
Hazus analysis	N
Other	
How can these capabilities be expanded and improved to reduce risk?	
Utilize GIS resources as the department grows for better data collection and analysis	

Source: City of Lincoln

C.6.3. Fiscal Mitigation Capabilities

Table C-38 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table C-38 City of Lincoln's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	Y	
Community Development Block Grant	Y	
Other federal funding programs	N	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Annual review and update of fees to ensure adequate funding to improve City's resources to reduce risk		

Source: City of Lincoln

C.6.4. Mitigation Education, Outreach, and Partnerships

Table C-39 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table C-39 City of Lincoln's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Limited
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase public outreach and community participation through existing service organizations		

Source: City of Lincoln

The City of Lincoln works cooperatively with the State Regional Board, the Central Valley Regional Water Quality Control Board, the Placer County Flood Control and Water Conservation District, and the neighboring jurisdictions of Rocklin, Roseville, Auburn, and Placer County.

C.6.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

- Public awareness and information programs specific to emergency preparedness that include: e-mail bulletins, fire prevention events, police department events, police Community Services Officer conducts neighborhood meetings, writes newspaper articles, and sends mailings with reminders on weed abatement for fire safety;
- Implementation of the City's stormwater management program with public outreach (e-mail bulletins, newspaper articles, posters, and elementary school activities), regular inspections, and enforcement activities;
- Adoption of new building code requirements with stricter fire construction standards;
- New specific plans/planned developments are required to prepare wildfire management plans to identify responsibilities, funding, and ongoing methods to reduce potential damage and threat of wildfires;

- Enforcement of existing wildfire management plans and assisting private Homeowner Associations (HOAs) with their fuel reduction programs; and,
- Implementation of fuel reduction methods identified in open space management plans for existing open spaces.

C.7 Mitigation Strategy

C.7.1. Mitigation Goals and Objectives

The City of Lincoln adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

C.7.2. NFIP Mitigation Strategy

The City of Lincoln joined the NFIP on February 3, 1982. As a participant of the National Flood Insurance Program (NFIP), the City of Lincoln has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Lincoln will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Lincoln actively participates with the County of Placer to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Lincoln as for Placer County since participation at the County level includes all local jurisdictions. An elected official of the City of Lincoln is a designated representative on the Placer County Flood Control District Board.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and new development and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The City has a Flood Damage Prevention Ordinance that regulates construction in the floodplain. The City intends to continue to implement the ordinance and participate at the regional level with Placer County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The City of Lincoln Planning and Engineering Department provides public outreach activities which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current and accurate flood mapping. In addition, the Planning and Engineering Department provides information about their stormwater management program and up-to-date information related to the maintenance of the City's drainage system.

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate

insurance rating, and promote the awareness of flood insurance. The City of Lincoln is not a current participant in the CRS program.

More information about the floodplain administration in the City of Lincoln can be found in Table C-40.

Table C-40 City of Lincoln Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	80 policies in force $38,864 in premiums $27,429,600 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	8 claims $65,572 in paid losses 1 substantial damage claims
How many structures are exposed to flood risk within the community?	12 in 1% flood zone 110 in 0.2% flood zone
Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL)	2 RL properties 1SRL property
Describe any areas of flood risk with limited NFIP policy coverage	Unknown
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	CFM on staff
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit Review and Outreach
What are the barriers to running an effective NFIP program in the community, if any?	Money and time
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV 6/26/2009
Is a CAV or CAC scheduled or needed?	Y
Regulation	
When did the community enter the NFIP?	February 3, 1983
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Y
Provide an explanation of the permitting process.	Permit applicants must adhere to Floodplain Regulations as stated in the Lincoln Municipal Code
Community Rating System	
Does the community participate in CRS?	N
What is the community's CRS Class Ranking?	N/A

NFIP Topic	Comments
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

C.7.3. Mitigation Actions

The planning team for the City of Lincoln identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140).

Project Description: Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Lincoln Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: City of Lincoln in partnership with the County

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Action 3. Lincoln Boulevard: Auburn Ravine Bridge – Reconstruct Bridge

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The present bridge structure crossing Lincoln Boulevard is antiquated and does not pass the 100-year storm event. In fact flooding of the roadway has occurred in storm events smaller than the 10-year. This is a major entryway to the City, and road closures at this location represent a serious risk to health, safety, and emergency services. Replacement of the bridge structure will involve adding capacity and raising roadway elevations to meet current design standards

Project Description: Remove existing bridge and replaced with taller, wider bridge to mitigate flooding issues.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Engineering Department

Cost Estimate: $15M

Benefits (Losses Avoided): The main benefit would be for the safety and welfare of the citizens of the City of Lincoln. Lincoln Boulevard is one of three entry and exit points to the downtown area of the City. All three entry and exit points are projected to flood in the 100-year event, which results in isolation of the

downtown areas. Auburn Ravine also bisects the historical areas of the City from the newly developing South Lincoln Master Plan area. Roadway closures at this location would prevent emergency services from being able to provide service across this waterway.

Potential Funding: Highway Bridge Program funds and local funds

Timeline: Ongoing – not likely before 2025.

Project Priority (H, M, L): High

Action 4. McBean Park Drive: Auburn Ravine Bridge – Additional 110' Span

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The existing McBean Park Drive bridge at Auburn Ravine does not meet City requirements for freeboard in the 100-year design storm event. A new bridge span of 110 feet located in the overbank areas would provide additional conveyance capacity, but roadway elevations at McBean Park Drive/SR-193 would also need to be raised.

Project Description: Remove existing bridge and replace with taller, wider bridge to mitigate flooding hazard.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Engineering Department.

Cost Estimate: $16.5M

Benefits (Losses Avoided): This project is necessary for health and safety issues relating to emergency service accessibility during a major flood event. This is also one of three major access points to the historical downtown Lincoln area and new areas of future growth.

Potential Funding: Highway Bridge Program and local funds

Timeline: 2015-2024

Project Priority (H, M, L): High

Action 5. Lakeview Farms Regional Volumetric Mitigation Facility

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Newly developing areas of the Markham Ravine and Racoon Creek watersheds, which are a part of the current general plan, and which have not previously been studied for potential peak flow and volumetric impacts will require the development of mitigation facilities.

Project Description: Phase 1 of this project would bring the Lakeview Farms Volumetric Storage Facility into operation. The project includes grading a 150 acre basin along with the installation of weir structures and piping that would allow the City to channel waters of Racoon Creek into the storage basin during heavy rain events and then pump the water out after the storm event has passed.

Other Alternatives: Require project by project mitigation or no action which would result in downstream impacts.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Engineering Department.

Cost Estimate: $3.3M (Phase 1)

Benefits (Losses Avoided): Reduces the potential for development impact at known flooding areas downstream of the City at Sutter County and the Cross Canal areas.

Potential Funding: Combination of City and Development Fees.

Timeline: 2016-2023

Project Priority (H, M, L): High

Action 6. Gladding Parkway, Lincoln Boulevard and McCourtney Road – Stream Restoration and Culvert Improvement

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Gladding Parkway, Lincoln Boulevard and McCourtney Road require additional storm drain infrastructure to decrease the prevalence of flooding.

Project Description: Project improvements include new culverts at Gladding Road at Markham Ravine, raising roadway elevations at the north/south stretch of Gladding Road and local storm drainage improvements for Gladding Parkway, Lincoln Boulevard and McCourtney Road.

Other Alternatives: Required by adapted master plan

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: $2,025,000

Benefits (Losses Avoided): This project is necessary for health and safety issues relating to emergency service accessibility during a major flood event.

Potential Funding: Combination of City and development fees

Timeline: Ongoing

Project Priority (H, M, L): High

Action 7. "O" Street Drainage Improvements

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Modifications to the south tributary of Markham Ravine channel as it meanders through the City will be necessary to reduce flooding potential in the adjacent subdivisions.

Project Description: The project will lower the invert of the south tributary of Markham Ravine channel to provide additional capacity to reduce flood elevations by zero to three feet.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: $533,500

Benefits (Losses Avoided): An analysis of the existing storm drainage systems in the area shows that there is a potential of structural flooding and roadway flooding in a 100-year event.

Potential Funding: Combination of City and development fees.

Timeline: Ongoing improvements as new development permits.

Project Priority (H, M, L): Medium

Action 8. 7th Street Drainage Improvements

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Significant surface flooding is known to occur in the area.

Project Description: An additional Storm drainage trunk pipeline is planned for 7th Street to extend storm drain service along this corridor and to relieve other existing systems which ultimately pick up this drainage area. The proposed system would bring the storm drainage protection to City Standards.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: $1,010,000

Benefits (Losses Avoided): Many of the roadways along this corridor flood during normal rainfall events, and access to the high school and residences is restricted. Several residents have complained that they fear the flood waters and have witnessed encroachment of floodwater in their yards, which may encroach into their structures in larger storms.

Potential Funding: Combination of City and development fees, grants

Timeline: Construct as funds available.

Project Priority (H, M, L): Medium

Action 9. Auburn Ravine at McBean Park Drive/State Route 193 Bridge

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Significant sediment and debris accumulate at the "chevron" style piers and abutments.

Project Description: Removal of accumulated sediment and debris at piers and abutments to allow for full bridge capacity for flood protection.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: $110,000

Benefits (Losses Avoided): Improvements would reduce flood frequency upstream of SR 193 and increase flood protection back to the intended installation of the bridge structure.

Potential Funding: Local funds.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 10. Auburn Ravine at Lincoln Boulevard (formerly State Route 65) Bridge

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Significant sediment and debris accumulate at the invert and abutments of the bridge. The accumulation of sediment in this location also results in a significant sediment accumulation issue upstream.

Project Description: Removal of accumulated sediment and debris at piers and abutments to allow for full bridge capacity for flood protection.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: $110,000

Benefits (Losses Avoided): Improvements would reduce flood frequency upstream of SR 193 and increase flood protection back to the intended installation of the bridge structure.

Potential Funding: Local funds.

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 11. Ingram Slough – Orchard Creek Return Channel

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: This project is located east of the Lincoln Crossings Development at the Nader Property which is at risk of flood inundation.

Project Description: The Construction of the channel would provide a gravity release for the new channels constructed through the Lincoln Crossings development and reduces floodplain elevations and floodplain inundation areas.

Other Alternatives: No action would result in a large shallow overspill area with limited development potential.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: $1,725,000

Benefits (Losses Avoided): The construction of the channel would bring 100-year flood elevations within Ingram Slough at the Lincoln Crossing development to City Standard Freeboard requirements; however, the interim operation would not be expected to cause any structural damages.

Potential Funding: Combination of City and development fees.

Timeline: Dependent on Nader Ranch/Village 7 development

Project Priority (H, M, L): Medium

Action 12. Markham Ravine – Updated FEMA Analysis and Mapping

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Existing FEMA mapping for the Markham Ravine watershed requires updating to improve accuracy of maps.

Project Description: Detailed mapping and analysis will be performed for the Markham Ravine watershed. Evaluation and updating of existing FEMA mapping will be accomplished.

Other Alternatives: Required by master plan

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: FEMA/Placer County Flood Control and Conservation District/ City of Lincoln Engineering Department

Cost Estimate: Staff time

Benefits (Losses Avoided): Precise definition of 100-year flood allows for construction to be set at required criteria. Verification of base flood data will help to determine if any flood protection deficiencies exist in this system.

Potential Funding: Development Fees

Timeline: 2019-2022

Project Priority (H, M, L): Medium

Action 13. Markham Ravine Drainage Improvements – Union Pacific Railroad & Lincoln Boulevard (formerly State Route 65) Crossings

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Existing UPRR and Lincoln Boulevard crossings at Markham Ravine structures do not provide 100-year flood protection.

Project Description: Modification of the existing UPRR and Lincoln Boulevard crossings at Markham Ravine will be necessary to provide 100-year protection at these structures.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: City of Lincoln Engineering Department.

Cost Estimate: $500,000

Benefits (Losses Avoided): The main benefit would be the safety and welfare of the citizens of the City of Lincoln. Lincoln Boulevard north of Lincoln is one of three entry and exit points to the downtown area of the City. All three are projected to flood in the 100-year event, which results in isolation of the downtown areas.

Potential Funding: Development Fees

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 14. Auburn Ravine Stream Restoration Projects (Analysis and Repairs)

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Auburn Ravine is one of the three major watercourses in the City. The previously defined streambed may have been altered by improper encroachment into the floodplain, which changed sediment loading conditions, or acts of nature, resulting in changes to the flow regimes. This task will analyze and recommend specific areas of improvement.

Project Description: This task will analyze and recommend specific areas of improvement along Auburn Ravine.

Other Alternatives: Leaving stream unrepaired results in erosion potential, and the potential of additional deposition downstream of the City, which reduces conveyance capacity.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department

Cost Estimate: $500,000

Benefits (Losses Avoided): Creek restoration improvements to include restoring the channel's cross section for maximum flow, efficient transportation of sediment, and restoration of the ecosystem

Potential Funding: Combination of City and development fees, grants.

Timeline: As funding becomes available

Project Priority (H, M, L): Low

Action 15. Markham Ravine Streambed Restoration Projects (Analysis Only)

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The existing streambed of Markham Ravine must be evaluated to determine what is necessary to restore the creek section to optimum capacity for flow of water and sediment transport.

Project Description: This task will analyze and recommend specific areas of improvement along Markham Ravine.

Other Alternatives: This stream is extremely sensitive to the large amounts of attenuation currently present. Changes in the sediment loading of this system could reduce the storage capacity of the system and result in significant increases to peak flow rates and flooding potential.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department

Cost Estimate: $100,000

Benefits (Losses Avoided): Determination can be made of deficiencies

Potential Funding: Combination of City and development fees, grants.

Timeline: As funding becomes available

Project Priority (H, M, L): Low

Action 16. Racoon Creek Streambed Restoration Projects (Analysis Only)

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The existing streambed of Racoon Creek must be evaluated to determine what is necessary to restore the creek section to optimum capacity for flow of water and sediment transport.

Project Description: This task will analyze and recommend specific areas of improvement along Racoon Creek.

Other Alternatives: Leaving stream unrepaired results in erosion potential, and the potential of additional deposition downstream, which reduces conveyance capacity.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department

Cost Estimate: $100,000

Benefits (Losses Avoided): Determination can be made of deficiencies

Potential Funding: Combination of City and development fees, grants.

Timeline: As funding becomes available

Project Priority (H, M, L): Low

Action 17. Fire Prevention and Fuels Management Plan

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City of Lincoln has adopted a General Plan that will carry the City's growth and planning into the year 2050. The new General Plan calls for a balance of development and open space with the recommendation of maintaining 40 percent open space. This presents some significant maintenance and fire suppression challenges. Additionally, it increases the fire prevention workload to monitor and provide for abatement. Access, abatement, fuels management, and staffing to address the increased incidents are just some of the problems forecasted in order to implement the new General Plan policies.

Project Description: Creation of a Fire Prevention and Fuels Management Plan

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Currently the City of Lincoln has several fuels management plans in place for specific areas within the existing boundaries. Bringing forth a comprehensive plan to ensure continuity within the City's jurisdiction would aid in planning (Community Wildfire Preparedness Plan). Additionally, a funding mechanism would have to be developed in order to provide for adequate abatement and fuels modification which the Public Services and Fire Departments have not been able to provide.

Responsible Agency/ Department/Partners: City of Lincoln Community Development, Public Services and Fire Departments

Cost Estimate: Unknown, but would have to rely on new staff or consultant services due to limited fire department staffing.

Benefits (Losses Avoided): Responses to such areas would be quicker with proper access. Incidents could be reduced in magnitude under normal environmental conditions (not including high fire danger weather events) by reducing fuel load. A comprehensive citywide plan would provide greater public safety without loss of desirable open space features. A comprehensive plan would provide higher protection for housing, commercial, and recreational components that border such areas. Several different fuels management plans could be consolidated into a citywide plan

Potential Funding: Grants, development, cooperation with other jurisdictions that have developed plans of this type.

Timeline: Continuous as the General Plan is implemented and the City of Lincoln realizes additional growth and development.

Project Priority (H, M, L): High