



JEFFERSON COUNTY

Fire Service Needs Assessment

July 2020

Prepared by:



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EXECUTIVE SUMMARY

Fire departments are essential for protecting County residents and their property. The members of County fire departments not only fight structural and wildland fires, they also provide emergency medical services, rescue people from a variety of other dangerous situations, and assist residents in many other ways. It goes without saying that much of the work performed by firefighters is dangerous.

This Fire Service Needs Assessment was developed by Fire Logistics, Inc., and Great West Engineering. The assessment is meant to complement the new Capital Improvements Plan the County is developing.

The goal of this assessment is to identify the needs of each County fire department. This was completed by inventorying the existing resources each department as compared to the resources they should have per the recommendations provided by existing standards, regulations, and nationally recognized guidance documents. Ultimately this comparison is meant to help the departments obtain the resources necessary to operate in a safe and effective manner.

Inventory and Analysis

Inventory data was requested from all ten (10) fire departments located in Jefferson County. The data requested included:

- Fire station addresses, locations, and approximate age of each.
- Number of engine bays in each station.
- Firefighting apparatus in each station.
- Number of volunteers that are currently rostered with each department.
- Fire apparatus with mobile radios.
- Number of portable (handheld) radios for volunteers.
- Access to pagers for volunteers.
- Approximate age of personal protection equipment (PPE) for wildland and structure.
- PPE (wildland and structure) available for volunteers.
- Backup power generators for each station.
- Availability of a cascade system for each department. A cascade filling system is a high-pressure gas cylinder storage system which is used for the refilling of smaller compressed gas cylinders.
- Training space available to each department.
- Water supplies at each station sufficient to enough to fill apparatus and maintain emergency operations for one operational period.
- Location of water storage tanks or hydrants in each department (including dry hydrants).
- Access to a Thermal Imaging Camera (TIC) for each structure engine.
- Access to a four-gas meter for each structure engine.
- Operations/mapping hardware and software capacity for each district.
- Internet access at each fire station.
- Copies of each recent ISO Report from each department.
- Batch Report from ISO for required fire flows.

- Auto Aid Agreements: Automatic aid agreements are for assistance that is dispatched automatically by a contractual agreement between two fire departments, communities, or fire districts.
- Critical facilities that need to be protected from fires in each district.
- Road bridges in each district that have identifiable problems.

The response rate from each district was 100 percent, although it is important to note that some departments did not provide complete information. The complete inventory can be found in Appendix 1.

ACKNOWLEDGEMENTS

Fire Logistics, Inc. would like to thank all of those volunteer Fire Chiefs who took time out of their daily lives to provide the requested information and provided us with site visits in their jurisdictional areas, especially Montana City RFD Chiefs Lyn Stimpson and Abraham, Clancy FSA Chiefs Johnson and Liebbrandt, Jefferson City RFD Chief Siderits, Boulder FD Chief Hecht, Bull Mountain RFD Chief Kirsch, Basin RFD Chief Gasch, Elk Park RFD Chief Zemljak, Whitehall FD & Jefferson Valley RFD Chiefs Granvold and Ward, and Willow Creek RFD Chief Reich. In addition, we need to thank LaDana Hintz, Doug Dodge, and the Jefferson County Board of County Commissioners for their support of the fire service in Jefferson County by ensuring this project was completed.

REPORT ORGANIZATION

This report is organized by the following sections:

Executive Summary

Introduction

(1) Personnel

(2) Facilities and Apparatus

(3) Personal Protective Equipment

(4) Communications and Advanced Technology

(5) Water Supply

(6) Roads and Bridges

(7) Vegetation Management and Fuel Reduction

(8) Regulatory Standards Review and Recommendations

(9) Growth Policy Recommendations

(10) Critical Facilities

(11) Public Education Recommendations

INTRODUCTION

The primary purpose of this report is to describe the capital improvement needs for each fire department in Jefferson County. These needs include buildings, fire apparatus, personal protection equipment, communications, and water supplies. In addition, the assessment examined issues that directly affect how fire protection is provided in the County including roads and bridges, addressing, vegetation management/fuel reduction, critical facilities, land use regulations, planning and public education.

Jefferson County is comprised of over 1 million acres of land and in 2017 had an approximate population of 11,625 people. There are ten (10) individual fire districts that provide fire protection services in the County. See Map 1 for the location of each district.

It is important to note that Jefferson County is in the process of creating its first Capital Improvements Plan. As part of that plan, the County wants to include the needs of each fire department into the plan. Therefore, some of the critical topics covered in this assessment include identifying district needs such as building facilities, equipment and training and water supplies. The detailed needs for each fire district are found in Appendix 1.

Fire department needs were identified by essentially asking the following question: “What does each fire department currently have?” This information was then compared to existing NFIP standards and other official recommendations.



1.0 PERSONNEL

1.1 Fire Department Staffing

All of the fire departments in the County are staffed with volunteer firefighters. Table 1 shows the number of volunteers in each fire district as of December 2019.

Table 1 - Number of Volunteer Firefighters per Department in the County

Fire Department	Number of Firefighters
Montana City RFD	25
Clancy FSA	18
Jefferson City RFD	10
Boulder FD/Bull Mountain RFD	19
Basin RFD	11
Elk Park	13
Whitehall/Jefferson Valley	14
Jefferson River / Willow Creek RFD	19

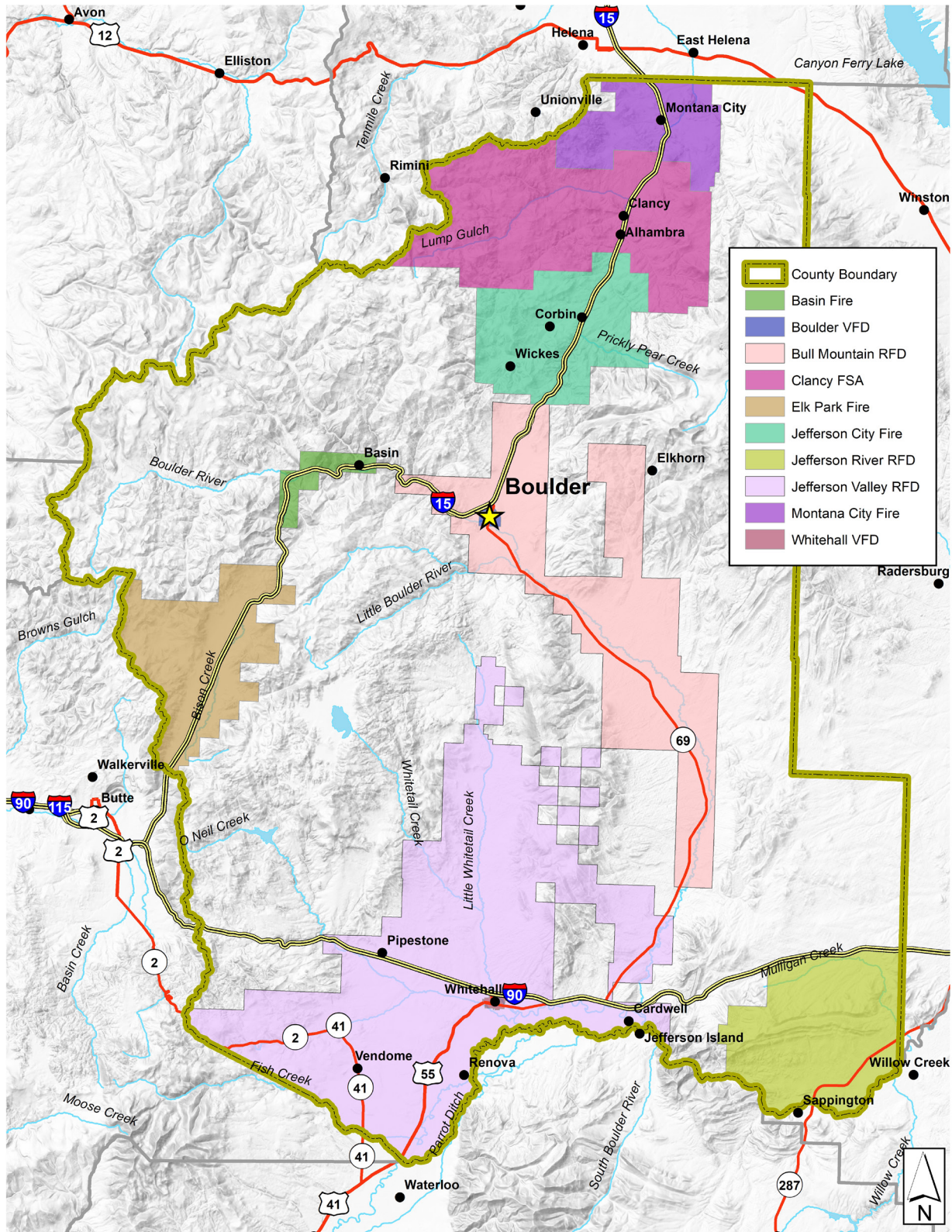
National Fire Protection Association (NFPA) Standard 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments, recommends that a minimum of four (4) firefighters be on-site before an interior attack on a structure fire is begun. Keeping this number in mind, it is important to note that typically, the response time for volunteers can vary widely. Response by volunteers is generally better during evenings and on weekends, compared to weekday calls. This is primarily because of the unavailability of firefighter's due to their work commitments. All of the fire departments in the County operate under mutual aid agreements that can help ensure enough firefighters are available for incidents.

The inventory data requested from each fire department did not include the average number of volunteer firefighters responding to an incident. However, National Fire Protection Association (NFPA) Standard 1720 does provide some guidance for measuring staffing and response times for a fire at a "low-hazard occupancy, i.e., a 2000 ft², two-story, single family dwelling without a basement and exposures." Table 2 shows those recommended staffing levels depending population density. Map 2 shows the population density for the County.

Table 2 Necessary Staffing and Accompanying Response Time by Type of Area

Demand Zone	Demographics	Minimum Staff to Respond	Response Time (Minutes)	Meet Objective (%)
Urban Area	>1000 people/mi ²	15	9	90
Suburban Area	500-1000 people/mi ²	10	10	80
Rural Area	<500 people/mi ²	6	14	80
Remote Area	Travel distance > 8 miles	4	Directly dependent on travel distance	90
Special Risks	Determined by AHJ	Determined by AHJ	Determined by AHJ	90

Map 1 - Jefferson County Fire Districts



Based on the staffing data provided by each fire department, it is easy to see that the departments need more volunteers, particularly if they ever had to respond to multiple events at the same time. The shortage of volunteer firefighters is an issue at the state and national level that several programs are trying to address. One step the County fire departments could take is to register with and utilize the resources at www.makemeafirefighter.org.

Ultimately, well trained, and available firefighters are just as important if not more so than equipment and water supplies. Funding should be considered by the County and the fire districts to develop a County-wide recruiting campaign to find additional volunteers for the fire departments.

1.2 Technical Assistance: Grant Funding Etc.

Obtaining grants can be an effective way for fire departments to supplement the operational funds they collect through taxes. Grants can be a short-term solution for needs when department budgets cannot be adjusted quickly. Grants can help pay for NFPA-compliant PPE, new fire apparatus, advanced life support equipment, or even provide funding to hire staff.

Thus, grants could help the County's cash-strapped departments expand or maintain their capabilities. The reality is that every fire department in the County could benefit from some form of grant writing assistance.

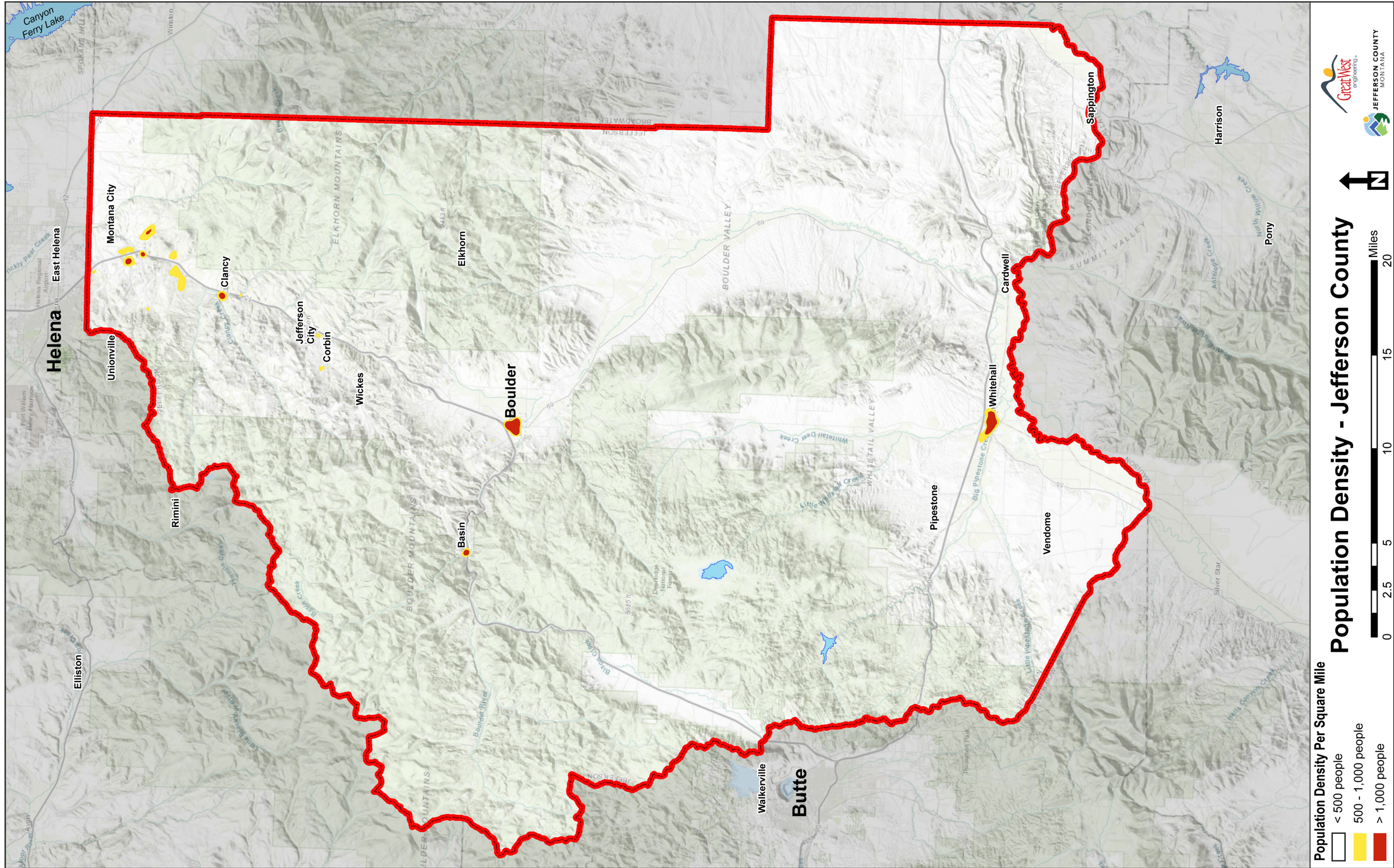
Grants are direct monetary assistance used to complete a specific project or program. Grants come mainly from federal and state sources but can also include private sources.

Volunteer fire-fighters are not only volunteers, but most are also working full time jobs. Thus, they have little time or resources to work on complex and competitive grant applications to help their fire districts. With this in mind, the County should consider developing and funding a cooperative grant writing program that could help the County's fire departments pursue grant funding opportunities in a timely and effective manner.

¹ A jurisdiction can have more than one demand zone.

² Minimum staffing includes members from the AHJ department and automatic aid.

³ Response time begins upon completion of the dispatch notification and ends at the time interval shown in the table.



2.0 FACILITIES AND APPARATUS

2.1 Characteristics of Fire Stations Indicating Need

The Fourth Needs Assessment of the US Fire Service completed by the National Fire Protection Association (NFPA), included a section on the characteristics of fire department facilities such as the number of fire stations, the number of stations older than 40 years of age, the number of stations having backup electrical power sources and the number that are equipped for exhaust emission control (e.g., diesel exhaust extraction).



2.1.1 Current Number of Fire Stations and Needed Facilities

Conceptually, existing fire stations should be able to serve the current needs of their respective communities, but also meet the needs of residents for the next 20 to 30 years. Experience shows that the most expensive purchase a fire department can make is the construction of an additional fire station, which would include additional personnel and equipment. The cost of an additional station is followed closely by the replacement of an existing station.⁴

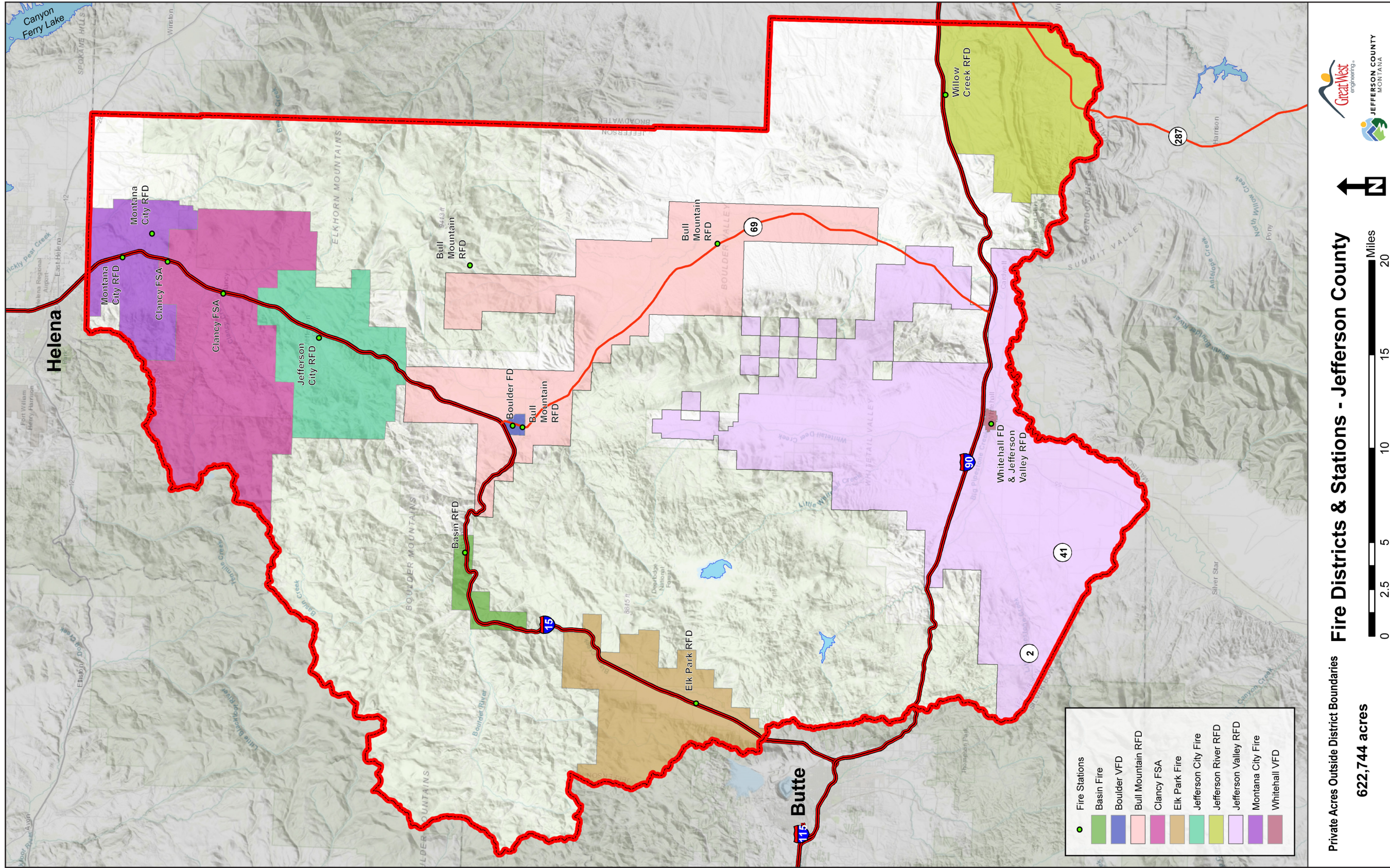
Adequate fire protection coverage can be achieved without adding new fire stations if first-response areas are organized using reciprocal cross departmental responses. This is a situation where an address with an emergency such as a fire would receive first response from the nearest fire station versus a response from only a jurisdictional station. Such arrangements can be done through mutual aid agreements, auto aid agreements, or done more formally through regionalization⁵. Table 3 lists the number of fire stations located in each of the County's fire districts.

Table 3 - Number of Fire Stations in Each District

Fire Department	Number of Stations
Montana City RFD	2
Clancy FSA	2
Jefferson City RFD	1
Boulder FD	1
Bull Mountain RFD	3
Basin RFD	1
Elk Park	1
Whitehall	1
Jefferson Valley	1
Willow Creek RFD	2

⁴ Fourth Needs Assessment of the US Fire Service, NFPA, 11/2016

⁵ ibid



2.2 Fire Stations Over 40 Years of Age

Although there is no national guidance for the maximum age of an operational fire station, it is assumed that the older the fire station is, the higher its operations and maintenance costs will be. It will also generally lack modern technologies. These fire stations are more likely to have problems that cannot be addressed through repair and maintenance alone. To evaluate this concern, the National Fire Protection Association (NFPA) uses “40-years old” as a threshold to identify aging fire stations.⁶

Table 4 - Age of Fire Stations in the County

Fire Department	Age of Station in years
Montana City Rural Fire District (RFD) Station 1	3
Montana City RFD Station 2	19+
Clancy Fire Service Area (FSA) Station 1	28
Clancy FSA Station 2	28
Jefferson City RFD Station 1	17
Boulder Fire Department (FD)	26+
Bull Mountain RFD Station 1	25
Bull Mountain RFD Station 2	Unknown
Bull Mountain RFD Station 3	11
Basin RFD Station 1	51
Elk Park RFD Station 1 (2 structures)	50/20
Whitehall/Jefferson Valley RFD	Unknown
Willow Creek RFD Station 1 (2 structures)	65/30
Willow Creek RFD Station 2	8

Based upon the current age of stations in the County the recommended priorities for building replacement are:

1. Basin RFD – the station is barely adequate for the apparatus storage needs of the fire department and has no training space for firefighters. If it were replaced with a two (2) bay structure, the cost would be approximately \$400,000 in today’s dollars.
2. Willow Creek RFD Station 1 – if the station were replaced with a new four (4) bay structure, the cost would be approximately \$1,000,000 in today’s dollars.
3. Elk Park RFD - if it were replaced with a two (2) bay structure, the cost would be approximately \$400,000 in today’s dollars.

2.3 Fire Stations Having Backup Electrical Power

During an emergency event, fire stations should have access to backup electrical power to ensure that firefighting activities can continue effectively even if electrical power is not available via the electrical grid system. If a fire station loses power at any time, it may be difficult for volunteers to answer phones, run computers, fuel

⁶ Renovation Needs of the US Fire Service, Foley, July 2019

trucks, and open garage doors. Despite this critical need, many fire stations in the nation do not have emergency backup generators.⁷

None of the fire stations in the County have a backup power source. Backup electrical power sources is of critical importance, especially for a station such as Montana City RFD Station #1, which is also designated by Jefferson County Emergency Management as an alternate Emergency Operations Center for the County. All the fire stations in the County should be provided with backup emergency electrical diesel generators.

Based upon recent cost estimates received by Great West Engineering for similar projects, the cost of a backup diesel generator would range from \$85,000 to \$100,000, which would include the cost of the generator and its installation. Because there are fifteen (15) separate fire stations in the County, the overall cost of such improvements could approach \$1.5 million dollars to complete.

2.4 Fire Stations Having Exhaust Emissions Control

When a diesel-powered fire engine leaves or returns to a fire station, it generates hazardous emissions that can spread throughout the engine bay, office space and training areas. If the exhaust is not properly captured and removed, firefighters can be exposed to diesel exhaust for an extended period. This hazard can be mitigated through the installation of an exhaust emission control system.⁸

According to the Occupational Safety and Health Administration (OSHA), prolonged diesel exhaust and diesel particulate matter exposure can increase the risk of cardiovascular disease, cardiopulmonary disease, respiratory disease, and lung cancer. In 2012, the International Agency for Cancer Research classified diesel exhaust as a known human carcinogen.

While this information was not requested from the fire departments, it is known that only the Montana City RFD Station 1 and the Jefferson City Fire Station are equipped with an exhaust system. Exhaust systems should be considered for installation at all fire department stations in the County. According to the NFPA's "Renovation Needs of the US Fire Service", a tailpipe system, which filters both particulates and gases, can be installed for roughly \$40,000 to \$60,000 per fire station.

2.5 Number and Coverage of Fire Stations

The number of fire stations and their accompanying resources are a critical to providing adequate fire protection to County residents. These resources include personnel, fire protection water supplies and equipment. In addition, stations need to be sited in appropriate locations in order to provide adequate coverage throughout the County.

Based upon the coverage requirements of the Insurance Services Office (ISO) and National Fire Protection Association (NFPA) Standard 1720, the only department in the County that currently needs additional fire stations as of the writing of this report is Jefferson Valley RFD. Ultimately the department will need five (5) additional fire stations throughout the district. Depending upon the size of a station its replacement cost could range from \$400,000 to \$1,000,000. At the time this report was compiled the cost of a two (2) bay structure was approximately \$400,000 and a four (4) bay structure was at approximately \$1,000,000.

⁷ ibid

⁸ ibid

Table 5 - New or Replacement Fire Stations Needed in the County

Fire Department	Number of Needed Stations	Number of Bays	Approximate Cost
Montana City RFD			
Clancy FSA			
Jefferson City RFD	1 Replacement	4	\$1,000,000
Boulder FD			
Bull Mountain RFD			
Basin RFD	1 Replacement	2	\$400,000
Elk Park	1 Replacement	2	\$400,000
Whitehall			
Jefferson Valley	5 Additional	Will vary	Will depend upon size and number
Willow Creek RFD	1 Replacement	4	\$1,000,000

2.6 Coverage of Properties Located Outside of a District

Like many rural areas in the State of Montana, not all private property in Jefferson County is located within a fire district. According to GIS mapping data from the State of Montana, 622,744 acres of private land in the County are not located within a fire district. People living or owning property in these areas outside of a fire district cannot assume that fire protection will be provided in the event of a structure fire.

County fire departments will respond to an incident outside of their district if they have enough personnel and resources. In some instances, the response to out-of-district calls can be delayed and only a limited response, such as one fire truck, may be sent. The fire departments' primary obligation is to the residents of their district who are paying for this service through their property taxes and sometimes through a special tax assessment. If a property owner is not located in the district, their taxes are not supporting the operation of the district.

The County in cooperation with the County fire departments should make an effort to educate property owners about the benefits of annexing into a fire district and assist those people who would like to join a district.

2.7 Fire Fighting Apparatus

The term firefighting apparatus describes any vehicle that has been built for or modified to be used during firefighting operations. These vehicles are highly customized depending on the needs and the duty they will be performing. These duties can include firefighting and emergency medical services.

The age of firefighting vehicles is not an adequate criterion to determine the need for replacement, but it is indicative of a potential need. The reality is fire districts should undertake regular engine replacements in order to keep pace with the normal aging and depreciation of fire apparatus.

National Fire Protection Association (NFPA) 1911, Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles defines the minimum requirements for establishing an inspection, maintenance, and testing program for fire apparatus and provides guidelines for fire apparatus refurbishment and retirement. The primary purpose of the Standard 1911 is to create an inspection, maintenance, and testing program that will ensure that in-service emergency vehicles are maintained in order to keep them in safe operating condition and ready for response. A secondary purpose of Standard 1911 is to determine if a fire apparatus should be repaired and made safe, or if it should be retired.

Each department should develop a formal schedule for the replacement of fire apparatus depending on their needs and their ability to fund a replacement.

It is important to note that the Elk Park RFD does not currently have a credible engine to qualify for an Insurance Services Office rating.

The ISO criteria to qualify for a rating are:

- At least one apparatus with a permanently mounted pump with a rated capacity of 750 gpm or more at 150 psi.
- Each credited firefighter must, while on the fireground, have available a protective clothing ensemble in accordance with the general criteria of NFPA 1001, Standard for Fire Fighter Professional Qualifications.
- Records should indicate date, time, and location of structure fires; the number of responding members; meetings; training sessions; and maintenance of apparatus and equipment. A roster of fire department members should be kept up to date for active members.
- Evaluate the fire service equipment in accordance with the general criteria of NFPA 1901, Standard for Automotive Fire Apparatus and assign points for equipment carried.

If the Elk Park RFD could meet these criteria it would enable the department to achieve either a Class 8B or Class 9 ISO insurance rating. Thus, residents of the District could see a reduction in their homeowner's insurance costs.

The cost of purchasing a used pumper truck or engine for the Elk Park RFD would run from \$275,000 to \$450,000 depending upon the age of the engine and the hours/miles on it. The other option might be to approach the Montana Department of Natural Resources and Conservation to see if a fire engine from the Department of Defense Firefighter Program (FFP) could be stationed at the RFD.

3.0 PERSONAL PROTECTIVE EQUIPMENT

3.1 Self-Contained Breathing Apparatus (SCBA)

National Fire Protection Association (NFPA) Standard 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments requires that ten (10) to fifteen (15) personnel respond to each incident in areas with population densities of greater than 500 people per square mile. Fire departments in the County that have specific areas with population densities greater than 500 people per square mile include the Montana City RFD, Clancy FSA, Bull Mountain RFD, Basin RFD, Jefferson Valley RFD, Whitehall FD, and Boulder FD.

To meet these personnel standards would require that each district has adequate personal protection equipment including self-contained breathing apparatus (SCBA). This is a device that firefighters wear to provide breathable air in an atmosphere where the air is immediately dangerous to life or health.

Currently without the support of neighboring fire departments, several of the County’s fire departments would not have enough SCBA to meet the personnel requirements of NFPA 1720. Table 6 below lists the number of SCBA’s per fire department.

Table 6 - Number of SCBA’s per Department

Fire Department	Number of SCBA’s
Montana City RFD	15
Clancy FSA	14
Jefferson City RFD	9
Boulder FD	9
Bull Mountain RFD	6
Basin RFD	8
Whitehall FD	8
Jefferson Valley RFD	7
Willow Creek RFD	4
Elk Park	Unknown

The inventory did not determine whether each department’s SCBA’s meet the current NFPA standards. However, departments should ensure that their SCBA’s are either upgraded or replaced periodically. Grant funds from FEMA can be available to help pay for SCBA replacement.

3.2 Personal Alert Safety System (PASS) Devices

Personal alert safety systems (PASSs) are devices carried by emergency responders and individual workers to signal distress or a need for assistance. While the inventory did not determine whether the fire departments have or need PASS devices, they are a critical device for firefighters responding to structural fires. Departments that need PASS devices should include them in their annual budgets. If a department is upgrading its SCBA’s it should also ensure that a PASS device is a component of any new SCBA.

3.3 Personal Protective Clothing

3.3.1 Structural

NFPA 1851, Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting requires that structural firefighting turnout gear be retired if it is older than 10 years from the date it was manufactured.

Table 7 - Age of Structural Turnout Gear per Fire Department

Fire Department	Age of Structural Turnouts in years
Montana City RFD	4 @ 1, 13 @ 3 & 28 @ 13
Clancy FSA	3
Jefferson City RFD	1@2, 9@10+
Boulder FD	Unknown
Bull Mountain RFD	10
Basin RFD	2
Elk Park RFD	20
Whitehall FD	7 @ 3
Jefferson Valley RFD	7 @ 3
Willow Creek RFD	12

Several departments need updated turnout gear, including Montana City RFD, Jefferson City RFD, Bull Mountain RFD, Willow Creek RFD, and Elk Park RFD. It is not known for sure, but it is likely the following districts also need gear replaced: Boulder FD, and Jefferson Valley RFD. Grant funds from FEMA can be available to purchase personnel protective equipment.

3.3.2 Wildland

The language in proposed NFPA 1877, Standard on Selection, Care, and Maintenance of Wildland Fire Fighting Protective Clothing and Equipment provides the criteria regarding retirement and disposition of wildland fire fighting clothing. Each district should consider replacing wildland gear that does not meet the criteria in NFPA 1877. Grant funds from FEMA can be available for purchasing safety gear.

3.4 Inspection and Laundering of Personal Protective Clothing

Data was not collected regarding the inspection and laundering of personal protective clothing. An important strategy in cancer prevention for firefighters is to launder PPE after contamination at a fire or other incident. Departments should consider either providing laundering facilities or contracting out the laundering of PPE to a clothing cleaning service. Grant funds from FEMA can be available for cleaning of safety gear.

4.0 COMMUNICATIONS AND ADVANCED TECHNOLOGY

4.1 Portable Radios & Pagers

Nationally, half of all fire departments (50 percent) do not have enough portable radios to equip all emergency responders on a single shift. Jefferson County fire departments in contrast are relatively well equipped with portable radios. One of the main concerns is that many of the radios currently in use by County fire departments are no longer supported by their manufacturers.

Table 8 - Portable Radios per Fire Department

Fire Department	Portable Radio - Each Firefighter
Montana City RFD	Yes, but carried by Officers and on Apparatus
Clancy FSA	Yes
Jefferson City RFD	Yes
Boulder FD	No, Officers & Active Member have personal radios
Bull Mountain RFD	Unknown
Basin RFD	Yes
Elk Park RFD	Yes
Whitehall FD	No, 9 in station
Jefferson Valley RFD	No, 9 in station
Willow Creek RFD	Yes

Table 9 - Pagers per Fire Department

Fire Department	Pager for each member
Montana City RFD	Yes
Clancy FSA	Yes
Jefferson City RFD	Yes
Boulder FD	Yes
Bull Mountain RFD	Yes
Basin RFD	Yes
Elk Park RFD	No, phone system
Whitehall FD	Yes
Jefferson Valley RFD	Yes
Willow Creek RFD	Yes

Elk Park RFD is the only department that does not currently have enough pagers to communicate with all its members.

4.2 Advanced Technology

The only advanced technology that County fire departments reported utilizing was a back-up paging system to the County Dispatch System. Departments reported using TwoTone Direct, E-Dispatch and lamResponding.

Of the reported systems, lamResponding has the most capabilities including:

- FREE iOS (Apple) and Android apps, with fully integrated Google Maps™
- Dispatch messages right to mobile devices.
- Mapping of incidents, with voice and visual navigation to the scene.
- Live mapping of the current location of responding members.
- Hydrant and water source mapping.
- 40+ map marker icons (truss construction information, Knox Box™ information and locations, road closures, bridge height and weight restrictions, and many more).
- AVL - automated mapping of the location of all responding apparatus.
- Pre-plans embedded right into maps for immediate identification and access to pre-plan documents and images.
- An instant mass-messaging system for enhanced communications within department or team.
- Web-based scheduling.
- Station Alerting with customized alert sounds and audio play of dispatch information.
- Full incident reporting (including NFIRS 5.0, at no additional cost).
- Training and Drill tracking and reporting.
- Attendance (meetings, fundraisers, etc.) tracking and reporting.
- Class completion tracking and reporting.
- Expiration date tracking and reporting (e.g. for all certifications).
- Apparatus status tracking.
- A fully interactive calendar.

It is possible that if Jefferson County or the Jefferson County Rural Fire Council was a subscriber to the lamResponding application, the fire departments in the County may be able to utilize the service for a minimal cost.

No departments reported using any form of tablet software. Tablet software or apps that are designed to be used in conjunction with CAD and GIS information can enable responders to identify building hazards and hydrant locations and assist with incident reporting.

A tool that is currently available to all emergency service personnel in Montana is the Situation Analyst Montana (SAM) program by Intterra. It is provided free through a Homeland Security grant managed by the Gallatin County Emergency Management Office. SAM would allow departments to manage and display incident, monitor incidents, provide situation awareness, monitor weather, flooding, etc. See www.intterragroup.com.

Some departments report they are not able to access the internet in their individual fire stations. A lack of internet access can affect a department's ability to provide training, efficiently report incidents in the NFIRS system and maintain situation awareness, etc.

Jefferson County currently utilizes a computer aided dispatch (CAD) system. The dispatch office is located at the Law Enforcement Center in Boulder. CAD technology allows efficient processing of calls, establishment of resource allocation, integration with record management systems, and data interoperability with other agencies. If fully integrated into the CAD system, the County's fire departments could measure their performance against predetermined benchmarks by reviewing incident data collected.

A thermal imaging camera (TIC) is a type of thermographic camera used by firefighters. The cameras render infrared radiation as visible light and allow firefighters to see areas of heat through smoke, darkness, or heat-permeable barriers. Thermal imaging cameras (TIC) are being utilized by fifty (50) percent of the fire departments in the County.

Gas detectors are being utilized by sixty (60) percent of the fire departments in the County.

The National Fire Incident Reporting System (NFIRS) is a standardized national reporting system used by fire departments in the country to report fires and other incidents to which they respond. It is meant to maintain records of incidents in a uniform manner. Montana City, Clancy, Jefferson City, Boulder, Bull Mountain, Basin, Whitehall, and Jefferson Valley Fire Departments are reporting to NFIRS system via the NFIRS website. It is unknown if Willow Creek and Elk Park are reporting.

5.0 WATER SUPPLY

Having access to adequate water supplies is a critical component to fighting fires. Unfortunately, like most areas in Montana, Jefferson County’s fire protection water supplies are not typically sited based upon a standardized plan and many times not designed to meet requirements such as those recommended by the National Fire Protection Association (NFPA). This is the result of many factors including limited resources on the part of the fire districts, statutory and legal requirements and a lack of comprehensive planning and funding for fire protection infrastructure.



5.1 Fire Protection Water Supply Issues

Many fire protection water supplies in the County are located at fire stations. There are also dry hydrants, ponds and other sources located at various sites around the County. In other cases, water supplies are located within larger residential subdivisions and were installed as part of the project approval. This is particularly true in the northern portion of the County which has seen the most subdivision activity of any area in the County. Water supplies located in subdivisions have historically had problems including poor design and construction, a lack of maintenance, poor access and in some cases unknown locations.

All of the County’s fire departments reported that most of their existing water supply points or water supply systems are either marginal or inoperable. Most also reported that they do not have the capacity in their fire department budgets to upgrade or maintain their existing water supply systems. Many of the districts also rely upon draft sites located at ponds and streams. These are problematic due to ongoing issues related to siltation and seasonal low flows all of which can make these draft sites unreliable in the event of an incident. Such sites need to be tested and maintained on a regular basis and it should be noted that during low flow times of the year they may not be useable.

Taken together these issues can make such fire protection water supplies in the County suspect and unreliable.

5.2 Funding Fire Protection Water Supplies

In order to address the issue of water supplies, the County would like to help its fire districts develop a comprehensive and logical approach to funding, siting, constructing, and maintaining fire protection water supplies.

Providing water supplies through the subdivision review process is problematic at best. There are several reasons for this. First subdivisions are generally not developed following a logical or planned process. Water supplies provided through the subdivision review process are often widely scattered and as mentioned earlier suffer from issues of poor design and construction, difficult access, and little to no maintenance. The bottom-line is that it is not practical from an operational or maintenance perspective to try and provide fire protection water supplies via small individual systems in every subdivision.

Logically, it would be better for the County to collect a proportional amount of money from the developer of each subdivision to help fund the development of larger centralized water supplies versus constructing smaller scattered water tanks. Unfortunately, the collection of such monies from a developer would be classified as an

impact fee under state law. This is not permitted without the County following the statutory process for creating an impact fees ordinance. Currently the County does not have an impact fee ordinance.

Impact fees assign a cost to providing services to people who build new homes, which can include fire protection. Impact fees are also meant to limit unnecessary cost increases to existing residents and property owners. The fees are a one-time payment that can be used to provide services such as fire protection and emergency services.



The amount of an impact fee would be determined by the cost-per-unit of service (i.e. gallons for water for fire protection, fire trucks needed etc.) needed to service new development. It is important to note that impact fees are meant to construct new facilities and cannot be used for maintenance purposes. The fees are generally paid when construction of a building/house begins, thus the adoption of a building permit process would be necessary for the County in order to effectively collect such fees. At this time, the County does not have building permit process.

Another issue that the County faces is that fire protection and water supplies are also needed in areas that may never see much subdivision development. There are places in the County that have a substantial number of existing lots that could eventually be developed with homes or cabins and would then need fire protection. These lots include mining claims in the mountains, and lots created prior to the enactment of the Subdivision and Platting Act or lots created using exemptions from subdivision review.

A more realistic option for the County to consider as a funding mechanism for fire protection water supplies is a County-wide Rural Improvement District (RID) or individual RIDs for each fire district. A Rural Improvement District (RID) is a legal taxing authority that can be used to generate funds in specific areas for specific services that provide a public benefit. An RID could allow the County to finance public improvements and maintenance projects by assessing a special district tax on each benefitting property within the district. The process to create a RID is defined in statute.

5.3 Recommended Water Supply Needs

The Insurance Services Office (ISO) uses the following fire protection water flow rates for different structures depending upon their use, size, and separation distances:

For 1- and 2-family dwellings not exceeding 2 stories in height, the following Needed Fire Flows at a duration of 1 hour shall be used:

Distance Between Buildings	Needed Fire Flow
More than 100'	500 gpm
31 - 100'	750 gpm
11 - 30'	1,000 gpm
10' or less ¹ '	1,500 gpm

The fire-flow duration for commercial properties is 2 hours for Needed Fire Flows up to 2,500 gpm and 3 hours for Needed Fire Flows of 3,000 and 3,500 gpm.

5.4 Water Supply Recommendations and Cost Estimates

Based on the inventory results and through visits with the County fire chiefs a comprehensive system for upgrading and maintaining water supply systems is needed throughout the County. Table 10 below identifies the recommended water supply needs and improvements for each fire district, including the number of water supply sites and their size in gallons. General cost estimates based upon the potential construction techniques used for storage tanks i.e. concrete, steel or fiberglass are identified in Tables 11, 12 and 13. Table 11 shows the estimated cost for a 540,000-gallon on-grade glass-lined steel tank with the associated infrastructure to operate the tank. Table 12 shows the estimated cost for a standardized 30,000-gallon buried fiberglass tank and associated infrastructure to operate the tank. Table 13 shows the estimated cost for a standardized draft site using wells and the associated infrastructure to operate the wells.

Table 10 - Recommended Water Supply Needs and Improvements

Fire Department	Recommended Water Supply Needs and Improvements (Number of Sites and Size/Gallons)
Montana City RFD	<ul style="list-style-type: none"> ▪ 1 system serving the core area of Montana City – based on the highest fire flow required of 3,000 gpm = 540,000 gallons storage. ▪ Sawmill Road – 500 gpm - 30,000 gallons ▪ Wing Ranch (McClellan Creek Road) – 500 gpm - 30,000 gallons ▪ Montana City Ranches Residential – 500 gpm - 30,000 gallons ▪ Clark Creek Loop – 500 gpm - 30,000 gallons ▪ South Hills Road at Holmes Gulch – 500 gpm - 30,000 gallons ▪ South Hills Road at Lime Kiln – 500 gpm - 30,000 gallons ▪ Holmes Gulch at Schmaus – 500 gpm - 30,000 gallons ▪ Complete replacement of existing non-functional system at Stoneybrook – 1000 gpm = 60,000 gallons ▪ Maintain and/or improve these existing systems: <ul style="list-style-type: none"> ▪ Martinez Gulch (40,000 gallons) ▪ Homestead (30,000 gallons) ▪ Moonlight (60,000 gallons) ▪ Ridgeview (40,000 gallons) ▪ Ruby Mountain ▪ Lone Mountain ▪ Improve the Saddle Mountain Water System to include a fire protection water supply.
Clancy FSA	<ul style="list-style-type: none"> ▪ Replace draft hydrant at Haab Lane & Prickly Pear Creek – 500 gpm – 30,000 gallons ▪ Replace draft hydrant at Highway 282 & Warm Springs Creek Rd – 500 gpm – 30,000 gallons ▪ Marks Lumber – 1,000 gpm – 120,000 gallons ▪ Marks & Miller Post and Pole – 1,000 gpm – 120,000 gallons ▪ Maintain and/or improve these existing systems: <ul style="list-style-type: none"> ▪ Clancy ▪ Forest Park ▪ Blue Sky Heights ▪ Hanging Tree

Fire Department	Recommended Water Supply Needs and Improvements (Number of Sites and Size/Gallons)
Jefferson City RFD	<ul style="list-style-type: none"> ▪ Sentinel Ridge Major – 500 gpm – 30,000 gallons ▪ Rosewood Estates – 500 gpm – 30,000 gallons ▪ North Main & Destiny Hills Road – 500 gpm – 30,000 gallons ▪ Wickes – 500 gpm – 30,000 gallons ▪ Highway 282 & Tizer Lake Road – 500 gpm – 30,000 gallons ▪ Maintain and/or improve these existing systems: <ul style="list-style-type: none"> ▪ Carlson’s Pond (pond) ▪ Rosewood Estates (dry hydrant) ▪ Corbin Fill Site (pump) ▪ Spring Creek (stream) ▪ Community Center (6 tanks, unknown size)
Boulder FD	<ul style="list-style-type: none"> ▪ An existing municipal system is maintained by the City of Boulder
Bull Mountain RFD	<ul style="list-style-type: none"> ▪ At or near Depot Hill Road & Silver Bell Road – 500 gpm – 30,000 gallons ▪ At or near Amazon Road and Boulder Frontage Road – 500 gpm – 30,000 gallons ▪ Depending on residential development, add a system somewhere along High Ore Road – 500 gpm – 30,000 gallons ▪ Maintain and/or improve these existing systems: <ul style="list-style-type: none"> ▪ Jack Creek Estates (30,000 gallons) ▪ Bull Mountain FS# 1 (Hydrant) ▪ Elkhorn Water System (1,500 gallons)
Whitehall FD	<ul style="list-style-type: none"> ▪ An existing municipal system is maintained by the Town of Whitehall
Jefferson Valley RFD	<ul style="list-style-type: none"> ▪ At or near Whitetail Road & Antelope Lane – 500 gpm – 30,000 gallons ▪ At or near Highway 2 West & Sheep Camp Road – 500 gpm – 30,000 gallons ▪ At or near Bluebird Lane & Boe Lane – 500 gpm – 30,000 gallons ▪ At or near Highway 2 West & Edwards Addition Road – 500 gpm – 30,000 gallons ▪ At or near Highway 2 West & Lower Radar Creek Road – 500 gpm – 30,000 gallons ▪ At or near Upper Radar Creek Road & Sage Meadow Circle – 500 gpm – 30,000 gallons ▪ At or near Makowski Lane & Curlew Lane – 500 gpm – 30,000 gallons ▪ Establish a process to maintain and improve existing systems: <ul style="list-style-type: none"> ▪ Cedar Hills Rd (pipe stand fed from creek) ▪ Fish Creek Rd (pipe stand providing 20,000 to 30,000 gallons from well) ▪ Parrot Castle Rd (pipe stand providing 20,000 to 30,000 gallons from well) ▪ Old Landmark Ranch (pipe stand from creek) ▪ Jefferson River Ranches (pipe stand from creek) ▪ Cardwell Store (pipe stand fed from pond)
Willow Creek RFD	<ul style="list-style-type: none"> ▪ At Fire Station 2 – Milligan Canyon – 500 gpm – 30,000 gallons ▪ Establish a process to maintain and improve the existing Highland Park water systems <ul style="list-style-type: none"> ▪ Highland Park North (hydrant pump for never hooked up) ▪ Highland Park South (hydrant provides 15,000 gallons)

Table 11 - Opinion of Probable Cost - New 540,000 Gallon Tank for Montana City

#	BID ITEM	QTY	UNITS	UNIT PRICE	TOTAL
1	Mobilization	1	LS	\$ 40,000.00	\$ 40,000.00
2	New 540,000 Gallon On-Grade Glass- Lined Steel Tank	1	LS	\$ 375,000.00	\$ 375,000.00
3	Tank Site Work and Piping	1	LS	\$ 30,000.00	\$ 30,000.00
4	Telemetry Controls	1	LS	\$ 30,000.00	\$ 30,000.00
5	Tank Mixer	1	LS	\$ 13,500.00	\$ 13,500.00
	Construction Subtotal				\$ 488,500.00
	Contingency (10%)				\$ 49,000.00
	Extend Electrical Service				\$ 10,000.00
	Geotechnical Investigation				\$ 10,000.00
	Engineering and Admin.				\$ 40,000.00
	TOTAL				\$ 597,500.00

Table 12 - Opinion of Probable Cost - New 30,000 Gallon Tank at Multiple Locations

#	BID ITEM	QTY	UNITS	UNIT PRICE	TOTAL
1	Mobilization	1	LS	\$ 6,000.00	\$ 6,000.00
2	New 30,000 Gallon Buried Fiberglass Tank	1	LS	\$ 48,000.00	\$ 48,000.00
3	Tank Site Work and Piping	1	LS	\$ 10,000.00	\$ 10,000.00
4	500 gpm Fire Pump and Piping	1	LS	\$ 9,000.00	\$ 9,000.00
5	Floats, Controls and Electrical	1	LS	\$ 6,000.00	\$ 6,000.00
	Construction Subtotal				\$ 79,000.00
	Contingency (10%)				\$ 7,000.00
	Extend Electrical Service				\$ 10,000.00
	Engineering and Admin.				\$ 18,000.00
	TOTAL				\$ 114,000.00

Table 13 - Opinion of Probable Cost - New Draft Hydrant Sites at Multiple Locations

#	BID ITEM	QTY	UNITS	UNIT PRICE	TOTAL
1	Mobilization	1	LS	\$ 4,000.00	\$ 4,000.00
2	Drill Well	100	LF	\$ 55.00	\$ 5,500.00
3	Temporary Surface Casing	1	LS	\$ 5,500.00	\$ 5,500.00
4	Steel Well Casing	100	LF	\$ 30.00	\$ 3,000.00
5	Perforate Casing	20	LF	\$ 45.00	\$ 900.00
6	Well Completion	1	LS	\$ 18,000.00	\$ 18,000.00
7	Well Development	4	HR	\$ 250.00	\$ 1,000.00
8	Controls and Electrical	1	LS	\$ 4,000.00	\$ 4,000.00
9	Dry Hydrant and Piping	1	LS	\$ 5,000.00	\$ 5,000.00
	Construction Subtotal				\$ 46,900.00
	Contingency (10%)				\$ 4,700.00
	Extend Electrical Service				\$ 10,000.00
	Engineering and Admin.				\$ 16,000.00
	TOTAL				\$ 77,600.00

Appendix 1 contains an inventory of the existing water supplies as provided by each fire department. Eventually, all of the water supply systems in the County should be mapped using GIS and the mapping should include information regarding the construction, size, actual operation capabilities and maintenance needs for each system.

As mentioned earlier, a County-wide Rural Improvement District (RID) or individual RIDs for each fire district may be good approaches to address the need to pay for standardized and adequate fire protection water supply systems.

6.0 ROADS AND BRIDGES

Vehicular road access is one of the biggest challenges faced by fire districts in the County. Fire department volunteers responding to fires encounter a variety of road access situations depending upon where they are called upon to provide protection. Road access may range from well-maintained state highways and County roads to poorly built two-track roads which can be impassable during certain times of the year. Impassability can be particularly true of access roads in the mountainous areas in the County.

Remote areas and private inholdings surrounded by public lands are frequently accessed using BLM and Forest Service roads. These roads may see limited to no maintenance. Poor forest health in many of these areas also results in downed trees that can block roads, and thus potentially impacting emergency response, residents trying to evacuate, and the recreationist that might be in the area.

6.1 Road Maintenance

Considering the limited resources available to the County Road Department, the Department does its best to maintain the roads that fall under its maintenance authority. Unless something dramatic occurs, the current levels of maintenance on County roads are likely to remain stable. Unlike County roads, non-County and private roads must be maintained by either individual homeowners or by the occasional homeowner's association.

An effective option to fund road maintenance is the creation of a Rural Improvement District (RID) which can pay for the improvement or maintenance of roads that are open for public use. An RID is a taxing authority allowed under state law that can raise funds for the maintenance of roads in a specified area. An RID would allow County residents to finance road improvements and maintenance by assessing a special "district tax" on each benefitting property within the district.

With regards to new roads constructed for subdivisions, it is critical that they be constructed to meet the County Roads Standards. Roads constructed and maintained to accepted engineering standards will provide safe access for residents and emergency service providers. As of the writing of this Assessment, the County was undertaking an update of its adopted Road Standards.

In addition to ensuring that new subdivision roads meet County Road Standards, the maintenance of these new roads should be addressed. The County may want to consider requiring the creation of a Rural Improvement District (RID) for each new subdivision to ensure that roads are maintained to an acceptable standard for the long-term. To use this mechanism for road maintenance, such a requirement would need to be incorporated into the coming update of the County Subdivision Regulations.

Neighboring Lewis and Clark County has successfully used RID's to maintain new subdivision roads. The County's Subdivision Regulations require that roads within new subdivisions be maintained using a RID. As part of the process, property owners in a subdivision must sign a waiver of right to protest joining a rural improvement district. If a rural improvement district already exists, the developer of a new subdivision is required to join the RID in question.

6.2 Dead End Roads

Many residential areas in the County are accessed via "dead-end" roads. Dead end roads pose a significant challenge for emergency services trying to access a fire. Dead end roads are exactly that, dead ends, and offer

only one way into fight a fire and only one way out if evacuation is necessary. Thus, the risk of being overtaken by a wildfire may increase for evacuees and fire crews using a dead-end road.

As part of this assessment, a GIS mapping analysis was conducted to identify all the dead-end roads in the County over a $\frac{1}{4}$ of a mile in length which provide access to at least two identified structures. The analysis was done using the County's road data and structure data obtained from the Montana State Library. The analysis identified sixty (60) areas in the County that had two or more structures located on a dead-end road over $\frac{1}{4}$ of mile long. See Map 4 for the entire County and Appendix 2 for detailed maps for each area containing dead end roads.

The development of new residential subdivisions located on dead-end roads should only be permitted in locations where the fire hazard ratings can be shown to be low or where that fire hazard can be effectively mitigated over the long-term to protect public health and safety.

6.3 Road Signage and Addressing

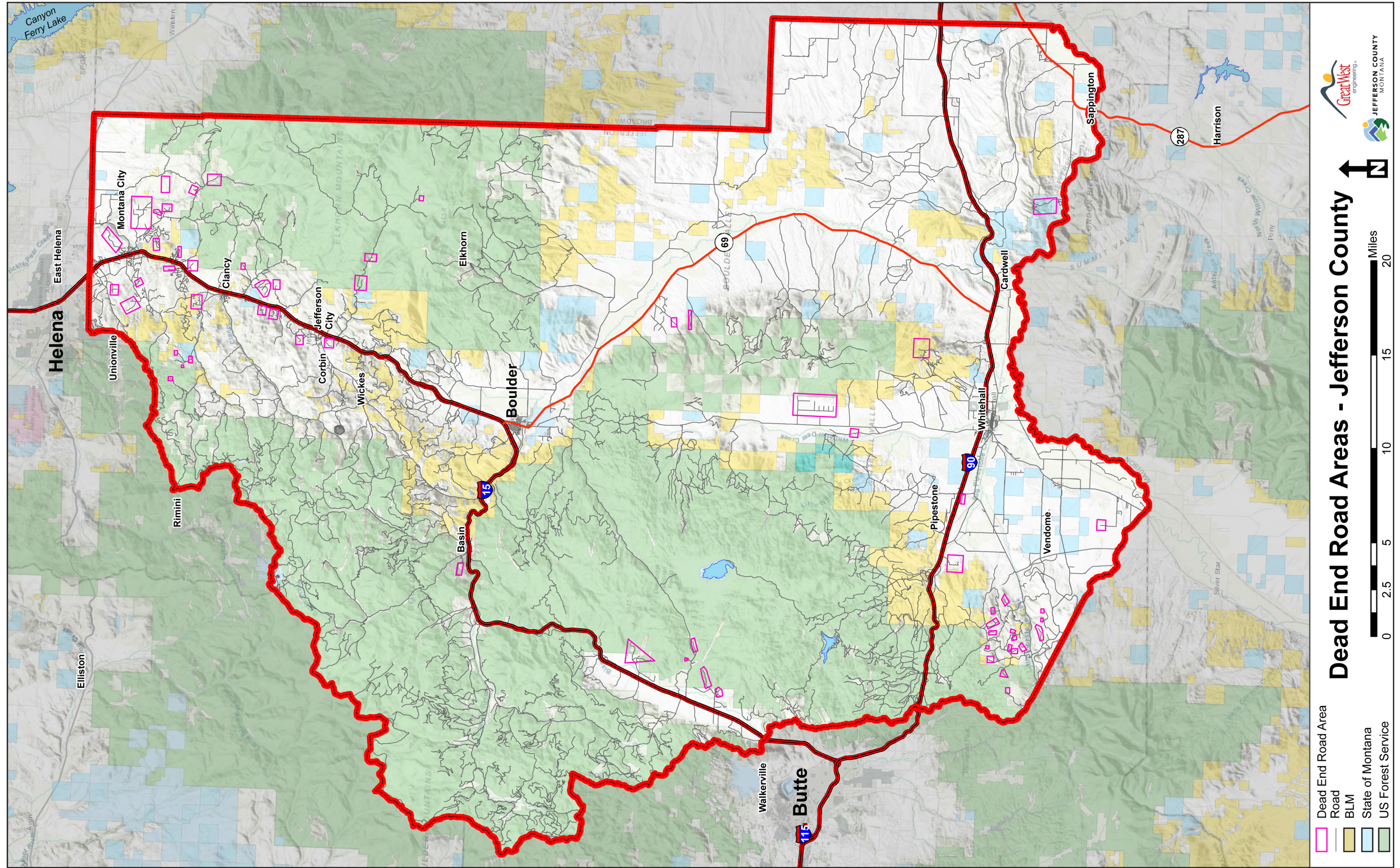
Adequate road signage and the accurate addressing of residential dwellings is critical for the efficient response of fire departments and EMS personnel during a fire or other emergency. Without good road signage and addressing it can be difficult for responders to locate homes. In addition, standardized road naming and addressing is essential for E911 to work properly this will be even more important for the County to comply with the upcoming transition to Next Generation 911 (NG911).

NG911 is a nationwide, standards-based, all-IP emergency communications infrastructure that will enable voice and multimedia communications between a 9-1-1 caller and a 911 center, and first responders in the field. County residents in need of emergency assistance would be able to transmit voice, photos, videos, and other forms of data to 911 dispatchers.

Unfortunately, complete standardization of road naming/signage and addressing is problematic in some areas of the County. Thus, it is likely that there are many roads in the County that are either not named/signed or are incorrectly addressed. In order to improve emergency response and the effectiveness of the E911 and eventually NG911, the County should review its road naming and addressing policies. It should also conduct a comprehensive review of its road network, existing road names and residential addresses to identify areas of concern and in need of correction. In addition, the County should update its "addressing policy" to require that all new addresses and road names comply with the adopted standards necessary to facilitate E911 and eventually NG911. The County should consider withholding the assignment of a new address/road name unless a homeowner agrees to meet the formal policy. In addition, all new subdivision road names should be reviewed for compliance with the formal "road-naming policy" and all lots in the subdivision should be addressed according to the adopted "addressing policy."

6.4 Bridges

While well maintained roads are essential to facilitating emergency response and evacuations in the event of a fire, ensuring that bridges and culverts can support the travel of emergency vehicles such as fire engines is equally critical. The failure of a bridge during a fire event could be catastrophic. This is particularly important when you consider that wildland fire engines can run gross vehicle weights ranging from 15,000 pounds to 33,000 pounds.



Jefferson County is currently responsible for maintaining forty-one bridges (eight minor bridges and thirty-three major bridges). Major bridges are single span bridge greater than 20 feet in length and minor bridges/culverts are single spans less than 20 feet. See Map 5 for the location of bridges in the County.

The County has been very active in maintaining and replacing its bridges. Since 2005, the County has replaced sixteen bridges, seven of which were culvert replacements. The following are bridges currently scheduled for replacement:

- Meridian Road Bridge – Replacement in conjunction the Gallatin County and Broadwater County is underway.
- Williams Bridge – Replacement (Jointly owned with Gallatin County)
- McClellan Creek Road Bridge – Replacement
- Basin Creek Road Bridge (BC3) – Replacement – Current single lane bridge w/detour culvert upstream
- Quantaince Lane Bridge (QL2) – Rehabilitation or Replacement

While the County does maintain a significant number of bridges many of the other bridges in the County are privately owned and probably do not meet any accepted engineering standards. Thus, these bridges may or may not be able to accommodate heavy equipment such as fire engines. If an existing bridge is proposed to provide access to a new subdivision, it must be evaluated to determine if it complies with the County's adopted bridge standards. If it does not, the structure should be replaced with a bridge or culvert that does meet the County's standards.

There are many bridges that only provide access to single homesites or remote cabins. It is important for people using such bridges to understand that if they do not meet an accepted engineering standard for construction, it may be difficult if not impossible for fire fighting vehicles to access their properties in the event of a fire.

7.0 VEGETATION MANAGEMENT - FUEL REDUCTION

The Tri-County Regional Community Wildfire Protection Plan (CWPP) provides a thorough analysis of the wild-land-urban interface (WUI) in Jefferson County. It also provides mitigation strategies that could be implemented to minimize the impacts of a WUI fire incident. Some key statistics in the CWPP are:

- Residential development trends in the County include:
 - Urban/suburban residential development (average lot sizes of less than 1.7 acres) in the County increased from 973 acres in the year 2000 to 1,139 acres in 2010, an increase of over 17 percent.
 - Exurban residential development (average lot sizes between 1.7 – 40 acres) in the same period increased from 10,413 acres to 22,416 acres, an increase of 12,003 acres, or just over 115 percent.
- The regional risk assessment from the CWPP indicates:

Wildland Urban Interface (WUI) Acres per Wildfire Risk Classification in the County:

Extreme	High	Moderate	Low
182,858	147,275	113,421	162,842

Structure Address Points per Wildfire Risk Classification in the County:

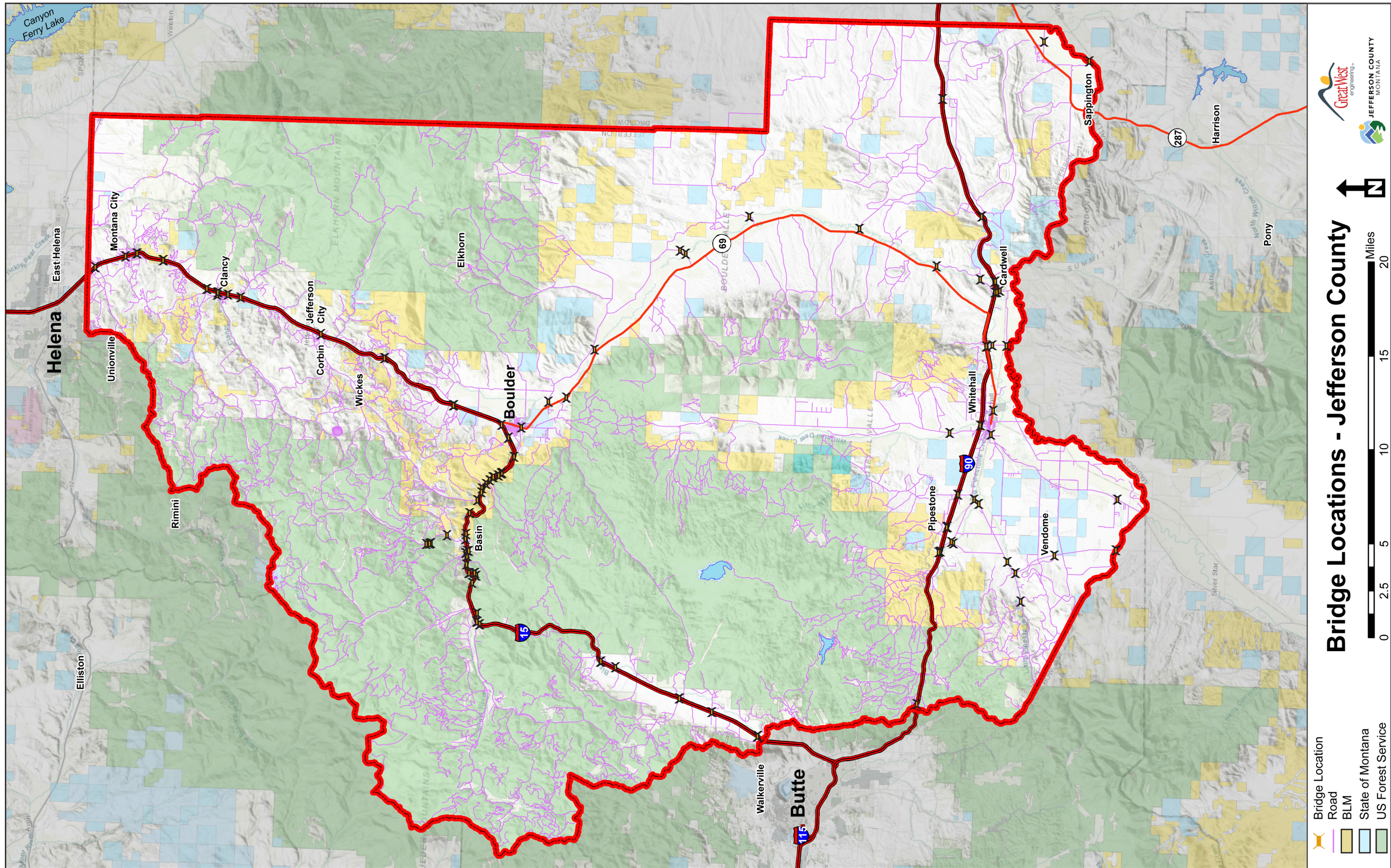
Extreme	High	Moderate	Low
646	1,986	850	2,446

Map 6 shows the Jefferson County Local Hazard Assessment Map that is part of the Tri-County Regional Community Wildfire Protection Plan.

As mentioned earlier one of the tasks completed as part of this Need’s Assessment was to provide a GIS layer of dead-end roads greater than ¼ mile that access structures. Most of the dead roads identified have multiple address points for structures associated with them. See Appendix 2 for detailed maps of dead-end roads in the County. Potential fuel management projects could be targeted to those roads where fuels encroach on the emergency ingress/egress routes.

7.1 Private Homeowners

Managing vegetation is one of the most effective methods for reducing the risk of property loss from wildfire. Unfortunately, short of adopting a zoning code, the County has limited authority for requiring residents to cut and remove vegetation to create defensible space around their homes. Achieving defensible space will be far more acceptable to residents if it is done voluntarily and with the assistance of organizations such as the Tri-County FireSafe Working Group which works in Broadwater, Jefferson and Lewis and Clark counties. Education of County residents would be critical to the success of any County-wide vegetation management program. See Section 10 Public Education for recommendations to help improve County residents’ understanding of vegetation management.

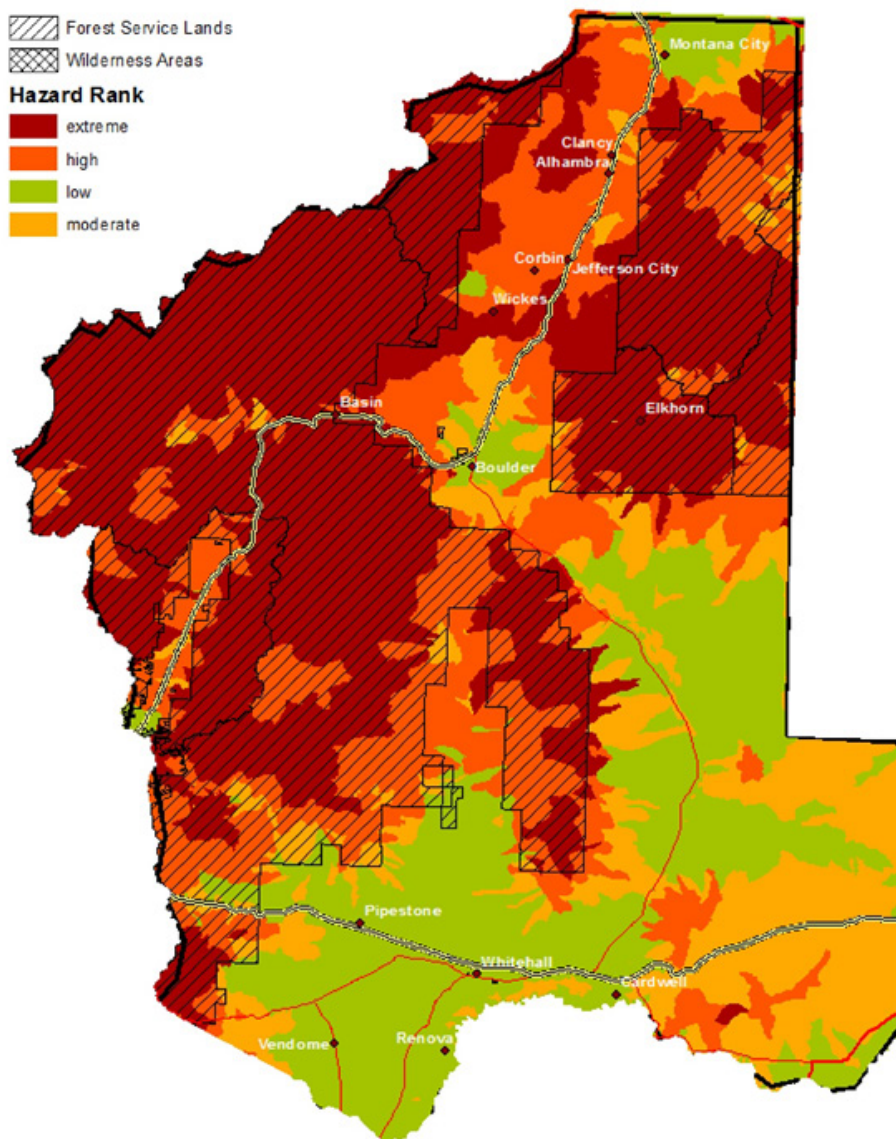


7.2 Subdivisions

As part of a preliminary plat approval for any new subdivision, the County Commission could require as a condition of approval that a vegetation management plan be completed for the project and if necessary, require the thinning of vegetation on the property prior to the filing of the final plat. It would be important that vegetation management be completed prior to the filing of the final plat. That being said, once the plat is filed and homes are built, the County would have little to no authority to require the reduction of vegetation. In order to implement such a requirement for new subdivisions, the County Subdivision Regulations would need to be amended to include a vegetation management plan and if necessary, the thinning of vegetation where it poses a significant threat to the health and safety of residents and fire-fighters.

Map 6 - County Local Hazard Assessment Map from CWPP

Jefferson County Local Hazard Assessment Map from CWPP



8.0 REGULATORY REVIEW AND RECOMMENDATION

The following is a review of the existing fire protection standards found in the County Subdivision Regulations and the North Jefferson County Zoning Regulations. The review includes recommendations for maintaining or improving the current regulations.

8.1 County Subdivision Regulations

The current County Subdivision Regulations date back to 1996 and need to be updated. The current regulations do include a section devoted solely to fire protection requirements for subdivisions. The following are those fire protection standards with comments regarding whether the standards are:

- Still relevant,
- Should be updated, or
- Make additional changes/edits

General Design and Improvement Standards: 8.1.18 Fire Protection (Current Regulations)

8.1.18.1: The placement of the structure in such a manner to minimize the potential for flame spread and to permit efficient access for fire-fighting equipment.

- This will be difficult to enforce through the subdivision review process. Thus, this should be removed from the regulations.

8.1.18.2: The presence of adequate fire-fighting facilities on site, when required by the governing body.

- “Fire-fighting facilities” should be clearly defined in the regulations if it will remain a standard.

8.1.18.3: An adequate water supply and water distribution system to fight fires on site, when required by the governing body.

- The County should develop and adopt a clearly defined and standardized system for determining the amount of water needed in a subdivision and to what design standards the water supply system should be constructed to. In addition, long-term maintenance needs to be considered. The Lewis and Clark County Subdivision Regulations may provide a template for addressing this issue.

8.1.18.4: The availability, through a fire protection district or other means, of fire protection services adequate to respond to fires that may occur within a subdivision.

- Subdivisions should only be approved if they are located within an established fire district. If a proposed subdivision is not located within a fire district it should be denied by the County Commission or the subdivision should be annexed into an existing district.

8.1.18.5: Special standards for subdivision proposed in areas of high fire hazard.

High fire hazard areas include heads of draws, excessive slopes, dense forest growth or other hazardous wildfire components. For subdivisions proposed in areas subject to high wildfire hazard, the following standards shall apply:

8.1.18.5.1: At least two entrance-exit roads shall be provided to assure more than one escape route for residents and access routes by fire fighting vehicles.

- This may not be a realistic standard for many subdivisions in the County due to topography and property ownership.
- The County should develop criteria that determines the type of access and the number of access points based upon wildfire hazard and/or the ability of a developer to adequately mitigate the hazard.
- For example, low fire hazard areas such as level grasslands or agricultural lands converted to residential use probably could be accessed using dead-end roads while posing a limited threat to public health and safety. This would be contrasted with a location that has steep topography and thick vegetation and where the danger posed by limited access and fire hazard may make it unacceptable to have a dead-end road.

8.1.18.5.2: Road right-of-way shall be cleared of slash.

- This work would need to be completed prior to the filing of the final plat. Once the plat is filed the County would have no leverage to ensure the work is completed.

8.1.18.5.3: Building sites shall be prohibited on slopes greater than 30 percent and at the apex of “fire chimneys” (topographic features, usually drainage ways, or swales, which tend to funnel or otherwise concentrate fire toward the top of steep slopes).

- “Building envelopes” shown on the face of the final plat or final plat supplements may be one avenue to ensure that construction does not take place in such locations.
- Without a site development permit system in place, once the final plat for a subdivision is filed, the County will have limited options to enforce the contents of the final plat.

8.1.18.5.4: Densities in areas of steep slopes of dense forest growth shall be reduced through minimum lot standards as follows:

Minimum Lot Size (Acres)

Percent Slope	Open Grass	Forest & Brush
0-10	1	2
10-20	2	3
20-30	3	4
>30	5	Not permitted

- This standard is still relevant and is seen in the subdivision regulations of neighboring counties such as Lewis and Clark County. Building envelopes shown on the face of the final plat or final plat supplements may be the only way to “ensure” that construction does not take place in certain areas. Again, once the final plat is filed, the County will have limited options to enforce the final plat approval.
- Without a site development permit system in place, once the final plat for a subdivision is filed, the County will have limited options to enforce the contents of the final plat.

8.1.18.5.5: Open space, park land and recreation areas (including green belts, riding, or hiking trails) should be located, where appropriate, to separate residences and other buildings from densely forested areas.

- This standard is still relevant and is also seen in the subdivision regulations of neighboring counties. The location of open space and parkland should be shown on the face of the final plat and some mechanism created to ensure maintenance of the vegetation in these areas.

8.1.18.5.6: A water supply of enough volume for effective the control shall be provided in accordance with standards set by the local fire protection authority.

- The County should develop and adopt a standardized system for determining the amount of water needed in a subdivision and to what construction standard the water supply system should be built to. This standard should be applicable across the entire County and should not vary from one fire district to another. This will ensure consistency and predictability with regards to water supplies. In addition, long-term maintenance needs to be considered for any water supply.

8.1.18.5.7. Consultation with the local fire protection authority.

- Consultation with the local fire district should not translate into giving the fire district any final authority over the approval of a subdivision. Final approval should be based upon adopted regulations, standards and plans with the final authority resting with the County Commission.

Additional Recommendations for the County Subdivision Regulations

- Vegetation management plans should be required for all subdivisions located in areas identified as having high to severe potential for wildfire. Those plans should be developed by a “qualified” wildland fire protection specialist and the recommendations of the plan should be completed before the filing of the final plat, including the thinning of vegetation.
- All bridges used to access a subdivision must be certified by a professional engineer in writing that they meet the County’s bridge standards in order to ensure use by emergency vehicles such as a fire engine.
- All external roads used to access a subdivision should be reviewed by a professional engineer to ensure that they are constructed and maintained in a manner that will ensure use by emergency vehicles.
- All internal roads in a subdivision must be constructed to County road standards and certified as meeting those standards by a professional engineer.
- New subdivision roads and bridges should be maintained through the creation of a Rural Improvement District (RID).
- The County may want to consider incorporating into the subdivision regulations the standards found in NFPA 1142, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas.

8.2 North Jefferson County Zoning Regulations

The mitigation of wildfire in the North Jefferson County Zoning Regulations is very limited. In fact, the term “wild-land fire” is used only once and that is in Section 3.3.8 Conserved Space. In that section, one of the stated purposes of Conserved Space is to:

- 5. Help minimize residential development in areas prone to wild-land fire.

Recommendations for the North Jefferson County Zoning Regulations

- Undertake a comprehensive review of the regulations to identify what portions of the regulations should be amended or removed.
- A comprehensive review should consider how mitigating wildfire could be better incorporated into the regulations.

9.0 ADDITIONS TO THE UPDATED COUNTY GROWTH POLICY

The following are potential goals and objectives specifically focused on the recommendations, needs and projects identified in the fire assessment. The County may want to consider adding them into the future update of the County Growth Policy.

Goal - Provide the necessary infrastructure and services to serve County residents safely and efficiently.

Objective – Provide adequate infrastructure to support fire protection, ambulance, and rescue services.

Objective -Create policies and standards that require developers and new users to pay their proportional share of the costs associated with serving new development. This may or may not include impact fees or rural improvement districts (RIDs).

Goal - Reduce risks and costs associated with wildland fire, flooding, and other hazards

Objective - Discourage residential development in hazardous areas where public and emergency responder safety is compromised.

Objective -Use hazard mapping of wildfire and floodplain risks to guide residential development into safer and more appropriate areas.

Objective - When residential development in hazardous areas does occur, appropriate measures should be taken to limit safety risks and ensure emergency personnel have enough resources to respond safely and effectively.

Objective - Work with County public safety and resource agencies to identify and mitigate risks and provide appropriate resources for public and responder safety.

Objective -Amend the County Subdivision Regulations to require the most effective hazard mitigation techniques, including water supplies adequate for fire protection, vegetation management, multiple accesses, etc.

Objective -Provide County residents with information regarding development in hazardous areas (vegetation management plans, evacuation plans, Firewise development practices, etc.).

Objective - Support funding efforts such as cost sharing to help County residents reduce fuels and take measures to make their properties more resilient to hazards.

9.1 Fire Protection

Goal - To provide adequate fire protection facilities, water supplies and services to ensure the safety of County residents and protection of their property.

Objective - The County will work to improve fire protection services based upon accepted national and state standards.

Objective- The County will not approve new subdivisions that are not located within a fire district.

Objective – The County will work to encourage residents living outside of fire districts to annex into a district in order to obtain fire protection services.

Objective - The County will assist in implementing the recommendations identified in this Needs Assessment of the County Fire Services.

Objective – The County will consider creating a funding mechanism to implement the recommendations of this Needs Assessment of County Fire Services. This may include the creation of a single County-wide rural improvement district (RID), the development of individual RIDs for each fire district or the development and adoption of an impact fee ordinance to collect fees from new developments.

Objective - Water supplies, storage, and conveyance facilities developed for fire protection for new subdivisions must be designed and constructed to accepted engineering standards and maintenance.

Objective - The County will require that all new road networks be designed and constructed to provide for safe and ready access for emergency equipment and provide an alternate route for evacuations and if practical, future road connectivity.

Objective - In order to meet the standards required for a migration to Next Generation 911, the County will ensure that all roads and buildings are properly identified by name or number with signs which are non-combustible and are clearly visible from main roadways.

Objective -The County will review its road naming and addressing policies and conduct an inventory of road locations, names, and existing addresses to prepare for the migration to NG 911.

Objective - The County will help facilitate the siting of new fire stations to enable the minimum acceptable response time to emergency calls.

9.2 Emergency Response

Goal – To ensure the maintenance of the County Emergency Operations Plan in order to maintain its effectiveness in preparing and responding to a natural or human-made disaster.

Objective -The County will coordinate with all other local, state, and federal governmental agencies charged with disaster and emergency preparedness responsibilities.

Objective -The County will continue to maintain emergency evacuation plans for identified WUI areas.

Objective - The County will ensure that the Emergency Operations Plan continues to meet current federal and state emergency requirements through periodic updating.

Objective –The County will work with other local agencies, including cities within the County, to develop coordinated geographical information systems (GIS) planning for emergency response services.

Objective -The County will maintain current and effective mutual aid or Joint Power Agreements (JPA) for fire, police, medical response, hazardous materials, mass care, heavy rescue, or other functions as appropriate.

10.0 CRITICAL FACILITIES

An inventory was conducted to document the critical infrastructure as identified by each fire district in the County. The following is the inventory provided by each fire district and supplemented by the critical facilities list identified in the 2017 County Predisaster Mitigation Plan.

Basin Fire Department



- Municipal water and sewer system facilities
- Wooden Bridge on Quartz Avenue (one lane)
- Basin Community Center
- Basin Fire Department Buildings
- Basin Grade School
- Basin Low Power FM (LPFM) Broadcast Radio Station
- Montana Department of Transportation Facility

Boulder Fire Department



- Beargrass Assisted Living
- Big Boulder Housing
- Boulder Airport
- Boulder Ambulance
- Boulder Basin Senior Center
- Boulder City Hall

- Boulder City Shop
- Boulder Fire Dept
- Boulder Grade School
- Boulder Hill Radio Site
- Boulder Low Power FM (LPFM) Broadcast Radio Station
- Boulder Medical Clinic
- Boulder Water Tank 1
- Bull Mountain Fire Stations
- County Attorney Office
- County Planning Building
- Courthouse Annex
- Depot Hill Radio Site
- Elkhorn Pharmacy
- Elkhorn Treatment Center
- Jefferson County Planning Department
- Jefferson County Courthouse Campus
- Jefferson County Fairgrounds
- Jefferson County Health Dept
- Jefferson County Sheriff/DES/Police
- Jefferson County Shop
- Jefferson County Transfer Station – Boulder
- Jefferson High School
- Montana Department of Transportation Facility
- Wastewater Treatment Plant (City)
- Youth Dynamics

Bull Mountain Fire Department

- Same as Boulder Fire Department



Clancy Fire Department



- Clancy Grade School
- Elkhorn Search & Rescue
- Fire Stations 1 and 2
- Jefferson County Transfer Station
- NorthWestern Energy Gas Gate Valve #1
- NorthWestern Energy Gas Gate Valve #2
- QWest Substation

Elk Park Fire Department



- Elk Park Fire Station
- Elk Park Low Power FM (LPFM) Broadcast Radio Station
- XL Heights Radio Site

Jefferson City Fire Department



- Jefferson City Community Center
- Jefferson City Fire Department
- Jefferson City (LPFM) Broadcast Radio Station
- Jefferson County Transfer Station
- Emerson Peak Cell Towers

Jefferson Valley Fire Department



- Cardwell/Bull Mountain (LPFM) Broadcast Radio Station
- Orica Mountain West INC - Blasting Plant
- Cardwell School
- Golden Sunlight Mine
- Conda Mine
- Smith Supply
- Cardwell Store
- Interstate 90
- Primary Highways - MT 2, MT 55, and MT 69
- Jefferson County South Repeater and towers on Bull Mountain
- Cedar Hills Area
- Upper & Lower Rader Creek Area
- Z-T Area
- Jefferson River Bottom

Montana City Fire Department



- COEH McClellan Radial Well #1
- COEH McClellan Radial Well #2

- COEH McClellan Water Tank #1
- COEH McClellan Water Tank #2
- COEH McClellan Wellhouse
- Country Life Assisted Living
- CRH Ash Grove Cement
- Discovery Kidzone A
- Elkhorn Preschool
- Jefferson County Shop
- Jefferson County Transfer Station
- Jumpstart Preschool
- Montana City School - K-8 school with 550 students
- Montana City Fire Department Stations 1 and 2
- Northern Pacific Dam
- Interstate 15
- Jefferson County radio repeaters and Verizon Cell Tower on Saddle Mountain.
- AT&T microwave towers on Microwave Hill
- St. Peter's Health Regional Medical Center - 3/4 mile from district boundary
- Shodair Children's Hospital - 1 mile from district boundary
- Touchmark Retirement Community - 1/2 mile from district boundary
- Edgewood Assisted Living & Memory Care Center - 1000 ft from district boundary

Whitehall Fire Department

- Cardwell/Bull Mountain (LPFM) Broadcast Radio Station
- Coachman Senior Apartments
- Delmoe Lake Dam
- Henningsen Vet Clinic
- Homes and businesses around the edge of Town limits
- Jefferson County Sheriff's Substation and DES Alternative EOC/MSU Extension Office
- Jefferson County Shop
- Jefferson County Transfer Station
- Jefferson Valley Search and Rescue
- Liberty Place 1 Assisted Living
- Liberty Place 2 Assisted Living
- Liberty Place Corporate
- Madison/Jefferson Extension
- Meadowlark Manor
- Whitehall Town Hall
- Whitehall City Shop
- Whitehall Community Center
- Whitehall Drug
- Whitehall Fire Dept

- Whitehall Grade School
- Whitehall High School
- Whitehall Medical Clinic
- Whitehall Middle School
- Whitehall Public Works Shop 2
- Whitehall Rodeo Grounds
- Whitehall Senior Center and Library
- Whitehall Senior Housing
- Whitehall Wastewater Plant
- Whitehall Water Tower

Willow Creek Fire Department



- None provided

Not all cellular communication towers or internet sites located in the County are included in the critical facilities list above. This is because their specific locations may not be mapped; however, these sites are considered vital communication links and they will become more so as landline usage becomes less common in many areas of Jefferson County.

In order to protect these facilities, vegetation management plans should be considered and if necessary, implemented for each. In addition, each facility should be inspected to determine if there are structural improvements that could be made such as using metal roofing and siding and improving venting in roof soffits etc.

11.0 PUBLIC EDUCATION

The Tri-County Fire Safe Working Group (TCFSWG) is the primary organization in the three-county area (Broadwater, Lewis & Clark, Jefferson) to provide wildfire education and fuels reduction program services. The TCFSWG is a collaborative group composed of private, local, state, and federal partners.

The TCFSWG identified three national wildfire protection goals that it would like to achieve. They include

1. Restoring and maintaining local landscapes
2. Creating fire-adapted communities
3. Implementing safe, effective, efficient risk-based wildfire management.

These goals were incorporated into the recently completed update of the Tri-County Community Wildfire Protection Plan (CWPP).

The TCFSWG's public education efforts include promoting the use of Fire Safe Montana's Ignition Resistant Construction Guide for building construction. The guide provides recommendations on how homeowners can reduce the risk of wildfire to their homes through construction techniques and collaborative fire prevention programs.

One of the most important things the County and the County's fire departments could undertake is Community Risk Reduction (CRR). The International Code Council through its Vision 20/20 Project (www.strategicfire.org) defines Community Risk Reduction (CRR) as a process to identify and prioritize local risks, followed by the investment of resources (emergency response, public education and prevention) to reduce their occurrence and impact.

A Community Risk Reduction (CRR) program would coordinate emergency operations in the County with fire prevention and mitigation efforts throughout both the County and at the fire department level. For such a program to be successful, it would be critical for the volunteers in each fire district to participate in gathering local risk data and performing activities such as the resident education necessary to implement the CRR plan.

A CRR plan could not only reduce fire risk in the County but could also improve firefighter and emergency responder safety and occupational health, along with reducing the potential for injury or death. In addition, a CRR program could help County fire departments better understand their communities and improve their Insurance Services Office (ISO) rating to reduce the cost of home-owners insurance.

In addition to firefighter safety, there are a number of other reasons why County fire departments should consider developing a CRR plan:

- The presence of new and emerging hazards.
- Declining budgets among fire departments and local governments.
- High-risk residents tend to remain underserved.

Other than the risks identified in the Tri-County CWPP and Jefferson County's Pre-Disaster Mitigation Plan, County fire departments should work to identify the specific risks in their jurisdictional areas. After identifying their risks, they could develop site specific strategies to mitigate the identified risks, i.e. vegetation management, road, and bridge improvements, etc.

Because the fire departments in the County are all volunteer, the process of developing district specific community risk reduction plans and education programs are beyond the ability of each department to complete. Knowing these limitations, the most effective way for the County to developing site specific plans and resident education would be to allocate money and resources to hire a fire protection specialist to work one on one with each fire district to complete such work.

No matter which approach is taken, public education efforts need to be conducted in cooperation with partners at the state and federal levels to ensure the use of standardized mitigation methods, messaging and terminology, such as the standardized evacuation terminology adopted by the Montana Sheriffs and Peace Officers Association.