

Annex E: Louisville

Annex E Louisville

E.1 Community Profile

The City of Louisville is a home rule municipality with 8 square miles within the municipal boundaries. The city lies in southeastern Boulder County roughly six miles east of the City of Boulder and 25 miles northwest of Denver. The Louisville area is characterized by generally flat lands and low hills with some gently rolling terrain trending toward Coal Creek and Rock Creek.

The City of Louisville's history is based on coal mines and the coal mining industry. Louisville is an area that was known as the Northern Coal Field, an extensive coal field in Boulder and Weld counties. In August 1877 the first coal mine was opened and Louis Nawatny, a landowner in the area, platted his farmland into the town and named it after himself. Coal miners from around the world moved to the new town to work in the new, safer mine. Because mining was seasonal, and strikes too often interrupted production, the economy was generally depressed. Family gardens and odd jobs were the way of life during summertime unemployment.

From 1890 to 1928, the Acme Mine operated directly beneath the original town of Louisville. Worked on two levels, the Acme produced nearly two million tons of coal and was one of 171 coal mines in Boulder County. There were 30 mines that opened in and around Louisville. During the peak years of 1907 to 1909, there were 12 mines in operation. The use of coal declined following World War II, and the last mines in and around Louisville closed in 1952.

The community has become a generally middle-class community where the workers leave for all manner of jobs in every direction. In recent years, a variety of advanced industries including bioscience, advanced engineering, software, and natural products have opened facilities and offices in Louisville providing employment opportunities and attracting new residents.

E.1.1 Population

According to the 2020 Census the estimated population of the City of Louisville is 21,171. Select 2019 American Community Survey demographic and social characteristics for Louisville are shown in Table E-1

Table E-1 Louisville's Demographic and Social Characteristics

Characteristic	Percentage
Gender/Age	
Male (%)	49.1%
Female (%)	50.9%
Under 5 Years (%)	4.8%
65 Years and Over (%)	13.9%
Race/Ethnicity (one race)	
White (%)	89.6%
Hispanic or Latino (Of Any Race) (%)	7.0%
Average Household Size	2.41
High School Graduate or Higher (%) (Population 25 years and over)	97.5%

Source: U.S. Census Bureau, 2019 American Community Survey

E.1.2 Economy

According to the 2019 American Community Survey, the industries that employed most of Louisville's labor

force were educational, health and social services (26.2%); professional, scientific, management, administrative and waste management services (20.6%); retail trade (8.7%); Arts, entertainment, and recreation, and accommodation and food services (8.5%) and manufacturing (8.4%); Select economic characteristics for Louisville from the 2019 American Community Survey are shown in Table E-2.

Table E-2 Louisville’s Economic Characteristics

Characteristic	Percentage
Families Below Poverty Level	2.5%
Individuals Below Poverty Level	5.9%
Median Home Value	\$573,400.00
Median Household Income	\$103,017
Population 16 years and older in Labor Force	11,904

Source: U.S. Census Bureau. 2019 American Community Survey

E.2 Hazard Summary

The most significant hazards for Louisville are floods, severe winter storms, and wildfire. Due to the impacts from the Marshall Fire in December 2021, the city determined the wildfire hazard level should be increased from Medium to a High hazard. Refer to Section 4.3 Vulnerability Assessment for detailed countywide vulnerability analysis. There are no hazards that are unique to Louisville. The overall hazard significance takes into account the geographic location, probability of occurrences and magnitude as a way to identify priority hazards for mitigation purposes. Section E.5 Vulnerability Assessment, where possible, analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area. Other hazards that could impact Louisville include dam failure, drought, hailstorm, earthquake, extreme heat, lightning, tornado, windstorm, and communicable/zoonotic disease outbreak. Due to the historical coal mining in the area subsidence of the land surface is a concern in Louisville. During the update of this annex the Louisville HMPC noted that most of the hazards are not singular often multiple compound and amplify each other. The Marshall Fire in late 2021 demonstrated the cascading nature of hazards that resulted from a combination of drought, strong winds in advance of a winter storm, and a wildfire.

Table E-3 City of Louisville Hazard Summary

Hazard Type	Geographic Extent	Probability of Future Occurrences	Magnitude / Severity	Increased Threat (Climate Change)	Hazard Level
Air Quality	Extensive	Highly Likely	Critical	Moderate	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Low
Communicable / Zoonotic Disease Outbreak	Extensive	Likely	Critical	Substantial	High
Dam and Levee Failure	Extensive	Occasional	Critical	Moderate	Medium
Drought	Extensive	Likely	Limited	Substantial	Medium
Earthquake	Extensive	Occasional	Limited	Low	Low
Extreme Temperatures	Extensive	Occasional	Limited	Severe	Low
Expansive Soils	Extensive	Highly Likely	Limited	Substantial	Low
Flood	Significant	Likely	Critical	Severe	High

Hazard Type	Geographic Extent	Probability of Future Occurrences	Magnitude / Severity	Increased Threat (Climate Change)	Hazard Level
Hailstorm	Significant	Likely	Limited	Moderate	Low
Landslide/Mud and Debris Flow/Rockfall	Significant	Likely	Limited	Substantial	Medium
Lightning	Extensive	Highly Likely	Limited	Moderate	Medium
Severe Winter Storm	Extensive	Highly Likely	Critical	Substantial	High
Subsidence	Extensive	Occasional	Limited	Moderate	Medium
Tornado	Significant	Occasional	Limited	Low	Medium
Wildfire	Significant	Likely	Critical	Severe	High
Windstorm	Extensive	Highly Likely	Limited	Moderate	Medium

<p>Geographic Extent</p> <ul style="list-style-type: none"> Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area <p>Probability of Future Occurrences</p> <ul style="list-style-type: none"> 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. 	<p>Magnitude/Severity</p> <ul style="list-style-type: none"> 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 <p>Increase Threat from Climate Change</p> <ul style="list-style-type: none"> Low- unlikely to become more of a threat due to climate change. Moderate – possibly will become more of a threat due to climate change. Substantial- likely to become more of a threat due to climate change. Severe- highly likely to become more of a threat due to climate change <p>Significance</p> <ul style="list-style-type: none"> Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact
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E.3 Asset Inventory

E.3.1 Property Inventory

Table E-4 represents an inventory of property in Louisville based on the Boulder County Assessor’s data as of March 2022.

Table E-4 Louisville Property Inventory

Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value
Agricultural	3	6	\$728,800	\$728,800	\$1,457,600
Commercial	251	245	\$433,063,223	\$433,063,223	\$866,126,446
Exempt	88	158	\$165,149,034	\$165,149,034	\$330,298,068
Industrial	148	117	\$501,166,046	\$751,749,069	\$1,252,915,115
Mixed Use	9	22	\$16,367,500	\$16,367,500	\$32,735,000
Residential	7,325	7,201	\$2,872,098,425	\$1,436,049,213	\$4,308,147,638
Vacant	2	2	\$699,500	\$699,500	\$1,399,000
Total	7,826	7,751	\$3,989,272,528	\$2,803,806,339	\$6,793,078,867

Source: Boulder County Assessor's Office

E.3.2 Critical Facilities

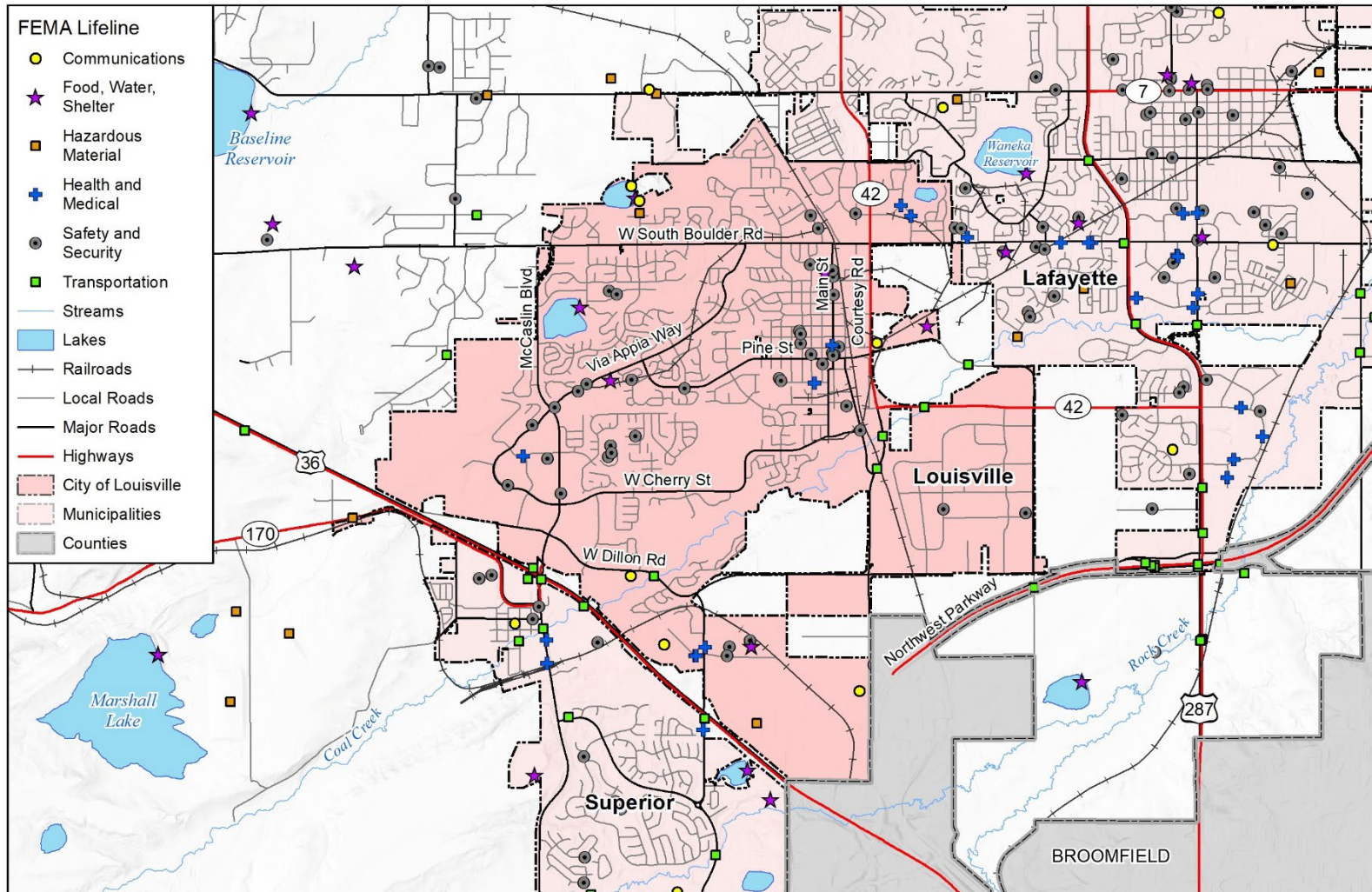
Table E-5 shows the critical facilities organized by FEMA Lifeline identified in the City of Louisville. The location of each facility is shown on Figure E-1.

Table E-5 Louisville Critical Facilities by FEMA Lifeline

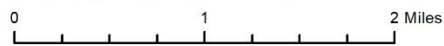
FEMA Lifeline	Count
Communications	6
Food, Water, Shelter	6
Hazardous Materials	2
Health and Medical	8
Safety and Security	43
Transportation	4
Total	69

Source: Boulder County, HIFLD, CDPHE, Wood Analysis

Figure E-1 City of Louisville Critical Facilities



Map compiled 3/2022;
intended for planning purposes only.
Data Source: Boulder County, CDOT,
City of Boulder, CDPHE, NBI, NID, HIFLD



E.3.3 Economic Assets

Economic assets at risk may include major employers or primary economic sectors, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster. After a disaster, economic vitality is the engine that drives recovery. Every community has a specific set of economic drivers, which are important to understand when planning ahead to reduce disaster impacts to the economy. When major employers are unable to return to normal operations, impacts ripple throughout the community.

According to 2019 data from the Colorado Department of Labor and Employment, the following are Louisville's major employers.

- Balfour Senior Living
- Avista Adventist Hospital
- Fresca Foods
- City of Louisville
- Design Mechanical
- Global Healthcare Exchange
- Sierra Nevada Corporation
- Centennial Peaks Hospital
- Medtronic
- JumpCloud

E.3.4 Natural, Historic, and Cultural Resources

Assessing the vulnerability of Louisville to disaster also involves inventorying the natural, historical, and cultural assets of the area. This step is important for the following reasons:

The community may decide these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy. If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher. The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.

Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

Floodplains along Coal and Rock creeks hold relatively intact riparian corridors that are critical for flood protection, wildlife movement, and the aquatic health of the streams. Boulder County and the Colorado Natural Heritage Program have not identified any rare, endangered, threatened, imperiled plant and animal species or critical wildlife habitats within the city limits or on City open space. The Colorado Tallgrass Prairie Natural Area lies just to the west of the city. Prebles Meadow jumping mice are found along Coal Creek, but not in the segment through Louisville.

For information about natural resources in Boulder County, which includes Louisville, see Section 4.3 Vulnerability Assessment of the base plan.

Historic and Cultural Resources

Table E-6 lists the properties in Louisville that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment of the base plan).

Table E-6 Louisville's Historic Properties/Districts in National and State Registers

Property	Address	Date Listed
Denver Elevator--Grain Elevator	Tract 712 near CO 42	2/14/1986
Ginacci House	1116 LaFarge Street	2/14/1986
Jacoe Store	1001 Main Street	2/14/1986
Lackner's Tavern	1006 Pine	2/14/1986
LaSalla House	1124 Main Street	2/14/1986
National Fuel Company Store	801 Main Street	2/14/1986
Petrelli--DelPizzo House	1016 Main Street	2/14/1986
Rhoades House	1024 Grant	2/14/1986
Robinson House	301 Spruce	2/14/1986
Stolmes House	616 Front Street	2/14/1986
Tego Brothers Drugstore--State National Bank of Louisville	700 Main Street	2/14/1986
Thomas House	700 Lincoln	2/14/1986

Sources: *Directory of Colorado State Register Properties*, www.coloradohistory-oahp.org/programareas/register/1503/; *National Register Information System*, www.nr.nps.gov/

Additionally, six properties have been designated as Louisville historic landmarks (Table E-7).

Table E-7 Louisville's Historic Landmarks

Property	Address	Year Designated
Austin-Niehoff House	717 Main Street	9/6/2005
Louisville Center for the Arts	801 Grant Avenue	9/6/2005
Jacoe Store	1001 Main Street	9/20/2005
Tomeo House	1001 Main Street	9/20/2005
Jordinelli House	1001 Main Street	9/20/2005
Jannucci House	1116 LaFarge Avenue	4/15/2008
Fabrizio House	557 Jefferson Avenue	2010
Ball House	1117 Jefferson Avenue	2010
Jacoe-Conarroe House	1131 Jefferson Avenue	2010
Zarini House	1109 LaFarge Avenue	2010
Adkins House	816 McKinley Avenue	2010
Zarini-Ross House	501 South Street	2010
Rex Theater	817 Main Street	2011
Thomas House	700 Lincoln Avenue	2011
Sotelli House	1021 Jefferson Avenue	2011
Caranci House	1145 Main Street	2011
Hibler House	612 Grant Avenue	2012
Allera House	1005 Lafarge Avenue	2012
Thomas-Decker House	733 Pine Street	2012
Guenzi House	1036 Walnut Street	2012
Butcher-Jones House	1013 Jefferson Avenue	2013
Restas-Morgan House	1131 Spruce Street	2013
James House	700 Pine Street	2013
Porta House	925 Lafarge Avenue	2013
Di Francia Saloon	740 Front Street	2014

Property	Address	Year Designated
Pearson Store	927 Main Street	2014
D'Agostino House	1245 Grant Avenue	2015
Atkin House	1101 Grant Avenue	2015
Louisville Grain Elevator	540 County Road	2015
Vaughn House	701 Lincoln Avenue	2015
Steinbaugh House	945 Front Street	2015
Mudrock House	613 Grant Avenue	2016
Standard Oil Sign	947 Pine Street	2016
Black Family House	725 Lincoln Avenue	2016
Louisville Hospital	721 Grant Avenue	2016
Romeo House	701 Garfield Avenue	2016
Gorce House	625 Lincoln Avenue	2017
Agatha Stecker House	720 Pine Street	2017
Joseph Stecker House	722 Pine Street	2017
Blue Parrot Sign	640 Main Street (Blue Parrot Sign)	2018
Harney House	620 Grant Avenue	2018
DiSalvo House	1021 Main Street	2018
Trott/Downer Cabins	Miners Field	2019
Wattellet House	816 Lincoln	2019
816 Main Street	816 Main Street	2019
Damiana House	917 La Farge	2020
La Salle House	833 Jefferson Avenue	2020
Mancini House	908 Rex Street	2020
Berardi House	1016 Grant Avenue	2020
DeSantis House	1200 Jefferson Avenue	2020
Stecker-Kerr House	633 La Farge Avenue	2020
Koci House from 1201 Lincoln Avenue	1201 Lincoln Avenue (633 La Farge Avenue)	2020

Source: City of Louisville Historic Preservation Commission, www.louisvilleco.gov

It should be noted that as defined by 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 NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

E.4 Growth and Development Trends

Table E-8 illustrates how Louisville has grown in terms of population and number of housing units between 2014 and 2019.

Table E-8 Louisville's Change in Population and Housing Units, 2014-2019

2014 Population	2019 Population Estimate	Estimated Percent Change 2014-2019	2014 # of Housing Units	2019 Estimated # of Housing Units	Estimated Percent Change 2014-2019
20,112	20,860	4%	6,357	7,740	22%

Source: U.S. Census Bureau, 2014 and 2019 American Community Survey

According to the City's 2013 Comprehensive Plan, growth in Louisville can be attributed to the fact the residential market improved and compensated for the lack of growth between 2000 and 2010 and residential supplies had completed the entitlement process. The plan also estimated that based on current zoning, the city would be built out at a population of 22,145 (assuming 2.4 people per household).

E.5 Vulnerability Assessment

The intent of this section is to assess Louisville's vulnerability separate from that of the planning area as a whole, which has already been assessed in Sections 4.4 Vulnerability Assessment and 4.5 Estimating Potential Losses of the base plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk for the more significant hazards or where available data permits a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment of the base plan.

E.5.1 Vulnerability by Hazard

The hazard summaries in Table E-3 above reflect the hazards that could potentially affect the city. Based on this analysis, the priority hazards (High Significance) for mitigation are flood and winter storm. Those of medium significance for the City of Louisville are identified below.

- Communicable/zoonotic disease outbreak
- Dam and levee failure
- Drought
- Landslide/Mud and Debris Flow/Rockfall
- Lightning
- Tornado
- Wildfire
- Windstorm

Due to the ability to quantify vulnerability further with available data, only dam inundation, flood, and wildfire hazards will be profiled in the following vulnerability assessment section.

Hazards assigned a significance rating of Low, and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section.

Dam Failure

General Property and People

While there is no concrete data available to indicate any likelihood of failure, based on best available dam inundation data there might be structures potentially at risk of dam failure flooding. The dam failure inundation maps contain sensitive information and are not available for display in this public planning document. Based on a GIS analysis performed with the best available data 491 people are potentially at risk of a dam inundation event. Table E-9 shows the potential exposure to people and property in Louisville.

Table E-9 Estimated Dam Inundation Exposure to Properties in Louisville

Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Commercial	43	55	\$47,429,710	\$47,429,710	\$94,859,420	
Exempt	9	25	\$13,137,125	\$13,137,125	\$26,274,250	
Industrial	2	3	\$955,600	\$1,433,400	\$2,389,000	

Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Mixed Use	4	3	\$1,000,500	\$1,000,500	\$2,001,000	7
Residential	140	200	\$66,314,922	\$33,157,461	\$99,472,383	484
Total	198	286	\$128,837,857	\$96,158,196	\$224,996,053	491

Source: Boulder County Assessor's Office, U.S. Census, DOLA, DWR, Wood Analysis

Critical Facilities and Infrastructure

Based on the GIS analysis summarized in the Table E-10, it is expected that around 9 critical facilities in Louisville are exposed to a potential dam inundation event. The majority fall within the safety and security lifeline.

Table E-10 Critical Facilities Exposed to Dam Inundation

FEMA Lifeline	Count
Communications	1
Food, Water, Shelter	1
Safety and Security	5
Transportation	2
Total	9

Source: Boulder County Assessor, HFLD, Wood Analysis

Refer to Section 4.3.4 of the base plan for the location of dams in Boulder County.

Economy

In addition to commercial and residential building impacts, a dam inundation event that affected the major roads which give access to the city. Which could significantly affect the local economy, by limiting or completely impeding access to shops, restaurants, hotels, and other major industries which keep the local economy thriving.

Historical, Cultural, and Natural Resources

Dam or reservoir failure effects on the environment would be similar to those caused by flooding from other causes. For the most part the environment is resilient and would be able to rebound, though this process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would.

Flood

According to the 2019 Boulder County Flood Insurance Study, Louisville has experienced flood damages on Coal Creek in the past. The 2013 flood event impacted homes, infrastructure, trails, and the public golf course in Louisville. As shown in Figure E-2 Coal Creek is primary cause of flooding in the City of Louisville.

General Property and People

Vulnerability to flooding was determined by summing potential losses to Louisville properties using GIS, the building footprint layer provided by Boulder County and the latest FEMA NFHL data. A separate parcel analysis was also conducted, where the parcel was used was used to create a centroid, or point, representing the center of each parcel polygon, in order to get the number of improved parcels, property types, and improved values. FEMA's NFHL data depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood events. Figure E-2 below displays Louisville's FEMA special flood hazard areas present in the city, color coded based on flood event (i.e., 100-year versus 500-year).

Based on the GIS analysis performed and the available FEMA flood mapping, the potential risk for the city is shown in Table E-11 and Table E-12. Louisville 1% annual chance flood zone presents has 16 residential buildings and over an estimated \$2 million in estimated losses. According to the analysis, 125 buildings (116 of which are residential) are exposed to the 0.2% annual chance event, totaling over \$16 million of damages to buildings and contents.

Table E-11 City of Louisville Properties at Risk to 1% Annual Chance Flood Zone

Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Estimated Loss	Population
Residential	16	16	\$5,897,600	\$2,948,800	\$8,846,400	\$2,211,600	39
Total	16	16	\$5,897,600	\$2,948,800	\$8,846,400	\$2,211,600	39

Source: Boulder County Assessor, U.S. Census, DOLA, FEMA NFHL Effective 8/15/2019, Preliminary 9/30/2019, Wood Analysis

Table E-12 City of Louisville Properties at Risk to 0.2% Annual Chance Flood Zone

Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Estimated Loss	Population
Commercial	2	4	\$1,043,200	\$1,043,200	\$2,086,400	\$521,600	
Exempt	3	5	\$8,294,284	\$8,294,284	\$16,588,568	\$4,147,142	
Residential	96	116	\$31,938,203	\$15,969,102	\$47,907,305	\$11,976,826	281
Total	101	125	\$41,275,687	\$25,306,586	\$66,582,273	\$16,645,568	281

Source: Boulder County Assessor, U.S. Census, DOLA, FEMA NFHL Effective 8/15/2019, Preliminary 9/30/2019, Wood Analysis

The population exposed to the flood hazards described in the flood vulnerability analysis above was estimated by applying an average household size factor to the number of improved residential properties identified in the flood hazard areas within Louisville. These estimates yielded the population exposures shown in the table above in Table E-11 and Table E-12. As such, the combined 1% and 0.2% annual chance floods would potentially displace 320 people, based on the residential structures which fall in those flood zones. For additional details on potential displacements by flood event, see the Boulder County Base Plan.

Critical Facilities and Infrastructure

There are a total of 4 critical facilities located in both the 1% and 0.2% flood hazard areas. Most of the critical facilities identified as being at risk to flooding fall within the Safety and Security FEMA Lifeline. These include two childcare providers (one within the 1% and one within the 0.2%) and Louisville Fire Station 1 (within the 0.2%). There is also one bridge that is within the 1% annual chance flood zone.

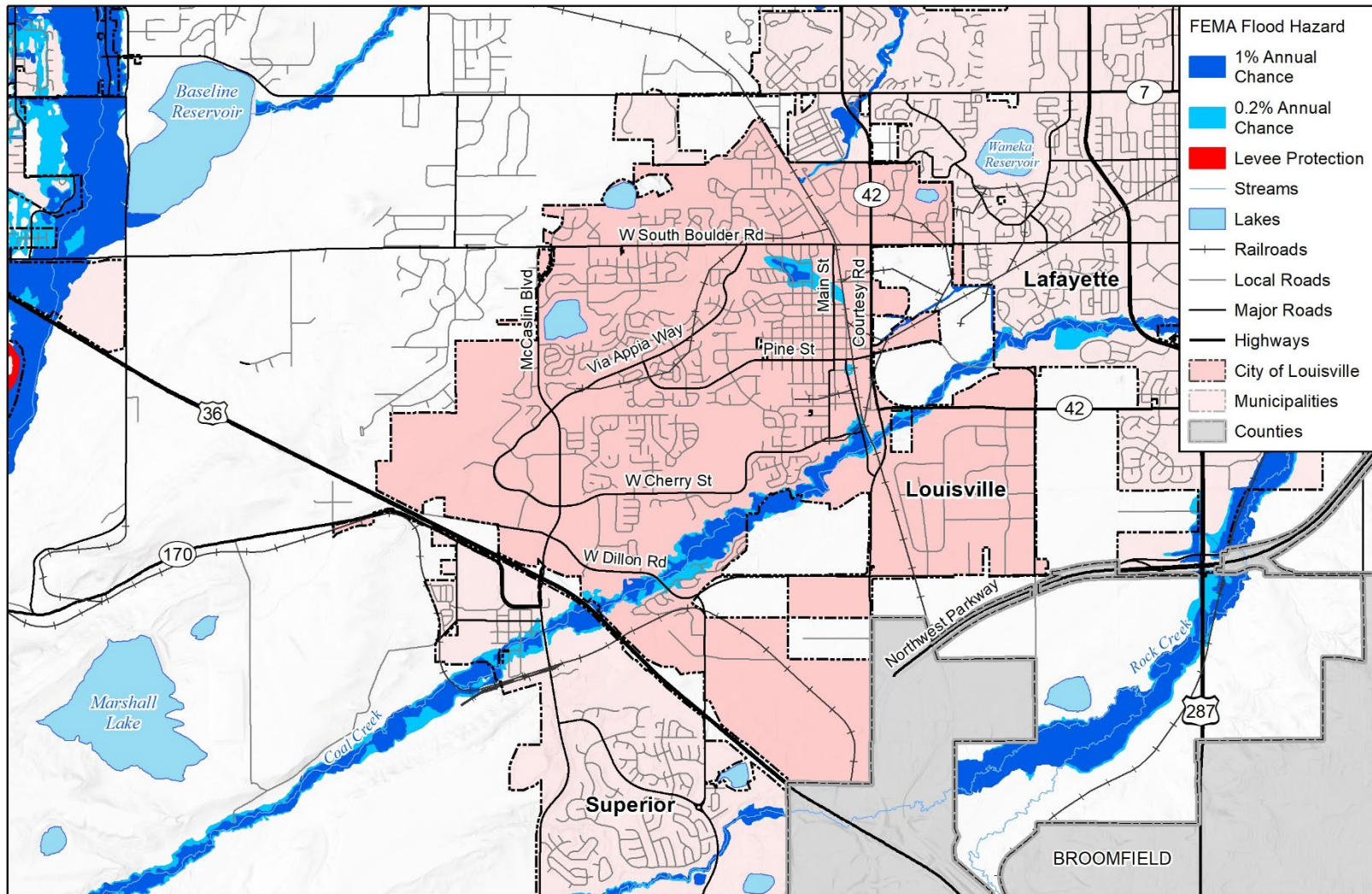
Table E-13 Louisville Critical Facilities at Risk Within 1% and 0.2% Annual Chance Flood Zone

FEMA Lifeline	Count
1% Flood Zone	
Safety and Security	1
Transportation	1
Total	2
0.2% Flood Zone	

FEMA Lifeline	Count
Safety and Security	2
Total	2
Grand Total	4

Source: Boulder County Assessor, CDPHE, NBI, Wood Analysis

Figure E-2 City of Louisville Flood Hazard Areas



Map compiled 3/2022;
intended for planning purposes only.
Data Source: Boulder County, CDOT,
FEMA NFHL Effective 8/15/2019, Preliminary 9/30/2019



Economy

Flooding can have a major economic impact on the economy, including indirect losses such as business interruption, lost wages, and other downtime costs.

Historical, Cultural and Natural Resources

The environment is mostly resilient to general flooding. However, cultural or historic properties within floodplains would be affected in similar ways as property and critical facilities/infrastructure, especially those with underground or basement levels where water would easily seep and potential ruin archives, resources, or other important assets.

Wildfire

General Property

Wildfire Risk analysis used best available data from the wildfire hazards zones defined by the Colorado Forest Atlas from the State Forest Service. Parcel analysis was conducted using GIS to analyze where parcels, buildings counts, property types and content values intersected with the wildfire hazards zones defined by the Colorado Forest Atlas, from highest to lowest risk. The Colorado Forest Atlas calculates a composite risk rating, defined as the possibility of loss or harm occurring from a wildfire. It identifies areas with the greatest potential impacts from a wildfire – i.e., those areas most at risk - considering all values and assets combined together – WUI Risk, Drinking Water Risk, Forest Assets Risk and Riparian Areas Risk. This risk index has been calculated consistently for all areas in Colorado, allowing for comparison and ordination of areas across the entire state. The Wildfire Risk Classes for Louisville are shown in in Table E-14 and Figure E-3 below.

Based on this analysis Louisville has 1,467 structures at risk of wildfire, 35 of which are at moderate or high risk. Residential property types have the greatest number of parcels at risk of wildfire.

Note, this analysis does not account for urban conflagration or the losses from the December 2021 Marshall Fire.

Due to the Marshall Fire, and the regular incidence of high wind events in Louisville, the city recognizes the clear and present increased risk of wildfire without intensive mitigation solutions that will require planning, funding, and time to implement.

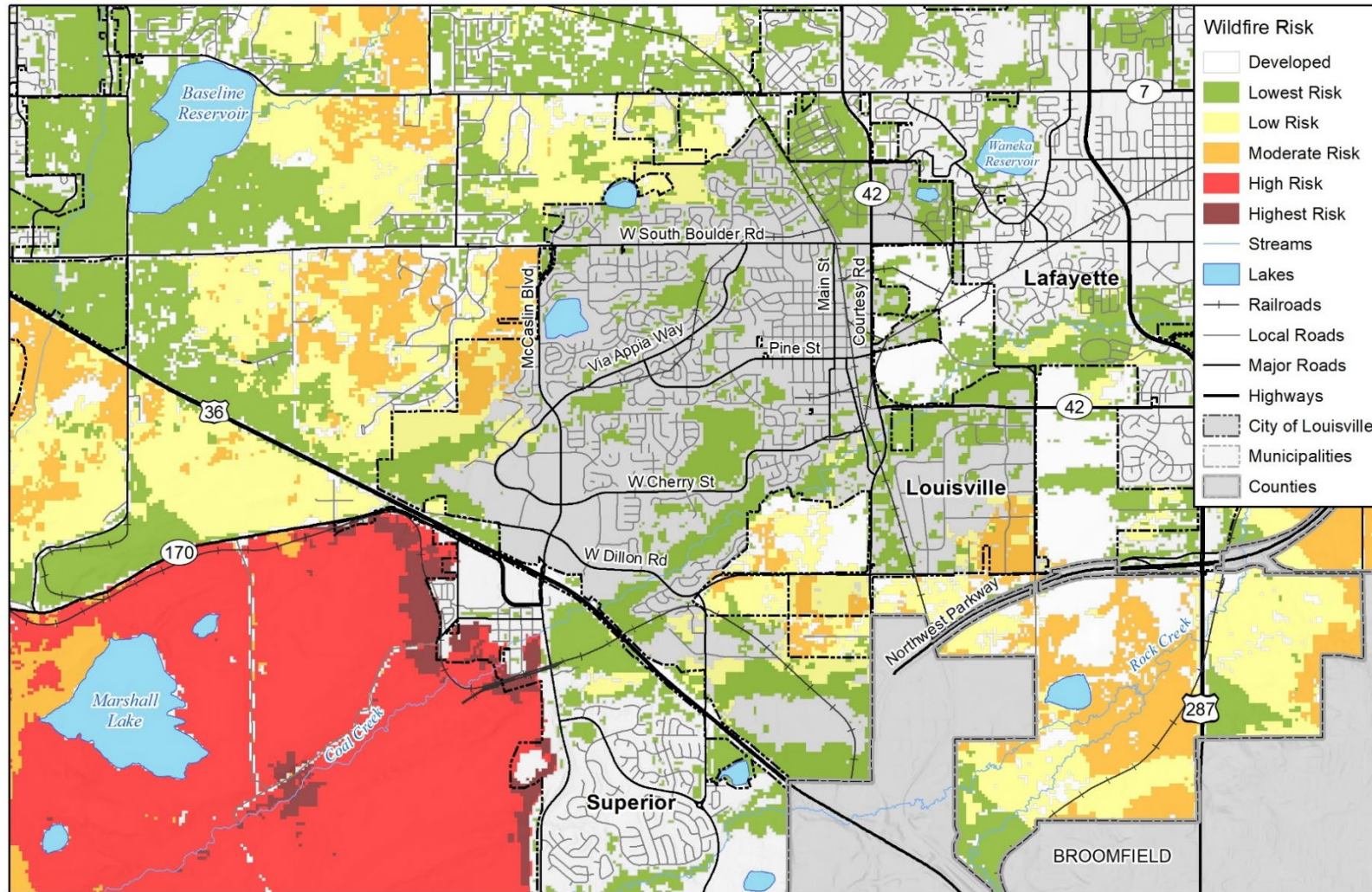
Table E-14 Properties within the Highest to Lowest Wildfire Risk

Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Highest Wildfire Risk						
Exempt	1	1	\$322,500	\$322,500	\$645,000	
Total	1	1	\$322,500	\$322,500	\$645,000	0
Moderate Wildfire Risk						
Exempt	3	7	\$7,166,200	\$7,166,200	\$14,332,400	
Industrial	2	9	\$26,387,300	\$39,580,950	\$65,968,250	
Residential	8	18	\$4,652,581	\$2,326,291	\$6,978,872	44
Total	13	34	\$38,206,081	\$49,073,441	\$87,279,522	44
Low Wildfire Risk						
Agricultural	1	9	\$110,800	\$110,800	\$221,600	
Commercial	4	12	\$13,255,300	\$13,255,300	\$26,510,600	

Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Exempt	3	24	\$0	\$0	\$0	
Industrial	1	2	\$3,919,700	\$5,879,550	\$9,799,250	
Mixed Use	2	4	\$298,200	\$298,200	\$596,400	10
Residential	53	64	\$23,054,200	\$11,527,100	\$34,581,300	159
Vacant	1	2	\$304,800	\$304,800	\$609,600	
Total	65	117	\$40,943,000	\$31,375,750	\$72,318,750	169
Lowest Wildfire Risk						
Agricultural	3	5	\$728,800	\$728,800	\$1,457,600	
Commercial	9	33	\$24,172,800	\$24,172,800	\$48,345,600	
Exempt	27	70	\$53,440,200	\$53,440,200	\$106,880,400	
Industrial	35	28	\$92,204,000	\$138,306,000	\$230,510,000	
Mixed Use	1	4	\$9,672,400	\$9,672,400	\$19,344,800	10
Residential	882	1,174	\$443,552,866	\$221,776,433	\$665,329,299	2,841
Vacant	1	1	\$698,000	\$698,000	\$1,396,000	
Total	958	1,315	\$624,469,066	\$448,794,633	\$1,073,263,699	2,851

Source: Boulder County Assessor's Office, U.S. Census, DOLA, Colorado Forest Service - Colorado State Forest Service, Wood Analysis

Figure E-3 City of Louisville Wildfire Risk



Map compiled 3/2022;
intended for planning purposes only.
Data Source: Boulder County, CDOT,
Colorado Forest Service - Colorado State Forest Service

0 1 2 Miles



Wildland-Urban Interface Risk

The Colorado Forest Atlas also provides an analysis for Wildland-Urban Interface (WUI) risk based on housing density consistent with Federal Register National standards. The location of people living in the wildland-urban interface and rural areas is essential for defining potential wildfire impacts to people and homes. To calculate the WUI Risk Index, the WUI housing density data was combined with flame length data and response functions were defined to represent potential impacts. The response functions were defined by a team of experts led by Colorado State Forest Service staff. By combining flame length with the WUI housing density data, it is possible to determine where the greatest potential impact to homes and people is likely to occur. The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. For example, areas with high housing density and high flame lengths are rated -9, while areas with low housing density and low flame lengths are rated -1. Data is modelled at a 30-meter cell resolution, which is consistent with other Colorado WRA layers. WUI Risk for Louisville is mapped in Figure E-4.

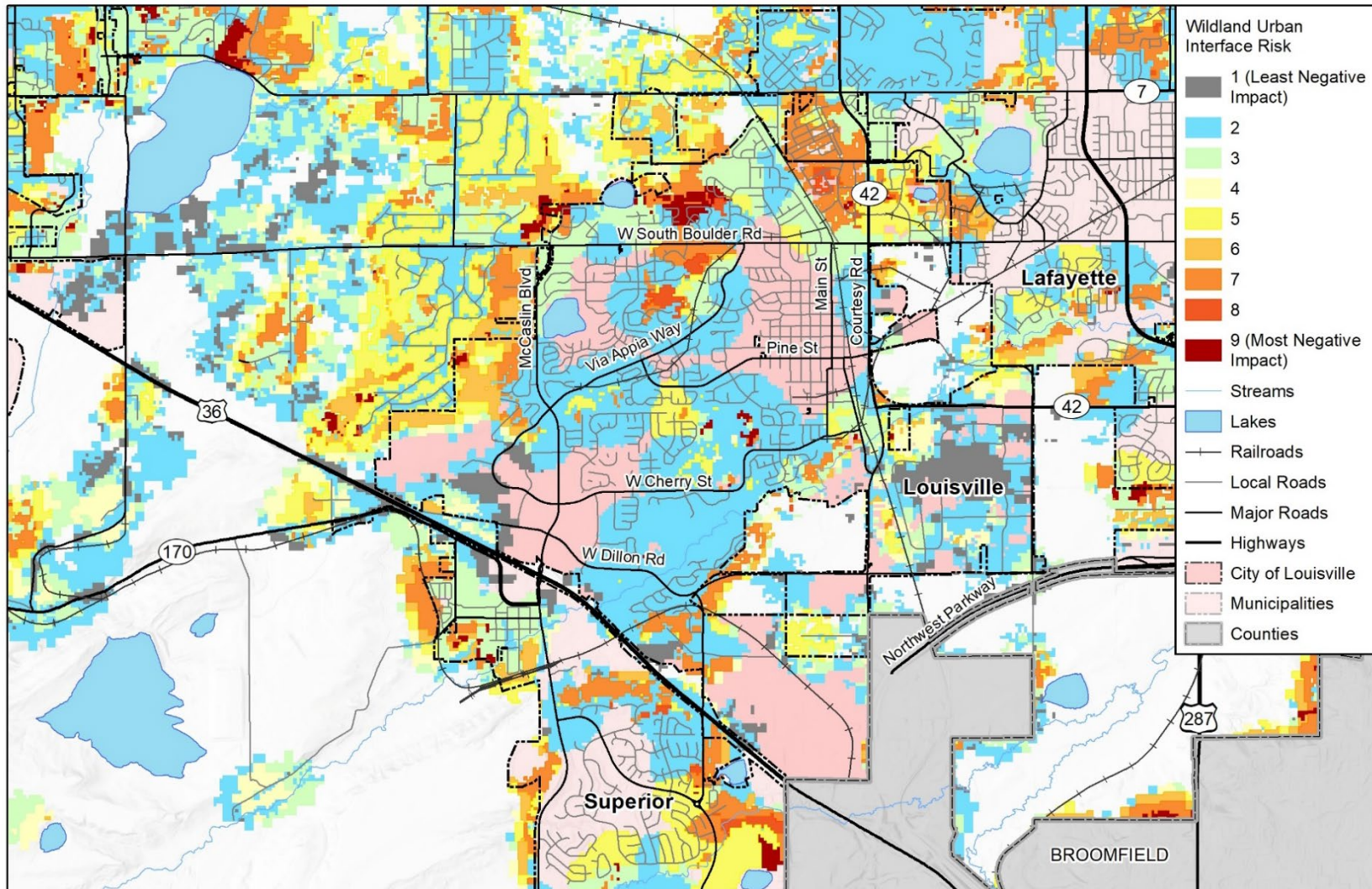
Based on this analysis Louisville has 1,095 structures within WUI risk areas, 978 of which are at moderate to high WUI risk. Residential property types have the greatest number of structures (986) within WUI risk areas. Note, this analysis does not account for urban conflagration or the losses from the December 2021 Marshall Fire. Based on what the City of Louisville experienced in the Marshall Fire, the risk within these WUI areas increase in extreme wind conditions.

Table E-15 Properties Within High to Low WUI RISK

Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
High WUI Risk						
Commercial	1	1	\$1,411,700	\$1,411,700	\$2,823,400	
Exempt	9	18	\$24,620,500	\$24,620,500	\$49,241,000	
Residential	537	559	\$279,362,492	\$139,681,246	\$419,043,738	1,353
Total	547	578	\$305,394,692	\$165,713,446	\$471,108,138	1,353
Moderate WUI Risk						
Commercial	19	15	\$20,353,300	\$20,353,300	\$40,706,600	
Exempt	8	12	\$10,205,200	\$10,205,200	\$20,410,400	
Industrial	25	9	\$33,372,000	\$50,058,000	\$83,430,000	
Residential	473	363	\$210,016,311	\$105,008,156	\$315,024,467	878
Vacant	1	1	\$698,000	\$698,000	\$1,396,000	
Total	526	400	\$274,644,811	\$186,322,656	\$460,967,467	878
Low WUI Risk						
Agricultural	1	9	\$110,800	\$110,800	\$221,600	
Commercial	4	12	\$13,255,300	\$13,255,300	\$26,510,600	
Exempt	3	24	\$0	\$0	\$0	
Industrial	1	2	\$3,919,700	\$5,879,550	\$9,799,250	
Mixed Use	2	4	\$298,200	\$298,200	\$596,400	10
Residential	53	64	\$23,054,200	\$11,527,100	\$34,581,300	159
Vacant	1	2	\$304,800	\$304,800	\$609,600	
Total	65	117	\$40,943,000	\$31,375,750	\$72,318,750	169

Source: Colorado State Forest Service, Boulder County Assessor's Office, Wood GIS Analysis

Figure E-4 City of Louisville Wildland Urban Interface Risk



Map compiled 3/2022;
intended for planning purposes only.
Data Source: Boulder County, CDOT,
Colorado Forest Service - Colorado State Forest Service

0 1 2 Miles



People

The last column of Table E-14 and Table E-15 above summarizes the number of people at risk to wildfire in the analyzed fire zones. Based on the assessment conducted, Louisville has an estimated 44 people living within the moderate wildfire risk zone. No residential properties were identified in the high wildfire risk zone. In terms of people living within WUI risk areas, an estimated 2,400 residents live within the low to high WUI risk areas. Of those, 2,231 are estimated to be living within the moderate to high WUI risk areas. In addition to living within wildfire or WUI risk areas, smoke resulting from wildfires, even fires outside of Boulder County or the state have been an issue for people in Louisville and Boulder County in the past.

Critical Facilities and Infrastructure

The City of Louisville has a total of 6 critical facilities at lowest to moderate risk to wildfire. Most (3) facilities are identified as being a food, water, shelter lifeline. These include the Louisville No.1 dam, a Red Cross Shelter and a City wastewater treatment plan. The safety and security lifeline has the second most facilities identified (2) at risk and include a fire station, Louisville Station 3 and a Boulder County Building. There are also 41 critical facilities within the low to high WUI Risk. The following tables show the results of the GIS analysis and is organized by wildfire or WUI risk and Lifeline. Refer to Chapter 4 of the Base Plan for more information on the methodology of the GIS analysis.

Table E-16 Critical Facilities Within Wildfire Risk Areas by FEMA Lifeline

FEMA Lifeline	Count
Moderate Wildfire Risk	
Safety and Security	1
Total	1
Low Wildfire Risk	
Food, Water, Shelter	1
Total	1
Lowest Wildfire Risk	
Communications	1
Food, Water, Shelter	2
Safety and Security	1
Total	4
Grand total	6

Source: Boulder County, CDOT, CDPHE, NBI, NID, HIFLD, Wood Analysis

Table E-17 Critical Facilities Within WUI Risk Areas by FEMA Lifeline

FEMA Lifeline	Count
High WUI Risk	
Food, Water, Shelter	1
Safety and Security	1
Total	2
Moderate WUI Risk	
Health and Medical	2
Total	2
Low WUI Risk	

FEMA Lifeline	Count
Communications	5
Food, Water, Shelter	1
Hazardous Material	1
Health and Medical	4
Safety and Security	22
Transportation	4
Total	37
Grand Total	41

Source: Boulder County, CDOT, CDPHE, NBI, NID, HIFLD, Wood Analysis

Economy

Tourism, the accommodation and food services industry (e.g., hotels and restaurants), and retail are major components of Boulder County's economy, and Louisville's as well. Wildland fires can, for example, lead to significant tourism reductions due to health and safety concerns, causing lost revenues from lack of visitation, stays in hotels, spending on restaurants and other commerce sources, and more.

Historical, Cultural and Natural Resources

Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the climate change trend which is leading to hotter, more widespread, and destructive fires can make it more difficult for the environment to recover, and lead to increased flood runoff or other secondary/cascading hazards, such as erosion, landslides, mudslides, and debris flows, and flooding. This can severely impact water quality and watershed health for years after a fire. Wildfires can negatively impact air quality, water quality, and vegetation and biodiversity.

With regards to historic or cultural structures and resources, wildfires would affect those in similar ways as general property and critical facilities/infrastructure, having the potential for burn downs and hence possible complete loss of important historical assets.

E.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 summarizes Louisville's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

E.6.1 Mitigation Capabilities Summary

Table E-18 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Louisville.

Table E-18 Louisville's Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, codes, plans)	Yes/No	Comments
Comprehensive plan	Yes	Louisville Comprehensive Plan, 2013

Regulatory Tool (Ordinances, codes, plans)	Yes/No	Comments
Zoning ordinance	Yes	Louisville Municipal Code
Subdivision ordinance	Yes	Louisville Municipal Code
Growth management ordinance	Yes	Louisville Comprehensive Plan, 2013
Site plan review requirements	Yes	Louisville Municipal Code
Floodplain ordinance	Yes	Louisville Municipal Code
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Louisville Municipal Code and Louisville Public Works
Building code	Yes	International Building Code, 2018
BCEGS Rating	No	
Fire department ISO rating	Yes	2 out of 10
Erosion or sediment control program	Yes	Louisville Land Municipal Code
Stormwater management program	Yes	Louisville Public Works
Capital improvements plan	Yes	Louisville Public Works
Economic development plan	Yes	Louisville Economic Vitality Department
Local emergency operations plan	Yes	Louisville Police Department
Other special plans	Yes	Drought Management Plan, Open Space Master Plan, Comprehensive Plan of Fire and Emergency Services 2005-2015
Flood insurance study or other engineering study for streams	Yes	FEMA Flood Insurance Study, August 15, 2019
Elevation certificates	Yes	Noneffective after 2019 map update
Community Wildfire Protection Plan (CWPP)	No	
Participate in the National Flood Insurance Program (NFIP)	Yes	Joined: 5/4/1973
Participate in Community Rating System (CRS)	Yes	Class 6

Table E-19 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Louisville.

Table E-19 Louisville’s Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Public Works Department and Planning & Building Safety Department staff members	Public Works Director, City Engineer, Civil Engineer III, Planning Director, Planner III
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works Department and Planning & Building Safety Department	Public Works Director, City Engineer, Civil Engineer III, Planning Director, Chief Building Official, and Building Inspectors.
Planner/engineer/scientist with an understanding of natural hazards	No		
Personnel skilled in GIS	Yes	Staff members in the following Departments: City Manager’s Office, Public Works Dept.,	There is no one centralized location for GIS. Staff throughout the organization are skilled in the use of GIS at various levels.

Personnel Resources	Yes/No	Department/Position	Comments
		Planning & Building Safety Dept., PROS – Parks, Recreation & Open Space, and IT	
Full-time building official	Yes	Planning & Building Safety Department	Chief Building Official
Floodplain manager	Yes	Planning & Building Safety Dept., Director	
Emergency manager	Yes	Partner of Boulder Office of Emergency Management	
Grant writer	No		No specific person designated for the organization
Other personnel	No		
GIS Data – Hazard areas	Yes	Personnel are throughout the organization – no centralized GIS team	
GIS Data – Critical facilities	Yes	Personnel are throughout the organization – no centralized GIS team	
GIS Data – Building footprints	Yes	Personnel are throughout the organization – no centralized GIS team	
GIS Data – Land use	Yes	Personnel are throughout the organization – no centralized GIS team	
GIS Data – Links to assessor's data	Yes	Personnel are throughout the organization – no centralized GIS team	
Warning systems/services	Warning systems/services	Warning systems/services	Warning systems/services
(Reverse 9-11, cable override, outdoor warning signals)	Yes	City of Louisville	City also operates low power FM Radio Station
Transportation Planner	Yes	Personnel are throughout the organization – including Planning & Building Safety, Public Works, City Manager's Office	
Resiliency Planner	Yes	Personnel are throughout the organization – including Planning & Building Safety, Public Works, City Manager's Office	

Table E-20 identifies financial tools or resources that Louisville could potentially use to help fund mitigation activities.

Table E-20 Louisville’s Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Y/N)	Comments
Community Development Block Grants	Yes	
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	No	
Incur debt through private activities	No	
Withhold spending in hazard-prone areas	No	
Stormwater Service Fees	Yes	

Table E-21 identifies education and outreach mitigation capabilities that Louisville currently has in place.

Table E-21 Louisville’s Education & Outreach Mitigation Capabilities

Education & Outreach	Y/N
Local citizen groups that communicate hazard risks	No
Firewise	No
StormReady	No
Other	Annual flood awareness and flood safety outreach- Mile High Flood District completes annual high risk notifications and City communications required by CRS certification through NFIP

E.6.2 Opportunities for Capability Enhancement and Improvement

The plan update process provided the city with an opportunity to review and update the capabilities currently in place to mitigate hazards. This also provided an opportunity to identify where capabilities could be improved or enhanced. Specific opportunities could include:

- Integrating risk assessment information into future updates to the City’s Comprehensive Plan.
- Integrating risk assessment information into future updates of the City’s Land Use Code.
- Providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and DHSEM
- Developing a Community Wildfire Protection Plan.
- Becoming a Firewise community.
- Becoming a StormReady community.
- Expanding staffing and other resources to address hazard planning and resiliency.

E.6.3 Community Rating System Activities (All Hazards)

National Flood Insurance Program (NFIP)

The City of Louisville joined the National Flood Insurance Program (NFIP) on May 4, 1973. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds. Community Rating System (CRS) on The CRS is a voluntary program for NFIP-participating communities. It provides flood insurance discounts to policyholders in communities that provide extra measures of flood above the minimum NFIP requirements. As of 2022, Louisville had a CRS class rating of 6 (one a scale of 1-10, 1 being the best). This rating provides a 15 percent discount for policyholders within a special flood hazard area (SFHA) and a 5 percent discount for those outside of an SFHA.

NFIP insurance data indicates that as of March 2022, there were 58 policies in force in Louisville, resulting in 17,504,900 of insurance in force. There are no repetitive loss properties located in the City of Louisville.

Continued Compliance with the NFIP

Recognizing the importance of the NFIP in mitigating flood losses, the City of Louisville will place an emphasis on continued compliance with the NFIP. As an NFIP participant, the city has and will continue to make every effort to remain in good standing with NFIP. This includes continuing to comply with the NFIP's standards for updating and adopting floodplain maps and maintaining and updating the floodplain zoning ordinance as well as review of any potential development in special flood hazard areas.

Community Rating System Categories

The Community Rating System (CRS) categorizes hazard mitigation activities into six categories. These categories, and applicable Louisville activities, are described below. Note: some of the activities are appropriate to multiple categories. For purposes of simplicity, they are only included in the category deemed most appropriate based on the definitions and examples provided in the CRS Coordinator's Manual.

Preventive

Preventive activities keep problems from getting worse. The use and development of hazard-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

City of Louisville Comprehensive Plan (2013)

The City's Comprehensive Plan gives general guidance, establishing a Vision Statement with 13 Core Community Values and a flexible Framework Plan with supporting community-based principles, policies, and implementation strategies recommended by the Planning Commission and adopted City Council to realize the community's vision for the City. The Vision Statement with its 13 Core Community Values and the Framework plan with its supporting principles and policies cover a broad range of subject matter related to aspirations, services, and issues needing to be addressed within Louisville. Combined, these elements serve to direct future policy decisions to preserve vital community attributes and service levels and manage growth.

Louisville Municipal Code

Title 17 Zoning (Includes Floodplain Zoning) : The Ordinances codified in chapters 17.04 through 17.72 are enacted for the purpose of promoting the health, safety, morals, convenience, order, prosperity and welfare of the present and future inhabitants of the city, by lessening congestion in the streets and roads; by securing safety from fire and other dangers; by providing adequate light and air; by avoiding undue

congestion of population and facilitating the adequate provision of transportation, water, schools, sewerage and other public requirements through the classification of land uses and the distribution of land development and utilization; and by other means in accordance with a comprehensive development plan and the zoning map adopted in section 17.04.060.

Ordinance No. 1625, Series 2012: An ordinance repealing and reenacting with amendments Chapter 17.56 of the Louisville Municipal Code concerning floodplain zoning was adopted November 20, 2012. This ordinance adopted the model floodplain zoning code developed by the Federal Emergency Management Agency (FEMA) the minimum standards for floodplain development codes developed by the State of Colorado. This adopted ordinance was reviewed by representatives from FEMA and the Colorado Water Conservation Board for compliance.

Ordinance No. 1764, Series 2018: An ordinance adopting by reference the 2018 editions of the International Building Code, including the International Residential Code, International Mechanical Code, International Fuel Gas Code, International Energy Conservation Code, International Fire Code, International Existing Building Code, International Property Maintenance Code, International Plumbing Code, and the 1997 Uniform Code for the Abatement of Dangerous Building; enacting certain amendments to the foregoing international codes; amending, repealing and reenacting certain sections of Title 15 of the Louisville Municipal Code in connection with the adoption of the foregoing international codes; and establishing penalties for violations of such codes was adopted August 27, 2018.

Ordinance No. 1751, Series 2017: An Ordinance Adopting the 2017 National Electric Code: Title 4 City Open Space: This title establishes a board of citizens to advise City staff and council on matters related to the acquisition, management, restoration, preservation, and use of open space lands and establishes standards for the acquisition, management, restoration, use, and preservation of such open space lands.

Title 13 Water and Sewers: This title includes provisions to construct, operate, and maintain stormwater facilities and to establish a methodology and requirement for the payment of reasonable stormwater utility fees for property owners to pay for a share of the costs of improvements and facilities reasonably necessary to manage stormwater. Furthermore, it promotes the general public health, safety, and welfare by reducing the potential for the movement of emergency vehicles to be impeded or inhibited during storm or flooding periods; by minimizing storm and flood losses, inconvenience, and damage resulting from runoff; and by promoting activities which improve the water quality of runoff in the City of Louisville.

Title 16 Subdivisions—Among the purposes of these regulations, as they relate to hazard mitigation, are the following:

- To promote the health, safety, convenience, order, prosperity and welfare of the present and future inhabitants of the city
- To promote orderly growth and to provide for the harmonious development of the City in accordance with its comprehensive plan
- To provide for adequate light, air, and privacy and to secure safety from fire, flood, and other danger
- To ensure that public facilities and services are available and will have sufficient capacity to serve the development
- To mitigate the pollution of air, streams, and ponds; assure the adequacy of drainage facilities; safeguard the water table; and encourage the wise use and management of the natural environment
- To preserve and enhance to the extent reasonably possible the natural beauty and topography of the city and areas of historical or archeological importance and to ensure appropriate development with regard to such natural, historical and archaeological sites and features
- To otherwise plan for and regulate the use of land so as to provide planned and orderly use of land and protection of the environment in a manner consistent with constitutional rights

Design standards require consideration of steep land, areas having inadequate drainage, and other natural hazard areas and limit development as necessary.

Other

Most areas identified as geologic hazard areas are protected as open space, thus prohibiting development.

The City's Engineering Department has an ongoing maintenance program for inspecting storm drainage facilities. The department also provides detailed hydraulic modeling to identify any deficiencies and what improvements are necessary. The city is currently following the Louisville/Boulder County Outfall System Plan, as completed in 1982, for necessary improvements to the stormwater system. Developers are responsible for completing elements of the outfall system to meet the City's land development and engineering codes.

The City's Stormwater Storm Drainage Design and Technical Criteria (1982) presents the minimum design and technical criteria for the analysis and design of storm drainage systems.

Property Protection

Property protection activities are usually undertaken by property owners on a building-by-building or parcel basis.

No current projects/activities.

Natural Resource Protection

Natural protection activities preserve or restore natural areas or their natural functions. They are usually implemented by parks, recreation, or conservation agencies or organizations.

The city provides a balanced system of open space composed of environmentally sensitive areas, natural areas, wildlife corridors, habitat areas, trails, and greenways using a variety of conservation methods to meet both the needs of the citizens and the City's resource protection goals.

The City's Open Space Master Plan inventoried, classified, and provided management direction for 26 City-owned and 10 jointly owned properties. While it provides detailed direction for managing and enhancing the cultural, agricultural, recreational, and ecological resources, it does not target any land for future acquisition.

Emergency Services

Emergency services measures are taken during an emergency to minimize its impacts. These measures are the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

The City's Drought Management Plan (2014) (<https://www.louisvilleco.gov/home/showdocument?id=448>) is a guide for the varying degrees of drought experienced in the normal variations of weather patterns. It identifies the conditions that formally place the City in a designated level of drought and pre-determine the general responses appropriate for given drought conditions. It also establishes the general framework for when drought conditions require special communications with residents and the type of information anticipated to be communicated.

The Louisville Fire Protection District provides fire protection and emergency medical services through a predominantly volunteer staff. The district has a comprehensive plan of fire and emergency services 2005–2015. The purposes of the plan are to provide a framework to review the basic organizational and performance requirements of the fire department, identify goals and objectives, and use as a basis to project programming and fire service policy.

The City's Public Works Operations Division has a Snow Control Plan to keep streets safe and accessible during periods of ice and snow. The goal is to provide snow and ice control services on all major City streets and to plow selected streets through subdivisions to provide access and egress to citizens' homes. Streets are cleared according to established priorities. Priorities are set based on traffic volume, public safety, and access to emergency facilities and schools.

Structural Projects

Structural projects keep hazards away from an area (e.g., levees, reservoirs, other flood control measures). They are usually designed by engineers and managed or maintained by public works staff.

No current projects/activities.

Public Information

Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of natural resources (e.g., local floodplains). They are usually implemented by a public information office.

The City's Planning Department invites property owners to visit its office or email them for information regarding whether or not their property is in a flood zone (and if so, which one). A flood insurance rate map information form is available on the City's web site.

The City's Public Works Operations Division posts a snow removal map along with safety tips on their web site.

E.7 Louisville Mitigation Projects

A review of 2016 mitigation actions progress reports indicates that the City of Louisville has been successful in implementing actions identified in the 2016 HMP Mitigation Strategy, thus, working diligently towards meeting the 2016 plan goals. The Louisville's 2016 mitigation strategy contained 14 mitigation actions. As of March 2022, 7 of these actions have been completed, 1 deferred and 6 are continuing. The table below summarizes progress implementing mitigation actions. The New Actions in 2022 are included in the mitigation action worksheets following Table E-22.

Table E-22 Mitigation Action Progress Summary

Mitigation actions	Responsible Office	Status	Estimated Completion Date	Priority Then	Priority Now
Drainageway 7-1	Public Works	Continuing-Not Started	2025	High	High
Coal Creek Station piping	Public Works	Continuing-In Progress	2024	High	High
Bullhead Gulch underpass	Public Works	Deferred due to railroad requirements	-	High	-
Cottonwood Park Floodplain	Public Works	Continuing-In Progress	Spring 2023	High	High
96 th and Dillon Drainageway G	Public Works	Continuing-In Progress	2022	High	High
Goodhue Ditch Diversion at Coal Creek	Public Works	Continuing-In Progress	2028	High	High

Mitigation actions	Responsible Office	Status	Estimated Completion Date	Priority Then	Priority Now
Dual 30" RCP for Highway 42	Public Works	Continuing-Not Started	2030	High	High
Post-Disaster Code Enforcement Projects	Planning & Building Safety	Not Started	2024	N/A	High
Enhance Communications through Hazard Awareness/Emergency Preparedness Campaign and Evaluation of Current System	CMO	Not Started	2022	N/A	Medium
Water Meter Replacement	Public Works	Not Started	2024	N/A	High
Install 2 MG Water Tank	Public Works	Not Started	2030	N/A	High
Generator Upgrade (South Water Treatment Plant)	Public Works	Not Started	2024	N/A	High
Identifying Wildfire Mitigation Hazards/Opportunities on Public Lands	Open Space CMO	In Progress	2023	N/A	High
Personnel/Staffing to Build Organizational Capacity around Wildfire Resilience	CMO	Not Started	2022	N/A	High
Land Management for Wildfire Prevention	Open Space Public Works CMO	In Progress	TBD	N/A	High
Ditch Clearing for Wildfire Prevention	Open Space Public Works CMO	Not Started	TBD	N/A	High
Implementation of Wildfire Risk Assessment Findings	Open Space Public Works CMO	Not Started	TBD	N/A	High
Enhance Communications across Fire Districts	Police Fire CMO	Not Started	TBD	N/A	High
Public Education Programs	Police Fire CMO Planning & Building Safety	Not Started	TBD	N/A	High
Expanding Wildfire Partners program	CMO Planning & Building Safety	Not Started	TBD	N/A	High
Emergency Preparedness	Police Fire CMO	Not Started	TBD	N/A	High

Mitigation actions	Responsible Office	Status	Estimated Completion Date	Priority Then	Priority Now
Organization Capacity Building around Disaster Management	Police Fire CMO	Not Started	TBD	N/A	High
Data Networks/ Telecommunications Resiliency	Public Works IT	Not Started	TBD	N/A	High
City Emergency Operations Center upgrade	Police IT	Not Started	TBD	N/A	High
Generator Upgrade for Critical Facilities	Public Works	Not Started	TBD	N/A	High
Power Backup for Critical Facilities	IT Public Works	Not Started	TBD	N/A	High

Name of Action: 96th and Dillon Piping, Drainageway G

Hazards Addressed: Flooding

Mitigation Goal or Objective Addressed: Goal 2

Issue/Background: Piping, culverts crossing Dillon to be installed by developer

Other Alternatives: No action

Action Status: Continue-In progress. Under Construction. Will be completed in 2022.

Responsible Office: Public Works

Priority (High, Medium, Low): High

Cost Estimate: \$200,000

Existing or Potential Funding: FEMA HMA grants

Benefits (avoided losses): Piping reduces risk for additional flooding and hazardous conditions to people, property, facilities and the environment.

Schedule: 2022

Name of Action: Coal Creek Station Piping

Hazards Addressed: Flooding

Mitigation Goal or Objective Addressed: Goal 1 and Goal 2

Issue/Background: Piping when development occurs. Development is being planned and expected to be complete by 2022-2025

Other Alternatives: No action

Action Status: Continue-In progress . Development is in design with a plat/PUD. Construction plans have not been submitted for review yet. Waiting on developer to submit construction plans for review.

Responsible Office: Public Works

Priority (High, Medium, Low): High

Cost Estimate: \$500,000

Existing or Potential Funding: FEMA HMA grants

Benefits (avoided losses): Piping to reduce risk for additional flooding and hazardous conditions to people, property, facilities and the environment.

Schedule: 2022.

Name of Action: Cottonwood Park Floodplain

Hazards Addressed: Flooding

Mitigation Goal or Objective Addressed: Goal 1 and Goal 2

Issue/Background: Remove townhomes from floodplain

Other Alternatives: No action

Action Status: Continue-In progress . In design stages of the project as of March 2022.

Responsible Office: Public Works Dept. in coordination with Mile High Flood District.

Priority (High, Medium, Low): High

Cost Estimate: \$1,200,000

Existing or Potential Funding: FEMA HMA grants, Mile High Flood District funding.

Benefits (avoided losses): Removal from floodplain reduces risk for additional flooding and hazardous conditions to people, property, facilities and the environment.

Potential or current subject matter expertise:

Schedule: Currently in design. Construction to start in Fall 2022 and Complete in Spring 2023. .

Name of Action: Drainageway 7-1 Improvements

Hazards Addressed: Flooding

Mitigation Goal or Objective Addressed: Goal 1, reduce the loss of life and personal injuries from hazard events and Goal 2, reduce impacts of hazard events on property, critical facilities/infrastructure and the environment.

Issue/Background: Build channel on Harney Lastoka Open Space

Other Alternatives: No action

Action Status: Continue-Not started. The project will move forward after completion of the Coal Creek Station development project (see above).

Responsible Office: Public Works Department in conjunction with Mile High Flood District.

Priority (High, Medium, Low): High

Cost Estimate: \$3,000,000

Existing or Potential Funding: FEMA HMA grants and Mile High Flood District funding

Benefits (avoided losses): Channel improvements reduce risk for additional flooding and hazardous

conditions to people, property, facilities, and the environment.

Schedule: 2028. Will begin design upon completion of the Coal Creek Station project (see above)

Name of Action: Dual 30" RCP for Highway 42

Hazards Addressed: Flooding

Mitigation Goal or Objective Addressed: Goal 1, reduce the loss of life and personal injuries from hazard events and Goal 2, reduce impacts of hazard events on property, critical facilities/infrastructure and the environment.

Issue/Background: Master Drainage Plan, pipes under Highway 42 to address flooding at Miner's Field. Storm flow diverted around upstream of Miner's Field to storm sewer at Spruce Street.

Other Alternatives: No action

Action Status: Continue-Not Started. Pending Funding and any improvements on Highway 42 to complete work in conjunction with the road project.

Responsible Office: Public Works department in conjunction with Mile High Flood District. **Priority (High, Medium, Low):** High

Cost Estimate: \$350,000

Existing or Potential Funding: FEMA HMA grants and Mile High Flood District funding

Benefits (avoided losses): Piping reduces risk for additional flooding and hazardous conditions to people, property, facilities and the environment.

Schedule: 2030

Name of Action: Goodhue Ditch Diversion at Coal Creek

Hazards Addressed: Flooding

Mitigation Goal or Objective Addressed: Goal 1, reduce the loss of life and personal injuries from hazard events and Goal 2, reduce impacts of hazard events on property, critical facilities/infrastructure and the environment.

Issue/Background: Diversion at ditch through Coal Creek Station and Drainageway 7-1 (after those 2 projects complete). To be completed by developer with Coal Creek Station piping. However, Drainageway 7-1 requires completion before it can be fully implemented.

Other Alternatives: No action

Action Status: Continue-Not started. Drainageway 7-1 requires completion before it can be fully designed and constructed.

Responsible Office: Public Works Department in conjunctions with the Mile High Flood District

Priority (High, Medium, Low): High

Cost Estimate: \$300,000

Existing or Potential Funding: FEMA HMA grants and Mile High Flood District funding

Benefits (avoided losses): Diversion reduces risk for additional flooding and hazardous conditions to

people, property, facilities and the environment.

Potential or current subject matter expertise:

Schedule: 2028

Name of Action: Post-Disaster Code Enforcement Projects

Hazards Addressed: Wind, Wildfire, Flood, Earthquake, Expansive Soils, Subsidence, Tornado.

Mitigation Goal or Objective Addressed: Goals 1 through 4

Issue/Background: After the Marshall Fire, as Louisville looks toward rebuilding, the City is facing extraordinary needs associated with enforcing local building codes during post-disaster reconstruction. In addition, the complexity of the debris removal process will also outstrip our ability to resource code enforcement and administration staff. We aim to ensure that enforcement and inspection processes are in compliance with all applicable laws and ordinances in our post-disaster recovery period.

Buildings built back to code will mitigate against wind and other hazards and ensure that all other disaster-resistant codes are implemented during disaster reconstruction. Hazards associated with structures built out of compliance with current local to national regulations and best practices for ignition resistant construction. Will prevent rebuilding post-disaster without adequate oversight, resulting in hazardous materials, practices, or methods applied in reconstruction. Avoids economic impacts from slowed, delayed, or halted reviews and approvals.

Other Alternatives: No action

Action Status: New in 2022

Responsible Office: City of Louisville, Building and Planning Department State of Colorado, CDPS

Priority (High, Medium, Low): High

Cost Estimate: \$730,000 annual. \$1,825,000 total.

Existing or Potential Funding: No existing funding. City funds are currently inadequate to fund the numbers and types of positions we need for the duration we need them. Potential funding: FEMA HMA grants, State grants

Benefits (avoided losses): Avoid delays in reconstruction due to lack of staff and capacity to perform all elements of the building inspection process. Avoid local economic impacts caused by delays in the rebuilding process. Avoid properties rebuilt with substandard work, not to code, or a variety of other issues by resourcing adequate staff to manage the unprecedented increase in reviews and inspections needed. Ensure rebuilt homes are built to all applicable standards that help to prevent hazards that may spread to other properties or worsen an active disaster incident.

Schedule: December 31, 2024

Name of Action: Enhance Communications through Hazard Awareness/Emergency Preparedness Campaign and Evaluation of Current System

Hazards Addressed: All Hazards

Mitigation Goal or Objective Addressed: Goal 1 and Goal 4

Issue/Background: Implement projects from Boulder County Community Wildfire Protection Plan and Marshall Fire After-Action Report in an effort to enhance communications and increase hazard awareness and emergency preparedness.

Other Alternatives: None.

Action Status: New in 2022

Responsible Office: City of Louisville Administration, Boulder Office of Emergency Management

Priority (High, Medium, Low): Medium

Cost Estimate: TBD

Existing or Potential Funding: Existing: None. City funds are currently inadequate to fund the campaign and study. Potential: FEMA HMA grants

Benefits (avoided losses): Avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.

Schedule: 2022

Name of Action: Water Meter Replacement

Hazards Addressed: Wildfire, Drought

Mitigation Goal or Objective Addressed: Goals 1 and 2

Issue/Background: Water meters will be replaced throughout the City with smart meters and wireless remote shutoff valves. Water meters that are currently located in basements/crawlspace will be relocated outside into a meter pit by the sidewalk. This will prevent meters from being destroyed during a house fire and prevent possible contamination of the potable water system during a fire due to loss of water pressure. The remote shut off valve will allow the city to turn off water to destroyed homes remotely to keep pressure in the water system for fighting fires. Additionally, the smart meters can detect and report leaks to home owners, which can be used to reduce water loss and increase supply/capacity and drought resistance.

Other Alternatives: None

Action Status: New in 2022

Responsible Office: Louisville Public Works Dept.

Priority (High, Medium, Low): High

Cost Estimate: \$15,100,000

Existing or Potential Funding: City Water Fund, FEMA HMGP

Benefits (avoided losses): This will prevent meters from being destroyed during a fire and prevent possible contamination of the potable water system during a fire due to loss of water pressure. The remote shut off valve will allow the city to turn off water to homes remotely to keep water pressure in the system for fighting fires.

Schedule: Start replacement in 2022 and complete in 2024

Name of Action: Install 2 MG Water Tank**Hazards Addressed:** Wildfire, Drought**Mitigation Goal or Objective Addressed:** Goals 1 and 2

Issue/Background: Install a new 2-million-gallon water tank within the water system. During the recent Marshall Fire, several fires were being fought and the City's supply ran critically low. Increasing storage capacity in the water system will allow more redundancy in the system and allow the City more capacity in a similar fire in the future. Additionally, a new water tank will increase the City's supply and capacity, which is critical for drought resistance.

Other Alternatives: None**Action Status:** New in 2022**Responsible Office:** Public Works**Priority (High, Medium, Low):** High**Cost Estimate:** \$3,500,000**Existing or Potential Funding:** City Water Fund, TBD

Benefits (avoided losses): During the recent Marshall Fire, several fires were being fought and the City's supply ran critically low. Increasing storage capacity in the water system will allow more redundancy in the system and allow the City more capacity in a similar fire in the future.

Schedule: 2030**Name of Action: Generator Upgrade at South Water Treatment Plant****Hazards Addressed:** Wildfire, Lightning, Windstorm, Winter Weather, Earthquake**Mitigation Goal or Objective Addressed:** Goals 1 and 2

Issue/Background: Upgrade or replace the current generator at the Howard Berry Water Treatment Facility to use diesel fuel. During the recent Marshall Fire, natural gas and electricity was turned off to the water plant. The plant could not operate during the fire because it had no power. The current generator only run on natural gas. Upgrading/replacing the generator would allow the plant to run in a similar fire scenario

Other Alternatives: None**Action Status:** New in 2022**Responsible Office:** Public Works**Priority (High, Medium, Low):** High**Cost Estimate:** \$500,000**Existing or Potential Funding:** City Water Fund, State grants, FEMA HMGP

Benefits (avoided losses): During the recent Marshall Fire, natural gas and electricity was turned off to the water plant. The plant could not operate during the fire because it had no power. The current generator only run on natural gas. Upgrading/replacing the generator would allow the plant to run in a similar fire scenario.

Schedule: 2024

Name of Action: Identifying Wildfire Mitigation Hazards/Opportunities on Public Lands

Hazards Addressed: Wildfire

Mitigation Goal or Objective Addressed: Goals 1, 2 and 4

Issue/Background: The City will hire a consultant to assist with identifying wildfire mitigation hazards/opportunities on public lands, including parks, open space, etc. within Louisville that is under the City's stewardship. The study will include consideration of protection of community assets/structures, analysis of risk areas that lead into and out of public lands and mitigation actions (i.e. wildfire resistant fencing).

This item is listed on City Council's 2022 Work Plan as a high priority. After completing the study, the City will define and refine mitigation opportunities based on the findings and focus on implementation.

Other Alternatives: None

Action Status: New in 2022

Responsible Office: City of Louisville Parks/Open Space, City Manager's Office

Priority (High, Medium, Low): High

Cost Estimate: \$50,000-\$100,000

Existing or Potential Funding: FEMA HMGP/BRIC, TBD

Benefits (avoided losses): Fire damage to public lands and potentially to private property.

Schedule: 2023

Name of Action: Personnel/Staffing to Build Organizational Capacity around Wildfire Resilience

Hazards Addressed: Wildfire

Mitigation Goal or Objective Addressed: Goal 3

Issue/Background: Manage collaboration across county municipalities/departments for wildfire resilience, particularly in urban/ WUI environment

Other Alternatives: No action

Action Status: TBD

Responsible Office: City Manager's Office

Priority (High, Medium, Low): High

Cost Estimate: TBD

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.

Schedule: 2022

Name of Action: Land Management for Wildfire Prevention

Hazards Addressed: Wildfire

Mitigation Goal or Objective Addressed: Goals 1-2

Issue/Background: Implement management programs on public lands, including mowing, prescribed grazing, etc. to address wildfire hazards

Other Alternatives: No action

Action Status: TBD

Responsible Office: Open Space, Public Works & City Manager's Office

Priority (High, Medium, Low): High

Cost Estimate: TBD

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Fire damage to public lands and potentially to private property.

Schedule: TBD

Name of Action: Ditch Clearing for Wildfire Prevention

Hazards Addressed: Multi-Hazard

Mitigation Goal or Objective Addressed: Goals 1-2

Issue/Background: Implement management programs on public lands, including ditch clearing, to address wildfire hazards and other disasters

Other Alternatives: No action

Action Status: TBD

Responsible Office: Open Space, Public Works & City Manager's Office

Priority (High, Medium, Low): High

Cost Estimate: TBD

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Fire damage to public lands and potentially to private property.

Schedule: TBD

Name of Action: Implementation of Wildfire Risk Assessment Findings

Hazards Addressed: Wildfire

Mitigation Goal or Objective Addressed: Goals 1-2

Issue/Background: Implement findings from Wildfire Risk Assessment on public lands

Other Alternatives: No action

Action Status: TBD

Responsible Office: Open Space, Public Works & City Manager's Office

Priority (High, Medium, Low): High

Cost Estimate: TBD

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Fire damage to public lands and potentially to private property.

Schedule: TBD

Name of Action: Enhance Communications across Fire Districts

Hazards Addressed: Multi-Hazard

Mitigation Goal or Objective Addressed: Goals 1-3

Issue/Background: Implement recommendations from after action report

Other Alternatives: No action

Action Status: TBD

Responsible Office: Police, Fire, City Manager's Office

Priority (High, Medium, Low): High

Cost Estimate: TBD

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Fire damage to public lands and potentially to private property.

Schedule: TBD

Name of Action: Public Education Programs

Hazards Addressed: Wildfire

Mitigation Goal or Objective Addressed: Goal 4

Issue/Background: Develop hazard awareness/ emergency preparedness campaign on human-caused fires, defensible space, landscaping & building resilient community & emergency preparedness (workshops, website, etc.)

Other Alternatives: No action

Action Status: TBD

Responsible Office: Police, Fire, City Manager's Office, Planning & Building Safety

Priority (High, Medium, Low): High

Cost Estimate: TBD

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Avoid loss of life and personal injuries due to lack of hazard awareness and

emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.

Schedule: TBD

Name of Action: Expanding Wildfire Partners Program

Hazards Addressed: Wildfire

Mitigation Goal or Objective Addressed: Goals 1-4

Issue/Background: Increased efforts/funding around home hardening, fencing, fire-resistance landscaping

Other Alternatives: No action

Action Status: TBD

Responsible Office: City Manager's Office, Planning & Building Safety

Priority (High, Medium, Low): High

Cost Estimate: TBD

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.

Schedule: TBD

Name of Action: Operational Emergency Preparedness/Evacuation Planning

Hazards Addressed: Multi-Hazard

Mitigation Goal or Objective Addressed: Goals 1-4

Issue/Background: Developing evacuation plans for every neighborhood and secure training/equipment for fire districts

Other Alternatives: No action

Action Status: TBD

Responsible Office: Police, Fire, City Manager's Office

Priority (High, Medium, Low): High

Cost Estimate: TBD

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.

Schedule: TBD

Name of Action: Organizational Capacity Building around Disaster Management**Hazards Addressed:** Multi-Hazard**Mitigation Goal or Objective Addressed:** Goal 3**Issue/Background:** Staff to coordinate with Boulder County, implement HMP projects, staff EOC, seek hazard mitigation funding, etc.**Other Alternatives:** No action**Action Status:** TBD**Responsible Office:** Police, Fire, City Manager's Office**Priority (High, Medium, Low):** High**Cost Estimate:** TBD**Existing or Potential Funding:** FEMA HMGP, TBD**Benefits (avoided losses):** Avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.**Schedule:** TBD**Name of Action: Data Networks/Telecommunications Resilience****Hazards Addressed:** Multi-Hazard**Mitigation Goal or Objective Addressed:** Goals 1-3**Issue/Background:** Investing in wireless/fiber to maintain communications for critical infrastructure (SCADA, City servers, etc.) during an emergency. This is essential for the City to continue monitoring water supply levels, etc.**Other Alternatives:** No action**Action Status:** TBD**Responsible Office:** Public Works, IT**Priority (High, Medium, Low):** High**Cost Estimate:** \$500,000**Existing or Potential Funding:** FEMA HMGP, TBD**Benefits (avoided losses):** Maintain essential services and avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.**Schedule:** TBD**Name of Action: City Emergency Operations Center Upgrade****Hazards Addressed:** Multi-Hazard

Mitigation Goal or Objective Addressed: Goals 1-3

Issue/Background: Invest in expansion of City's Emergency Operations Center (EOC) to include necessary equipment for smaller and larger disasters. Maintain communication during an emergency and critical services by acquiring additional radios, network connections, laptops, bidirectional amplifier, etc.

Other Alternatives: No action

Action Status: TBD

Responsible Office: Police, IT

Priority (High, Medium, Low): High

Cost Estimate: \$250,000

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Maintain essential services and avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.

Schedule: TBD

Name of Action: Generator Upgrade for Critical Facilities

Hazards Addressed: Multi-Hazard

Mitigation Goal or Objective Addressed: Goals 1-3

Issue/Background: Invest in generators to ensure continued functionality of critical facilities, including the Police Department (EOC), Recreation Center (designated shelter) & Library (designated shelter). Generators will need to be oversized to accommodate for future electrification and additional loads.

Other Alternatives: No action

Action Status: TBD

Responsible Office: Public Works

Priority (High, Medium, Low): High

Cost Estimate: \$3,000,000

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Maintain essential services and avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.

Schedule: TBD

Name of Action: Power Backup for Critical Facilities

Hazards Addressed: Multi-Hazard

Mitigation Goal or Objective Addressed: Goals 1-3

Issue/Background: Secure battery backup for critical facilities to serve as conditions between hot power

and generators during an emergency. The batteries will take over loads while the generators prime and ensure that critical services are maintained. This will help avoid system interruptions for critical infrastructure (water treatment, wastewater treatment, high zone tank).

Other Alternatives: No action

Action Status: TBD

Responsible Office: Public Works, IT

Priority (High, Medium, Low): High

Cost Estimate: \$500,000

Existing or Potential Funding: FEMA HMGP, TBD

Benefits (avoided losses): Maintain essential services and avoid loss of life and personal injuries due to lack of hazard awareness and emergency preparedness. Avoid impacts to property, facilities/infrastructure, and the environment by raising hazard awareness.

Schedule: TBD