



Tri-Lakes Monument FPD
Monument, Colorado

Fire Department Master Plan

January 2019



Emergency Services Consulting International

Providing Expertise and Guidance that Enhances Community Safety

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TABLE OF CONTENTS

Table of Contents	i
Acknowledgements	iv
Executive Summary	v
Organization Overview	1
Service Area	1
Governance	5
Organizational Design	7
Management Components	8
Foundational Management Elements	8
Management Documents and Processes	10
Internal and External Communications	10
Record Keeping and Documentation	11
Security	12
Critical Issues	13
Funding	13
Growth	13
Collective Bargaining	14
Financial Management and Analysis	15
Current Conditions	15
Financial Forecasts	27
Future Revenue Concerns	36
Best Practices in Financial Management	37
Capital Assets and Capital Improvement Programs	38
Facilities	39
Apparatus	42
Capital Replacement Planning	43
Service Delivery and Performance	56
Service Demand Analysis	56
Resource Distribution Analysis	62
Resource Concentration Analysis	71
Response Reliability	74
Response Analysis	76

Planning for Fire Protection and Emergency Medical Services..... 86

- Tactical Planning87
- Operational Planning 88
- Master Planning 89
- Strategic Planning..... 89
- Emergency Management Planning 90

Training 92

- Current State 92
- Initial Fire Training 93
- General Training Competencies 94
- Training Administration 94

Life Safety Services..... 96

- Community Risk Reduction 96
- Risk Reduction Strategy 97
- Fire and Life Safety Program..... 98
- Code Enforcement 98
- Fire-Cause Determination & Investigation 100
- Fire Prevention & Life-Safety Programs 100

Emergency Medical Services 102

- Current State 102
- Quality Management103
- EMS Training.....105
- Logistical Support105
- Medical Control and Oversight..... 106
- System Integrity and Required Credentialing..... 106

Hazardous Materials107

- Current State107
- Service Opportunities 107

Future Service Demand 109

- Population Growth Projections 109
- Service Demand Projections 110
- Impact of Aging Population on Service Demand 111
- Projected Development 112

Community Risk Analysis113

- Population Density Risk 113

Future Strategies123

 Short and Mid-Term Strategies.....123

 Long-Term Strategies125

 Optimal Station Locations 128

 Current Station Location Analysis132

 Relocating an Existing Station for Maximum Coverage.....134

 Summarizing the Station Modeling Information135

Conclusion 140

Appendix A—Table of Figures 141

Appendix B—Critical Task Analysis..... 145

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Also, ESCI would like to recognize other individuals from agencies external to the District. The Town of Monument and El Paso County, and citizens and community organizations for giving of their time and knowledge during our interviews. The insights by neighboring fire chiefs was also valuable in our gathering a complete picture of the District; we appreciate their willingness to participate.

EXECUTIVE SUMMARY

Tri-Lakes Monument Fire Protection District (TLMFPD or District) is a result of earlier mergers of departments and serves a population of around 30,000 north of Colorado Springs in northern El Paso County, Colorado. The 52-square mile service area contains a combination of urban and rural densities. The District serves a mix of commercial and residential occupancies. Governed by a seven-member Board of Directors as a Colorado special district, the Fire Chief acts as the Chief Executive Officer for the organization. Offering a full range of services commonly offered by fire departments, including EMS transport services, the District is well-operated to cover existing risks.

TLMFPD's demand for service averages about 2,500 calls per year of mostly (66%) EMS calls. Based on the current population, the District responds on 91.5 calls per 1,000 population which is slightly higher than other communities of this size in the western region according to National Fire Protection Association (NFPA) statistics.

TLMFPD is currently well funded since a recent mill levy increase was approved by the voters. The District has fire stations that are in good to very good condition. The apparatus appears in good mechanical condition and the fleet averages 8.8 years old. After funding the capital replacement schedule, the only negative impact on the budget revenues will be a decrease in property values or the impact on residential values due to the combination of TABOR and Gallagher constitutional amendments.

The operational staffing meets what is needed for a normal residential-type fire, but for fires that have progressed or in commercial buildings will require mutual aid assistance. The administrative staff is generally lower than many departments at 8 percent. Some line personnel have administrative tasks which helps to keep the administrative personnel lower and involves line personnel in the functioning of the department.

The stations are located so that 98 percent of the service demand is within an 8-minute travel time from the three stations and all incidents are within a 12-minute travel time. Based on the current incident locations it is estimated that 65 percent of the incidents are within a 4-minute travel time. With automatic or mutual aid from neighboring stations, 80 percent of the incidents could be within a 4-minute travel time.

The ability to put adequate staffing on the scene of an incident with automatic aid is shown to be 3 to 7 stations within a 12-minute timeframe. This equates to staffing of approximately 15 to 27 personnel. The frequency of concurrent incidents is 30 percent or higher each year. This can have a negative effect on the response times or the time required to get adequate staffing on the scene. For unit hour utilization, only one unit exceeds a 10 percent threshold. Usually higher utilization can cause fatigue or inability to complete other assignments.

Actual response time performance District-wide is 9 minutes, 54 seconds, at the 90th percentile, or 8 minutes, 31 seconds, at the 80th percentile. Turnout time was 2 minutes, 30 seconds, at the 90th percentile. Call processing time is 1 minute, 48 seconds. Total response time broken down into urban and rural response zones is 9 minutes, 20 seconds, for urban response at the 90th percentile, and rural is 9 minutes, 35 seconds, at the 80th percentile. The NFPA standard to urban response zones is 9 minutes, 90 percent of the time, and 14 minutes for rural response, 80 percent of the time.

Training, Life Safety, and Emergency Medical Services are discussed in detail in the report. As the current operations were reviewed, recommendations were made based on industry standards or best practices. These can be found at the end of each section or enumerated again in the Future Strategies.

Future service demand was analyzed base on probable growth within the District. Assuming the same call ratio to population, the 2028 service demand is estimated at 3,164; and in 2038, at 3,817 total calls for service. EMS calls for service is predicted to be 2,092 in ten years, and 2,524 in twenty years. Based on an increasingly aging population, within the first ten years the EMS service demand will likely increase over that predicted by population alone.

Several station location analyses are shown in the report. Station locations are analyzed based on optimal locations regardless of current station location. Another analysis considers the current station locations and how changes would improve performance. Future station performance is based on the future growth information.

Even though the District is operating well, some recommendations have been made in areas that the District has the opportunity to improve.

ORGANIZATION OVERVIEW

The Organizational Overview component provides a summary of the agency's composition, discussing its configuration and the services that it provides. ESCI combined data provided by Tri-Lakes Monument Fire Protection District (TLMFPD or District) management staff, as well as both internal and external stakeholders, with information collected during fieldwork to develop the following overview.

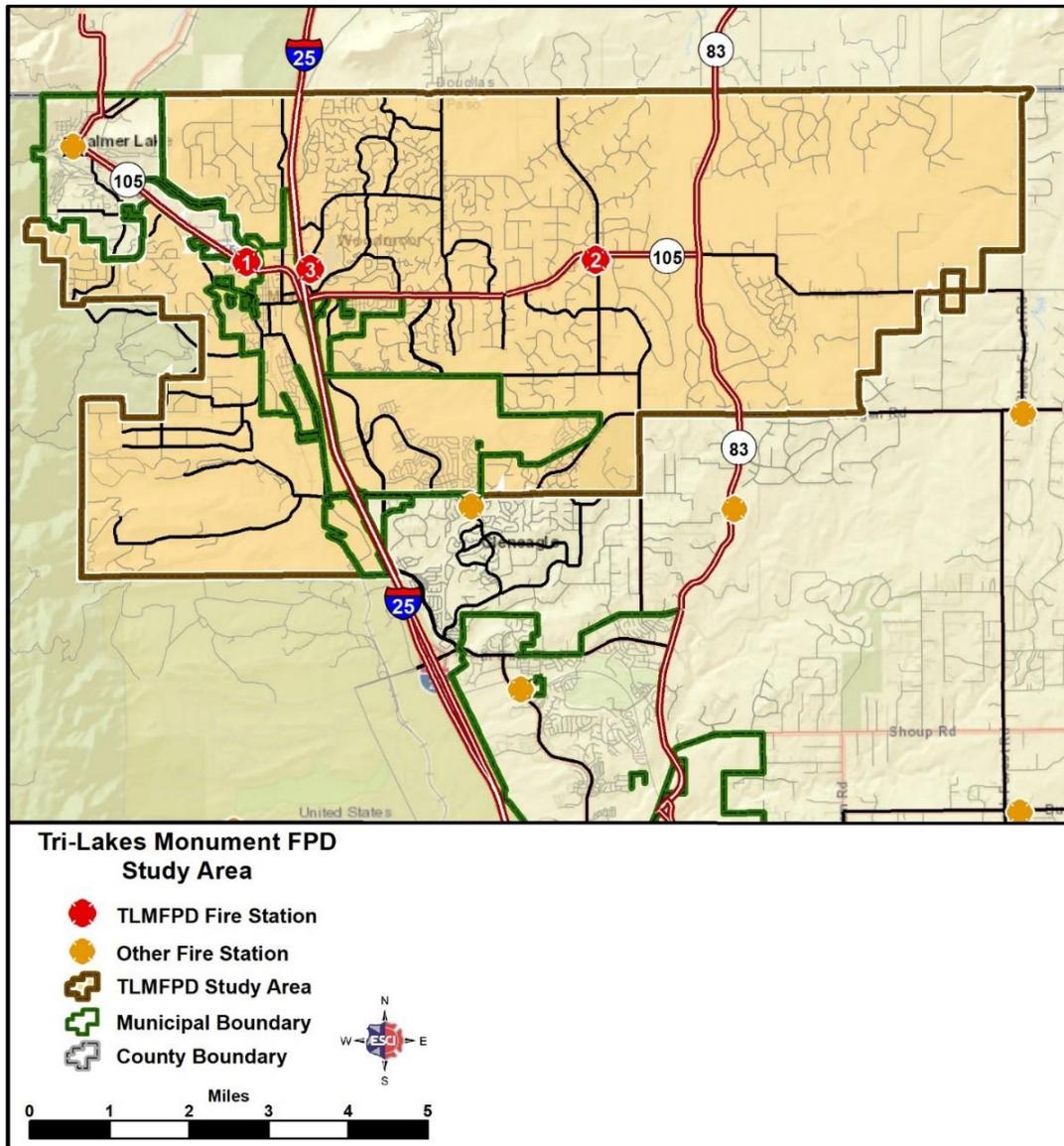
The purpose of this section is two-fold. First, it verifies the accuracy of baseline information along with ESCI's understanding of the agency's composition. This provides the foundation from which the Master Plan is developed. Secondly, the overview serves as a reference for the reader who may not be fully familiar with the details of the District's operations. Where appropriate, ESCI includes recommended modifications to current observations based on industry standards and best practices.

Service Area

The Tri-Lakes Monument Fire Protection District is a result of consolidation. The Monument Volunteer Fire Department began in the late 1930s. Much later in the mid-1970s, the Woodmoor-Monument Fire Protection District was formed to protect an area of new development. This was a statutory fire district with a tax base and paid staff. The Monument Fire Department became Tri-Lakes Fire Protection District. The growth of the area in the late 1990s precipitated the department to become a combination paid and volunteer staffed department. In 2004, the Woodmoor-Monument FPD and Tri-Lakes FPD became a regional fire authority, and finally became one district on January 1, 2008.

The following figure reflects the study area.

Figure 1: Fire Protection District Study Area



Service Area and Infrastructure

The size and composition of a fire district’s service area affects the type and number of personnel, fire stations, and vehicles that are needed to provide services efficiently. Sometimes complex decisions need to be made regarding the deployment strategies employed to properly position resources based on land area, geography, risk, cost, and similar factors. ESCI will provide a detailed assessment of current service delivery and effectiveness in both the Staffing and Service Delivery and Performance sections of this report.

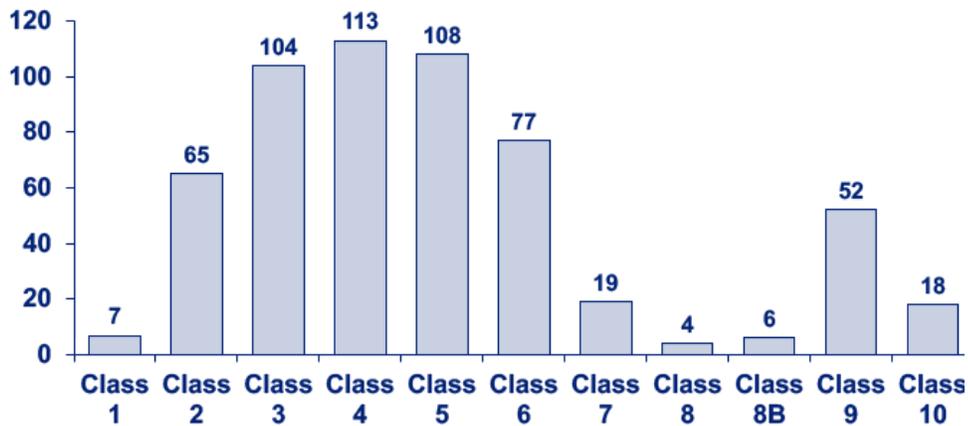
The District serves an area of 52 square miles from three fire stations. All stations are staffed with personnel on a full-time basis. The agency has two structural engines, one ladder truck, and three Type 6 engines for wildland fires. There are two ambulances that provide medical transport. Each is staffed with paramedics or a paramedic and EMT.

ISO Classification

Insurance Services Office (ISO) is a body that evaluates communities for fire protection capabilities. Many insurance companies use ISO information to determine the rates that they will charge their subscribers. The evaluation focuses on three primary areas: fire department—50%, water supply—40%, and alarm handling—10%. Under the new evaluation framework, additional credit of 5.5 points can be obtained for Community Risk Reduction efforts. ISO classifies communities on a 1 to 10 scale. Class 10 is considered no protection. TLMFPD has an ISO rating of 3/3Y. This is a 3 for areas within 5 miles of the responding fire station and where there is water supply available within 1,000 feet. The 3Y is for structures which are not within 1,000 feet of a water supply but still within 5 road miles of a fire station. The 3Y classification indicates that there is enhanced fire protection within areas of no water. This benefits homeowners on their insurance. Structures beyond 5 road miles are considered a classification 10 or the minimum fire protection.

The breakdown in classifications within Colorado is shown in the next figure. There are 104 departments that have an ISO classification of 3 out of 573 departments in Colorado with an ISO classification.

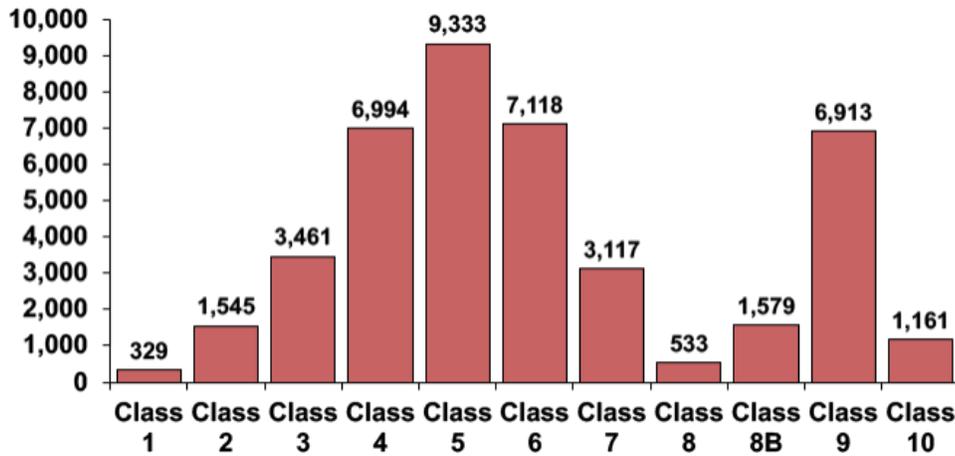
Figure 2: Colorado ISO Classifications¹



The next figure depicts the number of departments within each classification nationwide. This gives perspective on TLMFPD’s rating on a nationwide basis.

¹ Verisk Analytics Insurance Services Office website. <https://www.isomitigation.com/ppc/program-works/facts-and-figures-about-ppc-codes-around-the-country/>

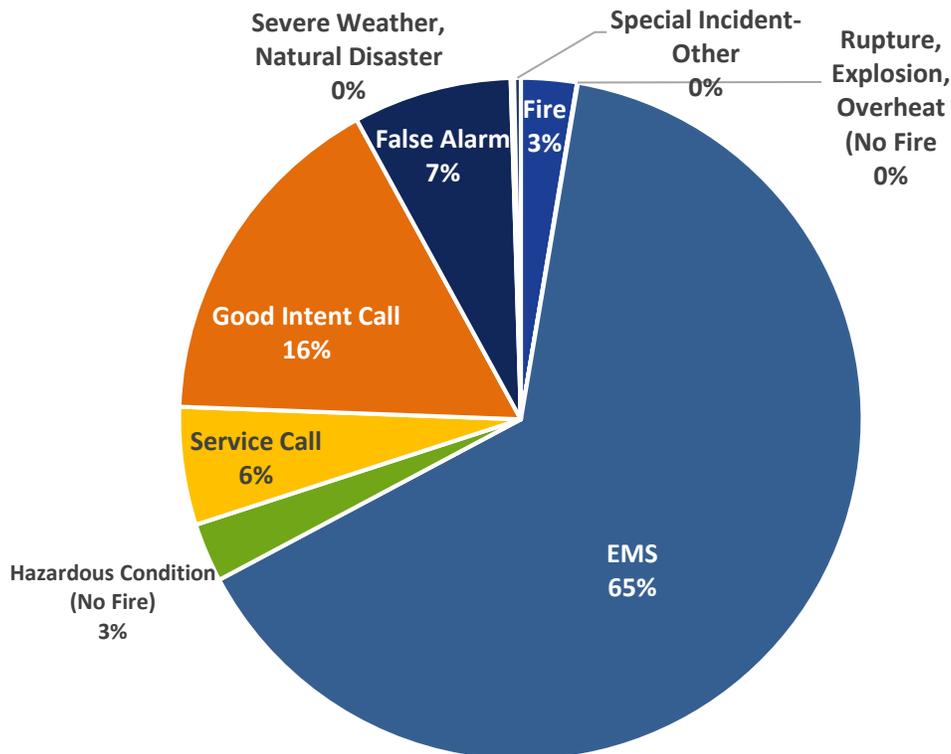
Figure 3: ISO Classifications Nationwide



Service Demand

Service demand, or calls for service, are classified in categories specified by National Fire Incident Reporting System (NFIRS). TLMFPD service demand is divided by type as shown in next figure.

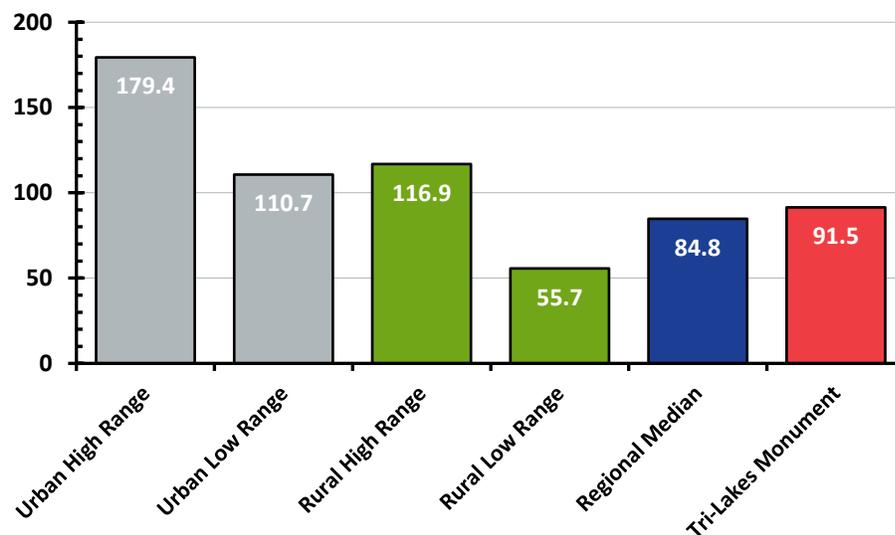
Figure 4: Service Demand by NFIRS Incident Type, 2017



The percentages for each category type are provided in the previous figure. Emergency Medical Services (“EMS”) (65%) are the largest category, as is true of most departments that offer this service. Next is “Good Intent Calls” (16%), or those that occur when a person calls for assistance thinking there is an emergency and it results that the fire department was not needed. “False Calls” (7%) usually are the result of an alarm system malfunction. These can also be intentional calls reporting an emergency by those who know there is not an emergency. “Service Calls” (6%) are when a person needs assistance but not necessarily in an emergency situation.

The following figure shows a comparison with other fire departments both nationwide and regionally. These figures are from data collected by the National Fire Protection Association.

Figure 5: Calls for Service per 1,000 Population Comparison²



This figure compares TLMFPD with other rural and urban departments of similar population nationwide. TLMFPD has an annual average of 91.5 calls per 1,000 population. Similar departments in rural areas encompass this number within the low range to high range. The call load compares very favorably with departments within the western region of the nation.

Governance

The very basis of any service provided by governmental or quasi-governmental agencies lies within the policies that give that agency the responsibility and authority upon which to act. In most governmental agencies, including TLMFPD, those policies lie within the service plan and other governing documents adopted by the agency.

² National Fire Protection Association, 2016 NFPA Fire Department Profile Report. 1 Batterymarch Park, Quincy, Massachusetts, USA.

The agency is formally identified as the Tri-Lakes Monument Fire Protection District (TLMFPD). The agency is organized and titled as a *Fire Protection District*, established under Colorado Revised Statute, Title 32, as a Special District. The District was organized under a service plan submitted in 1984. The District operates within the statutory functions that it is authorized to provide.

ESCI found that the District possesses a Service Plan and Board of Director Bylaws. Those documents are appropriate and necessary to effective governance of the District. None of the foundational documents are subject to regularly scheduled examination and revision. While these documents do not change often, it is advisable to periodically review them to be sure they reflect the current operations.

Board of Directors

The TLMFPD governance configuration is somewhat unusual for Colorado fire districts in that it functions under the direction of a seven-member Board of Directors (BOD or Board) rather than a five-member Board. The Board hires the Fire Chief, who is charged with managing the day-to-day operations of the District. The Board is responsible to set policies relating to guidance of the CEO or Fire Chief. They are ultimately responsible for the fiscal aspects and effectiveness of the District's operation. The Board retains legal counsel. Board minutes are kept by the Office Administrator and are available for public review. The minutes of the District are available on the website for easy access by the community.

Fire Chief Position

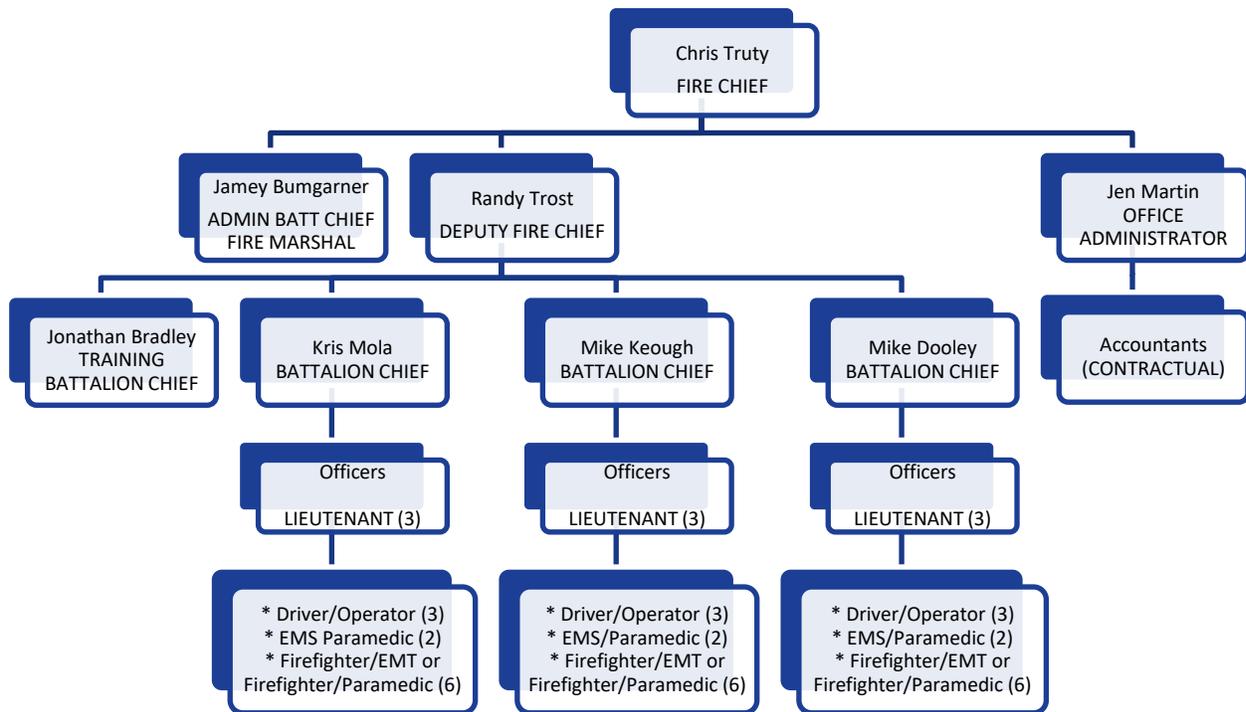
Like most fire protection districts, TLMFPD employs a Fire Chief to act as the chief executive officer of the District. The Chief has an employment contract which does not terminate on a specific date. The Fire Chief's roles and responsibilities are defined under the job description. The Chief's job performance has been reviewed twice in five years. ESCI recommends that the Board evaluate the Fire Chief annually based on specific goals that the Board sets for the Chief. This can be very helpful for the Chief to understand areas in which he is performing well, as well as areas of improvement for which he may be unaware.

The Chief has been delegated the responsibility to hire and terminate employees. Legal counsel is available to the Fire Chief. The responsibilities of the Fire Chief are varied, and they encompass both Board-designated and state statute requirements. Currently, the Fire Chief has three direct reports and is managing within the maximum span of command that ESCI recommends.

Organizational Design

The structural design of an emergency services agency is vitally important to its ability to deliver service in an efficient and timely manner while providing the necessary level of safety and security to the members of the organization—whether career, paid-on-call, or volunteer. TLMFPD is organized as a relatively typical fire department hierarchy. The following organizational chart represents the District as it is currently organized.

Figure 6: Organizational Chart



To operate effectively, the structure of a fire department needs to be clearly defined in the form of an organizational chart. The chart institutionalizes the agency’s hierarchy, identifies roles, and, most importantly, limits opportunities to circumvent the reporting structure. TLMFPD has clear definition of the reporting structure. Span of control is within the recommended 4 to 6 direct reports for each member of the staff.

RECOMMENDATION:

- The Board should evaluate the Fire Chief annually based on specific goals that the Board sets for the Chief.

MANAGEMENT COMPONENTS

Effective fire department management is a common challenge for fire service leaders. Today's fire department must address management complexities that include an effective organizational structure, a qualified workforce, maintenance of personnel competencies, adequacy of emergency response, and financial sustainability for the future. In this section, the components of management will be discussed, however it must be noted that good management alone will not guarantee a successful and effective organization.

Warren Bennis, in defining the difference between leadership and management made this observation, "Managers are people who do things right; leaders are people who do the right thing." Both leadership and management are critical for the effective operation of a fire department. It is important to do things right and to do the right things. Having effective management ensures the procedures and appropriate functions are in place to operate successfully. Leadership is the skill to know how to implement these procedures and functions as they interface with people.

As will be seen in this report, the many details involved in operating a successful fire agency have been addressed.

Foundational Management Elements

The development of baseline management components in an organization enables it to move forward in an organized and effective manner. In the absence of foundational management elements, the organization will tend to operate in a random and generally ineffective manner. TLMFPD has the foundational management elements: a mission statement, a vision statement in form of goals and objectives, and a values statement.

Mission Statement

The mission statement should tell why the department exists and perhaps how the mission will be executed. TLMFPD's mission is:

The mission of the Tri-Lakes Monument Fire Protection District is to minimize the loss of life and property resulting from fires, medical emergencies, environmental and other disasters.

The mission allows TLMFPD to do what is necessary to minimize loss both of lives and property. This can be through prevention, mitigation of potential damage, and through direct intervention of the emergency. This statement is broad enough to allow flexibility in methods but narrow enough to prevent mission creep.

Vision Statement

We will accomplish our mission through a progressive and professional system of personnel development, public education, fire suppression, code enforcement, medical services, and rescue skills. We will actively participate in our community, serve as role models, and strive to effectively and efficiently utilize all of the necessary resources at our command to provide a service deemed excellent by our citizens.

Typically, the vision statement is the declaration of what the organization wants to become in the future. It is not always reachable within the resources and abilities that are available today. It recognizes that the department is not necessarily where the members would like it to be but sets goals that are reachable by accomplishing the objectives.

This statement effectively communicates how the District will accomplish their mission through suppression, rescue, and medical services, but also utilize education and code enforcement to prevent incidents from happening. The District realizes that they have an important place within the community and will be an active participant. The overall standard is to provide a service that is excellent through personnel that are forward-thinking and well-trained, and by utilizing the resources given them efficiently and effectively.

Values Statement

The values statement of TLMFPD (although not yet adopted officially by the Board) is as follows:

Excellence | Integrity | Loyalty | Respect | Service

Defining common values that members hold important is key to understanding rewards and discipline. These can be the foundation of defining excellent performance. It is critical the words or phrases used are well understood in the same way by all members, otherwise there can be confusion on actions, rewards, and disciplines. The TLMFPD values are good ones to follow. The District has worked with a group to develop the values and are in the process of vetting them through the membership. ESCI believes there is real value in having the mission, vision, and values statements be reviewed by the organization or a group that represents a cross-section of the organization. This assures that all can understand, support, and live the messages contained in the statements. A strategic planning process is an excellent opportunity to do this as the goals and objectives are being formulated.

Management Documents and Processes

An organization should establish appropriate documentation, policies, procedures, and identification of internal and external issues that affect the agency. Processes must also be established to address the flow of information and communication within the District, as well as with its constituents.

Regulatory documents consist of policies and procedures, employee handbooks, and standard operating procedures or guidelines. These documents may be called different things and may be divided up differently in different departments. TLMFPD has a Policy and Guidelines manual. The manual is part of the Lexipol system. The templates that Lexipol furnishes are reviewed for legal compliance. This is a good way to assure compliance with new laws that may impact the District's policy or implementation of a policy. There is a training component available to have each employee learn policies through Lexipol. This has not been implemented yet, but it is a recommendation to do so.

New policies are reviewed by the Fire Chief before being released for use. This is an important activity and having current administrative procedures or policies available to every member of the District is a priority. An on-going review of the procedures and policies should be scheduled. It is recommended to have every policy reviewed within a three-year window. Taking one-third of the policies each year can make this less of a task. Also, utilizing a committee of personnel from within the District can spread the workload and involve others. This is especially true of standard operating guidelines (SOGs). Since firefighters are expected to know and operate under these guidelines, it makes sense to have them also review for any changes that may have been implemented in practice but not yet changed in the SOGs.

Internal and External Communications

The communication within the organization and to the external world are both very important. The following discussion describes internal and external communications in the District.

Internal Communications

There are multiple avenues of communication within the District. The formal chain of command is clearly defined for facilitating vertical communications. Staffing meetings occur with different groups. The executive staff meet the first Wednesday of the month. Operations staff meets one time a month and the officers meet once every other month. Emails and memos are used to disseminate information to all personnel. There is an internal website for all members to glean information as well. The Chief has an open-door policy for informal conversations with personnel.

Communicating the vision of the District to all members is important. The vision can be the vision statement but also the direction that the District is headed. This includes what is needed to be accomplished in the next year or several years. The Fire Chief is the primary person to share this, but it should come through all of the executive team to the troops. The vision and all communications should be consistent and factual from all members of the team. ESCI encourages a program designed to communicate with the response personnel. During interviews, some comments indicated that messages may not be getting to personnel below the executive team in an effective manner.

Communication from the line personnel to members of the Board outside of regular Board meetings is occurring. This type of communication should be avoided for a couple of reasons. Board members only function in their official capacity when acting as a board. If the information should be communicated to the Board, then it should be when they are meeting officially. Secondly, and perhaps more importantly, the communications undermine the chain of command. Communication should flow through the chain of command from the Chief, through the battalions, to the station personnel, and it should flow just as easily in the opposite direction. If the messages are being distorted somewhere through the path, then this should be rectified.

External Communications

Communications with citizens outside of the District are accomplished in several ways. The District's website, Facebook page, and NextDoor are used to communicate with the public. All are up to date and interesting which keeps citizens returning to learn more. Individuals in the District may not be on all of these, so each of them is a unique and important method of communications. Information posted on one should be posted on the others so that the same message is distributed through the different mediums. The District also uses Twitter to send messages about what is happening in real time as a method of releasing information on emergency responses. Community advisory committees or community surveys are not used on an on-going basis, but both were used to gauge the community's knowledge and willingness to support a tax levy increase which was successful in 2017.

The Fire Chief speaks to groups when there are specific messages that the District desires to have disseminated. This is very successful and is appreciated by the community. There are so many opportunities to be a part of the community besides formal talks. Involvement at community meetings even when the District is not the primary topic can be very beneficial. The relationships formed at these meetings are essential for good two-way communications. It is not necessary for it to always be the Fire Chief at every meeting. Other chief officers or someone appointed as a community relations/public relations officers can be effective as well.

Record Keeping and Documentation

In any organization, documentation of activities is of paramount concern. TLMFPD does a good job collecting information regarding incidents and other activities. The District uses Emergency Reporting Systems (ERS) as their records management system. Personnel records are kept in locked and secured files. Personnel exposure occurrences are documented and stored in the personnel files. Records for hose testing, gas monitors, and vehicle maintenance are completed and retained internally. Pump testing, SCBA maintenance and testing, breathing air testing, and ladder testing are all done by outside vendors and these records are maintained as well.

Reports are generated for the Board of Directors for finance, management, and operational areas of the District monthly. Annual reports are not generated each year. Response data is used for activity reporting which is good but best practice is to start using response data for analysis and decision-making. The data collected is complete and seemingly done accurately which is an excellent basis for making that next step.

Security

Fire department facilities and department vehicles are locked by key or combination locks. Computers are protected by passwords. Assets are tracked in the ERS system, but there is no periodic inventory to account for the location of the assets.

RECOMMENDATIONS:

- Implement the training component on policies through Lexipol.
- Review every policy within three years.
- Design a program to communicate vision and current status with response personnel routinely.

CRITICAL ISSUES

During stakeholder interviews, several issues were identified but those three identified most frequently were growth, including potential consolidations with other fire departments; funding; and the current labor request for collective bargaining. The last issue was very current at the time of the interviews which may explain why it was mentioned as a critical issue.

Funding

In 2017, the District received voter approval to raise the mill levy which increased the revenues in 2018. The issue of concern is now the impact of two constitutional amendments commonly referred to as Gallagher and TABOR. While the mill levy increase is meeting the needs of the District, it will be eroded by the decrease in the residential assessed valuation rate. The assessment rate is decreased due to the formula in the Gallagher amendment that requires the statewide ratio of residential to commercial rate to stay fixed. Over the period of time since Gallagher was placed into the Constitution in 1982, the residential rate has fallen from 21 percent to 7.2 percent and is likely to drop again to 6.11 percent in the next reassessment year. While the original intent was that the residential rate would fluctuate based on the rising and falling of property valuations, TABOR has prevented any upward fluctuation of the residential valuation. During interviews with District stakeholders, ESCI noted a concern that the average citizen who has not studied the workings of the amendment may not understand the continuing impact to the District. This will be discussed further in the financial section.

Another issue related to funding is the imposition of an impact fee for the District. TLMFPD has a study that defines the impact by new development on the District. The Town of Monument has reviewed it and passed the imposition of an impact fee for the District which will be a great help in funding the capital requirements of the impact. El Paso County has also been requested to impose an impact fee on behalf of the District but has not yet voted on the proposal.

Growth

Growth is another major issue for both Board and staff members. The basis for conducting a master plan is an understanding of the potential growth that may occur within the District. This concern is compounded by the potential for two additional areas of growth in the near future. The District will need to have adequate stations and personnel in order to meet the greater service demand. Growth is considered in depth in the Future Service Demand and Future Strategies sections of this report.

Collective Bargaining

A third issue which was recurring in interviews was the firefighting personnel expressed desire to have a collective bargaining agreement between labor and management. This is an issue that has just recently been raised and is therefore on the minds of those interviewed. Determining what should be done is a decision for the Board of Directors and with advice from the District's attorneys. Usually, the desire for a binding agreement is fostered by a perceived need on the part of the employees. This may be a lack of information on where the department is headed and the feeling that the employees other than management do not have a voice in the process. There may be other ways to fill these needs that may be more effective for both management and labor than collective bargaining.

FINANCIAL MANAGEMENT AND ANALYSIS

Considerable financial information and background data was provided to ESCI by staff of the Tri-Lakes Monument Fire Protection District (TLMFPD), which was reviewed in detail along with various Annual Audited Financial Reports and annual budgets. This data has enabled ESCI to develop the following discussion providing key stakeholders with historical, current, and future viewpoints of TLMFPD's financial picture.

Current Conditions

TLMFPD is a 50-person, career-staffed department, that provides traditional fire and EMS rescue services from three fire stations. The District operates on a modified accrual basis for the General Fund. The District has six outstanding leases for a fire station and several apparatus and vehicles in the amount of \$1,214,512.73 at December 31, 2018.

TLMFPD operates on a calendar year basis. TLMFPD had \$431,270,610 of taxable assessed value for the 2019 budget year. A mill levy of 18.4 was charged on this taxable value resulting in revenue of \$7,913,095 for the 2019 budget. The total budgeted revenue for 2019 is \$9,871,845. Expenditures are budgeted at \$9,212,974, increasing the fund balance by \$658,871.

The preliminary assessed values are received from the county in late August. The budget is prepared by the Fire Chief and presented to the Board in September. The budget is reviewed by the Board and staff, and public hearings are held. In early December, the final assessed values are received from the county, the Board approves the final budget, and the certification of mill levies is presented to the county.

Local Economic Profile

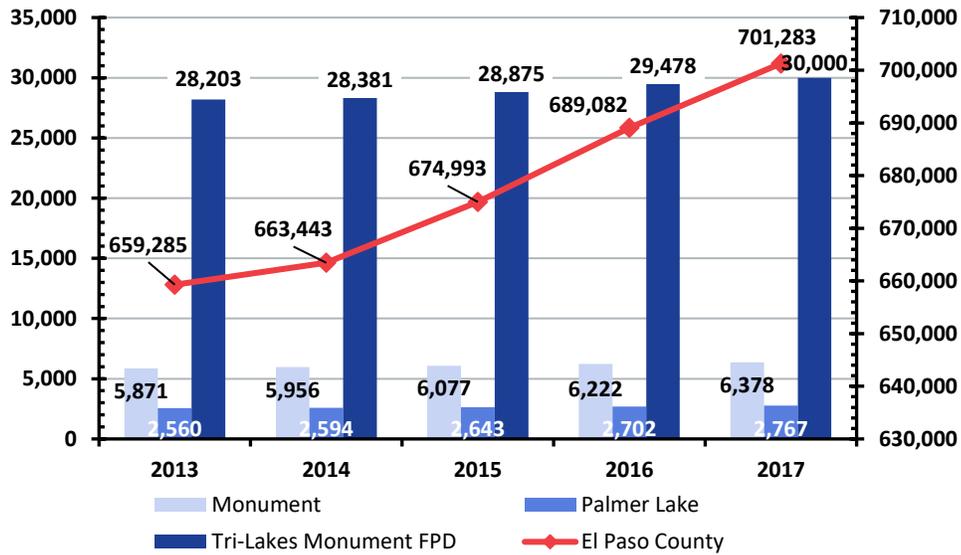
The local economy in El Paso County is growing moderately, however, the District is experiencing record growth in new construction and existing single-family home values. It is not known how long, or if, this boom will continue.

Population

The population in El Paso County increased a little over 11 percent since 2010. The 2017 population of El Paso County was projected to be 701,283 per data from the Colorado Division of Local Government, State Demography Office, in October 2017. The population of Monument, which nearly all lies within the District, was 6,378 in 2017, per the State Demography Office. The estimated population for the District is 30,000.

The following figure shows the population growth for the county, Monument, and Palmer Lake over the last 5 years. The District is a small portion of El Paso County population and area.

Figure 7: Population Trends

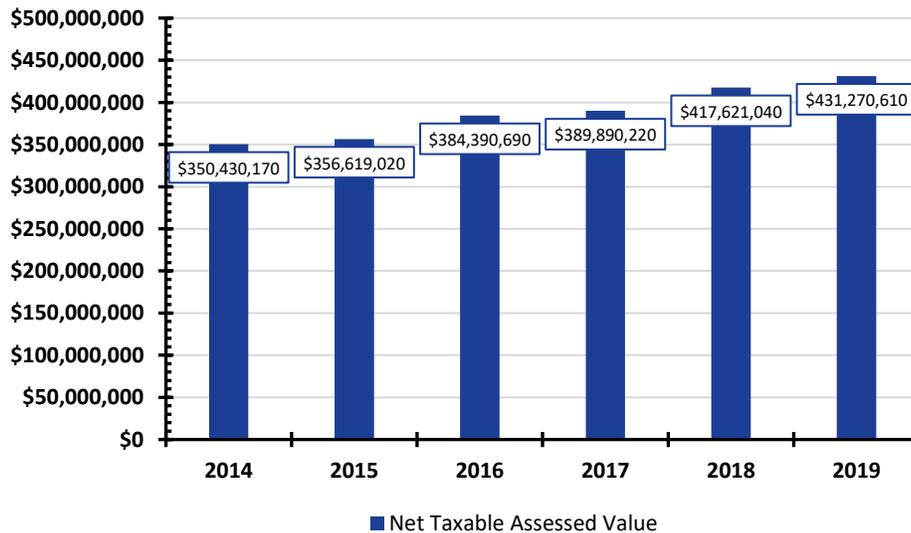


Housing and Property Values

The average price of a home in El Paso County was \$227,000 in 2016. The average home value in Monument is \$333,000, which is considerably higher than the average for El Paso County and for the state which is \$264,000. The change in residential actual values for TLMFPD, which includes new construction, has averaged 8.5 percent per year since 2014. The change in assessed values of residential property averaged 5.8 percent over the same period.

The *Total Assessed Value (TAV)* figures display certified total assessed property values for TLMFPD from 2014 to 2019. The change in total assessed values from 2014 to 2019 is 21.88 percent, while the total in the actual value increased 4.4 percent. The following figure shows the Total Taxable Assessed Values for TLMFPD.

Figure 8: Taxable Assessed Value for TLMFPD



In Colorado, properties are re-evaluated and reassessed every two years. The latest values were evaluated as of June 30, 2016. Those values will be used in the estimations and assessments for the years 2018 and 2019. Colorado's governing law for residential assessment is located in the Colorado Constitution.

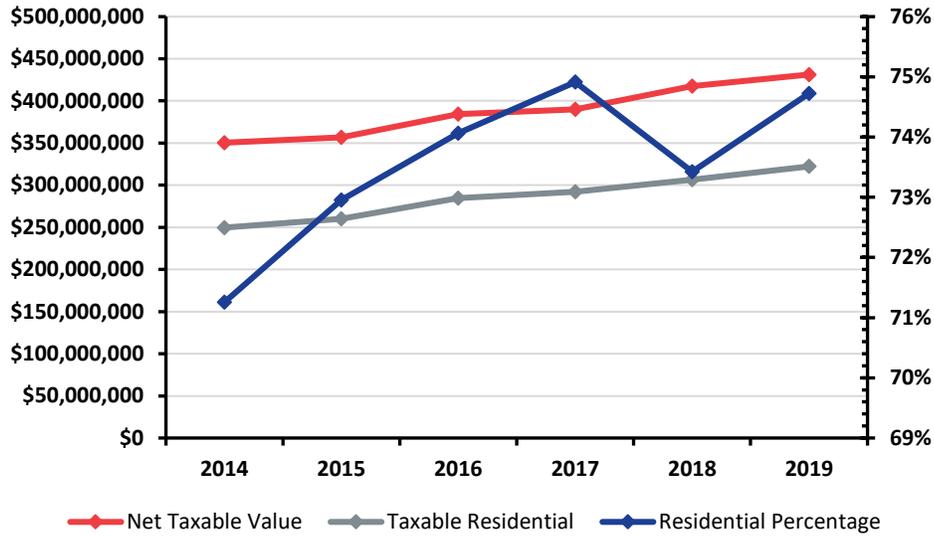
The Gallagher amendment, passed by voters in 1982, states that Colorado residential properties will contribute 45 percent of the total property tax revenue of the state. Commercial properties contribute 55 percent. Commercial properties are always assessed at 29 percent of the current fair market value.

In 1992, Colorado voters also passed the Colorado Taxpayer Bill of Rights, also known as the TABOR amendment. That amendment prohibits tax increases without a vote of the people living or owning property within a specific jurisdiction. Currently, when the residential assessment rate needs to go down, the state property tax administrator—along with the State Board of Equalization—makes the adjustment without a vote of the people. Conversely, if the residential assessment needs to go up, then a vote of Colorado taxpayers is required.

Colorado's residential assessment rate has not been adjusted since 2003, when it was lowered to 7.96 percent of the assessed value of the property. In 2017, the residential assessment rate was lowered to 7.2 percent. Between 2013 and 2017, some two-year periods required an upward adjustment on the residential assessment rate. Those rate increases did not occur, so the 2017 assessment rate adjustment is the first one in over a decade. The difference between 7.96 percent and 7.2 percent is slightly over a 10 percent decrease in taxable assessment. The preliminary estimate for the 2020 year for the residential assessment rate is 6.11 percent. The difference between the 7.20 percent and the 6.11 percent is slightly over a 15 percent decrease in the taxable assessment.

Colorado's fire protection districts are dependent on property taxes. TLMFPD is no different. The percent of TLMFPD assessed value that is residential ranges from 74.91 percent in 2017, to a low of 71.25 percent in 2014. The 2019 amount is 74.72 percent. The effect of the reduction in the ratio for residential property from 7.20 percent to 6.11 percent is projected to be \$5,413,515 over the next 5 years. This is a serious financial problem for TLMFPD that needs close monitoring.

Figure 9: Taxable Residential Assessed Value as Compared to Total Taxable Assessed Value for TLMPFD



As displayed, the residential percentage is very high at 74.91 percent of the total taxable assessed value. The ratio that is applied to the residential property on the state level needs to be monitored. In a highly residential district like Tri-Lakes Monument, a mill levy increase is the only defense to revenue reduction. Educating the public on this issue needs to be ongoing so that the community understands the effect on District finances and services.

Revenues

An analysis of departmental historical revenues and expenses for the District was completed to help identify relevant financial trends, strengths, and weaknesses, and to lay the groundwork for the financial scenarios presented later in this section of the report.

The historical analysis helps illustrate how the District funds its services—where the money comes from and where it goes. Historical budget data for the District was provided by staff and was supplemented with a review of past audits and historical budget records. The historical analysis should provide administration and elected officials with a solid basis upon which to evaluate recommendations and develop sustainable future policy.

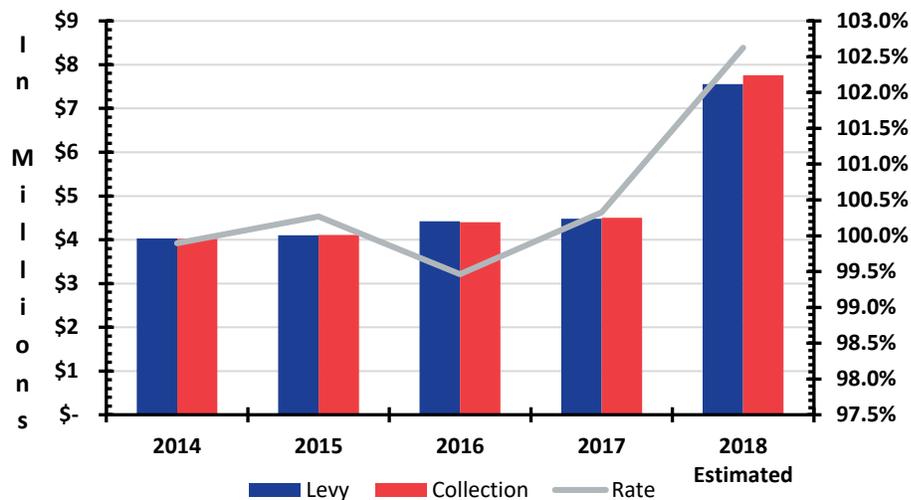
The following figure is a tabular short version of the financial resources of the General Fund. The line item types are property taxes, specific ownership taxes, impact fees, wildland, miscellaneous revenue, interest, ambulance revenue, grant, assessment fees of Palmer Lake, and proceeds from debt financing.

Figure 10: Tri-Lakes Monument Fire Protection District, Fiscal Years 2014 to 2019 Preliminary Budget

Financial Resources By Type	2014 Actual	2015 Actual	2016 Actual	2017 Actual	2018 Estimated	2019 Preliminary Budget
AV	350,430,170	356,619,020	384,390,690	389,890,220	417,621,040	431,270,610
Levied \$	4,029,947	4,101,119	4,420,493	4,483,738	7,558,941	7,935,379
Collection Rate	99.898%	100.268%	99.463%	100.329%	99.980%	99.719%
Mill Rate	11.5	11.5	11.5	11.5	18.1	18.4
Beginning Reserve Balance General Fund	1,834,789	2,401,823	2,610,950	2,659,809	2,620,128	4,814,216
Property Taxes	4,025,823	4,112,120	4,396,764	4,498,482	7,557,437	7,913,095
Specific Ownership Tax	425,516	463,445	509,282	604,734	825,000	750,000
Impact Fees	204,952	239,988	770	125,943	200,000	150,000
Wildland Deployment	107,870	188,939	23,806		54,000	100,000
Miscellaneous	46,400	16,408	39,542	20,190	12,250	14,250
Interest		2,256	9,573	9,620	15,000	10,000
Ambulance Revenue	590,271	512,069	820,411	771,426	807,500	790,000
Grants	331,009	36,300	176,360	24,531	396,544	137,000
Assessment Fees Palmer Lake					5,000	7,500
Proceeds from Debt Financing		453,040	754,538		578,013	
Total General Fund Revenue	5,731,841	6,024,565	6,731,046	6,054,926	10,450,744	9,871,845

The following figure graphically compares actual property taxes versus levied taxes and the collection rate for the District. The collection rate averages 99.99 for the 4-year period of actual revenues reported for 2014 to 2017. The variations are mainly due to assessor adjustments.

Figure 11: General Fund Property Tax Collection, Levied Amount and Collection Rate, 2014–2018 Estimated



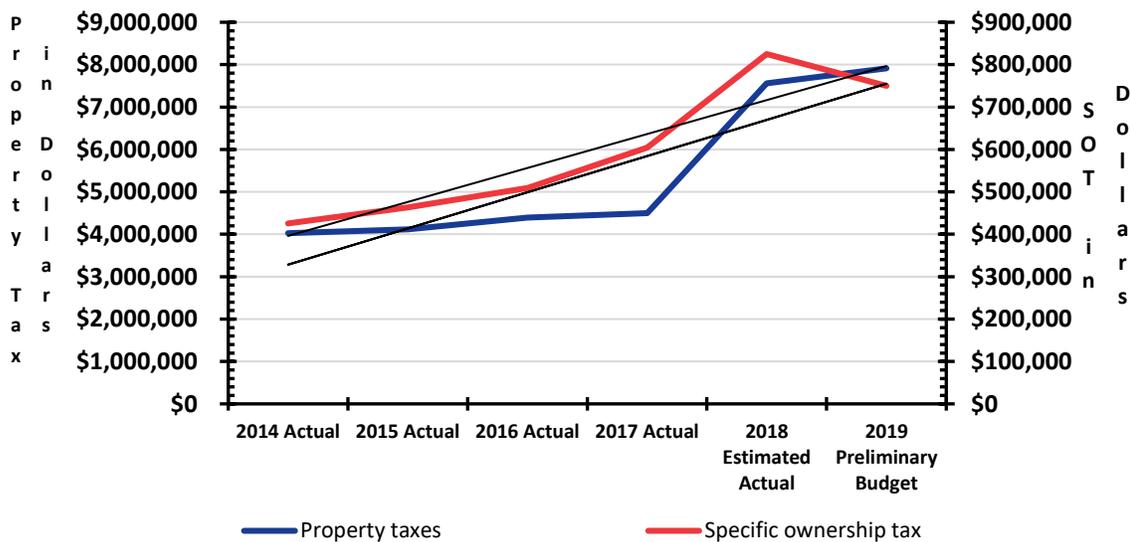
The collection rate of the District averages 100 percent. Any variances are adjustments made by the county to assessed values.

Property and Specific Ownership Taxes

Property and specific ownership taxes comprise anywhere from 73 to 88 percent of the District’s 2014 to 2019 revenues. The District has experienced an overall increase in property tax revenues since 2014, mostly from residential property assessments and the mill levy increase approved by voters in 2017. From 2014 to 2017, the District realized a \$472,659 increase (or 11.7 percent change) in property tax revenues; while specific ownership taxes increased \$179,218 from 2014 to 2017 (42.1 percent change). The mill levy increase added \$2.9 million to property tax revenues in 2019.

The following figure shows (graphically) increases along with linear trend lines.

Figure 12: Property and Specific Ownership Taxes, 2014–2019 Preliminary Budget



This shows a steady increase in property taxes and specific ownership tax over the study time period of 2014 to 2019.

Wildland Revenues. Wildland revenues comprises anywhere from 0 to 6 percent of the District’s 2014 to 2017 actual revenues. Wildland revenues have been very volatile as they range from nothing to \$218,845 over the last 5 years.

Impact Fees. Impact fees have been anywhere from 0.0 to 3.9 percent of total revenues from 2014 to 2017 actual revenues. A large refund of impact fees was refunded to developers in 2017. There could be additional refunds up to \$336,000, although it is unlikely that all that amount will be refunded. The county has not agreed to collect impact fees from the unincorporated portion of the District.

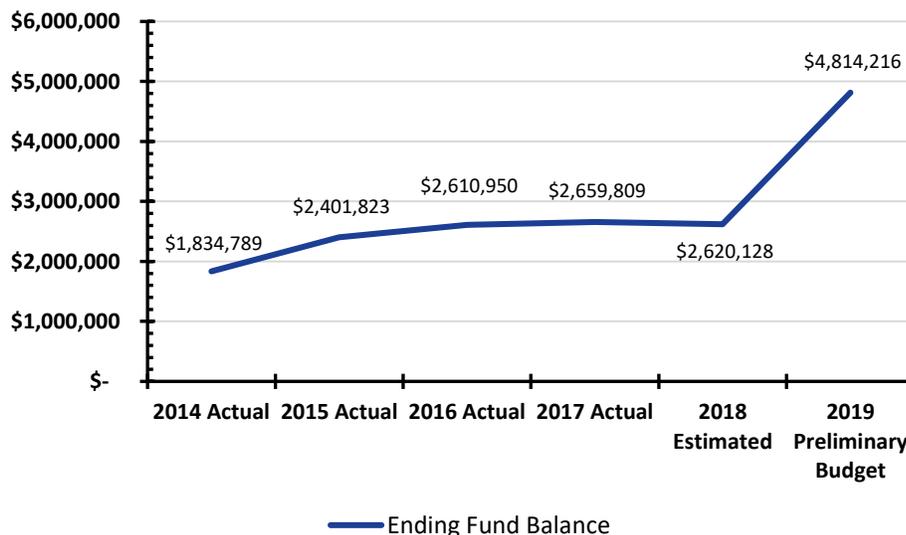
Ambulance Revenues. Ambulance revenues comprise anywhere from 8.5 percent to 12.7 percent of actual revenues from 2014 to 2017. The largest percentage is paid by insurance (69.6 percent) only 21.7 percent are paid by Medicare. The payer of ambulance needs to be monitored. Shifts in this percentage as the population ages to increase Medicare usage could have a dramatic effect on income. Total billed and total amounts collected need to be monitored so the District can effectively manage the revenue stream.

Misc., Interest, and Grants. Combined, these comprise anywhere from 0.5 to 3.3 percent of the District’s 2014–2017 budgets, and is \$151,250 of the 2019 preliminary budget.

Sources for Capital: The District has just begun to create a capital reserve. It has not been set up as a separate fund in the accounting system. The District might want to create a separate Capital Reserve or Projects Fund to account for the saving of dollars for capital projects and to record capital expenditures. The District uses terminology that is different than accounting terminology. In accounting, a Fund is a separate set of accounts that collect income and expenditures for a specific purpose. The District has set up reserves in the General Fund which are for specific purposes. There is also not a separate Debt Service Fund for the six leases which are outstanding. These items are paid out of the general operating funds. Setting up separate funds is not a requirement but can make it easier to follow income, transfers, and expenditures for specific purposes.

One last financial resource available to the District is the beginning fund balance. The following figure shows the beginning fund balances for the 2014 actual through the 2019 preliminary budget.

Figure 13: Beginning General Fund Balance, 2014–2019



The “General Fund Balance” includes all of the reserves of the District. Between FY 2014 and FY 2018, beginning fund balance increased \$785,339 (43% change). Due to the possibility of a slowdown in the housing market and possible changes to the ratio of actual to assessed values required by the Gallagher Amendment, the residential category of property tax revenue needs to be monitored carefully. The percentage of assessed values in the residential category (70+%) is a concern that needs to be analyzed on an annual basis. The increase in the mill levy approved by the voters in 2017 has helped to alleviate some of this problem.

Expenditures

All of the District’s expenditures are budgeted in the General Fund. This includes operating, capital, and debt service expenditures. The following figure shows, in tabular format, the respective expenses for FY 2014 through FY 2019 Preliminary Budget.

Figure 14: Tri-Lakes Monument Fire Protection District Expenditures, 2014–2019 Preliminary Budget

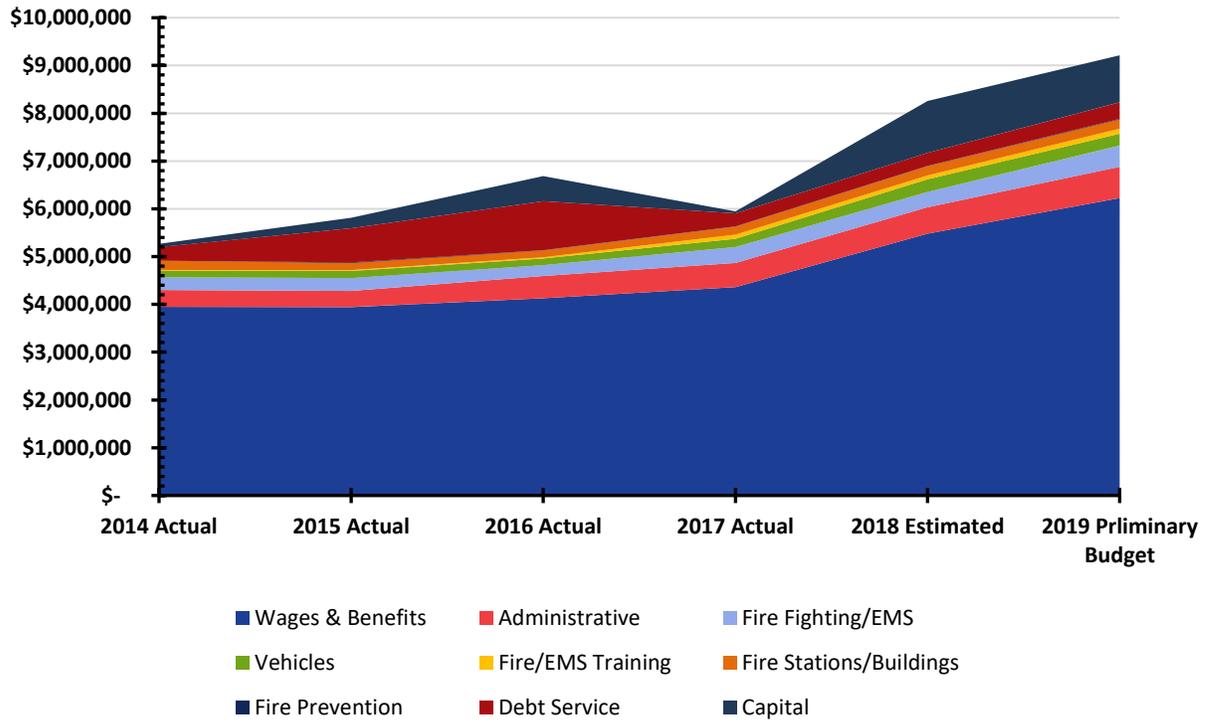
Financial Expenditures By Type	2014 Actual	2015 Actual	2016 Actual	2017 Actual	2018 Estimated	2019 Preliminary Budget
Treasurers Fees	60,387	61,682	65,951	67,477	113,384	118,696
Salaries and Benefits	3,948,214	3,944,604	4,125,081	4,361,100	5,479,402	6,224,453
Administrative Expenditures	290,379	275,261	399,951	440,770	442,344	536,606
Fire Operations	80,244	86,360	83,768	194,581	182,000	232,025
Fire Prevention		13,545	4,830	5,216	10,900	13,500
Medical	70,430	62,497	56,274	71,711	66,500	86,000
Vehicles	140,166	147,647	137,334	173,425	261,572	250,100
Communications	127,961	139,101	115,477	151,035	154,075	228,300
Building and Grounds	198,922	147,985	143,203	166,801	190,117	195,088
Lease Interest	76,528	70,991	52,635	31,205	24,680	40,867
Lease Principal	204,568	640,395	972,585	241,738	248,314	303,339
Total Debt Service	281,096	711,386	1,025,220	272,943	272,994	344,206
Total Capital Expenditures	66,405	225,370	525,098	40,203	1,083,368	984,000
Impact Fee Refunds				149,345		
Grand Total Expenditures	5,264,204	5,815,438	6,682,187	6,094,607	8,256,656	9,212,974
Revenues	5,731,841	6,024,565	6,731,046	6,054,926	10,450,744	9,871,845
Ending Fund Balance	2,302,426	2,610,950	2,659,809	2,620,128	4,814,216	5,473,087

The previous figure shows total expenditures for TLMFPD from 2014 actual through the 2019 preliminary budget.

- The total expenditures increased \$476,585 from 2014 actual to 2019 preliminary budget, an increase of 75 percent.
- The fund balance is budgeted to increased \$3,170,661 from 2014 actual to 2019 preliminary budget, an increase of 137.7 percent.

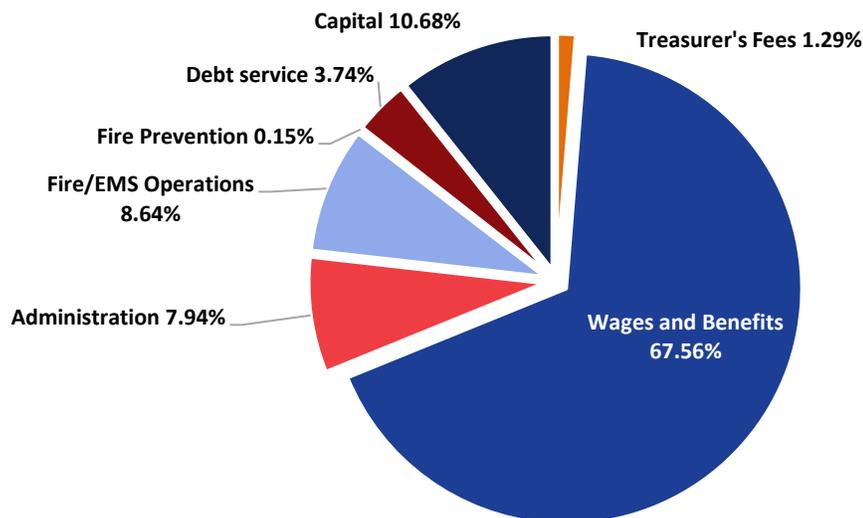
The following figure displays all of the expenditures of the District for the entire period. The bulk of the District cost each year is for salaries and benefits. The capital expenditures vary widely. Capital purchases include the issuance of six leases to purchase apparatus, vehicles, and a fire station. In 2015, three leases were issued to refinance previous leases for apparatus; in 2016, two leases were issued to refinance previous leases for apparatus and a fire station; and in 2018, a lease was issued for the purchase of apparatus.

Figure 15: General Fund, Expenditures By Type



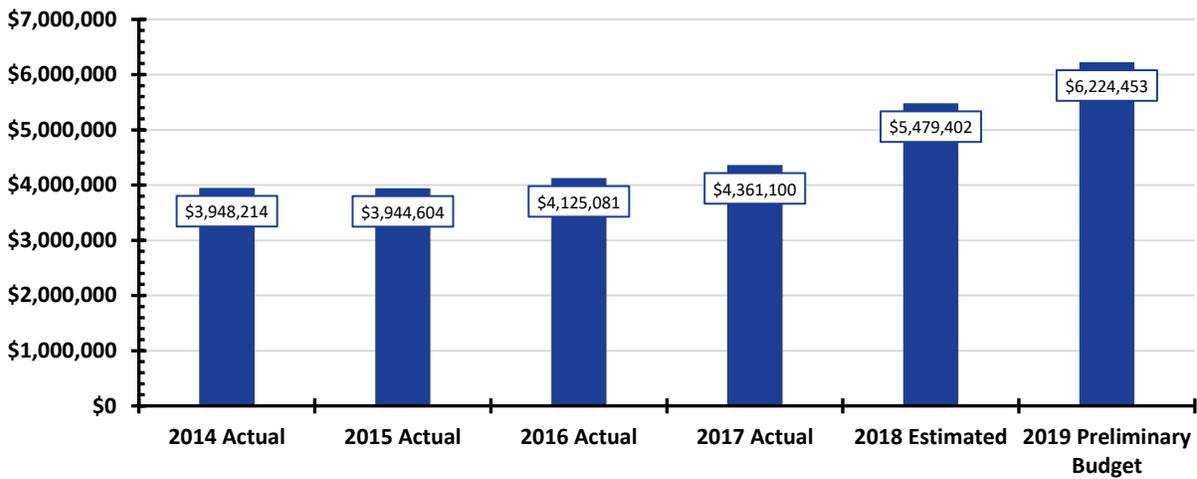
The next figure breaks down the major areas of total District expenditures, as budgeted for the Preliminary Budget for 2019, and shows percentage for each major category of expense. Clearly, at almost 68.0 percent, wages and benefits are the largest cost to the District. This is low for mostly career-staffed fire districts around the country. Generally, the number is in the 70 to the 80 percent range.

Figure 16: General Fund, Preliminary Budget 2019



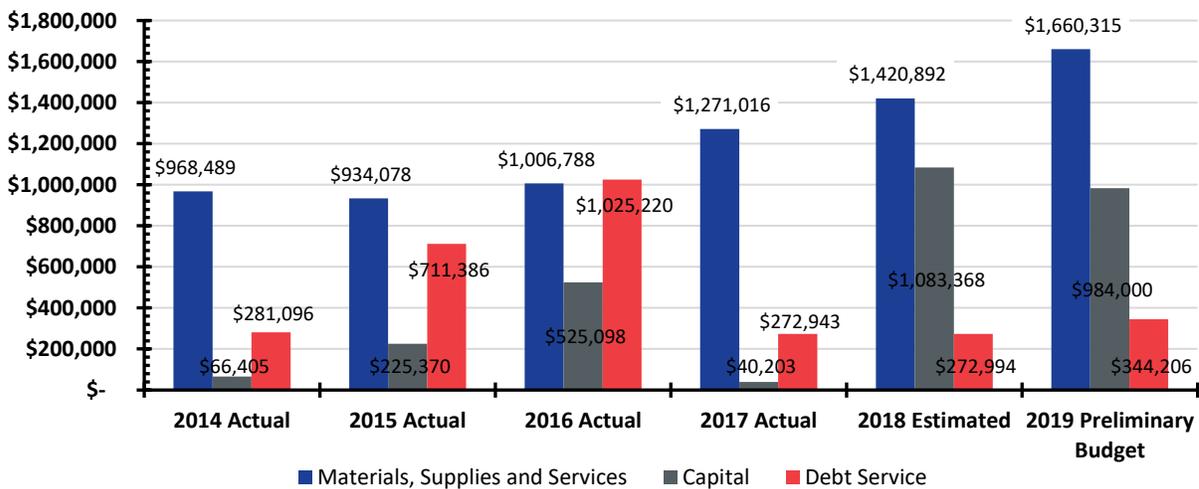
Wages and Benefits. Wages and benefits comprise the largest portion of the budget for most fire districts. The wages and benefits vary from 62 percent to 75 percent from 2014 to 2019, depending on the number of capital projects each year. The percentage of wages and benefits to the rest of the budget has increased as the District has increased salaries to compete with the metropolitan districts in the area and to increase personnel for growth and mergers of the District. Like many districts of comparison, TLMFPD has experienced an increase in wages and benefits of about 57.6 percent from 2014 to 2019. The majority of this increase is for bringing the apparatus up to full staffing by additions to staff and increases in wages and benefits.

Figure 17: General Fund Personnel Wages and Benefits Totals



Materials, Supplies, and Services for Administration, Fire Operations, and Fire Prevention. These charges encompass 25 percent to 38 percent of the expenditure budget. Capital expenditures vary from 0.68 percent to 13.12 percent depending on the year. The debt service payments are between 3 percent and 15 percent of expenditures.

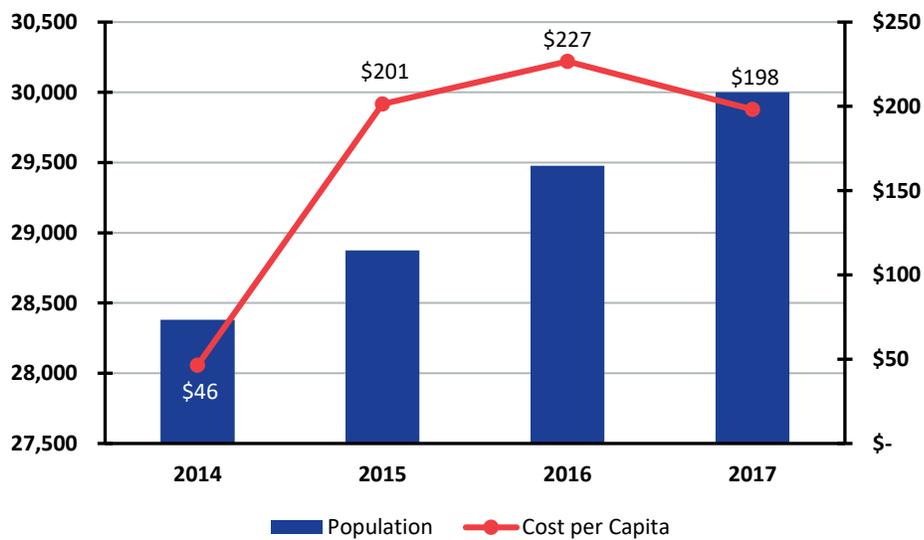
Figure 18: General Fund Materials/Supplies and Services, Capital and Debt Service



Cost per Capita

The following figure displays, from 2014 through 2017, per capita cost. Fundamentally, per capita costs are derived by taking the operating budget and distributing it over the estimated population of the District to arrive at a dollar value per capita. The population for the District was estimated at 30,000 in 2017, which is about 4.3 percent of the El Paso County population. The District population was derived from comparing the population of the Town of Monument. The District encompasses nearly all of the Town of Monument and some areas outside in the county. The changes in the Monument population percentages were used to derive the percentage of change for the TLMPFD population for years 2014 to 2016. The data suggests that per capita costs have ranged from \$46 (2014) to \$227 (2016). However, the average over this period is \$168 per capita. Based on this average, one of the years was below the average.

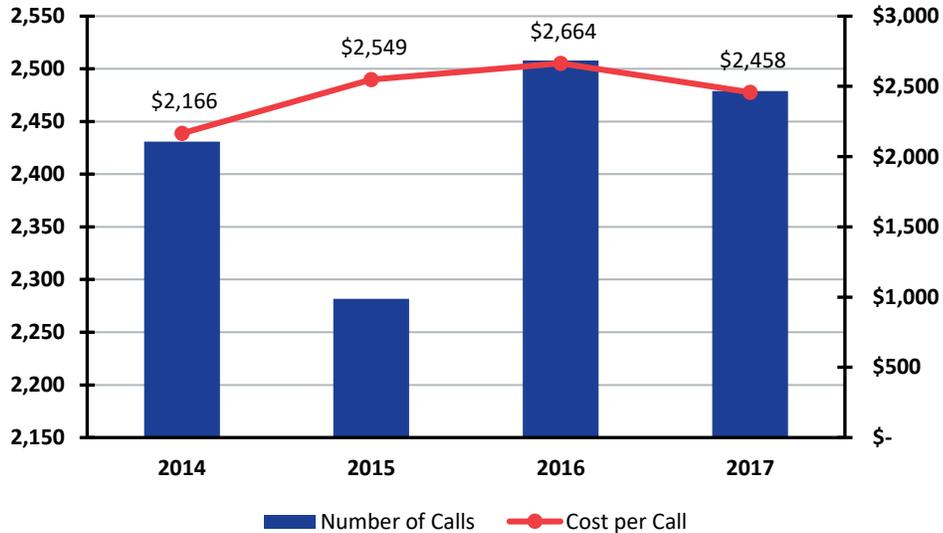
Figure 19: Cost per Capita



Cost per Call

A similar methodology was utilized for cost per call, but instead we replaced population with calls for service. For 2017, the average cost per call was \$2,458, compared to \$2,166 in 2014. The average cost per call for service over the four years was \$2,459. Two of the five years were below the average cost per call for service. The cost per call is not only affected by the expenditures but also the number of calls. The number of calls varied from 2,282 in 2015, to 2,508 in 2016.

Figure 20: Cost per Call



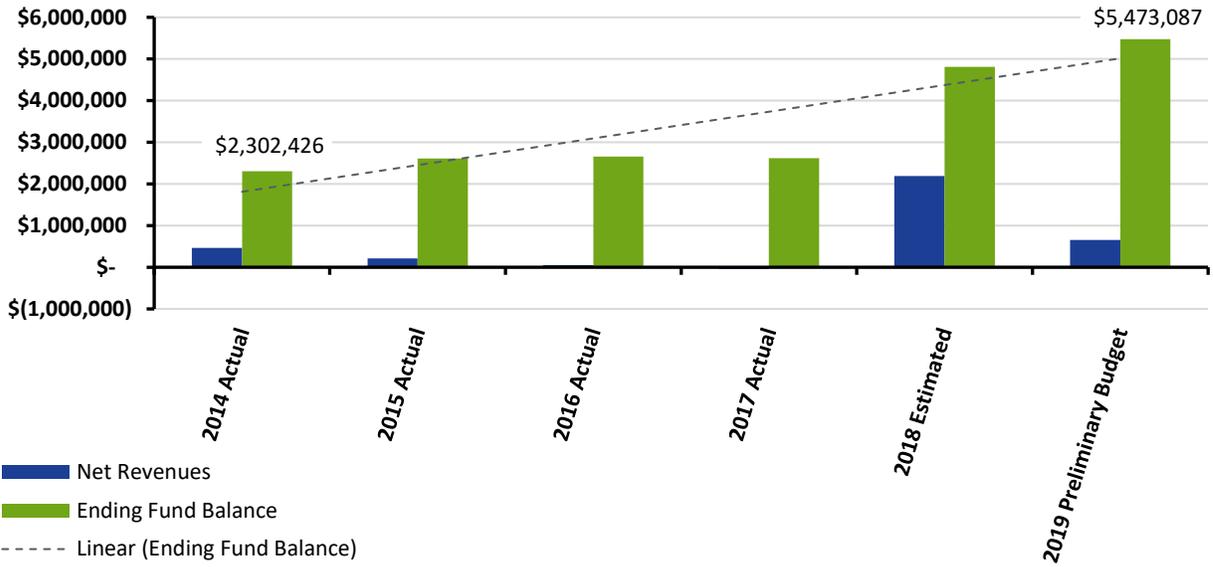
Net Revenue/Deficit and Fund Balance

The following figures display net revenue gains/deficits and reserve balances for the period of 2014 actuals through the preliminary budget for 2019 for the General Fund.

When revenues are less than expenditures, such as in FY 2017 in the General Fund (following figure), then the fund shows an operating loss (blue bars) and fund balance is reduced (green bars). Conversely, when the revenue exceeds expense, such as in FY 2014, then the fund shows an operating gain and fund balance increased.

General Fund. The District’s General Fund revenues have been more than District expenditures over most of the study period. The result of this gain can be seen in the following figure (green bars), which shows the effect of the net gain or loss on fund balance (includes the District’s internal reserves) each fiscal year. As revenues have increased over time, the fund balance has increased considerably, except for the years 2016 and 2017. The ending fund balance has grown from \$2,302,426 in FY 2014, to \$5,473,087, as estimated, in the preliminary budget for 2019.

Figure 21: Revenue, Expense, Net/Deficit, and End Reserve Balance—General Fund



Financial Forecasts

ESCI developed two forecasts of revenues and expenditures for the next five years. These are: 1) assessed values continue as per trend analysis; 2) with the addition of a Capital Reserve (Projects) Fund. The assumptions for revenues and expenditures are the same. Expenditures remain status quo with assumptions for normal inflation and apparatus replacements per the schedule provided by TLMFPD and contributions to the capital reserve fund.

The first Revenue Trend Analysis is to assess the financial sustainability of projecting revenues based on the trend analysis. The forecast is based upon historical actual revenues and expenditures, and informed assumptions about how those revenues and expenditures will change in the future. The key assumptions used in the forecast are presented in the next figure followed by the forecast results and selected metrics.

This scenario has been prepared for stakeholder consideration. This is considered a status quo service level scenario with no new positions to add and comparative year over year growth assumptions in revenues and expenses with anticipated future needs in capital improvements.

Revenue/Resource Inputs

Figure 22: Financial Revenue Assumptions

Financial Resources By Type	Assumptions
Assessed Value (AV)	Trend Analysis of Actual Value for 2014 to 2019 Times AV Rate 29%, 7.20%, or 6.11% as per State
Levied \$	Mill Levy times AV
Collection Rate	100%
Mill Levy Rate	18.4 Mills
General Fund Beginning Reserve Balance	Prior Year Ending Fund Balance
Capital Reserve Beginning Balance	Prior Year Ending Reserve Fund Balance
Property Taxes	AV/1,000 times Mill Rate
Specific Ownership Tax	Constant \$600,000
Impact Fees	Constant \$100,000
Interest	Calculated as 0.5% Times Average Annual Balance for each Year
Ambulance Revenue	Increased by the Average Annual Increase from 2014 to 2019 – 6.77%
Fire Inspection Revenues	Constant \$5,000
Wildland	Not Projected—Income Would be Offset by Expenditures
Grants	Not Projected—Income Would be Offset by Expenditures
Assessment Fees—Palmer Lake	Constant \$7,500
Miscellaneous	Constant \$15,000 for All Other Revenues
General Revenue Total	Sum of all Projected Revenues for each year
Capital Reserve Revenue Total	Contribution Less Expenditures plus 0.5% Interest on Average Balance
Grand Total all Revenues	Sum of all Projected Revenues for each year

- Property and Specific Ownership Taxes:
 - Property taxes. Assessed values have been projected using the Trend Function. The calculation uses the historical data of 2014 to 2019 to create a projection for each year. This calculation was applied to the actual values of each category of property (i.e., Commercial, Residential, Agricultural, etc.), then the values of each category were multiplied by the ratio for that category of property to calculate the assessed values (i.e., 29%, or 6.11%). The property tax income is subject to the current mill rate and a collection rate of 100.00 percent.
 - Specific ownership taxes have been forecast at a constant rate of \$600,000.
 - Impact fees are projected at a constant \$100,000.
 - Ambulance revenue is projected using the average annual increase from 2014 to 2019, or 6.77 percent.
- Wildland Revenue:
 - Wildland revenue has not been projected. It is very sporadic and would be offset by expenditures.

- Other Revenue Sources:
 - Forecast assumes that miscellaneous revenue will be a constant of \$15,000.
 - The forecast does not anticipate any grant funding.
 - Interest is calculated based on the average of the beginning and ending reserves divided by two times the assumed interest rate of 0.5 percent.
 - Assessment fees for Palmer Lake a constant \$7,500.
 - Fire inspection revenues a constant \$5,000.
- Capital Reserve:
 - General Fund transfers into a Capital Reserve have not been made until the last couple of years. Based on the Capital Replacement Schedule from TLMFPD; a contribution of \$256,284 per year is projected in later scenarios.

Expenditure Inputs

Figure 23: Financial Expenditure Assumptions

Financial Expenditures By Type	Assumptions
Treasurers Fees	1.5% of Property Tax Revenues
Wages	Increased by 5% per Year
Benefits	Increased by 10% per Year
Administrative Expenditures	Increased by 3% per Year
Fire Operations	Increased by 3% – Training & Education, Firefighting, and Uniforms
Fire Prevention	Constant \$10,000
Medical	Increased by 3% per Year
Vehicles	Increased by 3% per Year
Communications	Increased by 3% per Year
Building and Grounds	Increased by 3% per Year
Total Lease Payments	Total of Principal and Interest 6 Leases
Transfer to Capital Reserve	Annual Contributions Necessary to Fund Capital Replacement Schedule Provided by Tri-Lakes
Total Capital Expenditures	From the Capital Replacement Schedule Provided by Tri-Lakes Monument FPD
Impact Fee refunds	Nothing Budgeted Not known
Grand Total Expenditures	Total of all Expenditures
Change in Fund Balance	Difference Between Revenues and Expenditures
Ending Fund Balance	Beginning Fund Balance Plus Change in Fund Balance
Ending Capital Reserve Fund	Previous Years Ending Fund Balance plus Current year Contribution, Less Purchases plus Interest at 0.5 percent on Average Balance

- Wages and Benefits:
 - For purposes of this forecast, it is assumed that the wages will increase by 5 percent per year.
 - Forecast uses a 10.00 percent increase each year for benefits.

- Other Service Charges:
 - The forecast assumes an average annual increase of 3.0 percent.
- Materials and Supplies:
 - The forecast uses an annual increase of 3.0 percent for materials and supplies.
- Transfer into Capital Fund:
 - Transfers to the Capital Reserve are projected at \$256,284 per year to cover the cost of scheduled replacements.
- General Fund Capital Outlay:
 - Forecast for all scenarios is from The TLMFPD projected replacement schedule.
- Debt Service:
 - The forecast continues the lease payments on the current outstanding leases and no new leases are projected.

Forecast Scenario—Status Quo Trend Analysis

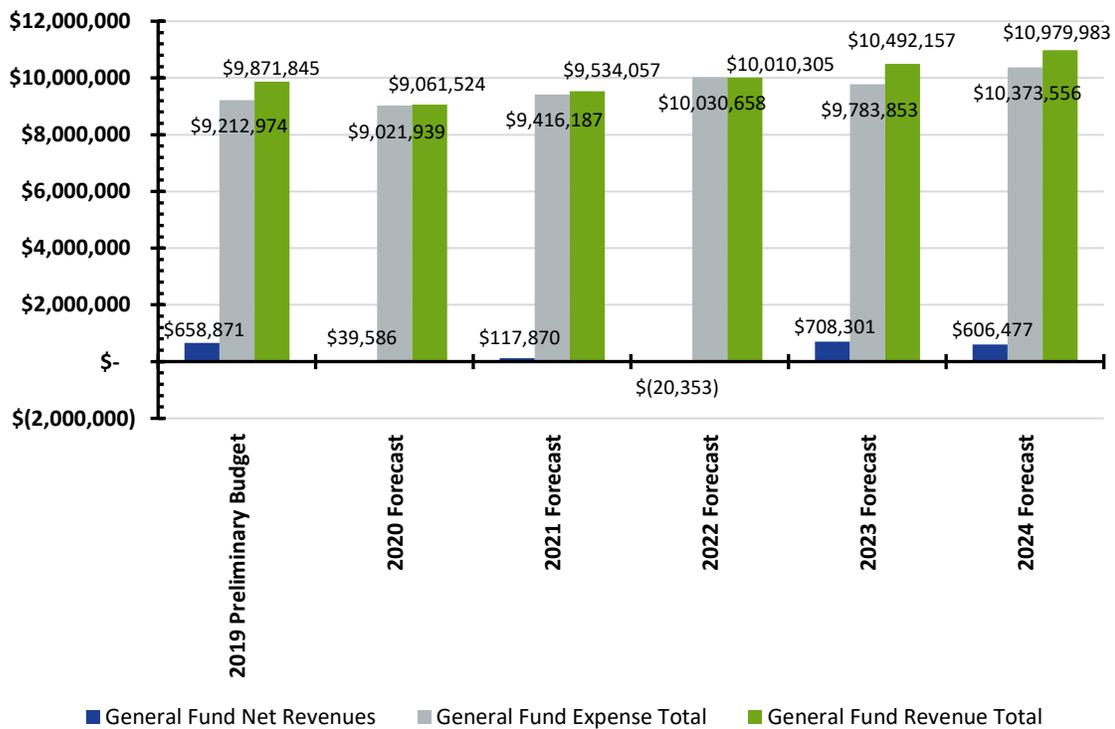
The Status Quo projection shows that the District is in very good shape and has a growing fund balance. The fund balance increases by \$1,451,832 from 2019 to 2024. With the mill levy increase in 2018, the District got ahead of the curve on the reduction in residential property ratio of actual to assessed for residential property. Overall, the District is doing very well. Monitoring growth in the District, and whether it is residential or another category that is assessed at the 29 percent rate, is necessary for the District to continue to maintain a good financial position.

Figure 24: Scenario—Status Quo Forecast, Trend Analysis Assessed Value Projections

Financial Resources By Type	2019 Preliminary Budget	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast	2024 Forecast
Taxable Assessed Values	431,270,610	405,602,023	428,158,251	450,714,479	473,270,707	495,826,935
Levied \$	7,913,095	7,463,077	7,878,112	8,293,146	8,708,181	9,123,216
Collection Rate	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Mill Rate	18.4	18.4	18.4	18.4	18.4	18.4
General Fund Beginning Reserve Balance	4,814,216	5,473,087	5,512,673	5,630,542	5,610,189	6,318,493
Property Taxes	7,913,095	7,463,077	7,878,112	8,293,146	8,708,181	9,123,216
Specific Ownership Tax	750,000	600,000	600,000	600,000	600,000	600,000
Impact Fees	150,000	100,000	100,000	100,000	100,000	100,000
Interest	10,000	27,464	27,858	28,102	29,822	33,1098
Wildland	100,000					
Ambulance Revenue	790,000	843,483	900,587	961,557	1,026,654	1,096,158
Fire Inspection Revenue	4,250	5,000	5,000	5,000	5,000	5,000
Grants	137,000					
Assessment Fees—Palmer Lake	7,500	7,500	7,500	7,500	7,500	7,500
Miscellaneous	10,000	15,000	15,000	15,000	15,000	15,000
General Revenue Total	9,871,845	9,061,524	9,534,057	10,010,305	10,492,157	10,979,983

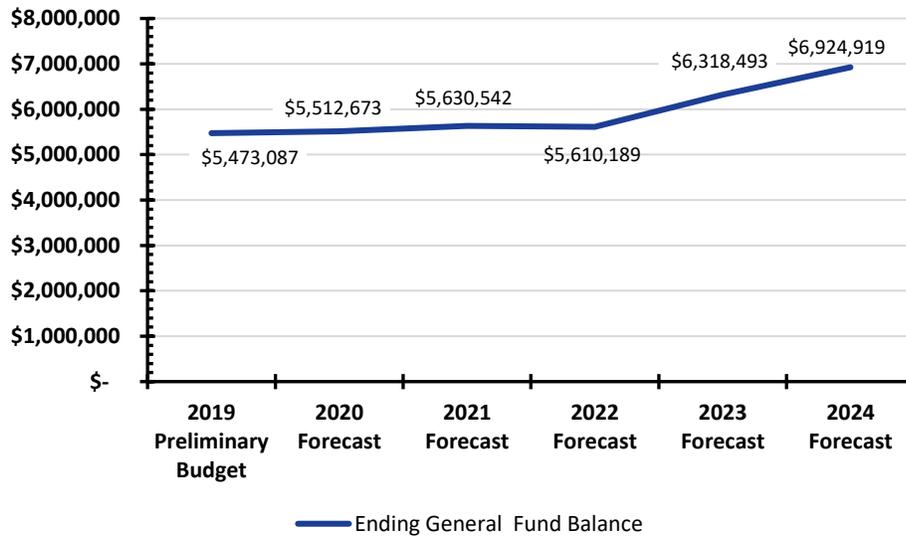
Financial Expenditures By Type	2019 Preliminary Budget	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast	2024 Forecast
Treasurers Fees	118,696	111,946	118,172	124,397	130,623	136,848
Salaries and Benefits	6,224,453	6,593,238	6,986,219	7,405,180	7,852,055	8,328,935
Administrative Expenditures	536,606	552,704	569,285	586,364	603,955	622,073
Fire Operations	232,025	238,986	246,155	253,540	261,146	268,981
Fire Prevention	13,500	10,000	10,000	10,000	10,000	10,000
Medical	86,000	88,580	91,237	93,975	96,794	99,698
Vehicles	250,100	257,603	265,331	273,291	281,490	289,934
Communications	228,300	235,149	242,203	249,470	256,954	264,662
Building and Grounds	195,088	200,941	206,969	213,178	219,573	226,160
Lease Interest and Principal	344,206	322,792	215,615	71,264	71,264	71,264
Total Capital Expenditures	984,000	410,000	465,000	750,000		55,000
Impact Fee Refunds						
Grand Total Expenditures	9,212,974	9,021,939	9,416,186	10,030,659	9,783,854	10,373,556
Change in Fund Balance	658,871	39,586	117,870	(20,353)	708,304	606,427
Ending Fund Balance—General Fund	5,473,087	5,512,673	5,630,542	5,610,189	6,318,493	6,924,919

Figure 25: Status Quo Scenario—General Fund Forecast



Employing the assumptions presented previously, General Fund revenues are expected to increase from \$9,871,845 in FY 2019, to \$10,979,983 in FY 2024, at an average annual rate of 2.24 percent for the forecast period. Expenditures are expected to increase from \$9,212,974 in FY 2019, to \$10,373,556 in FY 2024, at an average annual rate of 2.52 percent for the forecast period. As shown in Figure 25, revenue exceeds or equals expenditures in most years. The following figure shows the General Fund Ending Balance which includes the internal reserves.

Figure 26: Status Quo Scenario—General Fund Ending Balance

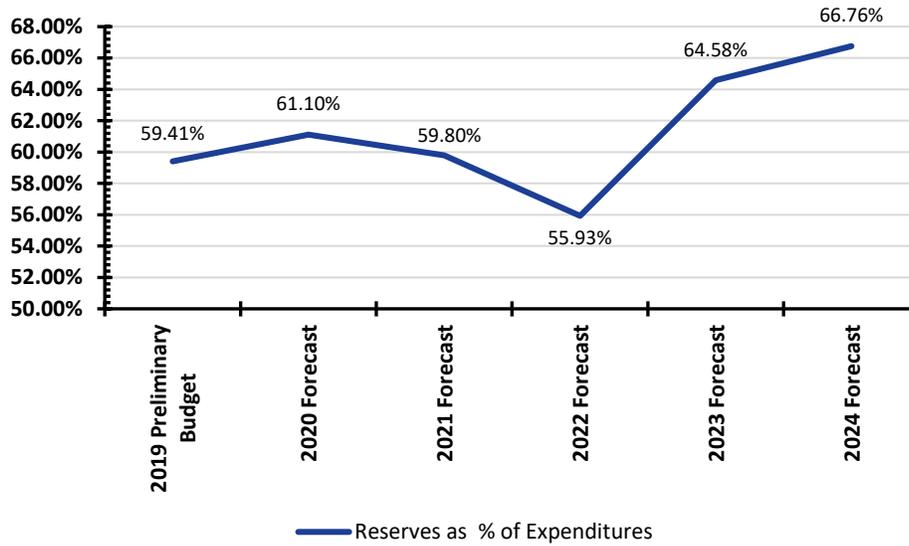


The following figure shows more clearly the relationship between the ending fund balance and expenditures. The District is in great shape with the continued increases that have occurred over the last five years. TLMFPD’s main concern is a downturn in the housing market either as a slowdown in new construction or decreases in market values of existing residential property. In the forecast, the District lost an estimated \$5.4 Million of revenue due to the drop from 7.20 percent to 6.11 percent in the ratio of actual to assessed value in residential property.³ The following figure shows the ending fund balance as a percent of General Fund expenditures. The requirement for a three percent emergency reserve can easily be met. From a policy standpoint, 25 percent is considered an ideal percentage when developing a reserve policy. In fact, the GFOA considers 16 percent to be the minimum baseline level that a government should maintain.⁴ TLMFPD’s practice is to maintain a reserve level of 16 to 25 percent of just the operating expenditures. The internal required minimum balance would be \$1.7 Million at 16 percent, to \$2.5 Million at 25 percent. TLMFPD is well within these limits.

³ Since this report was completed, the Division of Local Government has revised the 6.11 to 6.95 percent. This reduces the estimated reduction in revenue to approximately \$1.2 Million in the study period.

⁴ See GFOA Best Practice, “Appropriate Level of Unrestricted Fund Balance in the General Fund,” (2009), www.gfoa.org. The Best Practice states that reserves equal to about 16 percent of revenues or expenditures is the minimum a government should consider for its policy and that the actual target that a government adopts should be based on an analysis of the salient risks that a government faces (which in many cases may call for a higher reserve level than 16 percent).

Figure 27: Scenario—General Fund Reserves as a % of General Fund Expenditures



Forecast Scenario—Addition of a Capital Reserve or Projects Fund

Figure 28: Scenario—Status Quo Forecast Add Capital Reserve Fund

Financial Resources By Type	2019 Preliminary Budget	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast	2024 Forecast
Assessed Value (AV)	431,270,610	405,602,023	428,158,251	450,714,479	473,270,707	495,826,935
Levied \$	7,913,095	7,463,077	7,878,112	8,293,146	8,708,181	9,123,216
Collection Rate	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Mill Rate	18.4	18.4	18.4	18.4	18.4	18.4
General Fund Beginning Reserve Balance	4,814,216	3,337,567	3,520,549	3,837,673	4,303,286	4,748,112
Property Taxes	7,913,095	7,463,077	7,878,112	8,293,146	8,708,181	9,123,216
Specific Ownership Tax	750,000	600,000	600,000	600,000	600,000	600,000
Impact Fee	150,000	100,000	100,000	100,000	100,000	100,000
Interest	10,000	17,145	18,396	20,352	22,628	24,732
Wildland	100,000					
Ambulance Revenue	790,000	843,483	900,587	961,557	1,026,654	1,096,158
Fire Inspection Revenue	4,250	5,000	5,000	5,000	5,000	5,000
Grants	137,000					
Assessment Fees—Palmer Lake	7,500	7,500	7,500	7,500	7,500	7,500
Miscellaneous	10,000	15,000	15,000	15,000	15,000	15,000
General Revenue Total	9,871,845	9,051,205	9,524,595	10,002,555	10,484,963	10,971,606

Financial Expenditures By Type	2019 Preliminary Budget	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast	2024 Forecast
Treasurers Fees	118,696	111,946	118,172	124,397	130,623	136,848
Salaries and Benefits	6,224,453	6,593,238	6,986,219	7,405,180	7,852,055	8,328,935
Administrative Expenditures	536,606	552,704	569,285	586,364	603,955	622,073
Fire Operations	232,025	238,986	246,155	253,540	261,146	268,981
Fire Prevention	13,500	10,000	10,000	10,000	10,000	10,000
Medical	86,000	88,580	91,237	93,975	96,794	99,698
Vehicles	250,100	257,603	265,331	273,291	281,490	289,934
Communications	228,300	235,149	242,203	249,470	256,954	264,662
Building and Grounds	195,088	200,941	206,969	213,178	219,573	226,160
Total Lease Payments	344,206	322,792	215,615	71,264	71,264	71,264
Transfer to Capital Reserve	3,119,520	256,284	256,284	256,284	256,284	256,284
Total Capital Expenditures	984,000	410,000	465,000	750,000		55,000
Impact Fee Refunds						
Grand Total Expenditures	11,348,494	8,868,223	9,207,470	9,536,943	10,040,138	10,574,839
Change in Fund Balance	(1,476,649)	182,982	317,124	465,613	444,826	396,766
Ending Fund Balance	3,337,567	3,520,549	3,837,673	4,303,286	4,748,112	5,144,878
Ending Capital Reserve Fund	2,140,872	1,997,502	1,798,275	1,312,335	1,575,839	1,785,526

Figure 29: Scenario—Forecast, General Fund Add a Capital Reserve Fund

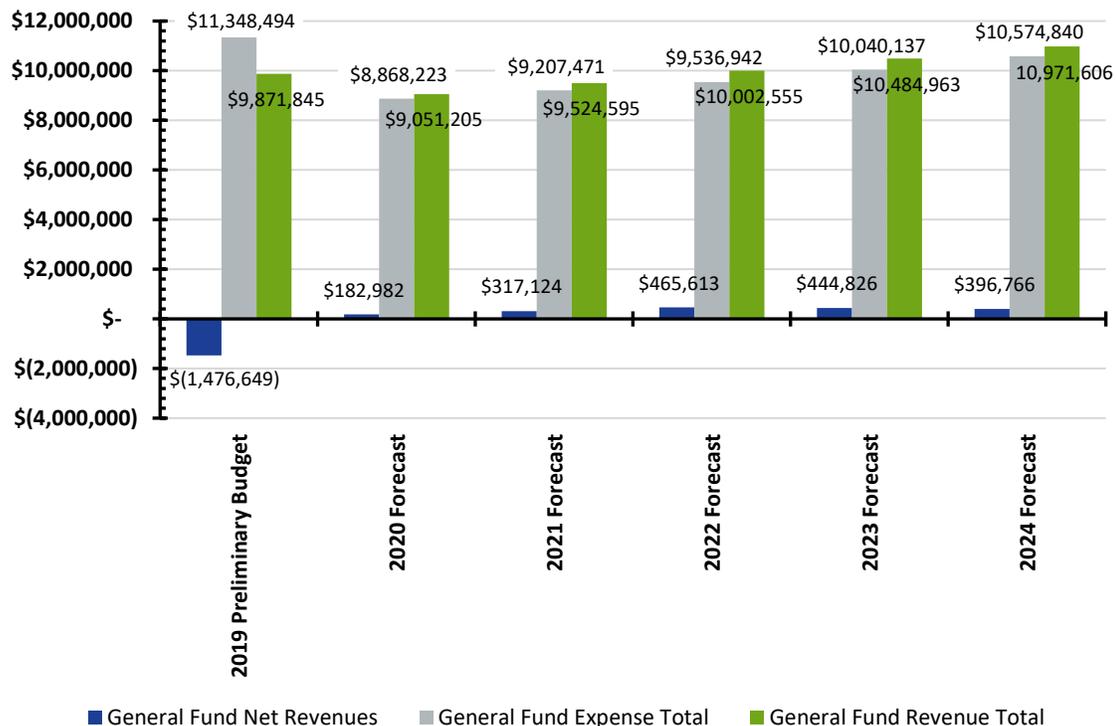
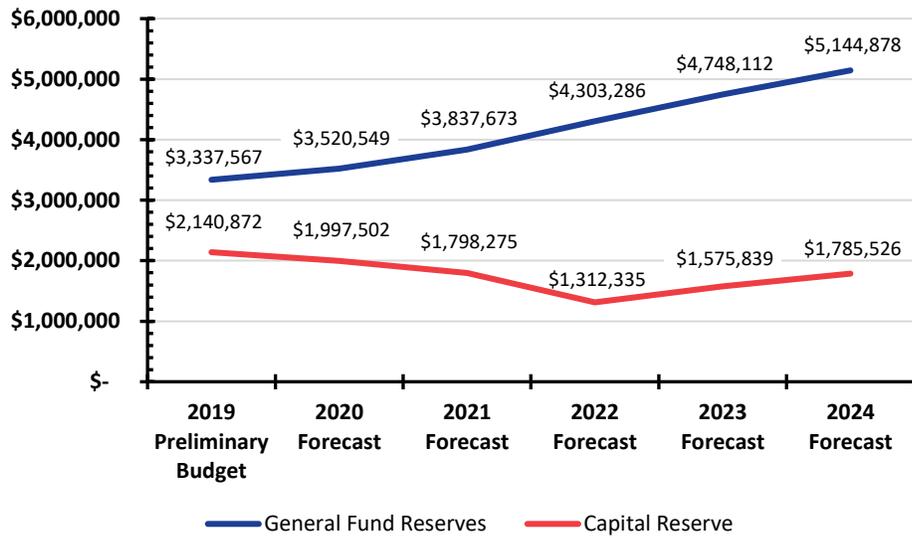
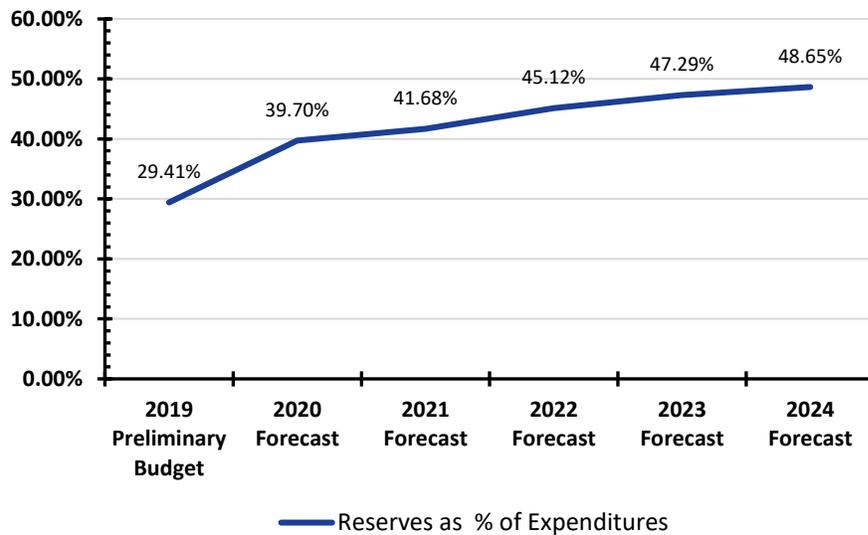


Figure 30: Ending Fund Balance General Fund and Capital Reserve Fund



Both the General Fund ending balance and the Capital Reserve Fund ending balance increase in this scenario. The Capital Reserve Fund balance increases and decreases with the contributions and purchases made from the Capital Reserve Fund.

Figure 31: General Fund Reserves as a Percentage of Expenditures



This figure shows that General Fund Reserves are adequate and increasing each year. The addition of a Capital Reserve Fund levels off the General Fund expenditures and sets aside a separate fund for capital purchases.

Future Revenue Concerns

The mill levy increase approved by the voters in 2017, was a giant step in the right direction to help head off the reduction in the ratio of actual value to assessed value for residential property. As stated previously, the proposed deduction in the ratio from 7.20 percent to 6.11 percent in 2020, reduces revenue from 2020 to 2024 by \$5.4 Million.⁵ The increase in the mills from 11.5 to 18.4 reduced that reduction by \$2.0 Million on residential property tax. The total increase of the 6.9 mills on all property tax revenue over the five-year study period was \$15.5 Million.

Possible Options to Offset Future Revenue Reductions

The most obvious way to help this problem is to increase the commercial and industrial categories in the assessed value tax base. Not so easy to do in real life, especially for a fire district. ESCI recognizes that TLMFPD has made a great effort to make citizens aware and recommends that the District continue to educate the tax payers on the effects of the Gallagher Amendment. This is a behind the scenes problem that most people do not understand or perhaps are unaware. The increase in the mill rate was beneficial and timely and minimized the immediate impact.

Based on the 2024 projected residential actual value, a reduction of 10 percent in the actual values would result in a \$676,000 reduction in revenue for the District at the 18.4 mills. Changes in revenues caused by changes in the economy will exacerbate the decrease. The District should monitor for any projected downturn in the economy.

Other options might be to charge fees for other services and monitor the fees as compared to other districts as well as the costs to provide this service. ESCI recommends that the District's accounting system collects costs for the services which are charged as fees. This is to make sure the District appropriately covers costs and provides service as efficiently as possible.

⁵ Since the report was completed, the state has increased the estimate for the ratio of residential from 6.11 to 6.95 percent. This reduces the loss to \$1.2 Million over the 5 years of the study.

Best Practices in Financial Management

As part of the fiscal analysis, our project team explored various data collection and site visit notes to examine measures of effective organizational performance in comparison to industry standards. The following figure includes select industry best practices and methods for performance improvement. The practices listed do not encompass every facet of the finance function, rather key targets for the District should/continue to monitor as a performance measurement.

Figure 32: Best Practices in Financial Management

Best Practices in Finance
Budgeting
Procedures are in place to monitor, adopt, and amend budgets.
The budget process includes performance measures, goals, objectives, etc.
The government body is recognized by the GFOA for its budget (FROA Distinguished Presentation Award).
A five-year financial plan is in place.
Written policies and procedures have been developed and updated.
Finance Department monitors actuals versus budgeted expenditures.
A fund reserve policy is in place.
New hires, reclassifications, and position changes are signed off (budget sign off).
Financial reports are provided to key stakeholders, such as Fire Chief and the Board of Directors.
Purchasing and Risk
Written policy is in place for purchasing good, services, etc.
Reasonable purchase limits and levels are in place.
Policies exist for excessive equipment and vehicles.
Training is provided regarding purchases.
Accounting
Finance functions are cross-trained.
Accounting policies are in place and enforced.
Accounts payable disbursements include proper documentation.
Invoices are approved/reviewed prior to payment.
AP is processed in a timely manner.
Monthly reconciliation, financial reports, and audits are handled in a timely manner.
Payroll is distributed in a timely manner.
Debt management policy is in place.

RECOMMENDATIONS:

- Continue to educate taxpayers on the combined effects of Gallagher and TABOR amendments on the District.
- Track costs on items that the District charges fees to assure cost recovery.
- Consider creating a formal Capital Projects or Reserve Fund to track major capital expenditures, such as vehicle purchases and replacements, and any building purchases.

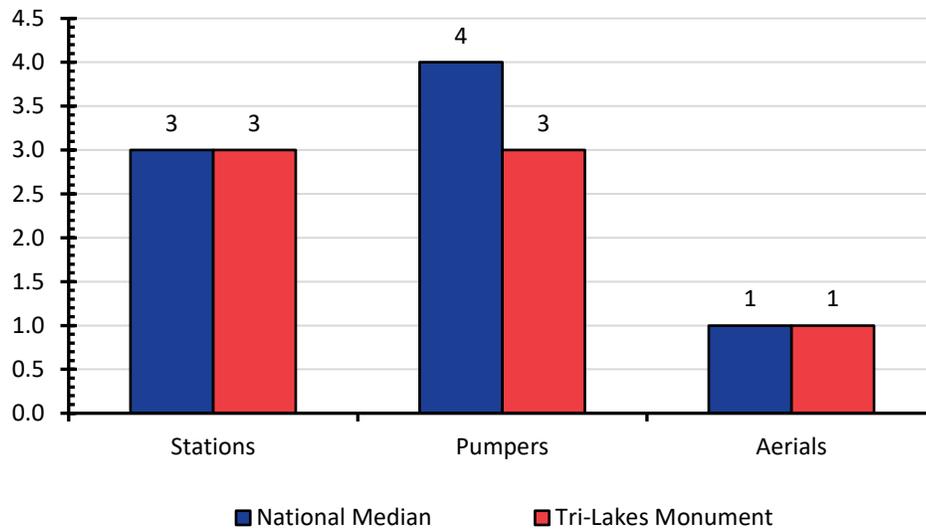
CAPITAL ASSETS AND CAPITAL IMPROVEMENT PROGRAMS

Regardless of an emergency service agency’s financing, if appropriate capital equipment is not available for the use by responders, it is impossible for a fire department to deliver services effectively. Two primary capital assets that are essential to the provision of emergency response are facilities and apparatus (response vehicles).

TLMFPD maintains a balance of three basic resources that are needed to carry out its emergency mission: People, equipment, and facilities. Because firefighting is an extremely physical pursuit, the adequacy of personnel resources is a primary concern; but no matter how competent or numerous the firefighters are, the District will fail to execute its mission if it lacks sufficient fire apparatus distributed in an efficient manner.

The District owns three fire stations and millions of dollars-worth of capital assets. These assets are necessary to provide service and must be maintained and replaced as needed. A comparison of major capital assets, including fire engines, aerial ladder trucks, and fixed facilities is provided in the following figure.

Figure 33: Capital Assets per 1,000 Population



TLMFPD’s major capital asset inventory compares in a similar manner to national medians for the region, based on the per 1,000 population data. The number of stations and aerial devices are the same as the identified medians, pumpers fall slightly below.

Facilities

Appropriately designed and maintained facilities are critical to a fire department’s ability to provide services in a timely manner and with appropriate deployment of assets. ESCI observed and reviewed the fire station operated by TLMFPD. The findings are summarized in the following discussion and any areas of concern observed are identified.

Figure 34: Station 1

Address/Physical Location:	18650 Hwy 105					
	General Description:					
	<p>Station 1 consists of three apparatus bays of drive-through configuration, along with one back-in bay. The station was constructed in 1998, and is in good condition overall. E2211, T2231, B2241, and M2281 are housed in the station.</p> <p>The facility includes administrative offices as well as quarters for responders. Typical emergency response staffing is three, cross staffing the engine, truck, and brush unit, and two responding on the medic unit. This station utilizes an adjacent property for driveways and generator.</p>					
Structure						
Construction Type	Type 1 – Cinder block					
Date of Construction	1998					
Seismic Protection	No					
Auxiliary Power	Natural gas generator					
General Condition	Good to Very Good					
Apparatus Bays	3	Drive-through bays		2	Back-in bays	
Special considerations (ADA, etc.)	Generator and side driveways/pkg on adjacent property					
Square Footage	8,200					
Facilities Available						
Separate Rooms/Dormitory/Other	4	Bedrooms	6	Beds	1-2	Beds in dormitory
Maximum Station Staffing Capability	6					
Exercise/Workout Facilities	Yes					
Kitchen/Dormitory	Yes					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	Yes					
Washer/Dryer	Yes					
Safety & Security						
Sprinklers and/or Smoke Detection	Smoke detection only					
Decontamination/Biohazard Disposal	Yes					
Security	Combination/keyed lock doors					
Apparatus Exhaust System	Yes					

Figure 35: Station 2

Address/Physical Location:		18460 Roller Coaster Rd	
	General Description:		
	<p>Station 2 is a smaller station that consist of two back-in apparatus bays. The building can accommodate a maximum of six responders and includes quarters and office space. The station was constructed in 2004 and is in good physical condition.</p> <p>There is no meeting space to accommodate firefighter training, and space in the station is maximized leaving no room for future expansion of services. Further, the septic system is located on property that is not owned by the District, a concern that needs to be addressed if TLMFPD continues to use of the facility.</p> <p>E2212, B2242, are located in the building and cross-staffed by the crew of three responders, and M2282 is staffed by two responders.</p>		
Structure			
Construction Type	Type 1 – Cinder Block		
Date of Construction	2004		
Seismic Protection	No		
Auxiliary Power	Natural gas generator		
General Condition	Good		
Apparatus Bays	0	Drive-through bays	2 Back-in bays
Special considerations (ADA, etc.)	North parking and septic system are located on adjacent property		
Square Footage	6,400		
Facilities Available			
Separate Rooms/Dormitory/Other	7	Bedrooms	7 Beds 1 Bed per room
Maximum Station Staffing Capability	7		
Exercise/Workout Facilities	On apparatus floor		
Kitchen/Dormitory	Yes – kitchen sink is butler sink size		
Individual Lockers/Storage Assigned	Partial – none in bunkrooms		
Shower Facilities	Yes		
Training/Meeting Rooms	No		
Washer/Dryer	Yes		
Safety & Security			
Sprinklers and/or Smoke Detection	Smoke		
Decontamination/Biohazard Disposal	Yes		
Security	Combination/keyed lock doors		
Apparatus Exhaust System	Yes		

Figure 36: Station 3

Address/Physical Location:	1855 Woodmoor Drive					
	General Description:					
	<p>Constructed in 1972, Station 3 is the District’s oldest station, but found to be in good condition. It is of masonry construction and features two drive-through apparatus bays and one back-in bay, along with quarters for up to five responders and office space.</p> <p>E2213 and B2243 are located here and cross-staffed by the crew of three responders. Batt 2202 also responds from this station and a reserve medic unit and snow cat are stored here.</p>					
Structure						
Construction Type	Type 1 – Cinder block					
Date of Construction	1972 w/addition in 1998					
Seismic Protection	No					
Auxiliary Power	Yes w/Natural Gas generator					
General Condition	Good					
Apparatus Bays	2	Drive-through bays			1	Back-in bays
Special considerations (ADA, etc.)	No					
Square Footage	5,700					
Facilities Available						
Separate Rooms/Dormitory/Other	5	Bedrooms	5	Beds	3	Beds in dormitory
Maximum Station Staffing Capability	5					
Exercise/Workout Facilities	Yes					
Kitchen/Dormitory	Yes					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	No					
Washer/Dryer	Yes					
Safety & Security						
Sprinklers and/or Smoke Detection	No					
Decontamination/Biohazard Disposal	Yes					
Security	Combination/keyed lock doors					
Apparatus Exhaust System	Yes					

The TLMFPD stations are in good physical condition, generally. However, all three are at full capacity regarding apparatus and storage space, and will present challenges looking toward the future to assure that there is adequate room for both equipment and personnel. While there is sufficient space for the fire apparatus that is currently on hand, there is no room to house additional units in the future.

Apparatus

TLMFPD maintains a fleet of response vehicles that are generally newer and appear to be well maintained. The overall condition of the fleet was found to be fair to good overall, with some units that are aging. An inventory of major apparatus, configuration, and condition is provided in the following figure.

Figure 37: Major Apparatus Inventory

Unit	Type	Manufact.	Status (Frontline, reserve)	Year	Condition	Mileage	Gal/GPM
E2211	Engine	Spartan	Reserve	2005	Fair	74,811	1250/750
E2212	Engine	Spartan	Frontline	2005	Fair	107,787	1250/750
E2213	Engine	Spartan	Frontline	2007	Fair	92,250	1250/750
T2231	100' Aerial	Spartan	Frontline	2009	Very Good	41,358	2000/300
M2281	Medic	Dodge 4500	Frontline	2016	Very Good	46,195	N/A
M2282	Medic	Dodge 4500	Frontline	2016	Very Good	33,022	N/A
M2289	Medic	Dodge 4500	Reserve	2014	Very Good	60,000	N/A
B2241	Brush	Dodge 5500	Frontline	2015	Excellent	2,851	Not provided
B2242	Brush	Ford F450	Frontline	2001	Good	17,851	Not provided
B2243	Brush	Ford F450	Frontline	2008	Very Good	27,481	Not provided

The District's fire apparatus is in generally good condition and appear to be well maintained, demonstrating a high level of pride in ownership. Medic 2289 is listed as in poor condition, but at the time of ESCI's field visit, that unit was being replaced.

In total, the District's units range in age from two to 17 years, with an average age of 8.8 years. Two engines are approaching their acceptable service lives. Specifically, E2211 and E2212, listed with 2003 and 2004 manufacture dates, meaning both are over 14 years of age currently. While both still have some service life, the District needs to be prepared for the expense of two engines at about the same time. Commendably, the District has established a plan for meeting this and future apparatus replacement needs.

Apparatus maintenance is difficult due to the lack of emergency vehicle repair facilities. This may be an opportunity for a cooperative venture for fire agencies in El Paso County and surrounding counties.

Capital Replacement Planning

Fire apparatus are typically unique pieces of equipment, often very customized to operate efficiently in a narrowly defined mission. A pumper may be engineered such that the compartments fit specific equipment and tools, with virtually every space on the truck designated in advance for functionality. This same vehicle, with its specialized design, cannot be expected to function in a completely different capacity, such as a hazardous materials unit or a rescue squad. For this reason, fire apparatus are very expensive and offer little flexibility in use and reassignment. As a result, communities across the country have sought to achieve the longest life span possible for these vehicles.

No mechanical piece of equipment can be expected to last forever. As a vehicle ages, repairs tend to become more frequent, parts more difficult to obtain, and downtime for repair increases. Given the emergency mission that is so critical to the community, this factor of downtime is one of the most frequently identified reasons for apparatus replacement.

Because of the large expense of fire apparatus, most communities find the need to plan for the cost of replacement. To properly do so, agencies often turn to the long-accepted practice of establishing a life cycle for the apparatus that results in a replacement date being anticipated well in advance. Forward thinking organizations then set aside incremental funds during the life of the vehicle, so replacement dollars are ready when needed.

The same holds true for fire stations, training grounds, and other fixed facilities. And as support equipment becomes costlier, particularly EMS equipment, planning for the replacement of these items is of equal importance.

ESCI surveyed capital replacement planning efforts at TLMFPD, with the findings as follows:

Apparatus Replacement

As a very general rule, ESCI uses the following life expectancy and replacement cost numbers for replacement planning:

Figure 38: Vehicle Service Lives

Vehicle	Life Expectancy	Replacement Cost
Squad/Utility	15	\$75,000
Med Rescue Truck	15	\$210,000
Heavy Rescue Truck	20	\$500,000
Commercial Pumper	20 (5 frontline)	\$600,000
Custom Pumper	20 (5 frontline)	\$700,000
Water Tender	20	\$375,000
Ladder	25	\$1,200,000
Brush	20	\$160,000
Type 3 Engine	15	\$310,000

The values listed are subject to modification based on each vehicle's age, condition, current use, and multiple other factors, so it should be viewed as a general guideline only.

In ESCI's experience with fire departments nationwide, we find that a low percentage of agencies have developed, and funded, an adequate apparatus replacement plan. The absence of a plan puts a fire department in a position of risk when the time comes that an expensive piece of equipment has to be replaced and funding is not available.

Tri-Lakes Monument Fire Protection District is an exception to ESCI's experience. Commendably, the District was able to provide ESCI with a well-developed apparatus replacement schedule, extending from budget year 2018 to 2032. The schedule was reviewed, with the following findings:

1. The apparatus service lives are appropriate and generally consistent with the table in Figure 38: Vehicle Service Lives.
2. The replacement costs are generally based on the District's purchasing history and consistent with ESCI's experience.
3. An inflation rate of two percent is included in the schedule's calculations.
4. Funding of replacements has been planned in advance, indicating which will be purchased outright and which will be incurring associated debt.

The District's replacement plan is found to be very well done, establishing an important financial course by which to meet the future financial needs of apparatus replacement. However, it was indicated that the plan is new, having only recently been developed and has not been funded previously. The source of funding was described as limited at the time of ESCI's field work, and it was stated that funding presently is primarily from the annual budget. It was also conveyed that financial resources from a recently established mill levy are to be dedicated to funding of the plan.

ESCI notes that when starting a replacement funding schedule from the beginning, the plan needs to address the lack of initial funding for the front end of the schedule. Doing so can be accomplished by dedicating financial resources, like what may be available from the mill levy, or from other reserved funds, if they are available. In the absence of startup funding for the plan, debt will have to be incurred.

ESCI recommends that the District take steps to assure an adequate funding strategy is established in support of the apparatus replacement schedule. Further, it is recommended that the inflation factor of two percent be revisited to assure that it is adequate. Typically, ESCI's schedules use a three percent factor.

Facility Replacement

The District does not have a replacement schedule in place for fixed facilities. Future development of a facility replacement plan is recommended.

Support Equipment Replacement

Support equipment including Self Contained Breathing Apparatus, hose, nozzles, and related equipment are not scheduled separately for replacement. Instead, the cost of support equipment may be factored into the apparatus replacement costs at times, which is an acceptable approach. However, equipment is not always replaced upon purchase of a new apparatus and is, instead, transferred from the old to the new vehicle. Informally, there are known replacement times that are being met for such items as bunker gear and breathing apparatus. For this reason, it is advisable to develop a more formal equipment replacement schedule, much like the apparatus replacement schedule. This allows for predicting known expenditures for future years and managing cash flow for capital purchases.

RECOMMENDATIONS:

- Assure that an adequate funding strategy is established in support of the apparatus replacement schedule.
- Revisit the inflation factor of two percent in the apparatus replacement schedule to assure that it is adequate.
- Develop a facility replacement plan.
- Develop a separate support equipment replacement schedule.

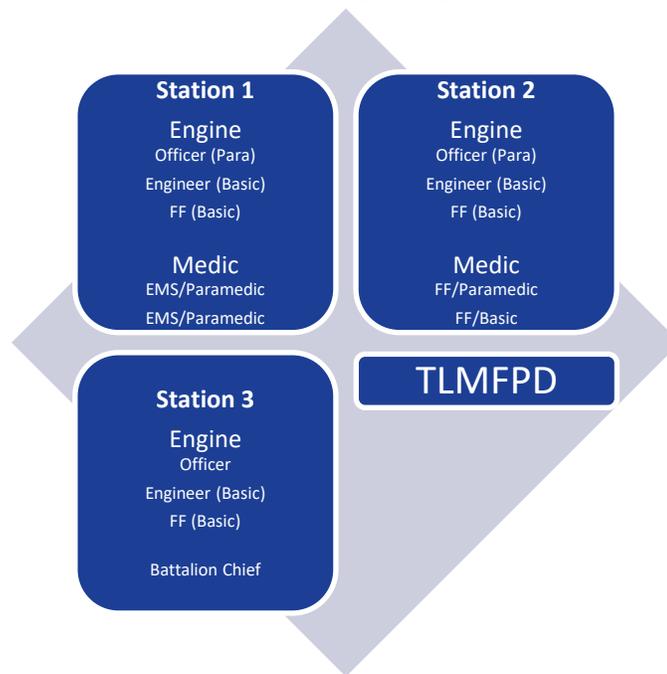
STAFFING

Tri-Lakes Monument Fire Protection District has demonstrated a remarkable progression over the past eight years. Tri-Lakes Fire, Woodmoor Fire, and Monument Fire Protection Districts merged into the current organization in 2008. Chief Truty was hired in 2013, and documentation supports that the majority of personnel were hired and most of the staffing progression has occurred over the past eight years. Currently, TLMFPD has four uniformed administrative staff, one non-uniformed support staff, and 45 line personnel. ESCI commonly sees a 12 to 18 percent administrative/support to operational staffing with higher levels in fire districts than municipal departments. TLMFPD has a ratio of 8 percent, indicating that the department is functioning in an efficient and cost-effective manner. Common concerns identified throughout the ESCI evaluation process were the challenges associated with hiring and retaining firefighters and paramedics. TLMFPD recently received an increase of their mill levy to 18.4 mills from 11.5. This growth in funding allowed for an increase in wages making the department more competitive with the neighboring urban systems. The additional funding enabled the department to maintain current staffing demands, however, it may still be insufficient for future growth.

Most small fire departments face the challenge of maintaining the necessary level of staff, 7 days a week and 24 hours a day. TLMFPD has demonstrated innovative solutions for solving staffing shortages, especially with paramedic positions. Due to the shortage of FF/Paramedics, TLMFPD developed a program to hire paramedics who function in an EMS-only capacity (EMS/Paramedics) on the Station 1 medic vehicle. These individuals are paid the same salary and scheduled the same as the FF/Paramedics assigned to Station 1 (see Figure 39). EMS/Paramedics are assigned EMS functions instead of firefighting duties. While the EMS-only personnel are effective for provision of emergency medical care, it has some limitations associated with firefighter staffing which will be discussed later. Departments that cover a diverse area of urban, suburban, and rural population densities often with limited resources need to maintain the ability to have flexible staffing models. TLMFPD described challenges of meeting staffing needs for multiple calls occurring at the same time. This will be analyzed under the Service Delivery and Performance portion of this report.

The following figure displays a normal staffing configuration for TLMFPD:

Figure 39: Staffing Configuration



Administration and Support Staff

Due to limited resources, TLMFPD staff are all expected to function in different capacities. Based on stakeholder interviews and the survey process, firefighters have demonstrated best practices when providing service. ESCI recognizes the necessity for staff to be proficient in numerous capacities when working in the small department setting. TLMFPD is no exception to this challenge. The low administrative-to-line ratio is partially due to the effective use of line personnel for administrative functions. This not only provides personnel to help with the duties, but gives personnel opportunities to learn about areas of the department that they would not otherwise. The following figure displays some of the administrative roles and duties required by specific individuals.

Figure 40: Administrative Functions and Responsibilities

Name	Title/Rank	Additional Administrative Role
Chris Truty	Chief	
Randy Trost	Deputy Chief/Operations Chief	
Jonathan Bradley	Training Chief	Fire/EMS Training
Jamey Bumgarner	Administration BC/Fire Marshal	
Mike Dooley	Battalion Chief/EMS Chief	Plant/Grounds Management
Mike Keough	Battalion Chief	Plant/Grounds Management
Kris Mola	Battalion Chief	Plant/Grounds Management
Jen Martin	Office Administrator	HR Manager/Compliance Officer
Janaka Branden	Line Lieutenant	EMS Officer (Duties undefined/being developed)
Open	EMS Paramedic	Logistics/Medical QA
Open	EMS Paramedic	Community Support/Medical QA
Open	EMS Paramedic	R&D/Medical QA
Open	EMS Paramedic	Training Manuals

As the District grows, it will be increasingly difficult to complete the primary functions and to share the administrative duties. One of those positions that is apt to realize the impact of the increased growth is the Office Administrator who also provides human resource functions. The Office Administrator performs administrative duties, compliance, and HR functions. As the organization grows or considers future mergers, the function of HR will become more demanding and essential. A report published by the Society for Human Resource Management (SHRM) supports the necessity for one HR specialist per 100 FTEs.⁶ Survey documents show 50 employees currently employed by TLMFPD. A potential merger with Donald Westcott Fire Protection District could result in 70 FTEs. While the number of employees if that occurs is less than 100, it is good to recognize that there is not one full human resource personnel at this time. ESCI recommends a proactive approach, that would include hiring an HR generalist prior to any mergers or as the organization grows in personnel. Policies and procedures need to be in place to facilitate effective consolidation of two or more organizations. As the organization grows, these processes will become labor intensive and require more emphasis from HR personnel. An HR generalist, and detailed personnel policies, would provide guidance for the department.

EMS administrative support is completed by EMS personnel that do not also have fire responsibilities. This helps to balance the workload but may at some time need to be performed by an EMS officer. Currently, the position is not well established and lacks documentation defining specific roles and duties. Considering the EMS/Paramedic program is in a developmental state, and there is a need for coordinated efforts regarding critical functions in EMS, ESCI recommends funding an EMS Supervisor position in the near future.

⁶ Society for Human Resource Management. (2015). *How Organizational Staff Size Influences HR Metrics*. Alexandria: Society for Human Resource Management.

Operational Staffing

An adequate number and properly trained staff of emergency responders are required in order to put the appropriate emergency apparatus and equipment to its best use in mitigating incidents. Insufficient staffing at the incident scene decreases the effectiveness of the response and increases the risk of injury to all those involved.

The first 15 minutes of any working fire is the most crucial period in suppression. How effective and efficient the fire personnel perform during this period will have a significant impact on the overall outcome of the event. This general concept is applicable to not only fires, but rescue operations and medical situations as well. Critical tasks must be conducted in a timely manner in order to effectively control a fire or complete a rescue and/or treat a patient.

Best practice in the fire service is to assess the relative risk of properties and occurrences, based on several factors. Properties with high fire risk often require greater numbers of personnel and apparatus to effectively mitigate the fire emergency. Staffing and deployment decisions should be made with consideration of the level of risk involved. There are two ways to compensate for staffing levels below the necessary levels. One is to depend on mutual aid responses which will be discussed further in this report, or, in the case of fire incidents, to reduce risk through property-based fire suppression systems.

The level of risk categories used in the fire service industry are as follows:

- Low risk—Areas and properties used for agricultural purposes, open space, low-density residential, and other low intensity uses.
- Moderate risk—Areas and properties used for medium-density single-family residences, small commercial and office uses, low intensity retail sales, and equivalently-sized business activities.
- High risk—Higher density businesses and structures, mixed-use areas, high-density residential, industrial, warehousing, and large mercantile structures.

Here is a sample critical tasking analysis for the number of personnel required on scene for various levels of risk. This information is shown in the next figure, illustrating an *example* of critical tasking only and is not intended to conclusively define the actual personnel necessary at TLMFPD based on risk.

Figure 41: Sample of Critical Task Staffing by Risk

Firefighter Personnel Needed Based On Level of Risk				
	Structural Maximum Risk	Structure Significant Risk	Structure Moderate Risk	Non- Structure Low Risk
Attack Line	4	4	2	2
Back-Up Line	4	2	2	(2)
Support for Hose Lines	4	3	2	
Search and Rescue	4	4	2	
Ventilation	4	2	2	
Rapid Intervention Team	4	4	2	
Pump Operator	2	1	1	1
2nd Apparatus/Ladder Operator	1	1	(1)	
Command	2	1	1	1#
Safety	2	1	1#	
Salvage	4			
Rehabilitation	2			
Division/Group Supervisors	(2)			
Total	37-39	23	14-16	3-6

() indicates tasks may not be required at all such incidents

indicates task may, at times, be completed concurrently with other position

This figure shows the difference in personnel numbers required based on the relative risk of the operation. While this focuses on fire-related operations, the same can be done for non-fire operations like rescues or hazardous material responses. Staffing the number of personnel to conduct all of the tasks is often beyond the capability of a fire department. Reduced numbers of emergency staffing will result in longer time to accomplish the necessary tasks and may result in larger fire losses. Conducting a critical task analysis for the types of responses that TLMFPD has is recommended as a best practice. Information on this can be found in Appendix B. As an alternative to conducting a critical task analysis, some departments utilize NFPA standards to determine the minimum required staffing. This will be discussed in the following section.

Effective Response Force

An *effective response force* (ERF) is defined as “the minimum amount of staffing and equipment that must reach a specific emergency zone location within a maximum prescribed travel or driving time.”⁷ While this can apply to any type of emergency, it typically is considered as it applies to structural fires. Structural fires typically require the greatest number of personnel to mitigate and no community can reduce its fire risk to zero. Therefore, the objective of any fire department must be to determine (usually through a Standards of Coverage study) a proper balance between efficiency, effectiveness, and reliability, which will keep fire risk at acceptable levels, while at the same time achieving the maximum ability to save lives and property at a reasonable cost.

There are nationally recognized standards that determine the recommended minimum staffing numbers and maximum response times: NFPA 1710 for career departments, and NFPA 1720 for volunteer and combination departments. NFPA 1720 states that the following figure “be used by the *Authority Having Jurisdiction* (AHJ) to determine staffing and response time objectives for structural firefighting, based on a low-hazard occupancy such as a 2,000-square foot, two-story, single-family home without basement and exposures.”⁸ Neither NFPA 1710 or 1720 are mandatory requirements, but recommended guidelines based on a consensus of fire service experts. Departments can adjust the levels of staffing based on the risk and community expectations.

NFPA 1710 is the standard designed for all career departments but anticipates urban population densities throughout. It is very difficult to apply the NFPA 1710 standard to a jurisdiction that is not fully urban. However, as it applies to an effective response force, it requires the same number for a residential dwelling or medium risk as the NFPA 1720 standard which is primarily for volunteer or combination departments. The requirements of this standard recognize differences in population densities particularly for response times. The difference in response times for NFPA 1710 and 1720 will be discussed later in this report.

For staffing purposes, the following figure that references NFPA 1720 will show the minimum staff sizes for different demand zones. The demand zones in TLMFPD will be discussed more thoroughly in the Service Delivery and Performance section of this report.

⁷ *Fire & Emergency Service Self-Assessment Manual, 8th Edition*; Commission on Fire Accreditation International.

⁸ *NFPA 1720: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, Article 4.3.2.

Figure 42: NFPA 1720 Response Objectives⁹

Demand Zone	Demographics	Minimum Staff to Respond	Response Time (minutes)	Meets Objective (%)
Urban Area	> 1,000 people/mi ²	15	9	90
Suburban Area	500–1,000 people/mi ²	10	10	80
Rural Area	< 500 people/mi ²	6	14	80
Remote Area	Travel distance ≥ 8 mi	4	Directly dependent of travel distance	90
Special risks	Determined by AHJ	Determined by AHJ based on risk	Determined by AHJ	90
* A jurisdiction can have more than one demand zone.				
* Minimum staffing includes members responding from AHJ's department and automatic aid.				
* Response time begins upon completion of the dispatch notification and ends at the time interval shown in the table.				

It is important to note that these staffing levels are for the medium-sized dwelling as indicated above. TLMFPD has residential structures that are considerably larger than this standard suggests. Also, commercial buildings may require more personnel than the standard residential dwelling. That should be kept in mind when considering minimum staffing levels.

NFPA 1720 standard recommends staffing of 15 for a medium-risk structure in urban areas. Information provided by TLMFPD shows 14 staff on a structure fire. This includes the two personnel responding on the ambulance. A possible issue is when the two ambulance personnel come from Station 1 who may not have full firefighter certifications or capabilities. This drops minimum staffing to 12 and may not be within recommended standards. Management is aware of this and in order to supply the necessary staffing, TLMFPD trains the EMS personnel in firefighting support roles so that the fireground functions can be met.

TLMFPD staffing is just sufficient for incidents involving medium risk but may not be sufficient for incidents involving higher risk. Staffing may need to be supplemented by mutual aid and planned for in advance.

ESCI recognizes the difficulty in hiring Firefighter/Paramedics and commends the District for taking the action necessary to fill the paramedic positions, but wants the District to stay alert of potential issues as it moves forward. There are potentially other limitations in not having fully cross trained FF/Paramedics such as: staffing for EMS/Paramedics during sick leave or vacation is limited and cannot support back fill for FF/Paramedics with the same absences. Also, there is a lack of career progression for the EMS/Paramedics. They do not have the same opportunity to pursue alternative positions such as engineers, special team technicians, or company officers. The District recognizes these limitations and is working to minimize any negative effect.

⁹ National Fire Protection Association (2014). *NFPA 1720: Standards for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations*. Quincy, MA 02169.

Recruitment

TLMFPD has faced numerous challenges regarding hiring and retention of FF/EMTs and Paramedics. Chief Truty stated that limitations including salary structure, and competition with urban departments resulted in small pools of applicants and even less able to pass the entrance requirements. Competition for Firefighter/Paramedics has been intense for at least five years. This shortage seems to be nationwide, so it is difficult to recruit Firefighter/Paramedics.

Due to growth and the numbers hired in the 1970s and now the requisite retirements, the Pueblo, Colorado Springs, and Denver urban fire departments will require significant hiring over the next two to three years. This environment leads to the larger agencies hiring a great deal of personnel. This competition is particularly severe and will continue until the needs are filled.

TLMFPD does a good job of testing candidates with a written test, resume review, medical skills testing, and finally oral Board interview. The process of selecting the right candidates is important as the tenure may be long and having the right person is better than having to correct ineffective behaviors.

Salaries

Due to the recent mill levy increase, TLMFPD has competitive entry level salaries compared to regional urban EMS systems (see Figure 43). TLMFPD is still facing challenges regarding long-term retention. Following a 15-month period that includes an academy and probationary year, the urban departments are paying up to 37 percent higher salaries. Continued efforts to increase revenue sources, combined with a dynamic recruitment process, would be an effective strategy for meeting the staffing needs of the future.

Figure 43: Regional Wages for Entry Paramedics and EMT-Basics¹⁰

Position	Denver Metro	Colorado Springs	TLMFPD
Entry EMT/Firefighter	\$58,672	\$45,801	\$52,496
Post Probation EMT/FF	\$71,386	Unavailable	N/A
Entry Paramedic/FF	\$65,676	\$52,101	\$60,496
Post Probation Paramedic/FF	\$82,094	Unavailable	N/A
EMT (Private Ambulance)	\$32,196–\$39,952	\$35,202	N/A
Paramedic (Private Ambulance)	\$37,963–\$48,177	\$41,721	N/A

TLMFPD management recognizes the need to be competitive, but in reality, will probably not be able to compete with the larger urban departments. Currently, TLMFPD's recruits are trained at West Metro Fire Academy. This gives excellent training, but could lead to providing the recruits with opportunities to be hired by West Metro Fire Rescue (WMFR) or another large agency. There are two reasons for this potential. The recruit is trained to the same certification level as the WMFR recruits; and secondly, the quality of TLMFPD's candidate is witnessed by the training officers in turn possibly sparking interest to recruit.

¹⁰ Salary.com, 2019, salary range for combined South Metro, Littleton, and Cunningham Fire Departments, 2019.

There is a cost for losing firefighters to the larger agencies. First, the cost of their training, both in price of academy and wages paid during the academy. Second, there is the loss of an employee that is valuable to the department and the need to start over with recruitment, selection, and training the new employee.

The only remedy for this may be for TLMFPD to train their own recruits in an academy that provides only the Firefighter I certification level. This would prevent the recruits from being as desirable to the larger agencies, and prevent the other agencies from viewing the quality of recruits that TLMFPD has chosen. The downside is that the firefighters that graduate will not be as well trained. This is a decision that the District needs to make based on whether the number of firefighters leaving for larger agencies within the first couple of years post-academy is acceptable. This is something that TLMFPD needs to track and calculate the investment that the training provided has cost the department. Should this option be implemented, it may only be needed during the time of the retirement hiring bubble and unnecessary once the period has concluded.

Recruitment of Firefighter/Paramedics is another issue that has been difficult for some time. This has caused TLMFPD to recruit Paramedics without fire training. This has been an effective way to fill the positions needed but has some drawbacks as discussed earlier for filling the needed Firefighter/Paramedic slots. To expand on this process, it is ESCI's opinion that there is a sufficient pool of Paramedics functioning in the private ambulance sector that would take the opportunity to be hired, receive initial fire certifications, and function in an all hazard response department. The key to success would be a comprehensive/focused marketing program that expands beyond local agencies. This is discussed in more detail in the next section.

In this model of recruitment, the current EMS/Paramedics could be encouraged to participate in the fire training as is already being done by the District. The District should consider a financial incentive for EMS/Paramedics and EMS/EMTs to, in a timely manner, complete their firefighter certifications. Those not desiring to participate in fire training can continue until attrition, but all new paramedics would be recruited on the basis of completing firefighter training within a certain time following hire.

Recruitment Process

After selecting a staffing model, the next step is a dynamic recruitment process. The traditional process for recruiting new firefighters is announcements/advertising through local publications and media. The northern part of El Paso County is an exceptional combination of a rural lifestyle, combined with benefits of a large city in close proximity. Major universities, professional sports, commercial airports, and other city culture is only a half hour away, and yet an individual can enjoy the benefits of living and working in a more rural community. TLMFPD should perform focused recruitment in areas where individuals are not looking for an urban department but desire a department with an excellent reputation for service delivery in a more rural setting.

One of the described benefits of working in a small system is the opportunity to function in multiple capacities. This provides the firefighter with the opportunity to learn and function in areas that are typically not available in the larger urban systems. This is recognized as a draw for some individuals entering the fire service and could be an excellent recruitment tool.

TLMFPD can use the challenges of recruiting for a suburban system into an opportunity for growth. Consider embracing the concept of individuals using TLMFPD as a transition to larger urban departments. This system would create two career paths. The first being a long-term member of the District who will progress into future leadership, and the second, a transitional firefighter who takes the training and experience to another organization. Individuals who commit two to four years to TLMFPD will fill necessary positions and provide stability during the transition years while the District considers mergers or manages growth. In return, the new firefighter gains exposure to all aspects of the fire service, from EMS to special teams. The reputation of TLMFPD's training program will reflect in the hiring practices in urban departments. This concept could become a strong marketing tool and significantly reduce the challenges of staffing. As discussed previously, there will be a cost to using TLMFPD as a progression to a larger urban department and that should be considered carefully in picking the recruitment approach.

RECOMMENDATIONS:

- Consider adding Human Resource Manager and EMS Supervisor as the District grows.
- Consider philosophy, design, and implementation changes to the EMS/Paramedic Program.
- Develop a Dynamic Recruitment Program:
 - Utilize Social Media with Search Engine Optimization.
 - Conduct demographic research of similar systems.
 - Recruitment at local, regional, and state EMS conferences.

SERVICE DELIVERY AND PERFORMANCE

The most important aspect of any emergency services agency is its ability to deliver services when requested. This section of the report evaluates the current and historical service delivery elements of:

- Service Demand
- Resource Distribution
- Resource Concentration
- Work Load and Reliability
- Response Performance

The discussion begins with a summary of the current service delivery and performance elements that are in place in the Tri-Lakes Monument Fire Protection District (TLMFPD).

Service Demand Analysis

ESCI analyzes the current and historical service demand of TLMFPD by incident type and temporal variation. GIS software is used to provide a geographic display of service demand within the study area. Incident data collected in the District’s records management software (RMS)–Emergency Reporting System (ERS), is utilized to provide a view of historical service demand and current temporal variations. In order to avoid data issues resulting from the transition to the ERS software in 2015; ESCI used the July to July time period to summarize annual incidents as FY 2017 and FY2018 in this section of the report. The following figure displays TLMFPD historical service demand from July 2016 to July 2018.

Figure 44: TLMFPD Historical Service Demand, July 2016–July 2018

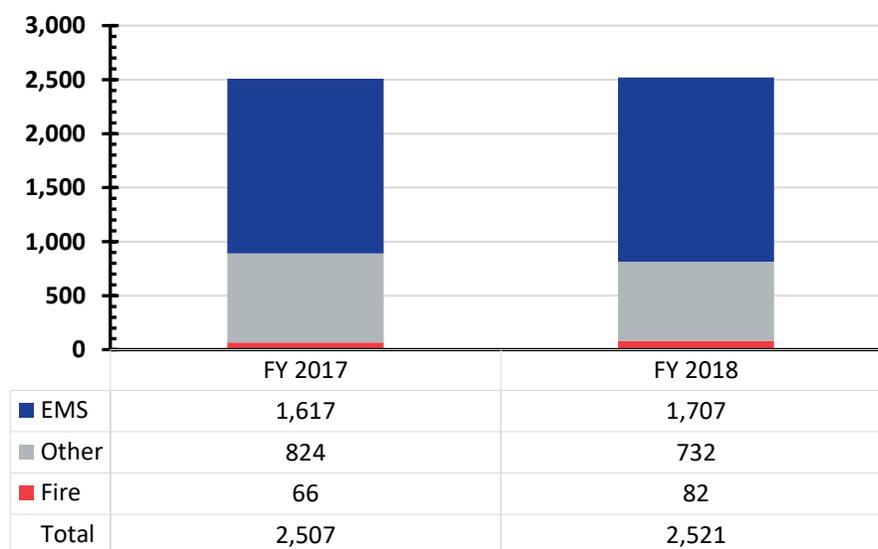


Figure 44 reveals that TLMFPD annual service demand was similar in the two-year time period displayed. Using National Fire Incident Reporting System (NFIRS) incident type codes, ESCI categorizes incidents as *Fires* (structures, vehicle, brush, any 100 series NFIRS code), *EMS* (all calls for medical service, including MVAs and rescues, any 300 series NFIRS code), and *Other* (false alarms, Haz-Mat incidents, service calls, all other NFIRS codes).

The next figure demonstrates the overall nature of service demand in the TLMFPD service area, summarized as Fire, EMS, or Other incident categories.

Figure 45: Percentage of Incidents by Category, 2016–2018

Incidents by Category, July 2016–July 2018	
Incident Category	Percentage
EMS	66.1%
Other	30.9%
Fire	2.9%

Overall, EMS incidents represent approximately 66 percent of service demand. Actual fires represent nearly three percent of service demand, and the “Other” incident category represents approximately 31 percent of the historical service demand displayed. The percentages displayed are similar to comparable fire jurisdictions in the region and nationally.

The following figure displays TLMFPD service demand by NFIRS incident type between July 2016 and July 2018.

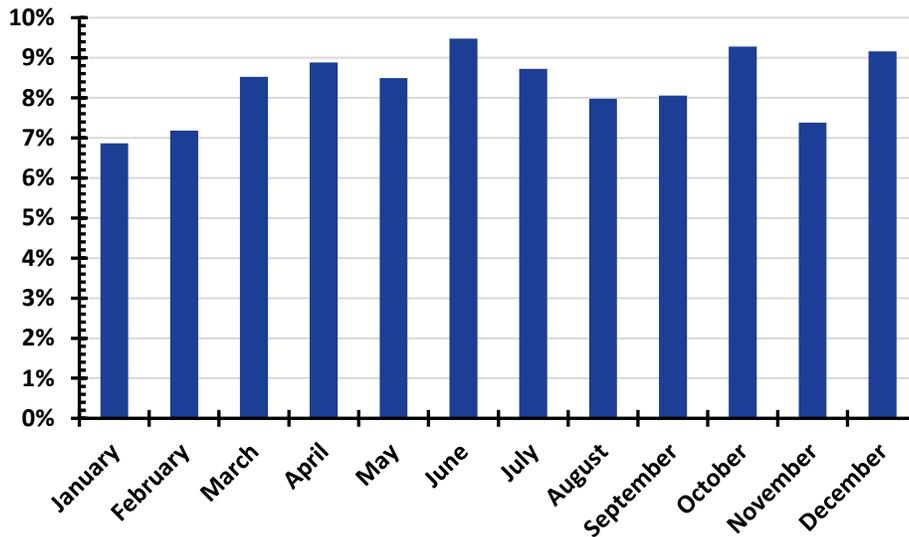
Figure 46: Service Demand by NFIRS Incident Type, July 2016–July 2018

NFIRS Incident Type	FY 2017	FY 2018
1 – Fire	66	82
2 – Rupture, Explosion, Overheat (No Fire)	1	3
3 – EMS	1,618	1,707
4 – Hazardous Condition (No Fire)	70	59
5 – Service Call	140	130
6 – Good Intent Call	412	341
7 – False Alarm	188	195
8 – Severe Weather, Natural Disaster	4	1
9 – Special Incident-Other	8	3
Total	2,507	2,521

Temporal Variation

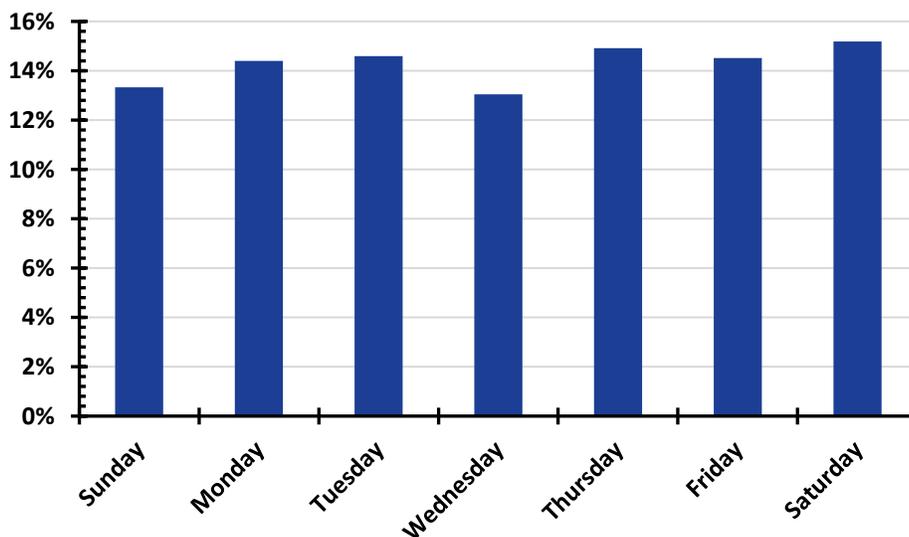
It is instructive to look at when service calls occur to see if there are identifiable trends. In the following figures, the fire department incident responses are shown by month, day, and time of day. The data used in these figures is July 2017 to July 2018 (FY 2018).

Figure 47: TLMFPD Service Demand by Month of the Year, FY 2018



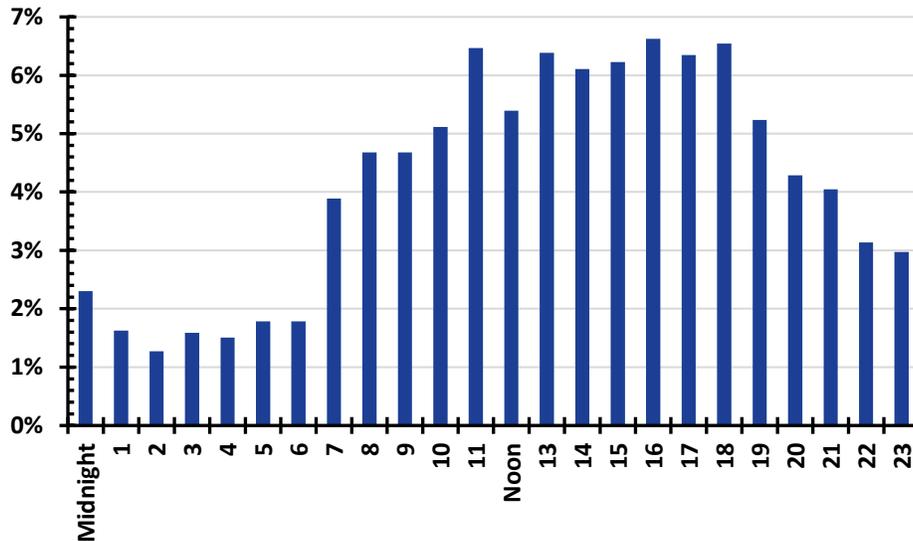
Service demand varies from a low of 173 incidents in January to a high of 239 incidents in June. January and February display the lowest demand for TLMFPD services, while June, October, and December demonstrate the highest service demand. On average TLMFPD responds to approximately 200 incidents per month. The next figure examines service demand by day of the week in FY 2018.

Figure 48: TLMFPD Service Demand by Day of the Week, FY 2018



In general, service demand varies within a relatively narrow range (approximately 2 percent) throughout the week. Sundays and Wednesdays experience the lowest service demand; while Thursdays and Saturdays display the highest service demand.

Figure 49: TLMFPD Service Demand by Hour of Day, FY 2018

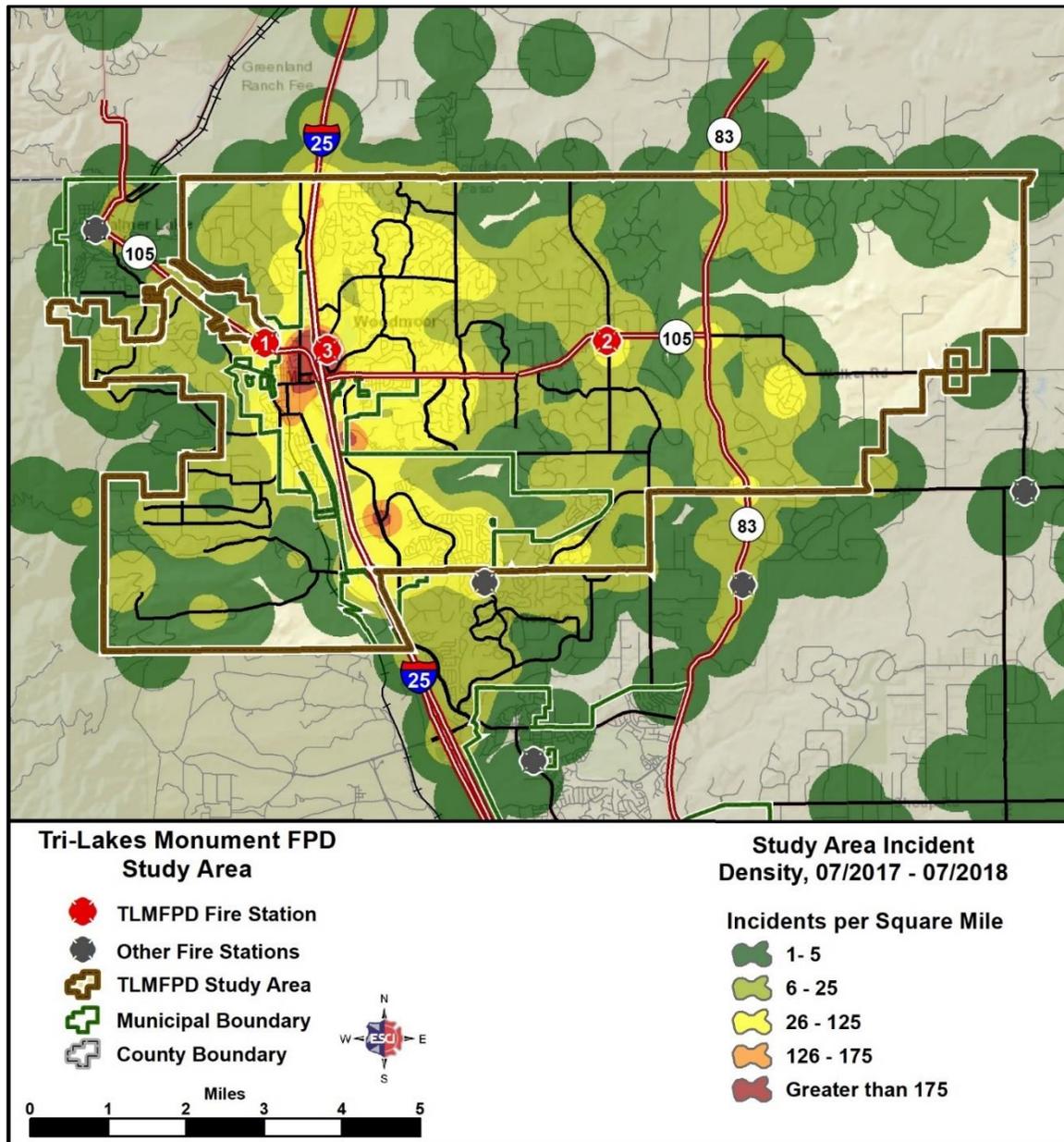


When summarized by hour of the day, TLMFPD service demand correlates with the activity of people; with demand increasing during the workday and decreasing in the evening and early morning hours. Nearly 70 percent (69.8 percent) of the service demand displayed in the figure occurred between 8am and 8pm.

Geographic Service Demand

In addition to the temporal analysis of workload, it is useful to examine the geographic distribution of service demand. ESCI uses geographic information systems software (GIS) to plot the location of incidents within the Tri-Lakes Monument FPD study area from July 2017 to July 2018, and calculates the mathematical density of incidents (incidents per square mile) in the study area.

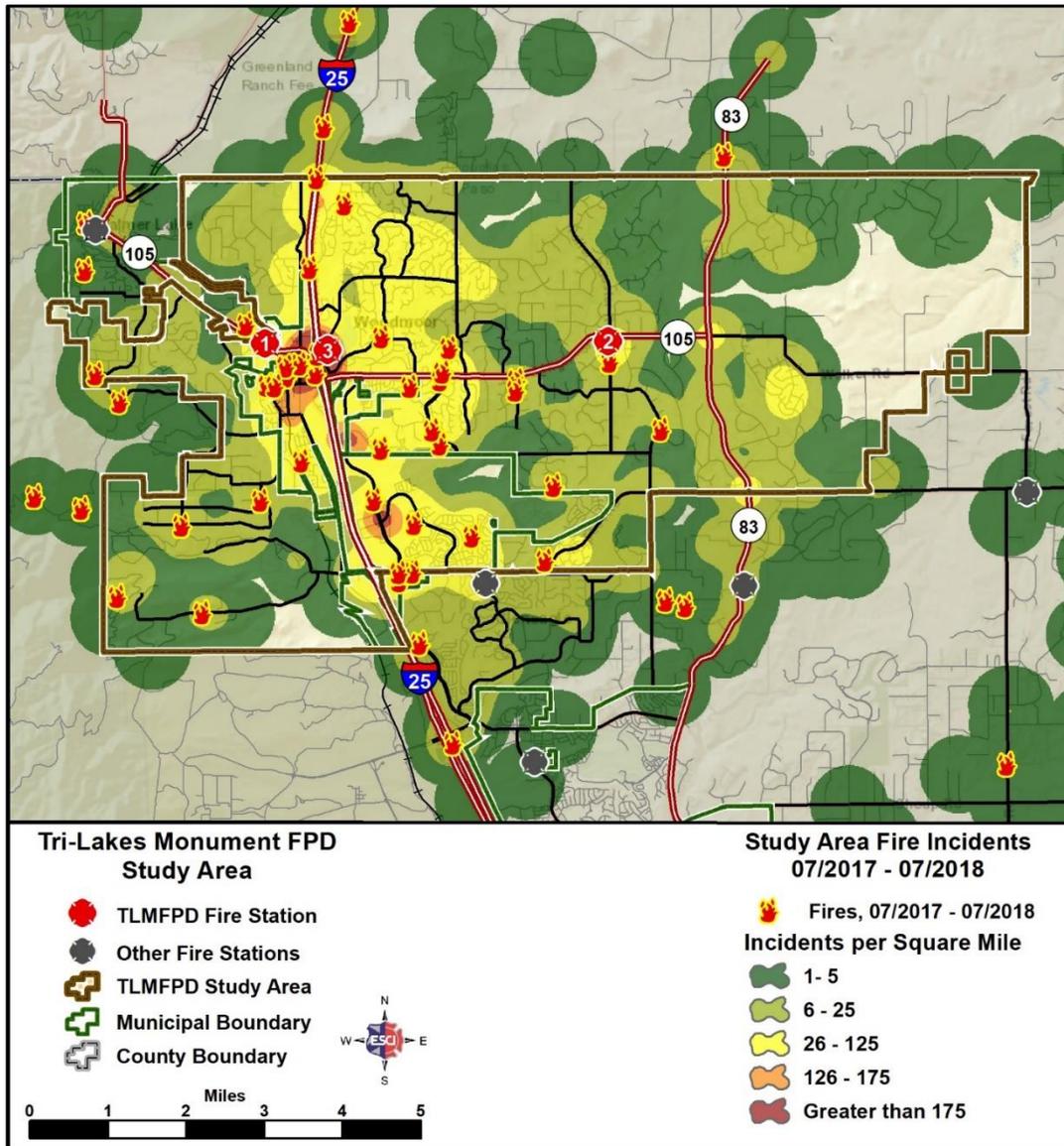
Figure 50: TLMFPD Geographic Service Demand (Incidents per Square Mile), FY 2018



TLMFPD service demand is disbursed throughout the service area. Mutual or automatic aid given to neighboring fire jurisdictions represents approximately 7.4 percent (186 incidents) of the service demand displayed in this figure. Incidents (approximately 250 in FY 2018) on Interstate 25 represent nearly 10 percent of the TLMFPD service demand displayed in this figure. The majority of incidents are concentrated within the Town of Monument and the area immediately adjacent to the Town.

The majority of the service demand displayed in Figure 50 is primarily EMS incidents (67.7 percent). The following figure displays incidents categorized as "Fires" (structures, vehicle, brush, or any 100 series NFIRS code).

Figure 51: TLMFPD Geographic Service Demand and Fire Incidents, FY 2018

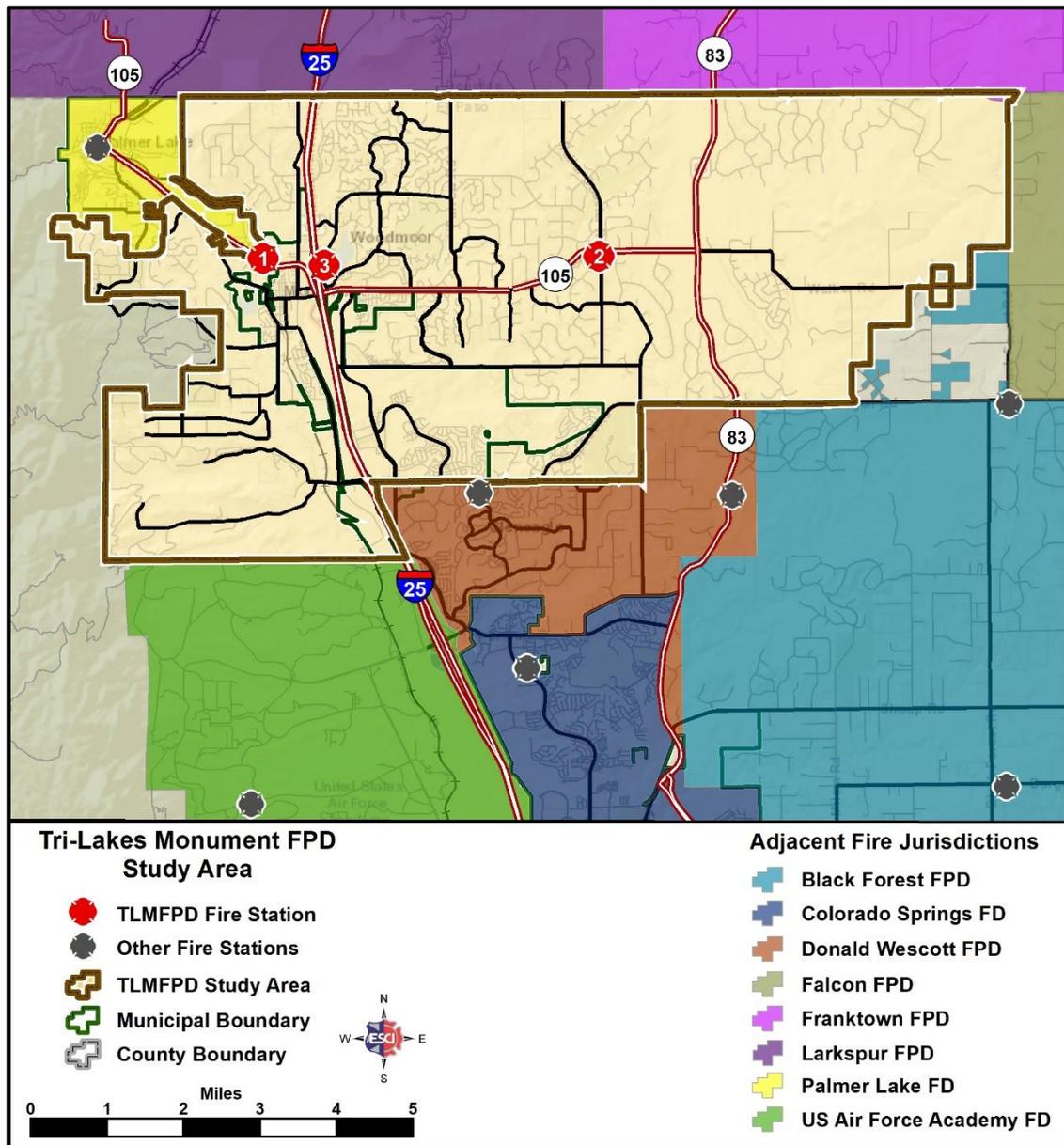


Fire incidents are the least frequent incident type in the data displayed. However, incidents categorized as fires are distributed throughout the study area in a pattern similar to the overall incident data.

Resource Distribution Analysis

The distribution analysis presents an overview of the current distribution of fire department resources within the TLMFPD service area. Figure 52 displays the study area and the adjacent fire jurisdictions.

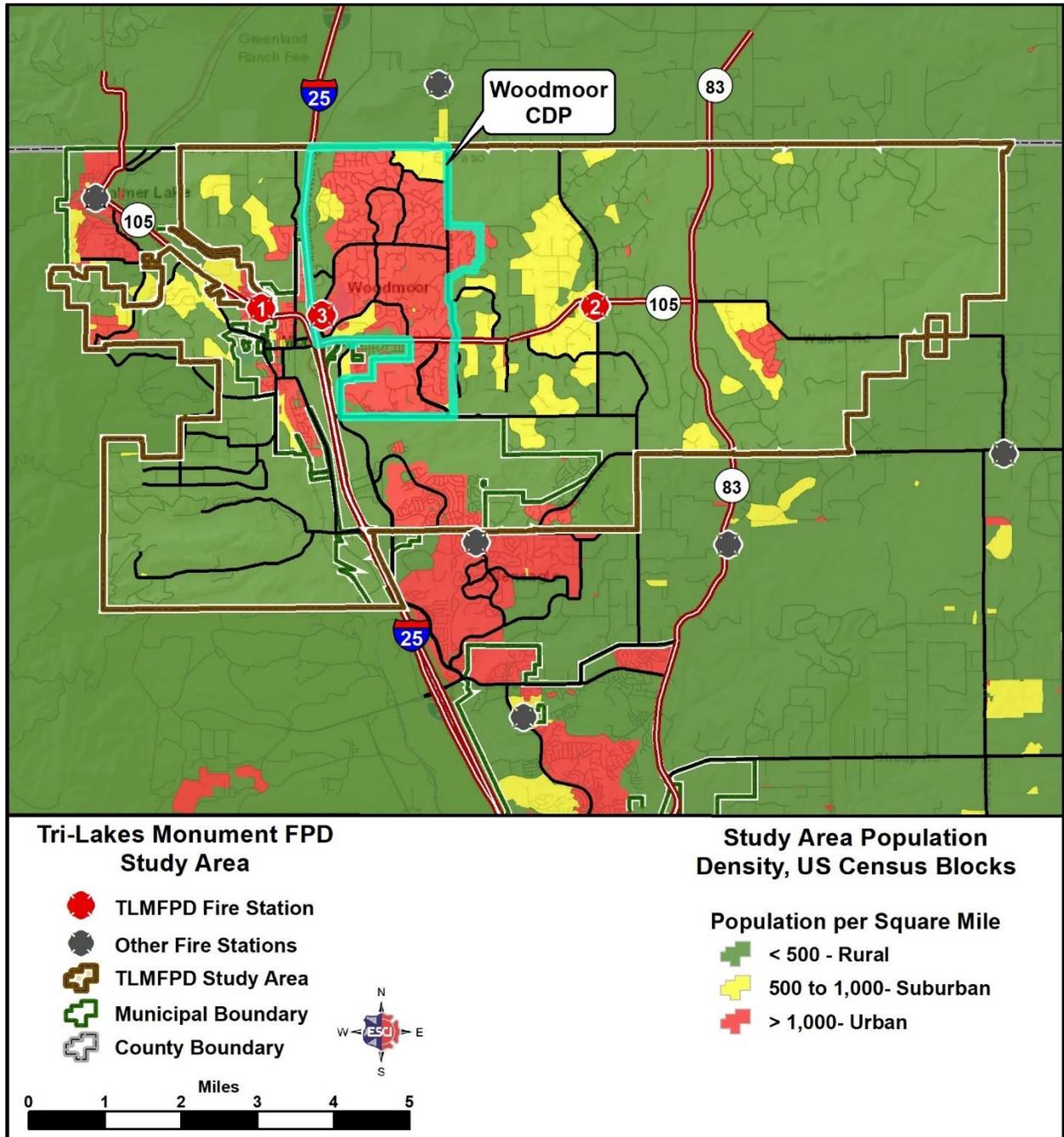
Figure 52: TLMFPD Service Area and Adjacent Fire Jurisdictions



The TLMFPD service area encompasses approximately 52 square miles and includes most of the incorporated Town of Monument and the unincorporated area within the boundary of the Tri-Lakes Monument Fire Protection District. TLMFPD operates three fire stations within the service area, which are staffed 24/7 by career personnel. Interstate 25, State Highway 105, and State Highway 83 are the main transportation routes through the service area. TLMFPD actively participates in aid agreements with the adjacent fire jurisdictions displayed in Figure 52.

In the next figure, ESCI uses U.S. Census Bureau census block data to display population density in the study area. Using National Fire Protection Association (NFPA) population classifications, population density is categorized as Urban, Suburban, and Rural.

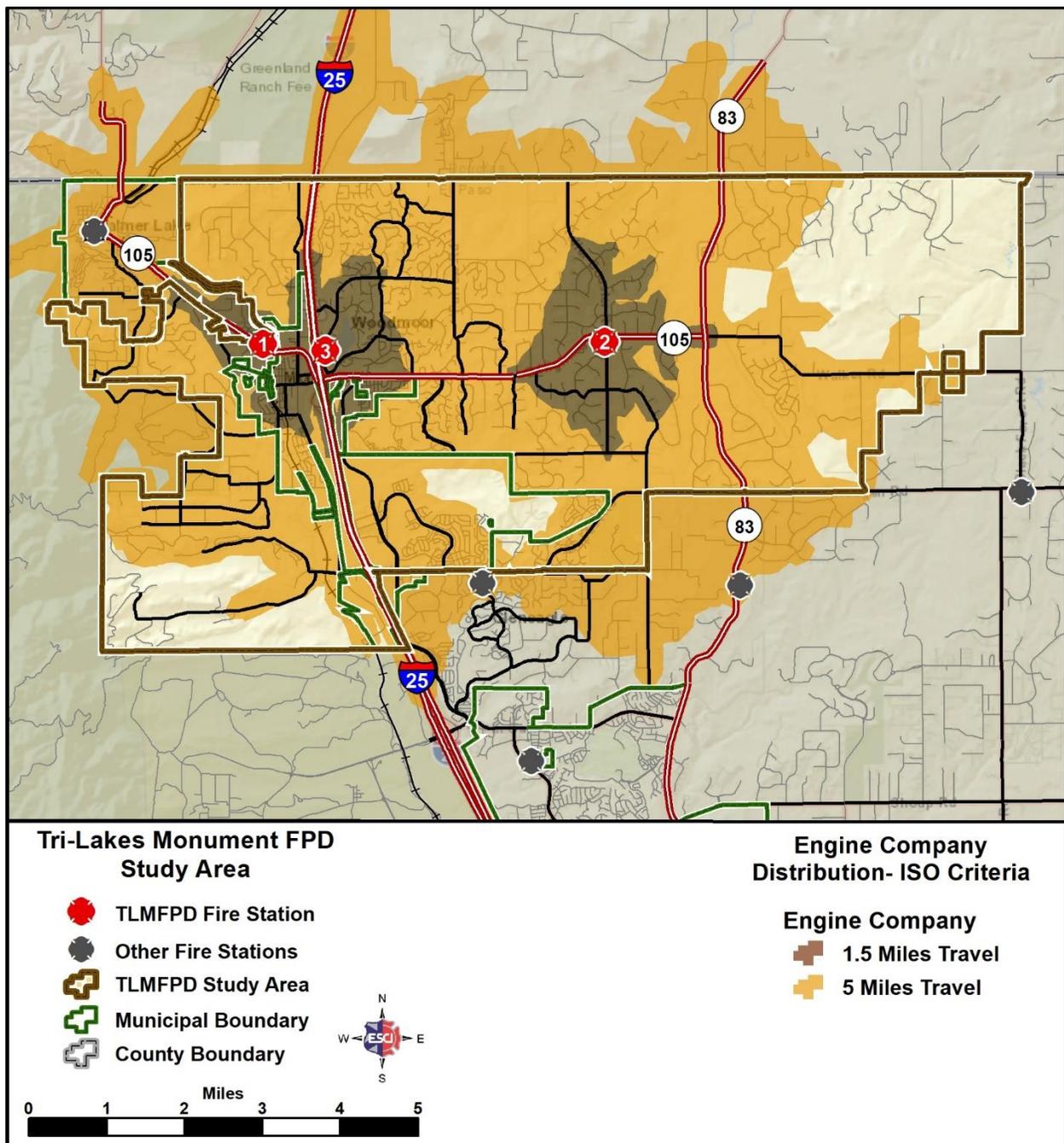
Figure 53: TLMFPD Study Area Population Density, 2010 Census Blocks



The current estimated population in the TLMFPD service area is approximately 30,000. As displayed, the population is concentrated in Monument and the Woodmoor census designated place (CDP), east of Monument. The most current U.S. Census Bureau population estimate for Monument is 7,380, as of July 1, 2017. The Colorado State Demography Department estimates the population of the Woodmoor CDP as approximately 8,587, as of July 2016. The population density within Monument is 1,118 per square mile; while the population in the Woodmoor CDP is approximately 1,408 per square mile. Based on an estimated population of 30,000, the overall population density in the TLMFPD service area is approximately 577 per square mile. Excluding Monument and the Woodmoor CDP, the population density in the remainder of the service area is approximately 333 per square mile.

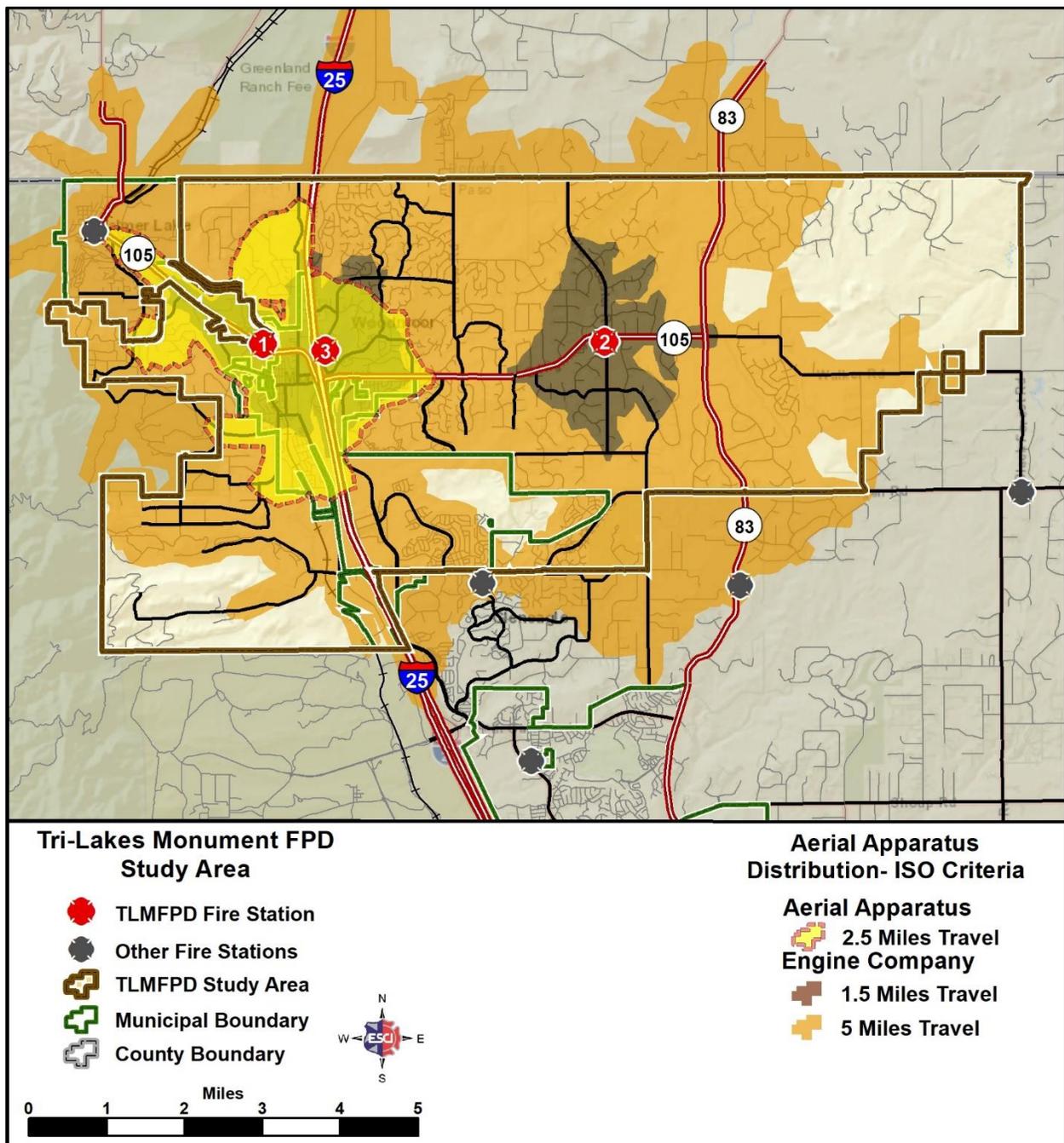
There are two standards commonly used in the fire service for response distribution. The Insurance Services Organization (ISO) is a national insurance industry organization that evaluates fire protection for communities across the country. A jurisdiction's ISO rating is an important factor when considering fire station and apparatus distribution, since it can affect the cost of fire insurance for individuals and businesses. To receive maximum credit for station and apparatus distribution, ISO recommends that in urban areas, all "built upon" areas in a community be within 1.5 road miles of an engine company. If there are more than five structures over three stories or have a "needed fire flow" of over 3,500 gallons per minute, ISO requires an aerial truck responding from within 2.5 miles. Additionally, ISO states that a structure must be within five miles of a fire station to receive any fire protection rating for insurance purposes. The following figure examines current TLMFPD station and apparatus distribution, based on rating criteria for the Insurance Services Organization (ISO).

Figure 54: TLMFPD Engine Distribution per ISO Criteria



Approximately 22 percent of address points (El Paso County GIS data) in Tri-Lakes Monument service area are within 1.5 miles travel distance or less of a TLMFPD fire station or engine company. Over 96 percent of address points in the service area are within five miles of a TLMFPD fire station.

Figure 55: TLMFPD Aerial Apparatus Distribution per ISO Criteria

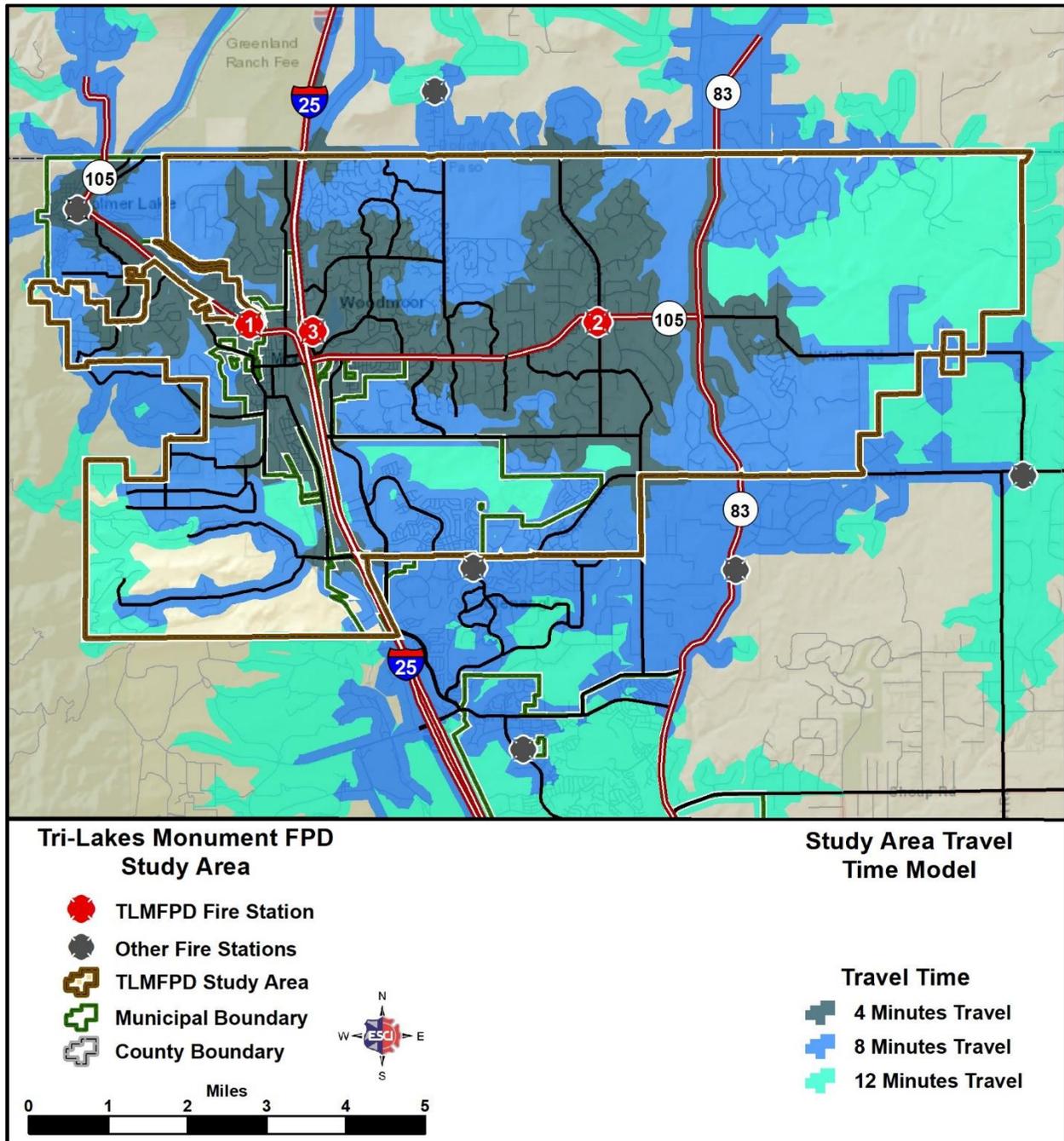


The TLMFPD aerial apparatus is located at Station 1. Based on ISO criteria, the aerial is appropriately located to meet the current need for an aerial apparatus in the TLMFPD service area.

Based on the proprietary criteria of the ISO, TLMFPD received a Public Protection Classification (PPC) of 3/3Y in December 2014. The ISO PPC is based on a scale of 1–10, with 1 representing exemplary fire protection and 10 corresponding to no recognized fire protection for insurance purposes.

The second standard for resource distribution is using response time criteria. This method is used by NFPA standards and the Center for Public Safety Excellence accreditation of fire departments. The following figure presents a travel time model from the current TLMFPD station locations over the existing road network. Travel time is calculated using the posted speed limit and adjusted for negotiating turns, intersections, and one-way streets. Note that the travel time model only displays potential travel time based on the local data provided by El Paso County.

Figure 56: TLMFPD Travel Time Model—Four, Eight, and Twelve Minutes Travel

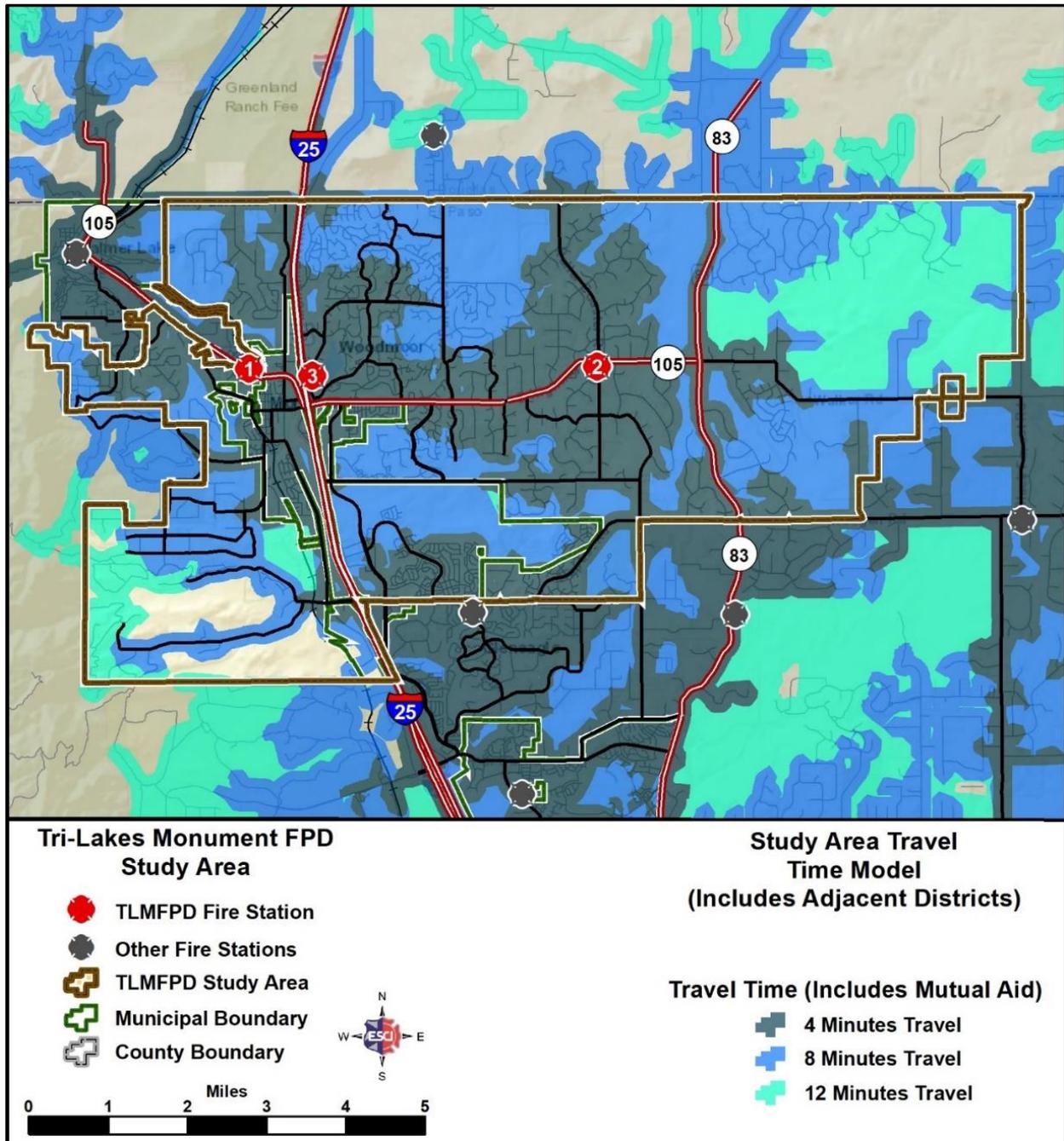


All of the service area is within 12 minutes travel of a TLMFPD station.¹¹ With some exceptions in the northeast and southwest corners of the District, most properties are within eight minutes travel of a TLMFPD fire station. Much of the most densely populated area in the Woodmoor area and Monument (west of Interstate 25) is within four minutes travel of Station 1 or Station 3. The Station 2 four-minute service area covers the less densely populated areas on either side of Highway 105 and Highway 83.

TLMFPD actively participates in mutual and automatic aid with neighboring fire jurisdictions. Cooperative efforts, such as mutual or automatic aid, provide an opportunity to improve response capabilities for all participating jurisdictions. Figure 57 displays a travel time model in TLMFPD including resources from the District's mutual or automatic aid partners. Note that travel time from the Larkspur FPD station located north of TLMFPD on Furrow Road in Douglas County is not included in the analysis. This is an unstaffed volunteer station that houses primarily reserve equipment.

¹¹ Twelve minutes is the travel time required to reach all of the service area based on the current station locations and road network; 12 minutes plus 2 minutes turnout time is the NFPA 1720 response goal for rural demand zones.

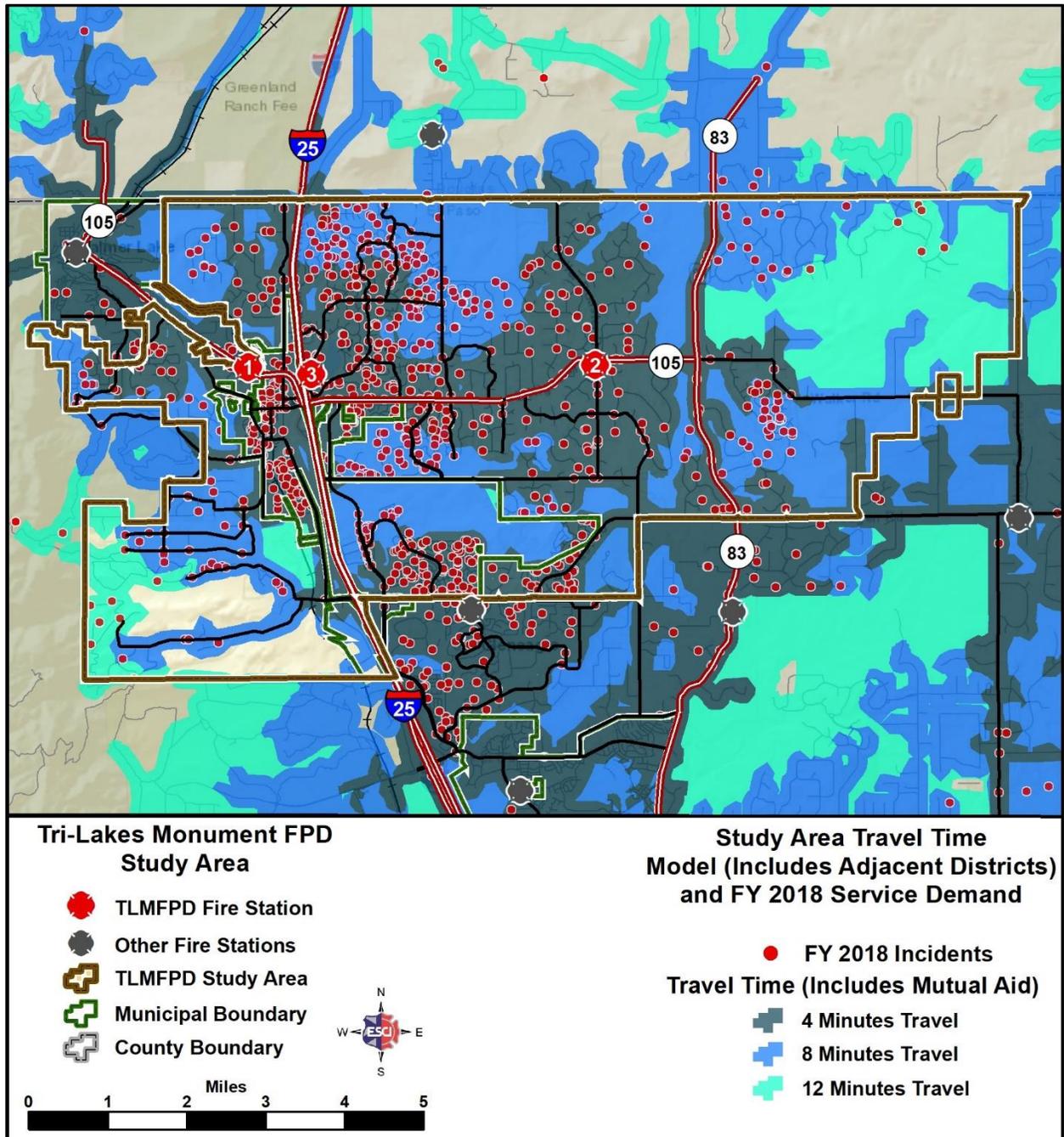
Figure 57: TLMFPD Travel Time Model (Includes Aid Stations)–Four, Eight, and 12 Minutes



As displayed in the previous figure, resources from Palmer Lake FD, Donald Wescott FPD, and Black Forest FPD can reach portions of the TLMFPD service area in four minutes travel which improves TLMFPD response performance, especially for the first unit on scene. Note that staffing levels and the resources available varies at the mutual aid stations displayed in this figure.

The following figure displays FY 2018 incidents over the travel time model to determine if fire stations are distributed to respond in a timely manner based on where incidents are occurring.

Figure 58: TLMFPD Travel Time Model (Includes Aid Stations) and FY 2018 Service Demand



Over 98 percent of FY 2018 service demand occurred within eight minutes travel of a TLMFPD fire station, and all incidents inside the District are within 12 minutes travel of a TLMFPD station. Further examination of the GIS data reveals that approximately 65 percent of incidents occurred within four minutes travel of the three TLMFPD stations. Including the mutual or automatic aid resources in the travel time model increases the percentage of incidents within four minutes of a fire station to slightly over 80 percent, an increase of approximately 300 incidents. Most of the increased coverage occurs in the portions of Monument just north of DWFPD Station 1 (Gleneagle). Note that the travel time models in these figures demonstrate potential travel time capability, assuming all apparatus are in quarters and available to respond. Actual TLMFPD travel time and response performance is discussed in the Response Performance Analysis.

The preceding figures demonstrate that mutual or automatic aid resources can improve coverage within the TLMFPD service area. The next figure displays TLMFPD mutual and automatic aid responses summarized by year between July 2016 and July 2018.

Figure 59: TLMFPD Mutual/Automatic Aid, July 2016–July 2018

Aid Received or Given	FY 2017	FY 2018
Mutual Aid Received	32	11
Automatic Aid Received	109	59
Mutual Aid Given	112	69
Automatic Aid Given	96	115
Other Aid Given	2	2

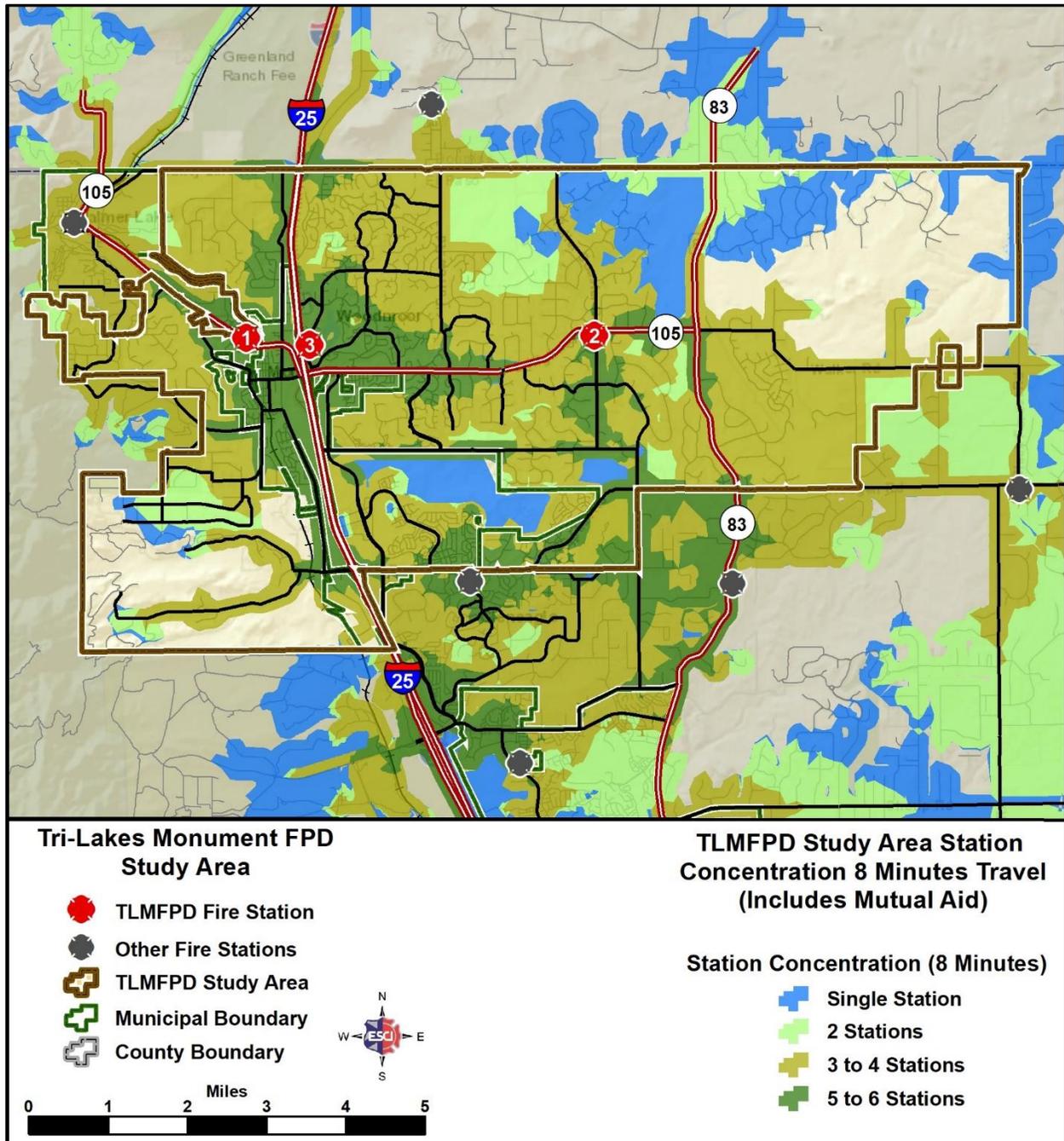
TLMFPD received mutual or automatic aid 141 times and provided aid at 210 incidents in FY 2017. In FY 2018, the District received aid 70 times and provided aid 186 times. Mutual or automatic aid agreements are jointly beneficial to the participating jurisdictions; and are a fiscally responsible method to improve the level of service for the participating agencies. ESCI encourages TLMFPD to actively work with neighboring jurisdictions to pursue mutual or automatic aid agreements. Especially in border areas where the closest available unit to an incident may be from an adjacent jurisdiction.

Resource Concentration Analysis

Accepted firefighting procedures call for the arrival of the entire initial assignment (sufficient apparatus and personnel to effectively deal with an emergency based on its level of risk) within a reasonable amount of time.¹² This is to ensure that enough people and equipment arrive soon enough to safely control a fire or mitigate any emergency before there is substantial damage or injury. TLMFPD relies on resources from neighboring fire departments to assemble multiple apparatus and personnel at the scene of incidents beyond the capabilities of on duty personnel. The following figure illustrates the concentration of TLMFPD and mutual aid resources within eight minutes travel or less throughout the TLMFPD study area.

¹² See: *NFPA 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments* (National Fire Protection Association 2014); and the Commission on Fire Accreditation (CFAI) Standards of Cover, 5th Edition.

Figure 60: TLMFPD Study Area Station Concentration (Includes Aid Stations)—8 Minutes Travel Time



Most of the TLMFPD service area is within eight minutes travel of three to four stations. The Interstate 25 corridor and the area on either side of Highway 105 can be reached by resources from five or six fire stations in eight minutes travel or less. Mutual aid resources (primarily from Donald Wescott FPD) help provide additional apparatus and personnel in the southern portion of TLMFPD and Monument east of Interstate 25. It is difficult to estimate the total number of personnel as staffing may change on any given day.

The following figure displays the concentration of resources available in 12 minutes travel or less in the study area.

Figure 61: TLMFPD Study Area Station Concentration (Includes Aid Stations)–12 Minutes Travel Time

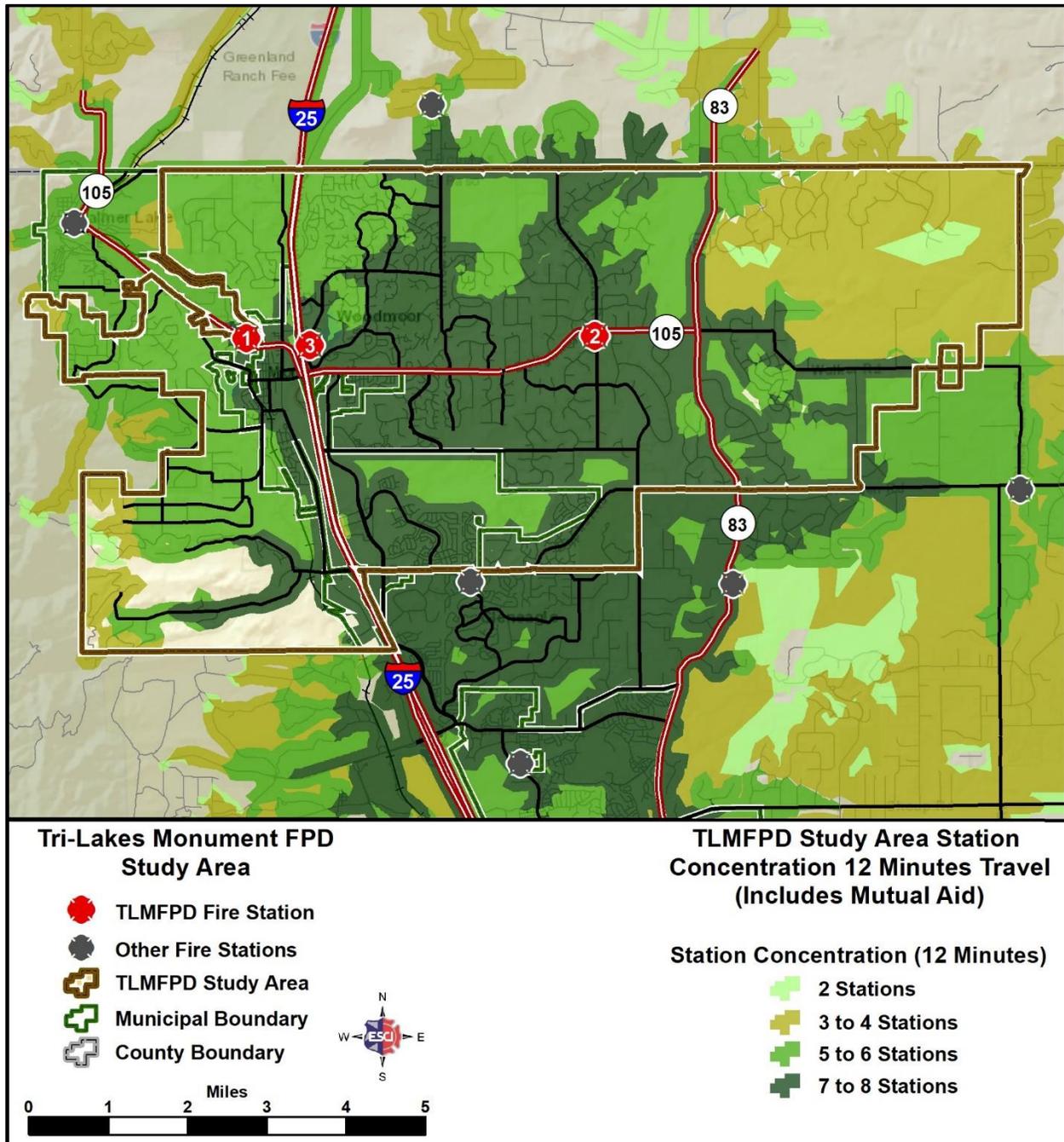


Figure 61 demonstrates that when measured at 12 minutes travel, the majority of the TLMFPD service area is within 12 minutes travel or less of five or six fire stations. A large portion of the service area can be reached by seven to eight stations in the same time frame. There are no portions of the service area that cannot be reached by at least two stations in 12 minutes travel or less.

Response Reliability

The workload of emergency response units can be a factor in response time performance. Concurrent incidents or the amount of time units are committed to an incident can affect a jurisdiction's ability to muster sufficient resources to respond to additional emergencies.

Figure 62 displays the count and percentage of concurrent incidents experienced by TLMFPD between July 2016 and July 2018.

Figure 62: TLMFPD Concurrent Incidents, FY 2017 and FY 2018

Concurrent Incidents	FY 2017		FY 2018	
	Count	Percent	Count	Percent
Single Incident	1,743	69.6%	1,622	64.6%
Two Incidents	711	28.4%	824	32.8%
Three or More Incidents	49	2.0%	66	2.6%

In FY 2017, over 30 percent of service demand occurred while at least one other incident was already in progress; in FY 2018 the number of concurrent incidents increased to over 35 percent (approximately 890 overlapping incidents). The majority of concurrent or overlapping incidents involved two incidents occurring simultaneously. Examination of the incident data reveals that five incidents overlapping for some period of time was the maximum number of concurrent incidents.

It is also useful to evaluate how busy an organization is relative to the total amount of available time. This is known as unit hour utilization (UHU).³³ UHU is calculated by measuring the amount of time individual apparatus are committed to an incident and dividing the result by the total number of hours in a year (8,760). The following figure illustrates TLMFPD unit hour utilization in 2017 and 2018, expressed as a percentage of the total hours in the year. Additionally, the figure displays the average time each apparatus was committed to an incident.

³³ The UHU rate is actual total hours committed to an incident divided by total hours in the year (for a 24-hour unit). For example, Medic 2281 was committed to incidents 1044.5 hours in 2018 ($1,044.5/8,760 = \text{UHU of } 11.92\%$).

Figure 63: TLMFPD Unit Hour Utilization, FY 2017 and FY 2018

Unit	FY 2017			FY 2018		
	Count of Responses	Average Time Committed	UHU	Count of Responses	Average Time Committed	UHU
Batt Chief 2202	735	22:44	3.18%	848	20:24	3.29%
Engine 2211	100	21:23	0.41%	249	18:30	0.88%
Engine 2212	583	27:20	3.03%	606	23:11	2.67%
Engine 2213	1,099	23:52	4.99%	1,318	21:08	5.30%
Tower 2231	781	21:28	3.19%	616	18:43	2.19%
Brush 2241	56	53:05	0.57%	54	1:07:34	0.69%
Brush 2242	26	45:41	0.23%	23	44:38	0.20%
Brush 2243	31	34:40	0.20%	43	19:35	0.16%
Medic 2281	1,274	48:23	11.73%	1,292	48:30	11.92%
Medic 2282	574	50:34	5.52%	730	47:15	6.56%
Total	5,259	33:01	33.04%	5,779	30:38	33.87%

TLMFPD units were actively involved in response activity approximately 33 percent in FY 2017 and nearly 34 percent of the total hours available in FY 2018. Individually, the two transport medic units demonstrate the highest UHU rates. Engine 2213 displays the highest UHU for fire suppression apparatus. On average, TLMFPD units were committed to an incident for just over 33 minutes in 2017, and approximately 33.5 minutes in 2018. Fire service best practices documents such as the Center for Public Safety Excellence (CPSE) *Community Risk Assessment: Standards of Cover, 6th Edition* suggest that UHU rates in the range of 25 to 30 percent for an individual unit can lead to employee burnout issues or affect station and unit reliability. Currently TLMFPD UHU rates do not exceed the levels mentioned. The TLMFPD unit hour utilization rate is comparable to other fire jurisdictions with similar call volume. Note that this analysis only looks at incident activity and does not measure the amount of time dedicated to training, public education events, station duties, or additional duties as assigned.

The following figure examines the number of apparatus committed to an incident in FY 2017 and FY 2018. Incidents cancelled prior to arrival are not included in this analysis.

Figure 64: TLMFPD Resource Drawdown, FY 2017 and FY 2018

Units per Incident	FY 2017		FY 2018	
	Count	Percentage	Count	Percentage
Single Unit	504	22.6%	354	15.4%
2 Units	1,182	53.1%	1,199	52.1%
3 Units	309	13.9%	439	19.1%
4 Units	173	7.8%	230	10.0%
5 or More Units	58	2.6%	78	3.4%

As displayed, the majority of TLMFPD service demand is handled by one or two TLMFPD units. EMS responses, which represent over 66 percent of TLMFPD service demand, are usually handled by the two units. Three or more apparatus commonly respond to fire incidents and a single apparatus handles the majority of other incidents such as false alarms or service calls, depending on the information provided by the dispatch center.

Response Analysis

Perhaps the most publicly visible component of an emergency services delivery system is response performance. Policy makers and citizens want to know how quickly they can expect to receive emergency services.

The National Fire Protection Association (NFPA) has issued a response performance standard for both career and volunteer or combination fire departments. Although not mandated or codified, the NFPA standards are considered industry best practices. The NFPA standards are based on current research and data that is periodically reviewed and updated.

Figure 65: NFPA 1710 Response Performance Criteria¹⁴

Response Element	NFPA Recommendation
Call Processing	60 Seconds @ 90 th Percentile (Also see NFPA 1221 for additional)
Turnout Time	60 Seconds @ 90 th Percentile for EMS 80 Seconds @ 90 th Percentile for Fire
Travel Time (First unit on scene-Fire or EMS)	4 Minutes @ 90 th Percentile
Travel Time (First arriving ALS unit)	8 Minutes @ 90 th Percentile
Travel Time-Full First Alarm (Moderate risk-structure fire)	8 Minutes @ 90 th Percentile

Figure 66: NFPA 1720 Staffing and Response Time Recommendations¹⁵

Demand Zone	Demographics	Minimum Staff to Respond	Response Time (minutes)	Meets Objective (%)
Urban Area	> 1,000 people/mi ²	15	9	90
Suburban Area	500–1,000 people/mi ²	10	10	80
Rural Area	< 500 people/mi ²	6	14	80
Remote Area	Travel distance ≥ 8 mi	4	Directly dependent of travel distance	90
Special risks	Determined by AHJ	Determined by AHJ based on risk	Determined by AHJ	90

* A jurisdiction can have more than one demand zone.

* Minimum staffing includes members responding from AHJ's department and automatic aid.

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

¹⁴NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. National Fire Protection Association, 2016.

¹⁵ NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*. National Fire Protection Association, 2014.

Establishing response performance standards is the responsibility of the Authority Having Jurisdiction (AHJ)—the fire department. Response standards should be developed based on the expectations of elected officials and citizens paired with the financial aspect of what a community is able and willing to afford.

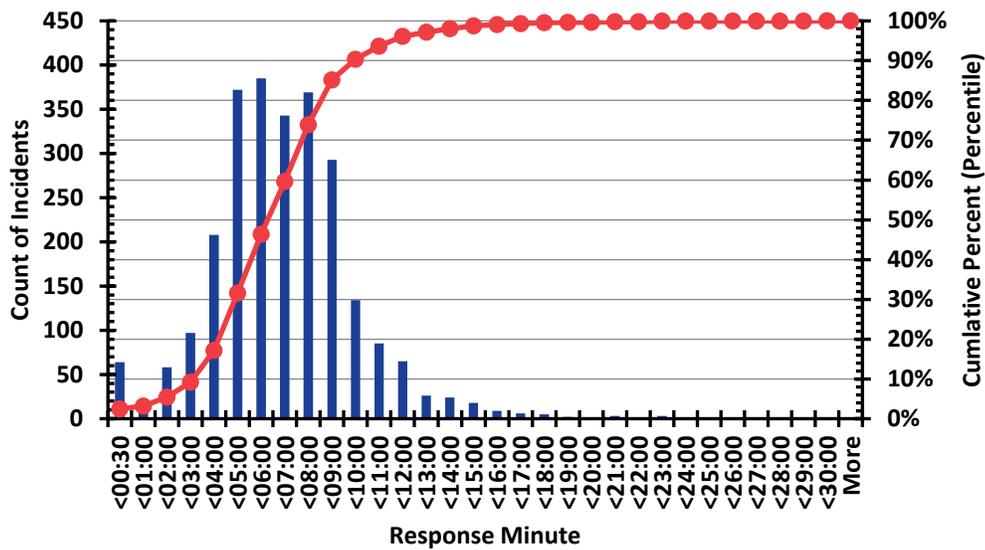
In order for policy makers and citizens to make informed decisions concerning response performance, it is essential that jurisdictions record and report the various components of the jurisdiction's current performance. TLMFPD utilizes Emergency Reporting Systems (ERS) as the department's records management software (RMS); and provided ESCI with incident data and access to extract additional data.

For the Response Performance analysis, ESCI uses incident data extracted from the TLMFPD RMS to provide an overview of response performance from July 2016 to July 2018. Only incidents categorized as an emergency ("Lights and Sirens") response mode in the department's ERS data are included. Non-emergency incidents, incidents cancelled prior to arrival, invalid data points, mutual aid responses outside of the TLMFPD service area, and data outliers are eliminated from the data set whenever discovered. This results in a data set of approximately 2,600 emergency incidents during the 24 months examined. Following the recommendations of the NFPA standards, percentile measurement of response time performance is calculated. The percentile means that if the stated value is nine minutes measured at the 80th percentile, 80 percent of response times are nine minutes or less. ESCI also calculates average response times, since this is a familiar measure, which measures the central tendency of the data set.

The most important reason for not using averages for performance standards is that it may not accurately reflect the performance for the entire data set; and can be easily skewed by bad data. Percentile measurements are normally used for performance objectives and performance measurement since they show that the majority of the data set has achieved a particular level of performance.

The following figure displays the frequency of emergency response times within one-minute increments and the cumulative percentage (percentile measurement) of response times for the first TLMFPD apparatus to arrive at an emergency incident between July 2016 and July 2018. Response time is calculated from the time the fire department is notified by the dispatch center of an emergency to the arrival of the first apparatus to arrive on scene. Note that TLMFPD reports that there appear to be discrepancies between reported notification and the actual time stations are notified of an incident.

Figure 67: TLMFPD Emergency Response Time Frequency, July 2016–July 2018



The most frequently recorded emergency response time for the arrival of the first apparatus occurs between five and six minutes. The average response time for emergency incidents in the TLMFPD service area is 6 minutes, 27 seconds (06:27). The first apparatus arrived at 80 percent of emergency incidents in 8 minutes, 32 seconds (08:32) or less, and 90 percent of emergencies were reached in 9 minutes, 54 seconds (09:54) or less.

The response time frequency data displayed in Figure 67 above is comprised of the following components:

- Turnout Time—The time interval between when units are notified of the incident and when the apparatus are enroute.
- Travel Time—The amount of time the responding unit spends travelling to the incident.
- Response Time—Response Time is calculated from the time the fire department is dispatched to the arrival of the first apparatus; and equals the combination of “Turnout Time,” and “Travel Time.”

Tracking the individual components of response time enables jurisdictions to identify deficiencies and areas for improvement. In addition, knowledge of current performance for the components listed above; is an essential element of developing response goals and standards that are relevant and achievable. Fire service best practice documents recommend that fire jurisdictions monitor and report the components of total response time.¹⁶

¹⁶ NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2014), NFPA 1720: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments (2014), Center for Public Safety Excellence Community Risk Assessment: Standards of Cover, 6th Edition.

The following figure displays TLMFPD overall emergency response performance for the various components of total response time previously listed.

Figure 68: TLMFPD Emergency Response Performance—Components of Response Time, July 2016–July 2018

	Turnout Time	Travel Time	Response Time
Average	01:23	05:04	06:27
80th Percentile	02:00	07:00	08:31
90th Percentile	02:30	08:13	09:54

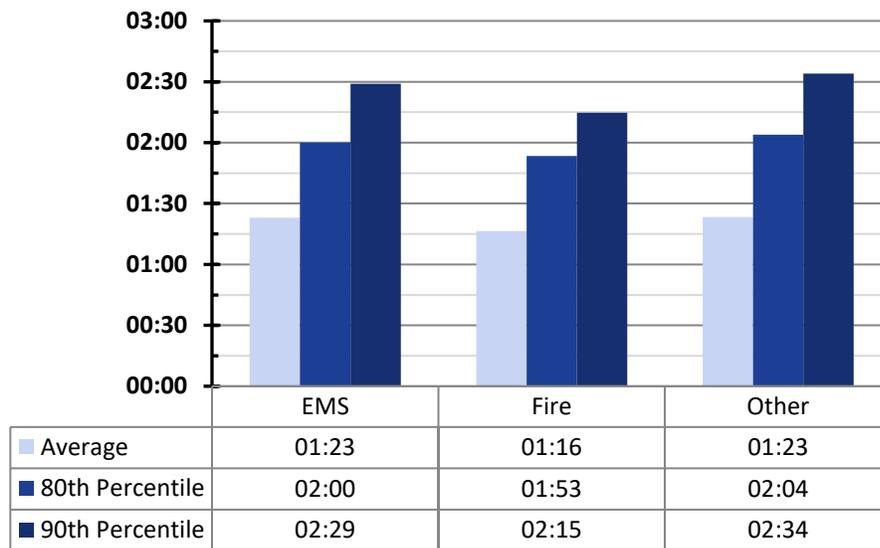
An important component of the total response time continuum is call processing time, which is defined as the time interval between when a dispatcher answers the 911 call to when fire department resources are dispatched. Industry best practices documents such as the CPSE *Community Risk Assessment: Standards of Cover* recommend that fire jurisdictions track this component of total response time. Like many fire jurisdictions, TLMFPD is dispatched by a regional 911 center and has no direct control over dispatch operations. However, ESCI encourages TLMFPD to work cooperatively with the dispatch center to ensure that call processing time is monitored and recorded correctly at the dispatch center for compliance with regional and national standards. Examination of the TLMFPD incident data reveals inadequate data was entered into the RMS in late 2016 and early 2017 (FY 2017) to calculate call processing time. However, this issue appears to have been remedied sometime in 2017 and 2018 (FY 2018). Between July 2017 and July 2018, call processing time averaged approximately 42 seconds (00:42); measured at 90th percentile call processing time was 1 minute, 48 seconds (01:48) in FY 2018.

Turnout Time Performance

The first component of the response continuum and the one that is directly affected by fire department personnel is turnout time. Turnout is the time it takes personnel to receive the dispatch information, move to the appropriate apparatus and proceed to the incident. NFPA 1720 specifies that when stations are staffed, turnout time performance should be less than 80 seconds (01:20) for fire and special operations and 60 seconds (01:00) for EMS emergency incidents, measured at the 90th percentile.

Figure 69 demonstrates that overall TLMFPD emergency turnout time performance averaged 83 seconds (01:23) between July 2016 and July 2018. Measured at the 90th percentile, turnout time was 150 seconds (02:30) for the first apparatus on scene; which does not meet the NFPA 1720 recommended performance. The following figure displays emergency turnout time performance, summarized by incident category.

Figure 69: TLMFPD Emergency Turnout Time Performance by Incident Category, July 2016–July 2018



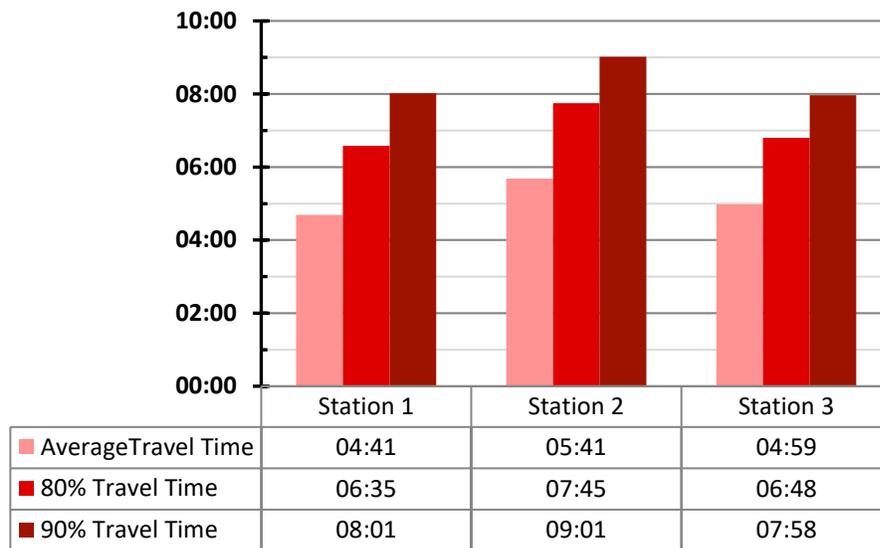
In this figure, ESCI categorizes incidents as *Fires* (structures, vehicle, brush, any 100 series NFIRS code), *EMS* (all calls for medical service, including MVAs and rescues, any 300 series NFIRS code), and *Other* (false alarms, Haz-Mat incidents, service calls, all other NFIRS codes). On average, TLMFPD turnout time ranges from 1 minute, 16 seconds (01:16) for fire incidents, to 1 minute, 23 seconds (01:23) for EMS and other incidents. Measured at the 90th percentile, turnout time ranges from 2 minutes, 15 seconds for fire incidents, to approximately 2 minutes, 34 seconds for EMS, and 2 minutes, 34 seconds for other incidents.

Emergency turnout time performance can be affected by a number of factors. The time of day, the layout of stations, or the type of incident are factors that can affect turnout time performance. Turnout time is an area of total response performance that field personnel have some ability to control, given adequate information and facilities that allow for rapid and efficient movement of personnel. TLMFPD turnout time performance does not meet the recommendations of the NFPA 1720 standards; but turnout time performance compares favorably to similar fire departments. However, there is an opportunity for TLMFPD personnel to improve emergency response time performance by improving turnout time performance. Accurate timestamps in dispatch are critical to measuring this factor. Having mobile data terminals in the apparatus tied in to the Computer Aided Dispatch (CAD) is critical for accurate timestamps.

Travel Time Performance

Travel time is potentially the longest component of total response time. The distance between the fire station and the location of the emergency influences total response time the most. This is especially true for a jurisdiction such as TLMFPD that protects a large diverse service area. The following figure displays TLMFPD emergency travel time performance, summarized by Station Area between July 2016 and July 2018.

Figure 70: TLMFPD Emergency Travel Time Performance by Station Area, July 2016–2018



Referring to Figure 68: TLMFPD Emergency Response Performance—Components of Response Time, July 2016–July 2018, overall TLMFPD travel time performance averaged just over 5 minutes (05:04), was 7 minutes (07:00) measured at the 80th percentile, and 8 minutes, 13 seconds (08:13) at the 90th percentile.

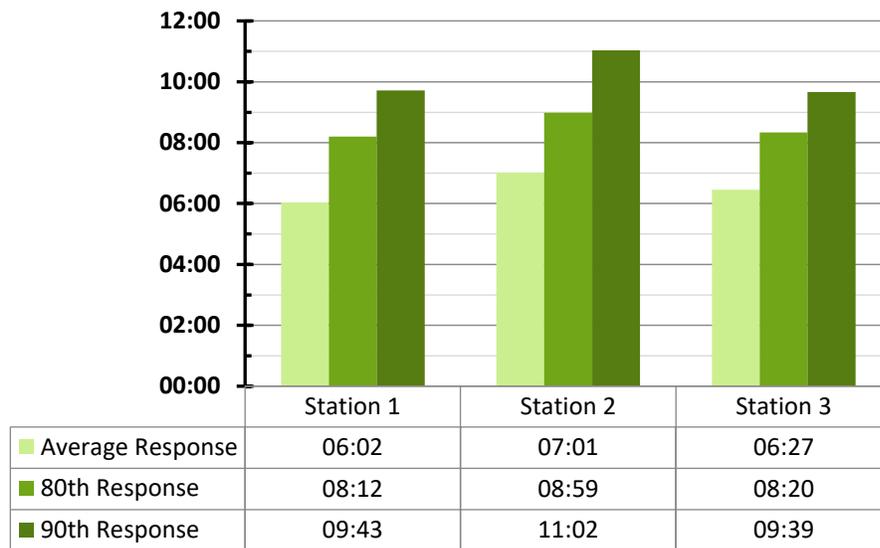
Figure 70 illustrates that TLMFPD travel time performance is affected by where the emergency incident occurs. Station 1 and Station 3 serve more densely populated portions of the service area, where most of the service demand occurs (approximately 78 percent). Station 1 and Station 3 demonstrate very similar travel time performances. Station 2, which primarily serves the larger less densely populated eastern portion of the TLMFPD service area, required approximately one minute longer to travel to the scene of an emergency in the two-year period displayed.

Emergency Response Time Performance (Dispatched to First Unit on Scene)

As displayed in Figure 68: TLMFPD Emergency Response Performance—Components of Response Time, July 2016–July 2018, overall TLMFPD emergency response time performance (dispatched to first unit on scene) averaged 6 minutes, 27 seconds (06:27). Measured at the 80th percentile, the first unit arrived in 8 minutes, 31 seconds (08:31); and 9 minutes, 54 seconds (9:54) measured at the 90th percentile.

The next figure displays TLMFPD emergency response performance summarized by station area. Average, 80th percentile, and 90th percentile total response time values are displayed in this figure.

Figure 71: TLMFPD Emergency Response Time Performance by Station Area, July 2016–July 2018



This figure demonstrates the effect of travel time on overall response time. Station 2, which displays the longest travel times, experienced the longest total response time performance between July 2016 and July 2018. Station 1 and Station 3 which demonstrate the best travel time performance, also demonstrate better total response time performance in this figure.

As discussed in the Distribution Analysis, the TLMFPD service area is comprised of a primarily urban area (Town of Monument and Woodmoor CDP) and a rural area (the rest of the service area). The following figure demonstrates TLMFPD travel time and total response time performance (Turnout Time +Travel Time), summarized by as Urban or Rural.

Figure 72: TLMFPD Travel Time and Response Performance by Population Density, July 2016–July 2018

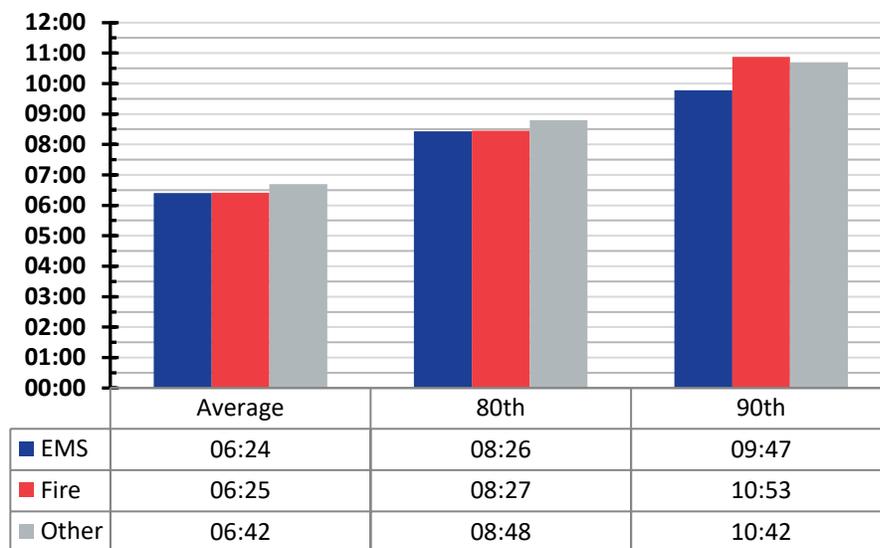
Population Density	Average		80th Percentile		90th Percentile	
	Travel Time	Response Time	Travel Time	Response Time	Travel Time	Response Time
Urban	04:44	06:07	06:36	08:04	07:45	09:20
Rural	06:06	07:28	08:00	09:35	09:59	11:15

Figure 58 in the Distribution Analysis showed that approximately 80 percent of TLMFPD service demand occurred within four minutes travel of a TLMFPD or mutual aid fire station. Practically all (98 percent) of the same service demand occurred within eight minutes travel of the same stations.

Figure 72 demonstrates that the first unit arrived at 80 percent of urban incidents in 6 minutes, 36 seconds (06:36) travel time, and 80 percent of rural incidents in 8 minutes travel or less. The NFPA standard recommended response time for urban areas is 9 minutes, 90 percent of the time, and rural areas 14 minutes, 80 percent of the time. TLMFPD has a shorter rural response time than the standard by 4 minutes, 25 seconds and has a slightly longer response time (20 seconds) in the urban areas. If it is the desire of the District to meet the NFPA 1710 requirement in the urban areas, then travel time would be 4 minutes with a 1-minute call processing time, and either 1 minute or 80 seconds turnout time (depending on type of call). For fire calls this would be a total response time goal of 6 minutes, 20 seconds (6:20), 90 percent of the time.

The following figure displays emergency response performance summarized as Fire, EMS, and Other incident categories.

Figure 73: TLMFPD Emergency Response Time Performance by Incident Category, July 2016–July 2018

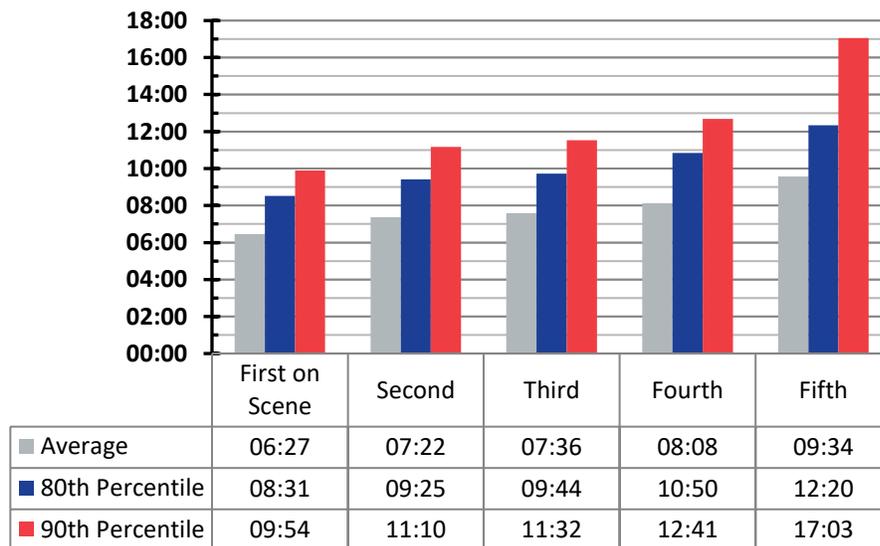


Emergency response performance varies to some degree, depending on the type of incident. Examination of the July 2016 to July 2018 TLMFPD data reveals that while there is some variation in total emergency response performance, the range is relatively narrow. EMS emergency incidents demonstrate the shortest response times measured at the average, 80th percentile, and 90th percentile. On average, response time varies in a range of 18 seconds. At the 80th percentile, the difference is approximately 22 seconds. Measured at the 90th percentile the range is slightly over 60 seconds; with fire incidents demonstrating the long total response time performance (10:53).

Up to this point, the performance analysis has been concerned with response time performance for the first arriving apparatus. The last analysis in the performance analysis examines response performance as it pertains to the assembly of multiple apparatus. As discussed in the concentration study, multiple apparatus and personnel are required to mitigate complex, high-risk incidents. These resources should arrive at the emergency scene with a minimal time difference. The maps in the concentration analysis demonstrate the potential concentration of resources in the study area, based on the travel time model; the next figure displays TLMFPD actual response time performance for the first through the fifth unit to arrive on scene of an emergency requiring multiple resources.

Note that that mutual aid resources are not included in this analysis, since time stamps for mutual or automatic aid resources are not included in the TLMFPD incident data. ESCI recommends that TLMFPD include apparatus response time data for mutual or automatic aid resources responding into the District as part of the TLMFPD RMS.

Figure 74: TLMFPD Response Performance by Arrival Order, July 2016–July 2018



On average, TLMFPD required 9 minutes, 34 seconds to assemble five units at an emergency in this figure. Measured at the 80th percentile, the fifth apparatus arrived in 12 minutes, 20 seconds (12:20); and the fifth unit arrived at 90 percent of incidents requiring five apparatus in slightly over 17 minutes (17:03) or less. As discussed in the Reliability Analysis, most TLMFPD emergency responses are handled by two apparatus, the previous figure reveals that the first unit on scene at an emergency waits approximately one minute for the second unit to arrive. When the first two vehicles are travelling the same distance (from the same station) the difference might be from difference in the recording of times within the communications center.

RECOMMENDATIONS:

- Track, monitor, and report the individual components of response time.
- Work cooperatively with the dispatch center to ensure that call processing time is monitored and recorded.
- Include mutual or automatic aid resources apparatus response times into the response data tracked by the District.
- Set response time goals for urban and rural areas of the District.

PLANNING FOR FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES

Emergency services exist in a rapidly changing environment. Along with improved tools and technologies used to provide service, there is the increased regulation of activities, new risks to protect, and other challenges that can quickly catch the unwary off guard. Only through continuous internal and external environmental awareness and periodic course corrections can an organization stay on the leading edge.

To do a better job with available resources, an organization like TLMFPD must focus on improving services while identifying programs or activities that may no longer serve its changing needs. Through appropriate planning, a fire department can establish a vision for the future, create a framework within which decisions are made, and chart its course to the future. The quality and accuracy of the planning function determines the success of the organization.

To be truly effective, an emergency services agency must consider planning on five distinct levels:

- Tactical Planning
- Operational Planning
- Master Planning
- Strategic Planning
- Emergency Management Planning

Tactical, or pre-incident, planning is the development of strategies for potential emergency incidents. Operational planning is the organization of day-to-day activities—as primarily outlined by a district's standard operating guidelines and procedures—and the integration of the agency into other local, regional, or national response networks. Master planning is preparation for the long-term effectiveness of the agency as the operating environment changes over time. Strategic planning is a process of identifying an organization's mission, vision, and values and prioritizing goals and objectives for things that need to be accomplished in the near future. Finally, emergency management planning is the process of identifying local hazards and risks, gauging the potential incidents that could result in large scale emergencies or disasters, and establishing response plans for addressing them.

Overall, TLMFPD's planning processes have been somewhat limited in the past but are clearly enhanced by the decision to undertake this master planning process. The District performs some fundamental short-term planning in the form of the annual budget development process, which is used to define the activities and priorities identified for the upcoming year. However, establishing a long-term planning perspective for the District is important as well. Without a plan, it is impossible for an organization to know when it is reaching milestones or providing exceptional services to its constituency.

The District has not adopted a formalized planning process, but is involved in county-wide mutual aid planning, and, while a mutual aid plan has been established, there is no regionalized incident command agreement in place. Those efforts, constitute a good start in terms of operational planning and, combined with the commendable undertaking of this master planning project, are moving the District forward positively. Planning initiatives are discussed further in the following sections.

Tactical Planning

A firefighter's typical work area is usually quite foreign to him or her. Normally, a firefighter's first visit to a building is when the building is involved in fire or another emergency. It is critically important that firefighters and command staff have information readily at hand to identify hazards, direct tactical operations, and use built-in fire resistive features. This can only be accomplished by building familiarization tours, developing pre-fire plans, and conducting tactical exercises, either on-site or by tabletop simulation.

TLMFPD has only partially undertaken a pre-incident planning, or pre-plan, program to date. There are no hazard-specific plans or hazardous materials response planning except that which is in place at the county level. District personnel do conduct periodic building familiarization tours, a first step toward a more formalized pre-incident planning initiative.

The District is encouraged to develop and maintain effective pre-incident and special hazard plans, and to incorporate the plans routinely into internal training efforts as well as dispatch communications. Further developing and maintaining the program should be considered a priority for TLMFPD. A defined list of "target hazards" should be developed and aggressive effort taken to ensure response crews have ready access to the plans.

Target hazards are defined by:

- Buildings with large potential occupant loads.
- Buildings with populations who are partially or completely non-ambulatory.
- Buildings of large size (greater than 12,000 square feet).
- Buildings that contain process hazards, such as hazardous materials or equipment.

Pre-incident plans should be easy to use, quick reference tools for company officers and command staff. At a minimum, a pre-incident plan should include information such as:

- Building construction
- Occupant characteristics
- Incorporated fire protection systems
- Capabilities of public or industrial responding personnel
- Water supply
- Exposure factors
- Facility layouts

NFPA 1620 provides excellent information on the development and use of pre-incident plans and should be used as a reference. Once pre-plans are established and/or updated, training should be provided to all personnel who may respond to an incident at those locations. In addition, copies of pre-incident plans and drawings should be available on each response vehicle and incorporated into dispatch procedures.

Operational Planning

Operational planning includes the establishment of minimum staffing policies, standardized response plans or protocols, regional incident command, mutual aid and automatic aid (locally and regionally), resource identification, and disaster planning.

Within an agency, operational plans should be in place that assure that adequate volumes of the appropriate types of resources are deployed to an emergency. Doing so involves:

- Identification of potential risk types;
- Determination of resources needed to mitigate an incident affecting the risk type; and
- A methodology assuring adequate resources are dispatched to an incident via 911 center protocols.

Looking beyond the agency's own resources, operational plans need to address the timely implementation of mutual and automatic aid. To do so, the identified risk exposures and resource needs are incorporated into mutual aid agreements. Further, of significant importance, automatic activation of mutual aid deployment is seamlessly incorporated into the 911 center's Computer Aided Dispatch (CAD) systems.

TLMFPD is an active participant in mutual aid planning in El Paso County and a mutual aid agreement is in place, inclusive of all of the fire agencies throughout the county. However, the system does not include automatic mutual aid procedures that are pre-programmed and fully automated. Automatic mutual aid involves the implementation of pre-programmed dispatching of mutual aid resources, without the need for an incident commander to ask for them individually during a serious incident. TLMFPD is attempting to develop the use of a "run card" system. Under this type of system, the response area is defined by response districts, call types are identified, and procedures established for dispatching pre-defined units based on the geographic location and call type.

A fully automated mutual aid system is essential to effective fire and EMS operations. ESCI recommends that the District continue its efforts to work with the other El Paso County agencies to establish an effective system of run cards and programmed emergency response procedures.

Finally, the existing system is not configured to automatically provide for the dispatch of the closest response unit to an emergency incident. Referred to as a "closest forces" or "dropped boundary" response protocol, the system is based on pre-programmed assignment of units based on geographic location, and without regard to the jurisdiction in which the incident is reported.

The shortcoming of a dropped boundary approach is that the method necessitates that units involved be of similar capability and similar staffing configuration. For example, a station that is staffed by on duty personnel is going to have a faster response time than one from a department that requires volunteers to respond to a station. Regardless of the shortcomings, the implementation of a dropped boundary dispatching approach can be applied, with adjustments where necessary, and is recommended by ESCI.

Master Planning

Master planning, also called Long Range Master Planning, is a process that seeks to answer three questions:

- Where is our organization today?
- Where are we going to need to be in the future? and
- How do we get there?

The Tri-Lakes Monument Protection District has wisely recognized the need for a long-range planning effort by undertaking this master planning process. This plan gives the District a clear idea of where it is today, based on the Evaluation of Current Conditions, along with its future needs and strategies for meeting them, detailed in the Future Service Demand and Future Strategies sections of the report. This Master Plan is designed to provide a view of the organization in a 15-year time frame.

However, a master plan is of no value if it is not put to use upon completion. It is imperative that the District's leadership, and most importantly the elected officials, provide direction with regard to the implementation of the final report findings and ongoing use of this report. To do so, ESCI recommends two important steps.

1. Upon final presentation of this report, the District's elected officials should review the findings and recommendation in detail with the Fire Chief and his staff. In doing so, identify recommendations that are considered to be applicable, and modify others as needed to fit the organization's future needs. Having completed this effort, the Board members are advised to formally adopt the Master Plan, with modifications if needed, by way of formal resolution. Doing so institutionalizes the intended future efforts of the District and provides staff with direction for implementation of the findings.
2. The Master Plan report will result in a lengthy list of work that needs to be completed over an extended time frame. Prioritizing and planning for the implementation of the findings can be a daunting task, one that may be best addressed by the use of a Strategic Plan process, as discussed in the next section.

Strategic Planning

A Strategic Plan involves a three-to-five-year planning window and establishes prioritized goals and objectives for the organization. The planning approach is particularly important when a Master Plan has been completed. The reason is that a Master Plan identifies multiple recommendations and future strategies, which are then evaluated and prioritized via the Strategic Plan.

Establishing a customer-oriented Strategic Plan accomplishes the following:

- Development of a mission statement giving careful attention to the services currently provided and which logically can be provided in the future.
- Development of a vision statement for the future.
- Establish the core values of the members.
- Identification of the strengths, weaknesses, opportunities, and challenges of the agency.
- Determination of the community's service priorities.
- Understanding of the community's expectations of the agency.
- Establishment of realistic goals and objectives for the future, based on the findings and recommendations of the Master Plan report.
- Identifications of implementation tasks for each objective.
- Definition of service outcomes in the form of measurable performance objectives and targets.

The District has not completed a Strategic Plan in the past. A Strategic Plan is an essential tool with which the Fire Chief can manage the agency. It provides not only a defined sense of purpose and direction, but also a structured means by which to chart the course for the agency moving forward.

ESCI adds that, once the current Master Plan is completed, the final report will contain an extensive list of recommendations and advice for changes and new initiatives. The most effective way to prioritize and plan for the implementation of the Master Plan findings is via a strategic planning process. Completion of a Strategic Plan upon completion of this Master Plan is highly recommended. ESCI can assist with the process.

Emergency Management Planning

Emergency management, once a low priority in the mind of the public, has risen to the conscious level of everyday life. Nonexistent before 2001, the DHS (Department of Homeland Security), terrorist threat warnings, the Transportation Safety Administration (TSA) screenings on public transportation, and security checks at sporting events and concerts are now common parts of urban life.

Mindful community governments prepare themselves, other institutions, businesses, and the public to survive disaster by mitigating hazards to eliminate or reduce risk. By developing and maintaining emergency action plans, and by exercising and updating the plans regularly, municipal governments help limit (or manage) the consequences of a disaster. The common term for governmental disaster preparedness is emergency management.

The Superfund Amendment and Reauthorization Act, found in Title III of the Federal Code (SARA Title III), defines requirements for the tracking of hazardous materials used in fixed facilities and establishes requirements for emergency response planning. The District is involved with the Local Emergency Planning Committee (LEPC) in place at the county level. The LEPC is charged with the responsibility to identify and collect information on the use of hazardous materials by private and public entities. Information collected includes the type of material, quantity, and location at each site. Additionally, the LEPC is charged with ensuring local response plans are adequate based on potential risk.

SARA Title III requires industries that use over a threshold limit of certain highly hazardous materials (extremely hazardous substance facilities [EHS]) must develop comprehensive emergency plans for their facility. The act requires that local fire departments coordinate with the involved industry to ensure a quality response to the emergency.

Moving forward, it will be important that TLMFPD remain actively involved in response planning at the county and the state level.

El Paso County has developed an Emergency Management Plan that is inclusive of the entire county. The District does not have a stand-alone emergency management plan, which is not expected, and instead relies on working with El Paso County Office of Emergency management (OEM). TLMFPD works with the OEM, but is not closely involved in participating with the development of emergency plans, or with training and hands on exercises related to the plans. The District is advised to seek to take an active role in emergency management planning efforts at the county and state levels.

Further, TLMFPD is advised to work closely with the LEPC to confirm that all EHS facilities within its service area have been identified, ensure that a local plan has been developed, and that District operations have been coordinated. Additionally, the District should confirm that mandated Tier II reporting forms are received, reviewed, properly filed, and available for training and use during emergency responses.

RECOMMENDATIONS:

- Establish a more structured and formalized planning process.
- Develop and maintain effective pre-incident and special hazard planning practices.
- Continue with the development of a “run card” programmed automatic response system.
- Consider implementation of a dropped boundary dispatching approach, with adjustments, where necessary and applicable.
- Upon completion of this Master Plan, undertake a Strategic Planning process to prioritize and plan for the implementation of the findings and recommendations in this report.
- Actively engage with El Paso County Office of Emergency Management as a participant in the county’s Emergency Operations Planning efforts.
- Engage and remain closely involved in current and future emergency planning initiatives.
- Work with the LEPC to assure that all required planning and reporting needs are addressed.

TRAINING

Training is the foundation of all aspects of emergency services. An individual's ability to effectively utilize resources and equipment is dependent on the level of training an organization has provided. The following section provides an overview of the equipment, facilities, execution, and efficacy of the current training program.

Current State

TLMFPD has seen a lot of progress in their training program over the past ten years. The first is the recent addition of a Training Chief. Based on Chief Bradley's efforts, a systematic training program is under development. It now includes coordinating with neighboring agencies in addition to the documentation and development of training schedules. A second achievement relates EMS education. TLMFPD recently received a certification to provide continuing education (CE) for EMT and Paramedic-level training. The state certification is a collaborative effort between Wescott Fire, Black Forest Fire, Falcon Fire, with TLMFPD functioning as the parent organization. Based on survey information, TLMFPD stated the following total training hours:

- Fire Training—4,016
- EMS Training—595
- Other Training—907

Total Training Hours—5,519

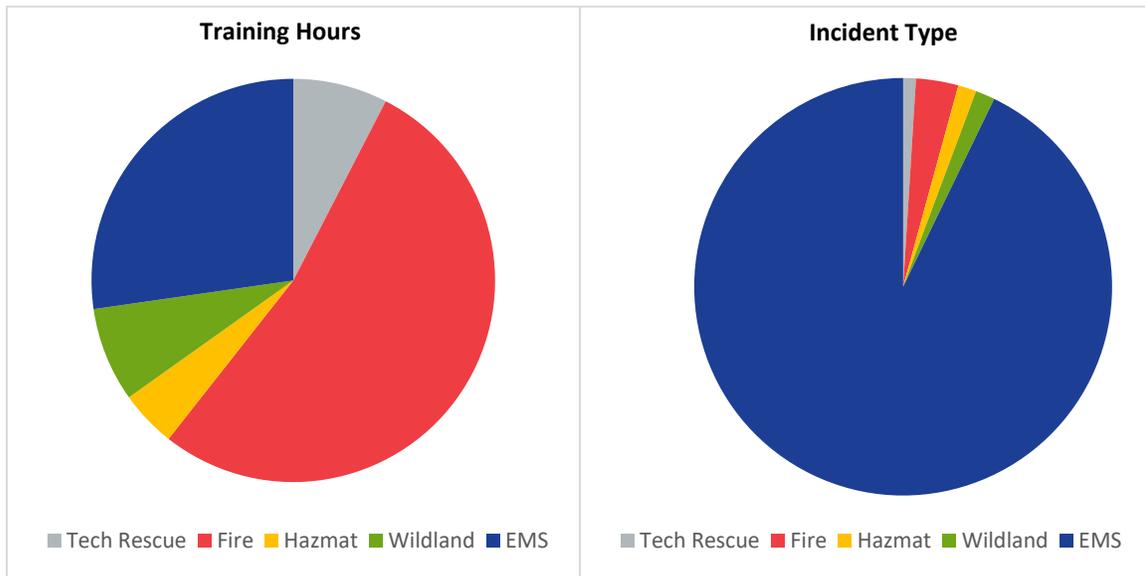
ESCI has broken down the information into the number of classroom/drill ground hours. The information does not include specific certifications that individuals acquired (Blue Card, Fire Instructor I, DOII) but focuses on training that the majority of firefighters received. The following figure shows the number of different training subjects and the hours for each category:

Figure 75: Training Hours

Subjects Presented	Category	Total Class/ Drill Hours (Approximation)
5	Tech Rescue	20 hours
35	Fire	71 hours
3	Hazmat	4 hours
5	Wildland	8.5 hours
18	EMS	41 hours
9	Driver Operator	16 hours

Based on the values in previous figure, and compared to data from incident types provided by TLMFPD, the following figure shows a relationship between training hours and incident types eliminating good intent and service calls for which there is no training required:

Figure 76: Training vs. Incident Comparison



The comparison shown in this figure is consistent with most fire service organizations. Gordon Graham, research consultant, described the necessity to focus on “high risk/low frequency” events.¹⁷ This concept is evident in the amount of training for structure fires compared to the actual low volume. However, it is still imperative to balance training that supports the current needs of the constituents. There will be more discussion on this topic later in this section.

Initial Fire Training

TLMFPD has a cooperative relationship with West Metro Fire Rescue (WMFR) to allow new hires to attend the full academy provided by WMFR. WMFR has an exceptional program and is a fully accredited academy. A challenge associated with sending TLMFPD firefighters to the WMFR Academy is they become highly marketable for Colorado Springs and the Denver Metro area fire departments. During the ESCI review process, there was a consistent concern regarding hiring and retention. Recent funding increases support initial salaries competitive compared to the Denver Metro market. However, Denver Metro fire departments will pay approximately 34 percent higher than the top wage offered by TLMFPD after three years. During this period of associated hiring and recruitment challenges, ESCI recommends focusing on the development of a regional Firefighter I–II training program. Training facilities are limited in the area and will be addressed later in this section. The ability to provide initial fire training internally will meet the requirements for new hire employees without increasing the likelihood they will lateral to one of the metro departments.

¹⁷ Gordon Graham. www.gorddongraham.com

General Training Competencies

All data presented supports that TLMFPD is meeting or exceeding all standards for training hours and covering all required subject matter. ESCI identified two areas for potential improvement. The first relates to the requirement for specific annual training by individual firefighters. Evaluation of 30 firefighters showed a large number of acquired training hours but also showed limited consistency between individuals or shifts. ESCI recommends a defined set of hours/topics that are required by each firefighter per year. Examples of required annual training should include SCBA training, rapid intervention training, mayday drills, and multi-causality incidents (MCI) training. These types of events have high importance or potential legal liability. This requirement should translate to the annual training calendar established by the department. The second relates to MCIs. Within the past year, TLMFPD received training specific to active shooter incidents and two hours of “triage” training in February 2018. Based on this information, ESCI recommends increasing the amount of MCI training, and the development of a regional MCI plan. An annual intra-agency MCI drill should be conducted with emphasis on transportation incidents on I-25.

Training Administration

As previously mentioned, the addition of a Training Chief is a significant improvement for the training program. Due to the demanding training requirements, this individual appears to be task-saturated and consideration should be made to expand training-specific personnel as the system grows. Centura Health recently decreased the number of hours provided to field agencies in order to develop a regional paramedic training program out of Penrose Hospital. This program will become a regional asset but will necessitate the need for additional training instructors specific to EMS. An opportunity exists for regionalization of training instructors in northern El Paso County. Additionally, ESCI identified the need for a systematic approach to how firefighters were selected for outside training opportunities. A policy should be developed that identifies individual eligibility for specific trainings, and prioritizes funding based on response needs within the District.

Training Schedules

A detailed utilization study would help identify opportunities for improved training. A balanced training program similar to the abbreviated schedule found in the EMS section will ensure that fire job performance requirements (JPRs) are covered during a three-year period. The program should be balanced into three areas: statistically based training reflecting current call volume, special team training, and re-certification course requirements. An example relating to the need for a balanced training program, is the Haz-Mat training provided last year by TLMFPD. Based on information in Figure 75, ESCI recommends additional training in Haz-Mat response. Although primary Haz-Mat response for I-25 will be provided by the Colorado State Patrol, initial identification and containment may be essential to protect life and property within the District.

Training Facilities

During site visit interviews and through the documentation provided, it is apparent that current training facilities are inadequate. There is only one designated classroom with limited seating capacity. TLMFPD currently does not have a designated drill ground or buildings for fireground evolutions. Access to live fire training facilities come from the Air Force Academy. Due to existing training requirements, these departments are now having to limit availability to outside agencies. Short and mid-term strategies should include collaborative efforts with the northern fire districts to combine resources to meet the requirements of a Firefighter I training program. Long-term strategies should include the construction of a regional training facility for the five northern fire districts.

Training Record Keeping

Training records are maintained utilizing the *Emergency Reporting*TM database. The system is working well and should be expanded to fully include all of the fire districts within the region. A multi-district documentation system will contribute to and support future fire district mergers.

Overall, TLMFPD is providing quality fire/EMS Training. Emphasis should be placed on the ability to provide autonomous/regional training to the northern El Paso County fire districts. Collaborative efforts with urban departments should be maintained, but TLMFPD's ability to provide comprehensive training will support future growth and service requirements.

RECOMMENDATIONS:

- Develop mandatory annual training requirements supported through the annual training calendar.
- Develop a regional MCI plan that includes an annual drill.
- Develop a regional Firefighter I or II training academy for new hire employees.
- Develop a balanced fire/EMS annual training schedule.
- Expand current training documentation program and include other northern El Paso County fire districts.
- Develop short, mid, and long-term strategies to address inadequate training facilities.

LIFE SAFETY SERVICES

An aggressive risk management program is a fire department's best opportunity to minimize the losses and human trauma associated with fires and other community risks.

The National Fire Protection Association recommends a multifaceted, coordinated risk reduction process at the community level to address local risks. This requires engaging all segments of the community, identifying the highest priority risks, and then developing and implementing strategies designed to mitigate the risks.¹⁸

The community risk assessment as a part of the risk management plan is relatively new. ESCI recommends that fire departments conduct a community risk reduction (CRR) planning process. Short of conducting a CRR plan, the fire department needs to review and understand the importance of fire prevention and public education, appreciating its role in the planning process of a community with diversified zoning including residential, commercial, and industrial properties.

Community Risk Reduction

TLMFPD has not conducted a current community risk assessment. Recently, U.S. fire departments have begun to recognize the value of community risk reduction programs that go beyond fire prevention activities alone. Some have gone so far as to re-name their "fire prevention" bureaus to "Community Risk Reduction Division."

Regardless of the name, fire departments should accurately identify the various potential community risks before developing prevention programs. This is not meant to imply that the existing fire problem should be ignored, but to look at other risks that can be mitigated through effective prevention activities.

Figure 77 illustrates the typical six steps to developing a Community Risk Reduction Plan. It begins by identifying the risks through a comprehensive community risk assessment process.

Figure 77: Steps for Developing CRR Plan



¹⁸ Kirtley, Edward, *Fire Protection Handbook*, 20th Edition, 2008, NFPA, Quincy, MA.

Risk Reduction Strategy

Community risk reduction depends on the five Es of protecting lives and property. They are: education, enforcement, emergency responses, engineering, and economics.

Education about fire is crucial in preventing them. People need to be made aware of all the potential causes of fires so that they know the proper way to avoid them. Also, people need to be educated about what to do in the situation that a fire occurs; for instance, to not put water on a grease fire, or how to exit a burning building in the safest manner. These educational topics should be taught to all people to provide the safest environment.

Enforcement is incredibly important in the event of a fire. The fire safety laws that are in place, such as maximum occupancy laws, keeping hallways and doorways clear, and not parking in fire lanes in front of hydrants, are all important measures to assure that peoples' environments are as safe as possible. In the event of a fire this will allow individuals in the structure to take self-protective actions without impediment and allow the fire department to operate without interference.

Emergency response groups also need to be sure that they respond quickly and effectively to fire or other life-threatening situations. Even with the best of education, enforcement, and engineering incidents will occur. Response personnel need to be competent regarding their jobs and equipped appropriately for the situation.

Engineering also plays a role in preventing fire-related injuries and loss. Buildings need to be constructed by the applicable building and fire codes. These would include items such as having doors open in the proper direction, having, sufficiently wide enough corridors to protected exits. Both built-in fire protection and emergency response techniques should be based on the latest technology. The District is active with the Community Wildfire Protection Planning (CWPP) process. Which encourages community homeowners to make changes that will make survivability of their homes more likely. The procedures to mitigate fire travel from the wildland to the structure is an example of using engineering to reduce risk.

Economics plays a significant part in life and property safety. The loss from fires can be direct or indirect. The direct loss is that which is for medical treatments or property rebuilding. These may or may not be covered by insurance, but large losses will increase the cost for insurance by all insureds. Fires cause business interruption to the business containing the fire but also to neighboring businesses or companies supplying resources to that business. Business interruption can lead to business failure or extended loss of revenue for employee salaries and taxes to the community. A large percentage of businesses with fire loss never reopen. The impacts of fire are significant; it is reported that nearly 50 percent of all small businesses that are forced to close due to fire, never re-open. The economic consequence of a fire is estimated to be 2.5 times the actual damage that the fire causes to a structure and its contents. Loss of life or injury has an extended economic impact for families and for the community. All of these costs are part of the cost benefit analysis that should be considered for the cost of built in fire protection or for fire department resources for the to assure better fire safety.

Fire and Life Safety Program

A comprehensive prevention and life-safety services program enables a fire department to minimize life and property loss and injuries associated with fires and other events by dealing with three of the five Es. These are: education, enforcement, and engineering. The essential components of a fire prevention program are described in the following figure:

Figure 78: Fire Prevention Program Components

Fire Prevention Program Components	Program Elements
Fire Code Enforcement	<ul style="list-style-type: none"> • Proposed construction & plans review • New construction inspections • Existing structure/occupancy inspections • Internal protection systems design review • Storage and handling of hazardous materials
Public Fire & Life-Safety Education	<ul style="list-style-type: none"> • Public education • Specialized education • Juvenile fire setter intervention • Prevention information dissemination
Fire Cause Investigation	<ul style="list-style-type: none"> • Fire cause and origin determination • Fire death investigation • Arson investigation & prosecution

The fire prevention life safety unit of the District is staffed by one person. This is the Battalion Chief of Administration who has other responsibilities as well as this unit.

Code Enforcement

General Inspection Program

The most effective way to combat fires is to prevent them. A strong fire prevention program, based on effective application of relevant codes and ordinances, reduces loss of property, life, and the personal disruption that accompanies a catastrophic fire.

Inspections of existing properties are an essential component of any fire protection system. The primary goal of such inspections is to identify and eliminate potential hazards to life and property. This is most effective when utilizing personnel with a proper combination of training and experience. In addition, property inspections must be completed with adequate frequency.

The Battalion Chief of Administration conducts the duties of a Fire Marshal. He is responsible for all inspections. There are no company inspections or self-inspection programs in place. The frequency is on an as available basis which is often only those businesses that request an inspection.

The recommend frequency for commercial fire safety inspections vary by the type of property and degree of hazard. The National Fire Protection Association recommends a standard for inspections by hazard class, as listed in the following figure:

Figure 79: Recommended Fire Inspection Frequencies

Hazard Classification	Example Facilities	Recommended Inspection Frequency
Low	Apartment common areas, small stores, and offices, medical offices, storage of other than flammable or hazardous materials.	Annual
Moderate	Gas stations, large (>12,000 square feet) stores and offices, restaurants, schools, hospitals, manufacturing (moderate hazardous materials use), industrial (moderate hazardous materials use), auto repair shops, storage of large quantities of combustible or flammable material.	Semi-Annual
High	Nursing homes, large quantity users of hazardous materials, industrial facilities with high process hazards, bulk flammable liquid storage facilities, facilities classified as an "extremely hazardous substance" facility by federal regulations (SARA Title III).	Quarterly

It is not possible for the Battalion Chief of Administration/Fire Marshal to conduct all the needed inspections. It is recommended that the use of the engine companies be considered to conduct the business inspections. This has advantages to improve the ISO rating and to familiarize the fire crews to the internal layout of the businesses.¹⁹ This is important both for safety and effectiveness of crews during a fire. Significant code violations need to be referred to the Fire Marshal for follow up.

New Construction & Plans Review

An essential component to a fire prevention program is new construction plan reviews. When a new building is proposed within a fire department's boundaries, the structure is the protection responsibility of the fire department for the life of that building. If it is not constructed according to the building and fire code, it may become a problem for the firefighters in the future and a risk to the community. Consequently, the fire department has a fundamental interest in ensuring a structure is properly constructed reflecting the latest engineering.

¹⁹ Insurance Services Office, Fire Suppression Rating Schedule 2012, Section 1022.

The District is involved with the new construction process, as well as occupancy and tenant changes. TLMFPD contracts with Colorado Springs Fire Department to do the fire and life safety review on new construction being built in the District. This is probably a cost-effective option for the department. Without the contract, the District would need to have a trained individual to handle the reviews. For the number of reviews conducted at this time, it is not to the District's advantage to hire another person for this function. As the District grows, adding to the staff an individual who has this expertise may be valuable and cost effective. The District has adopted the 2009 International Fire Code. The District is anticipating updating the fire code. El Paso County and the Town of Monument use the 2012 International Building Code. ESCI recommends that the building code and fire code be the same version to eliminate conflicts. Coordinating the District with these agencies for when they plan to change versions can facilitate this.

Fire-Cause Determination & Investigation

The second important aspect of a fire prevention/life safety division is the ability to accurately determine the causes of fires within the community. Effective fire-cause determination can define a community's fire problem. Causes of fires can help determine the need for code modifications and changes; identify areas in which to focus public education efforts; modify response deployment methods; and determine firefighter training needs and skills development.

In cases which fires have been set intentionally, identification and/or prosecution of the responsible offender is critical, in order to prevent further fires. When a fire is accidental, it is important to be able to identify the source of the problem. Knowing and understanding how accidental fires start, is one of the most effective means to identify fire prevention and public education requirements.

TLMFPD conducts the cause and origin investigation. BC Bumgarner conducts the fire investigation for cause and origin when he is on the scene. He is not dispatched normally on all structure fires but can be notified by an officer to respond. BC Bumgarner is certified as a Fire Investigation Technician by the International Association of Arson Investigators (IAAI). Fires that are suspicious in nature are turned over to law enforcement for investigation and prosecution. Evidence collection is handled by law enforcement who are able to maintain custody and security on the materials. This procedure is appropriate for an agency of this size.

Appropriate releases are utilized for entry beyond the emergency response. Reports are generated for all incidents. Juvenile fire setters are referred to Colorado Springs Fire Department for assessment. There is a regional fire investigation group but not active at this time. Security on these records is currently limited in nature. This may be an area to review for improvement.

Fire Prevention & Life-Safety Programs

Providing fire safety education to the public to minimize the occurrence of fire and train the community in appropriate actions to take when faced with an emergency is a particularly important fire protection strategy. Fire safety education provides the best chance for minimizing the effects of hostile fire.

Fire and Life Safety Education is conducted by TLMFPD to a degree. Programs are offered in schools. The District provides personnel at community events. This is limited for the same reason as other prevention programs—by available staffing. As the District grows, this may need to be assigned to a Fire Marshal separate from the Administrative Battalion Chief. Individual firefighters may be qualified and interested in working overtime to give presentations in the interim.

RECOMMENDATIONS:

- Evaluate the use of engine and medic personnel to conduct the business inspections.
- Consider the addition of a staff member who has expertise in plans review as the District grows.

EMERGENCY MEDICAL SERVICES

The Emergency Medical Services component provides a summary of the agency's services relating to pre-hospital medical care. ESCI used focused interviews with internal and external stakeholders combined with the EMS survey to develop a comprehensive perspective of current and future EMS needs throughout the Tri-Lakes Monument Fire Protection District (TLMFPD).

The purpose of this section is to evaluate the current level of pre-hospital care and future needs based on projected call volume and available resources. ESCI will identify challenges relating to the EMS program and make recommendations with projected outcomes.

The fire service has been providing EMS for over 40 years. In fact, 90 percent of the 31,000 departments in the United States provide some form of pre-hospital medical care.²⁰ Since 1980, residential and commercial structure fires nationwide have dropped 52 percent. In contrast, EMS responses have continued to climb nationally.²¹ Based on data from the Service Delivery section of this report, TLMFPD has seen a slight increase in fire calls, but EMS accounts for 66 percent of the total call volume. Structure fire response accounts for only 3 percent of total call volume. This data supports the need for TLMFPD to prioritize EMS when developing a Master Plan. Prioritization should include increased staffing, capital equipment expenditures, and administrative oversight.

Current State

TLMFPD currently provides fire-based EMS, utilizing a combination of Paramedics and FF/Paramedics. Based on the information provided, 66 percent of the system call volume is EMS-related. The department staffs two ambulances. One with dual paramedics and the second with a FF/Paramedic and FF/EMT. The northern El Paso County fire districts are dispatched through the County Dispatch Center. The system has significant limitations including the inability for station alerting or automatic dispatching of closest unit. These limitations hinder response times and minimize auto-aid responses. The primary support system for TLMFPD is Donald Wescott Fire Protection District (DWFPD). DWFPD has a contractual agreement with American Medical Response (AMR) to provide an ALS-equipped ambulance and Paramedic in DWFPD Station 2. DWFPD provides one FF/EMT to complete staffing on the unit. Two issues have been identified. The first is the prolonged transport and out of service (OOS) time when either department transports patients. The second is the potential for American Medical Response (AMR) to no longer provide ambulance service in El Paso County. Current contractual agreements expire in December. Both issues have a direct correlation to TLMFPD's ability to manage increased call volume, and multiple calls occurring at the same time.

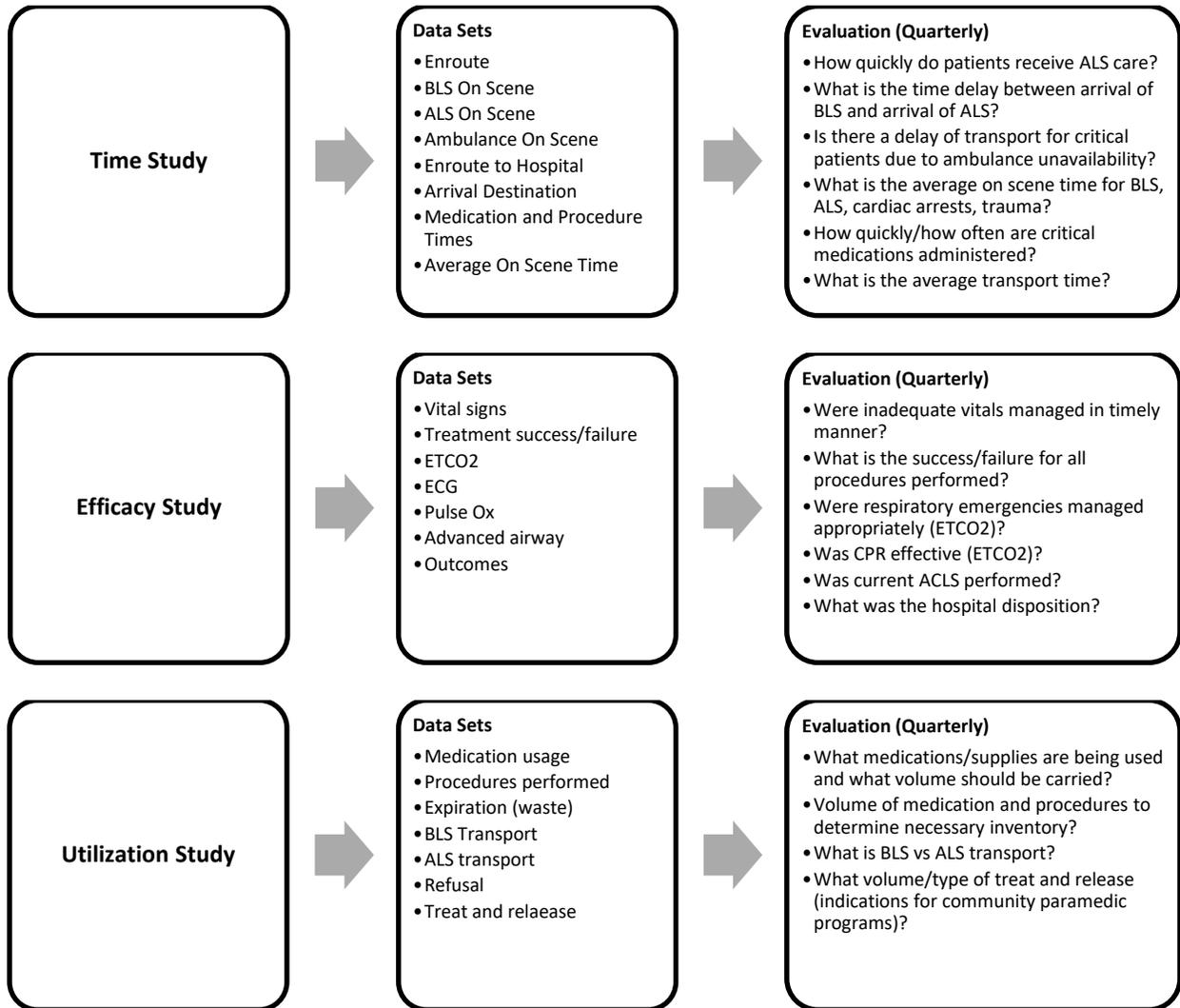
²⁰ Compton, D. (2006). Fire Department-Based EMS: A Proud Tradition.

²¹ Haynes, H. J. (2017, September). National Fire Protection Agency. Retrieved from NFPA.org.

Quality Management

During ESCI's external stakeholder interviews, it was apparent that constituent satisfaction was very high. Quality Management (QM) programs are essential to maintain or improve the level of care provided by pre-hospital providers. TLMFPD described the use of an informal peer review system where the EMS/Paramedics review the trip reports from an opposite shift. While this system has benefits, ESCI recommends a thorough internal retrospective data review and corresponding quality improvement (QI) program. This program should be managed by one individual for the purposes of consistency and expanded as the organization grows. The program should be broken down into three sections. The first is a time study looking at areas to improve initial response. Second, is an efficacy study evaluating the patient care provided as it relates to national standards and best practices. The third area of evaluation is a utilization study. This study looks at opportunities for improved efficiency, inventory control, and corresponding fiscal responsibility. TLMFPD currently uses EMSCharts for patient care reporting (PCR). This system will export data to an Excel format, and the data can be easily interrogated to provide various evaluations. Figure 8o shows a minimal data set and potential evaluation criteria that would be beneficial in making objective decisions:

Figure 80: Data Set and Quality Management Criteria



EMS Training

Benjamin Franklin once said, “An investment in knowledge pays the best interest.”²² TLMFPD recently demonstrated a commitment to education by applying for and receiving Colorado certification for EMR CE Group, EMT CE Group, and Paramedic CE Group. This was a collaborative effort between Wescott Fire, Black Forest Fire, Falcon Fire, and TLMFPD (parent organization). ESCI recognizes that the EMS training program is in development and recommends additional focus in several areas. First, staffing assignments for education are unclear. Consider, as previously discussed in the Staffing Section, assigning duties to the FF/Paramedics with Supervision by the Training Chief. Additionally, TLMFPD should consider a balanced EMS education program. One portion of the program should reflect the statistical data described in previous figure. Look for areas of improvement or opportunities (focused CE) for additional levels of patient care. The second portion should be to fulfill the continuing education requirements for EMS certifications. A training calendar should be established that assigns specific monthly training to a specific purpose. Following is an abbreviated example of a balanced EMS CE training program:

Figure 81: Example of Balanced EMS Training Schedule

January	February	March	April	May	June
Recert (OB/Peds)	Recert (Cardiac)	Recert (Trauma)	Focused CE	Recert (Medical)	Multi-agency MCI
July	August	September	October	November	December
Recert (Environmental)	Focused CE	Recert (BLS, ACLS, PALS as needed)	Recert (Respiratory)	Recert (Behavioral)	Focused CE

A balanced training schedule reflects the actual responses by TLMFPD, provides a structure for recertification, and assists staff with a yearly view to manage vacation or other leave.

Logistical Support

TLMFPD is currently managing EMS supplies at Station 1. Purchasing and inventory control is assigned to one of the EMS/Paramedics. Based on a brief inspection during the ESCI site visit, it appears that disposable supplies are well managed. As the system grows in volume or potential mergers, the current system may become inefficient. TLMFPD should consider several changes to the logistics process. First, a utilization study would help identify opportunities for improved inventory control. The study should include current consumption of disposable supplies, waste due to expiration, supply cost to patient ratio, and required inventory reserves. A second opportunity for improvement would be the utilization of a partial automated inventory control system. Routine inventories are challenging and often inaccurate in the absence of automated systems. There are various systems available that have proven to be cost effective in the long run, especially in reducing expiration waste and lost supplies. Examples of these systems include Bar Code Scanning, QR Readers, and Radio Frequency ID (RFID).

²² Anderson, P. (2007). *Great Quotes From Great Leaders*. Naperville: Simple Truth.

Medical Control and Oversight

Emergency medical services rarely constitutes definitive care. The continuum of care starting in the pre-hospital setting and ending in the appropriate medical facility, is critical to positive patient outcomes. During the survey process, TLMFPD identified challenges associated with recent construction of large assisted living facilities. One possible solution is the development of a community paramedic program. This type of program requires a close working relationship with the Medical Director. Survey documents describe a limited relationship and participation with the physician advisor. ESCI recommends establishing a program where the physician advisor participates in routine medical activities and helps plan the future of TLMFPD EMS. This relationship is essential in maintaining quality and limits District liability issues.

System Integrity and Required Credentialing

TLMFPD currently uses Emergency Reporting for documentation and tracking required training. Based on the documentation provided, TLMFPD meets or exceeds credentialing requirements for fire and EMS. As previously mentioned, as the system grows, additional resources will need to be allocated to credentialing management. A trigger point would be District mergers or pursuing accreditation.

Overall, TLMFPD is providing quality EMS care to the constituents they serve. The recommendations provided can help improve system stability, support future staffing needs, and provide metrics for quality assurance.

RECOMMENDATIONS:

- Develop an internal system to collect necessary EMS data.
- Develop internal retrospective EMS review and QA program.
- Develop a balanced EMS education program (recertification CE, statistically based CE, certifications required).
- Implement automated inventory control program.
- Enhance TLMFPD/Medical Director relationship.

HAZARDOUS MATERIALS

Hazardous materials (Haz-Mat) response is a particularly challenging aspect of the fire service. The complexity of events ranging from routine fuel spills to terrorism, can exceed any first response agency's capabilities. It is essential that all fire service entities have defined policies, procedures, and standard operating guidelines (SOGs) for response to a hazardous materials incident. The majority of standards or requirements can be referenced through the Occupational Safety and Health Administration (OSHA) 1910.120, or National Fire Protection Association (NFPA) 471, 472, 473.

Current State

TLMFPD has limited capabilities for hazardous materials response. All line firefighters are required to hold a Hazmat Operations Level certificate. Personal protection equipment (PPE) is limited to bunker gear and SCBA. The department does not currently have any PPE for splash or vapor events. Detection is limited to four gas detectors (O₂, LEL, CO, Cyanide). In the event there is a hazardous material release on I-25, the Colorado State Patrol will be the Designated Emergency Response Authority (DERA). TLMFPD will serve in a support capacity. For events occurring outside of the Colorado State Patrol's authority, TLMFPD relies first on the El Paso County Hazardous Materials unit and then the Colorado Springs Fire Department to provide hazardous materials response.

Service Opportunities

Considering the elevated terrorism threat throughout the country, high volumes of hazardous materials transported on I-25, a railroad line through the District, and the delayed response from outside agencies, ESCI recommends the development of a higher level of hazardous materials response. An increased response capability should be a cooperative effort with the Colorado State Patrol, the El Paso County Hazardous Materials Unit, and Colorado Springs Fire. The program should be expanded during two phases based on available funding.

The first phase has minimal financial impact and would focus on hazardous materials events specific to liquid releases. Based on information provided by TLMFPD the highest frequency of liquid releases was fuel spills. TLMFPD should consider the following:

- Purchase of Level B chemical splash protection suits.
 - All firefighters hold an Operations certification for use of this level of protection and SCBA. A chemical suit can be worn over bunker gear limiting the expense of ruining turnout gear exposed to fuel. For chemical spills, Level B protection can support defensive operations until a full hazardous materials team arrives.
- TLMFPD should increase the amount and type of absorbent supplies to provide additional environmental defensive operations.
 - Preventing chemical and petroleum spills from getting into the water way is essential. Delayed response could result in significant environmental impact.

The second phase would focus on the ability to perform rescue during an event involving a toxic vapor. TLMFPD has three hazardous materials technicians capable of making a Level A PPE entry. These types of events are rare but would provide full capability to perform offensive/defensive operations and required rescue.

- Purchase of four Level A vapor tight hazardous materials suits.
 - These suits are expensive (\$4,000–\$6,000), but would support operations with outside hazardous materials teams and emergency rescue.
- Budget and send additional personnel to a hazardous materials technician course (80 hours).
 - As the system grows, hazardous materials incidents will become more common and complex. The department’s ability to provide initial stabilization of a hazardous materials scene can improve life safety and property conservation.

RECOMMENDATIONS:

- Purchase Level B chemical splash protection suits.
- TLMFPD should increase the amount and type of absorbent supplies to provide additional environmental defensive operations.
- Purchase of four Level A vapor tight hazardous materials suits.
- Budget and send additional personnel to a hazardous materials technician course (80 hours).

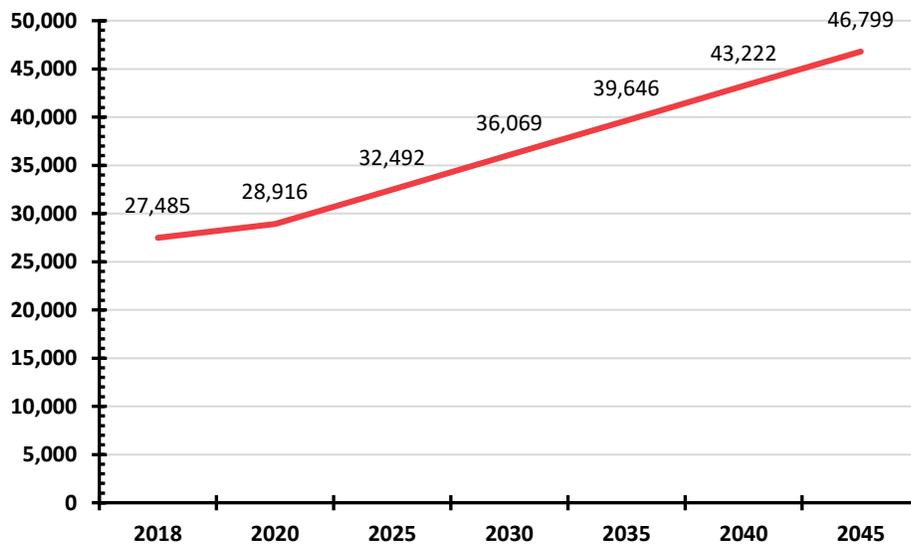
FUTURE SERVICE DEMAND

TLMFPD is located in El Paso County, Colorado. In 2017, the County had an estimated population of 701,283 people. The population of the District is estimated to be 30,000, and the 2018 GIS analysis estimate for the District population based on census data is 27,458. The District has main population centers of the Town of Monument and the Woodmoor community.

ESCI was assisted in predicting the area grown by information from El Paso County Planning, Northern El Paso Community Organization (NEPCO), and Pikes Peak Area Council of Governments (PPACG).

Population Growth Projections

Figure 82: TLMFPD Growth Projections²³



²³ Population Projection for 2045 was from the Pikes Peak Area Council of Governments.

Service Demand Projections

The service demand for the last three years is shown in the following figure along with average for the two years for each type of incident type.

Figure 83: Historical Service Demand

NFIRS Incident Type	FY 2017	FY 2018	Average	Calls/1,000 Pop
1 – Fire	66	82	74	2.7
2 – Rupture, Explosion, Overheat (No Fire)	1	3	2	0.1
3 – EMS	1,618	1,707	1,663	60.5
4 – Hazardous Condition (No Fire)	70	59	65	2.3
5 – Service Call	140	130	135	4.9
6 – Good Intent Call	412	341	377	13.7
7 – False Alarm	188	195	192	7.0
8 – Severe Weather, Natural Disaster	4	1	3	0.1
9 – Special Incident-Other	8	3	6	0.2
Total	2,507	2,521	2,514	91.4

The average total service demand over the two years is 2,514 calls per year. The two-year average and the current population of 27,458 will result in a rate of 91.4 total calls per 1,000 population and 60.5 EMS calls per 1,000 population.

The following figure defines the expected total and EMS number of calls for service in 2028 and 2038. It uses the projected growth discussed previously. EMS service is shown as it is the greatest type of demand for service.

Figure 84: Projected Service Demand

Projected Growth	Population		10-year Service Demand	20-year Service Demand
	2028	2038		
Total Service Demand	34,608	41,758	3,164	3,817
EMS Service Demand			2,092	2,524

Figure 84 gives some idea of the service demand ten and twenty years into the future. The ten-year forecast (2028) would be for a total service demand of 3,164 calls. The twenty-year forecast (2038) would predict 3,817.

Impact of Aging Population on Service Demand

The preceding discussion predicts EMS future service demand based on population forecasts with the demand equivalent to the average of 2017 and 2018. However, the increasing elderly population will likely increase the demand for emergency medical services as the elderly population is a disproportionately greater user of these services. National medical industry studies suggest that the patients over 65 years of age are three times more likely to access local emergency services than other age groups. The current county demographics of the population over 45 years of age is distributed as shown in the following figure. Assuming that there will not be any reason for the population to move out of the county when they reach a certain age, then it is very likely that the existing population will continue to age in place. Further, assuming that the county demographics are uniformly distributed, the percentage change of aging individuals within the District will reflect the county as a whole.

Figure 85: El Paso County Demographics for Ages Between 45 to 84 in 2018²⁴

2018			
Age	Males	Females	Total
45 to 54 years	40,147	43,791	83,938
55 to 64 years	40,088	44,809	84,897
65 and 74 years	25,299	29,558	54,857
75 to 84 years	10,900	14,921	25,822
Total of 65-84			80,679

Based on the current population, the 10 and 20-year age demographic forecasts are displayed in the next figure.

Figure 86: El Paso County Aging Population

Age	2018	2028	2038
65-74	54,857	71,076	66,668
75-84	25,822	41,944	54,895
Total	80,679	113,020	121,563
Percent Change		40.1%	7.6%

It is reasonable to assume that demand for emergency medical services in this age group will increase proportional to the increase in size of the demographic. This means that in next ten years, the county and the District will increase by 40 percent and in the following ten years to increase again by nearly another 8 percent. Since the service demand data for EMS calls is not stratified as to age, it is difficult to predict the exact impact on the number of calls. It is also impossible to know if whether as persons age they will remain in the county or move to other areas, or whether, conversely, it may be that the individuals moving into the District may be disproportionately in the over-65 demographic. Nevertheless, it does suggest that the demand for EMS services will increase to a higher degree than other types of calls for service. Action to increase the capacity for EMS services will be most critical in the short term.

²⁴ Colorado State Demography Office, Department of Local Affairs.

Projected Development

Based on the information ESCI received as to current or future development, the following map was created.

Figure 87: Growth Development

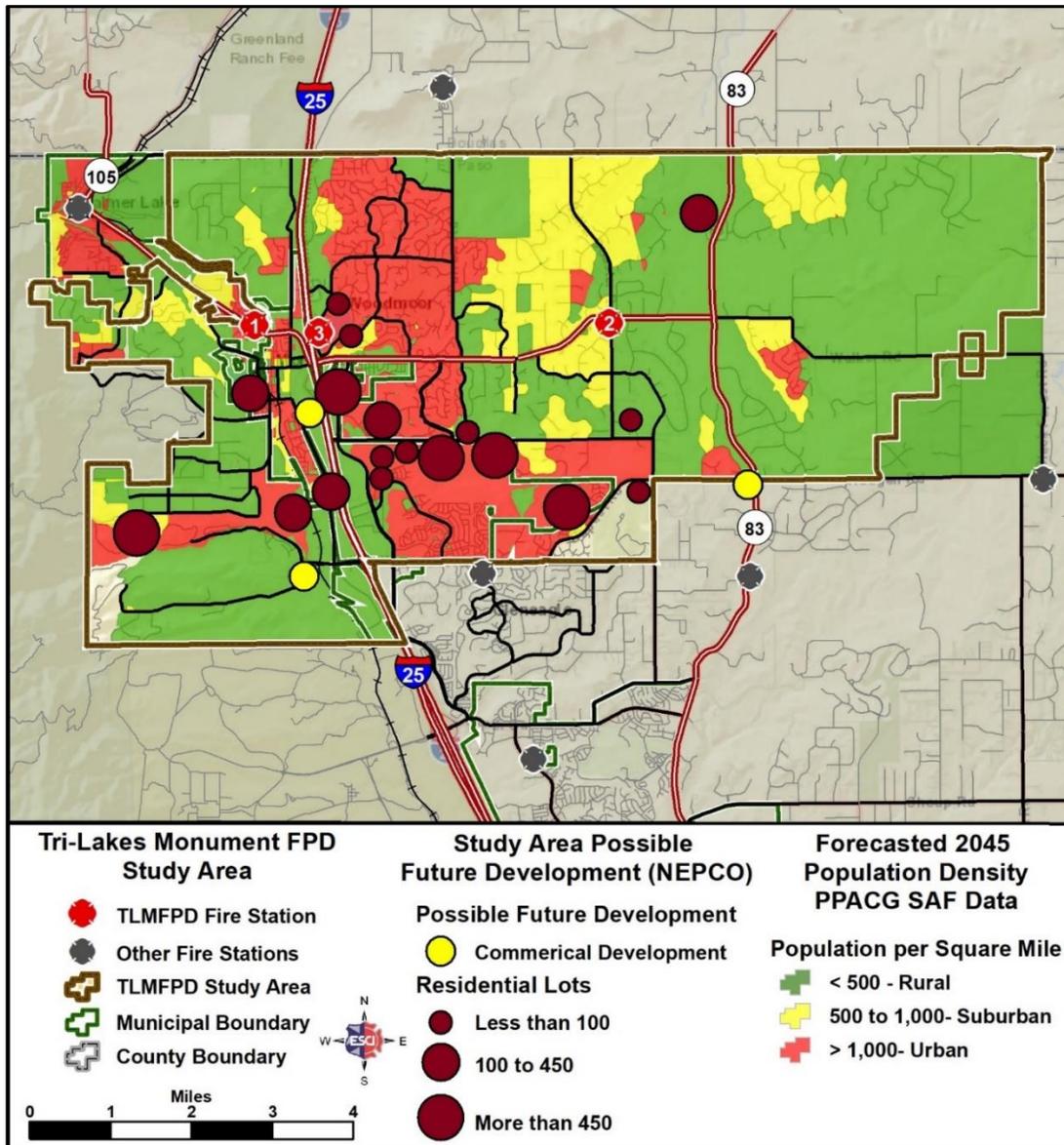


Figure 87 indicates the areas of growth and the number of residential lots added to the District. Based on the fact that each household in this area have on average 3.2 persons. The amount of population growth will be significant in some areas. Based on the NEPCO list of proposed and current projects; and the PPACG 2045 population model, the currently undeveloped portions of Monument east of Jackson Creek Parkway experience the greatest amount of growth over the next 25 years. Additional commercial development is expected in Monument on both sides of Interstate 25, north of Baptist Road. This information establishes the increased need for a station in the southern end of the District. This is discussed further in the Future Strategies section of the report.

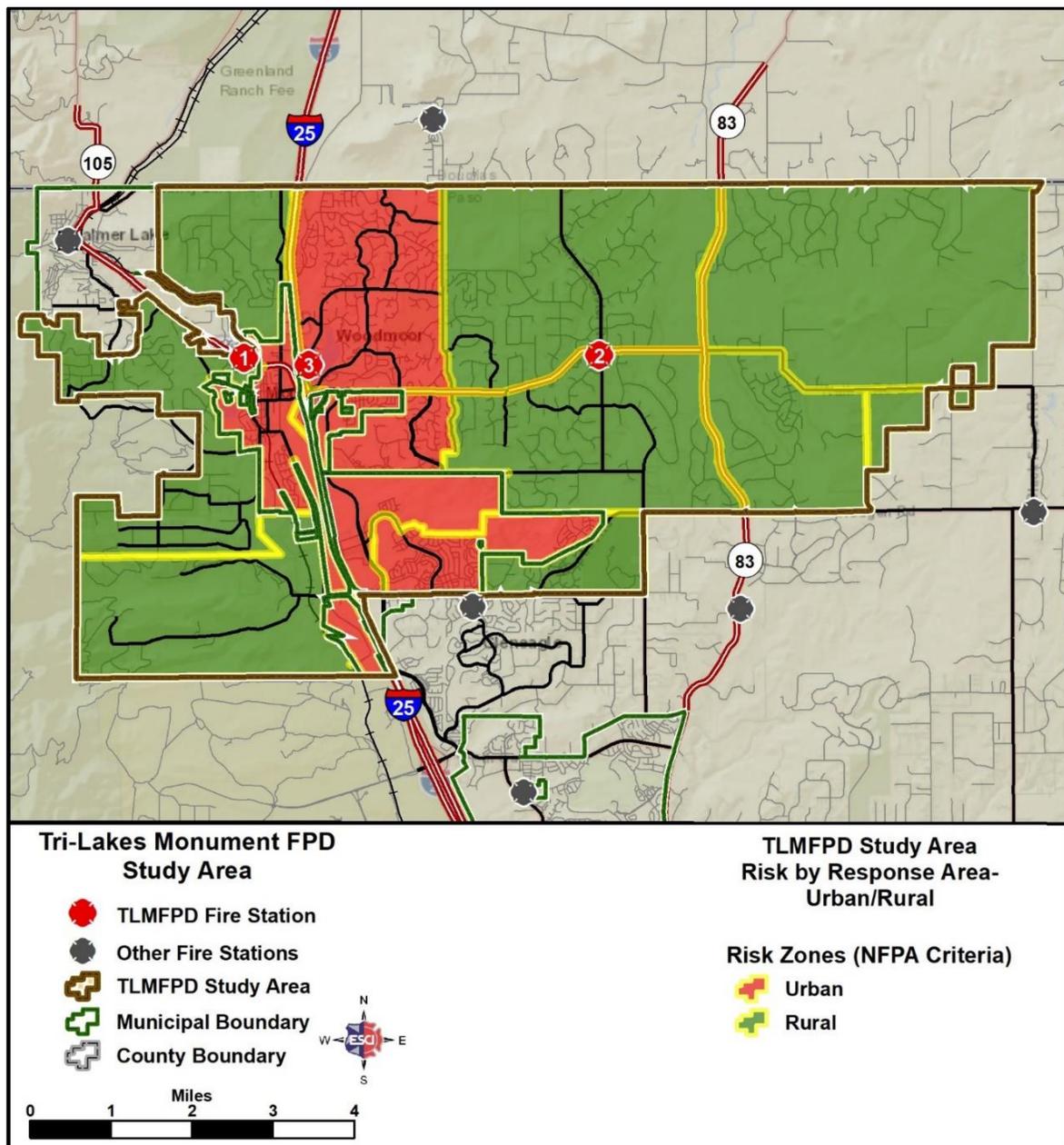
COMMUNITY RISK ANALYSIS

Population Density Risk

Community risk is typically assessed based on a number of factors; the population in the service area and where that population resides, current and future local land use, and the geography and natural risks present within the service area. These factors affect the number and type of resources (both personnel and apparatus) necessary to mitigate an emergency.

As discussed in the Distribution Analysis, the TLMFPD service area is comprised of various population densities. Based on NFPA population density definitions the Town of Monument and the Woodmoor CDP are classified as urban areas (population density or 1,000 per square mile) and the rest of the service area is classified as a rural area (population density less than 500 per square mile). The following figure displays the TLMFPD response area summarized as Urban or Rural.

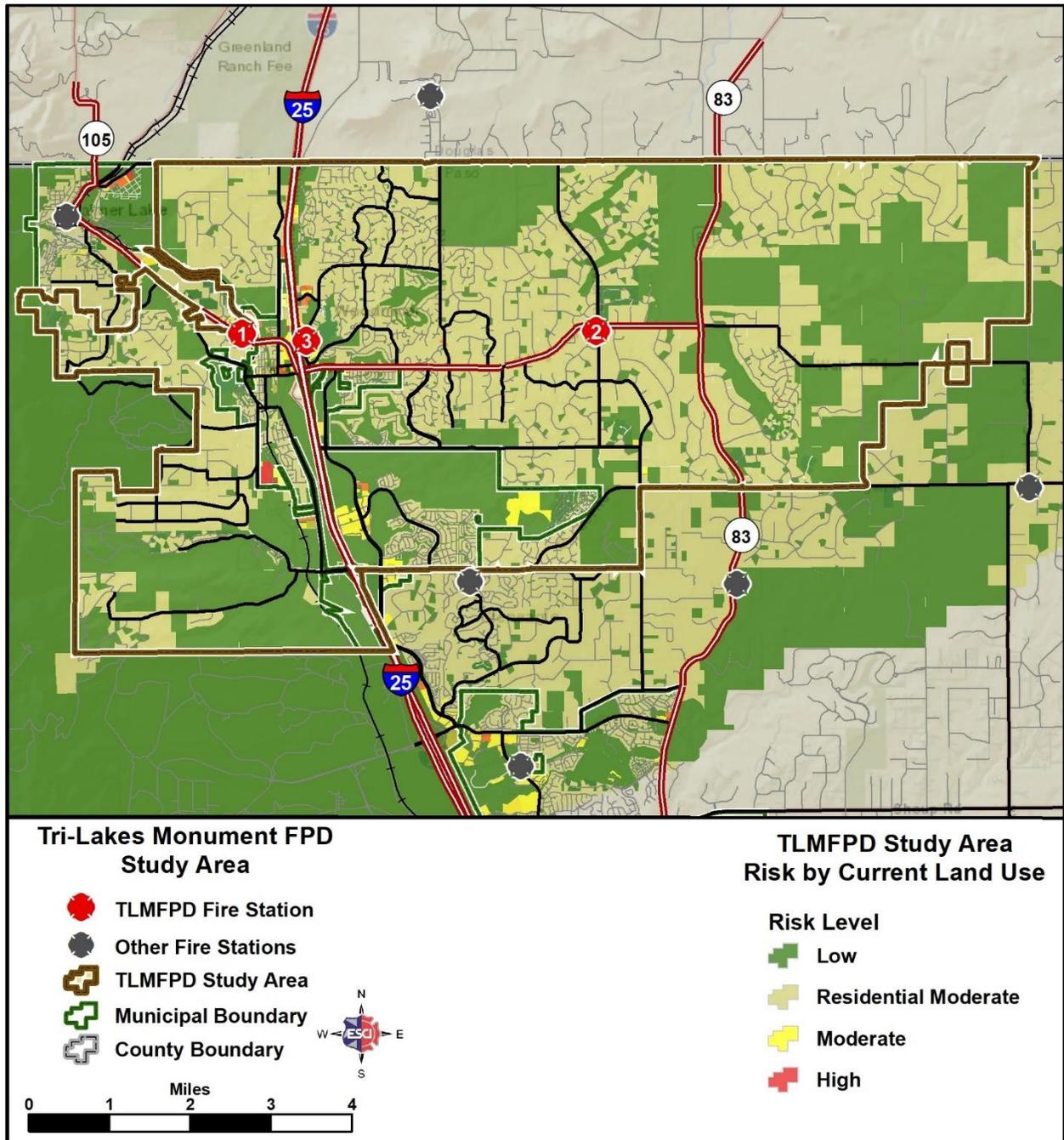
Figure 88: TLMFPD Urban and Rural Risk Zones



Population density varies throughout the TLMFPD service area. However, the overall population density inside Monument and the Woodmoor area exceeds 1,000 per square mile, which meets the NFPA definition of an urban area. Population density in the remainder of the service area is less than 500 per square mile and for the purpose of establishing demand or risk zones would be considered rural. As the population in the service area increases in the future, TLMFPD may need to re-evaluate demographic and census data and adjust response goals to adequately mitigate future service demand.

The next figure utilizes El Paso County parcel data (12/2018) to display current land use in the TLMFPD service area.

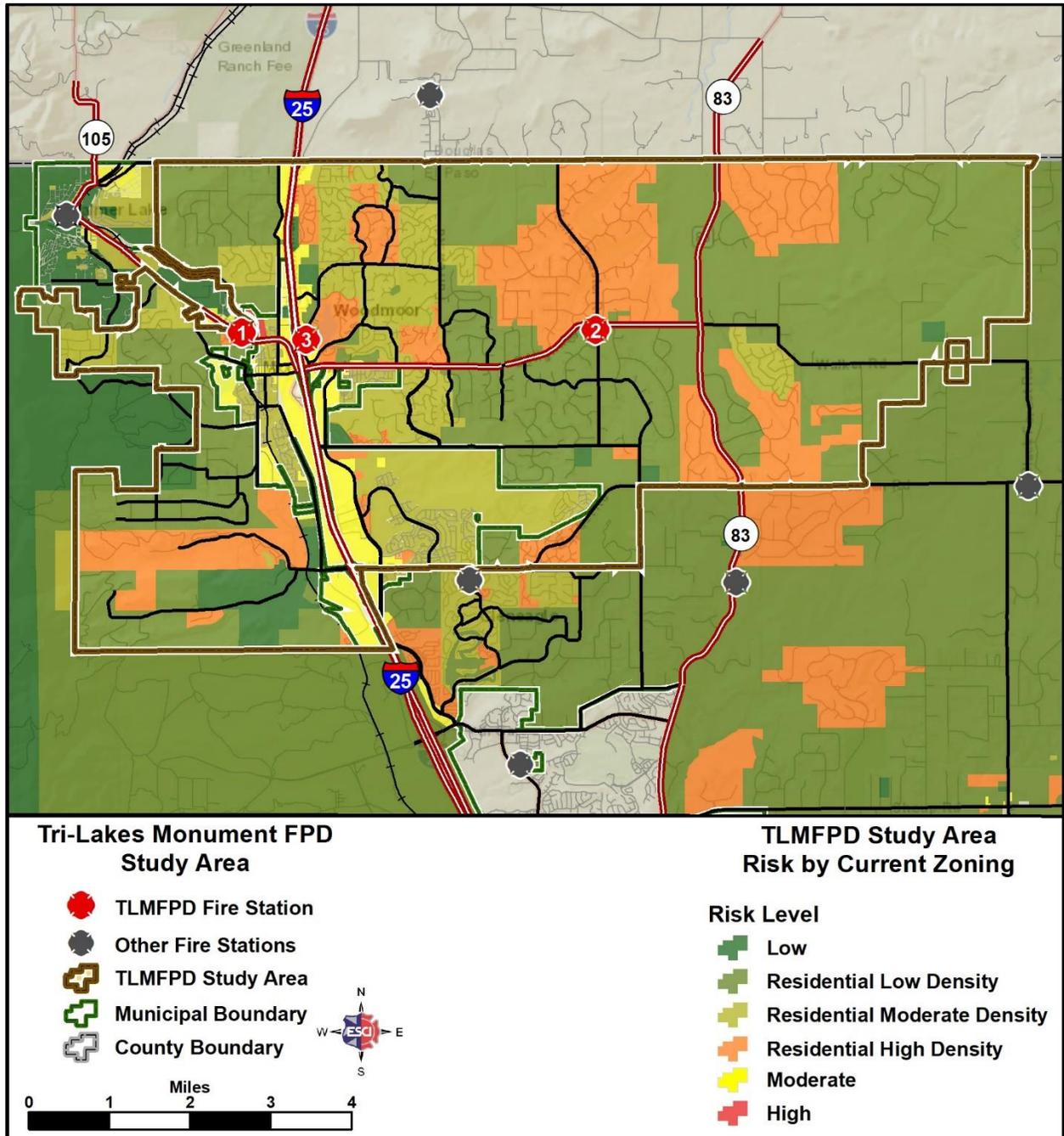
Figure 89: TLMFPD Risk by Current Land Use



Moderate risk residential properties (single family dwellings) represent the most common land use in the TLMFPD service area. Low risk properties are primarily vacant land, agriculture use (grazing or dry land farming), or low density rural residential properties. Areas categorized as moderate risk are generally commercial properties or higher density residential areas. In the TLMFPD service area, industrial or high-density mixed-use areas are categorized as high risk.

Local governments use zoning codes and regulations to ensure that development and new construction meet local planning goals for future land use. The following figure uses the current El Paso County and Town of Monument zoning designations to characterize risk by zoning in the service area.

Figure 90: TLMFPD Risk by Current Zoning



Comparing this figure with the previous figure (Figure 89), reveals that much of the vacant or undeveloped land in the service area is available for development, which changes the risk present in the TLMFPD service area. In the Town of Monument, vacant or agricultural use land on either side of Interstate 25 is zoned as Planned Industrial or Planned Commercial development. Additionally, currently undeveloped properties east of Jackson Creek Parkway and south of Higby Road are zoned as moderate and some high-density residential or mixed-use properties. In the unincorporated portions of the service area, most of the areas identified as Residential High Density are part of Planned Unit Development or Planned Development zoning classifications.

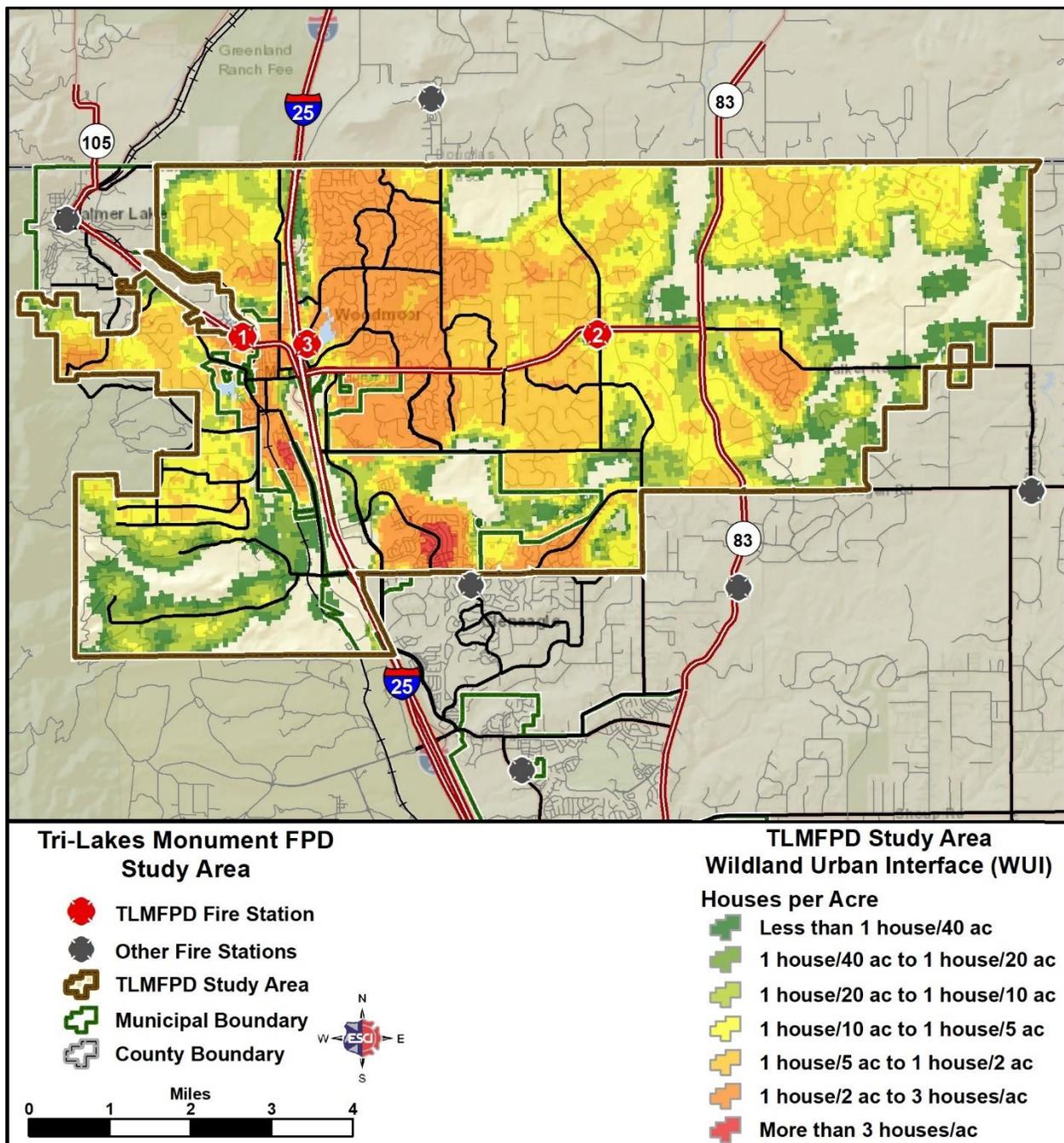
Natural and Manmade Hazards

The El Paso County Multi-Jurisdictional, Hazard Mitigation Plan (2015) identifies wildland fire, flood, dam failure, mud or debris flow, severe weather events, earthquake, and hazardous material spills (contamination of soil or groundwater) as some of the most likely natural or manmade disasters with the potential to affect public safety in El Paso County, including the TLMFPD service area. The Hazard Mitigation Plan is adopted as part of the El Paso County Emergency Operations Plan (2016). These two documents provide specific information concerning the likelihood of and reduction of loss from natural and manmade hazards. TLMFPD leaders should utilize these documents to identify the impact on public safety and the fire department's ability to mitigate the effects of these hazards.

As is true in many fire districts in Colorado that serve rural areas, wildland fire is a major risk factor in the TLMFPD service area; where growth has occurred outside of traditional urban boundaries. The wildland urban interface (WUI) is defined as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. The Colorado State Forest Service Colorado Wildfire Risk Assessment Portal (Colorado WRAP) is an assessment tool that allows users to identify a specific project area (fire district, community, etc.) to produce a risk summary report. The Colorado WRAP provides consistent, comparable scientific results; which can be used to prioritize wildfire mitigation and prevention planning.

ESCI has utilized the Colorado WRAP site to produce a risk summary report for the TLMFPD service area. The following figures are examples of the products available in the Colorado WRA report.

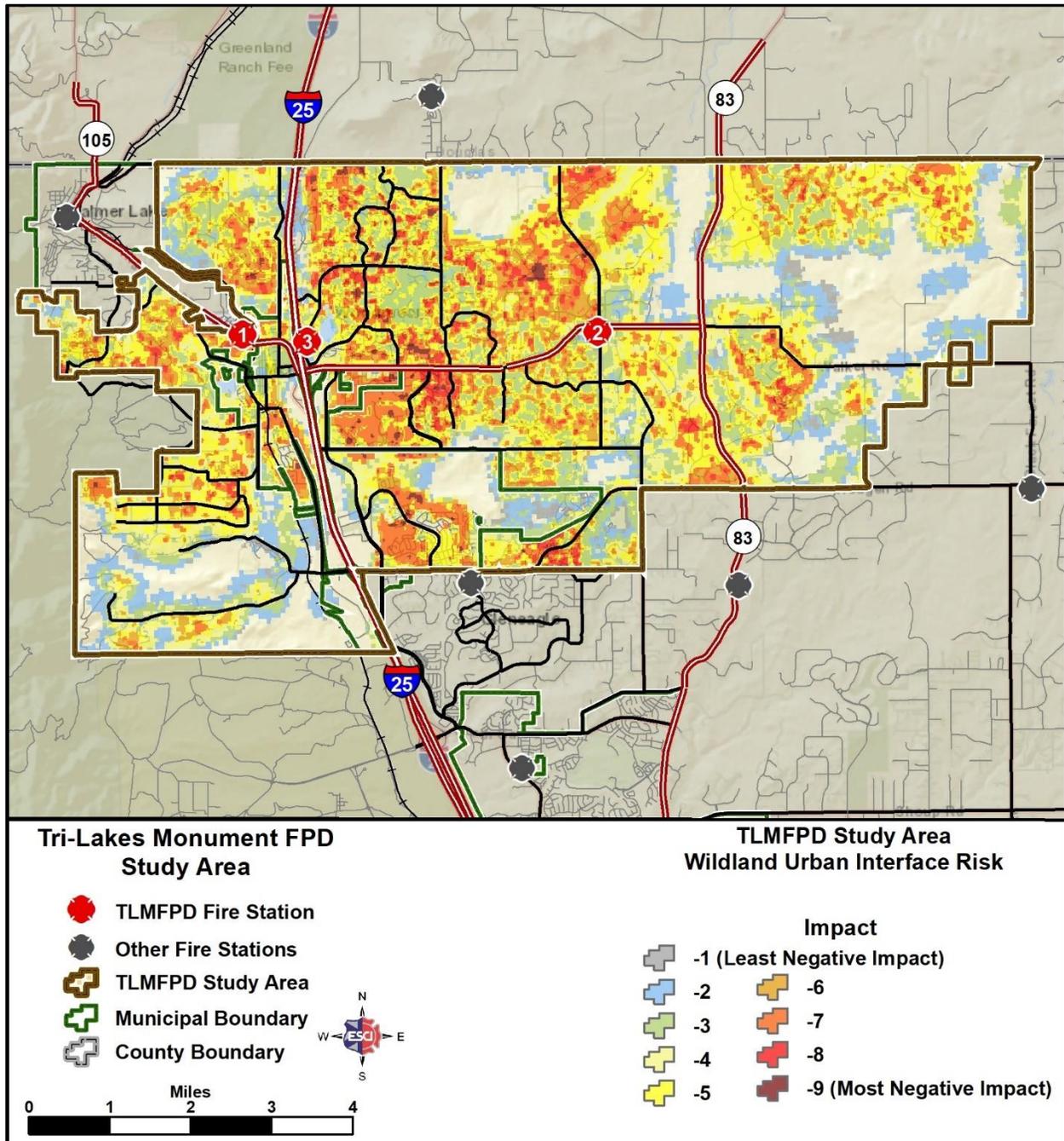
Figure 91: TLMFPD Wildland Urban Interface (WUI)



This figure reflects housing density and fuel types to display the portions of the TLMFPD service area within the wildland urban interface. As displayed, nearly all of the structures in the service area are within the WUI. Examination of the data reveals that over 99 percent of the population reside within the WUI.

The following figure is a rating of the potential impact of a wildfire on people and where they live.

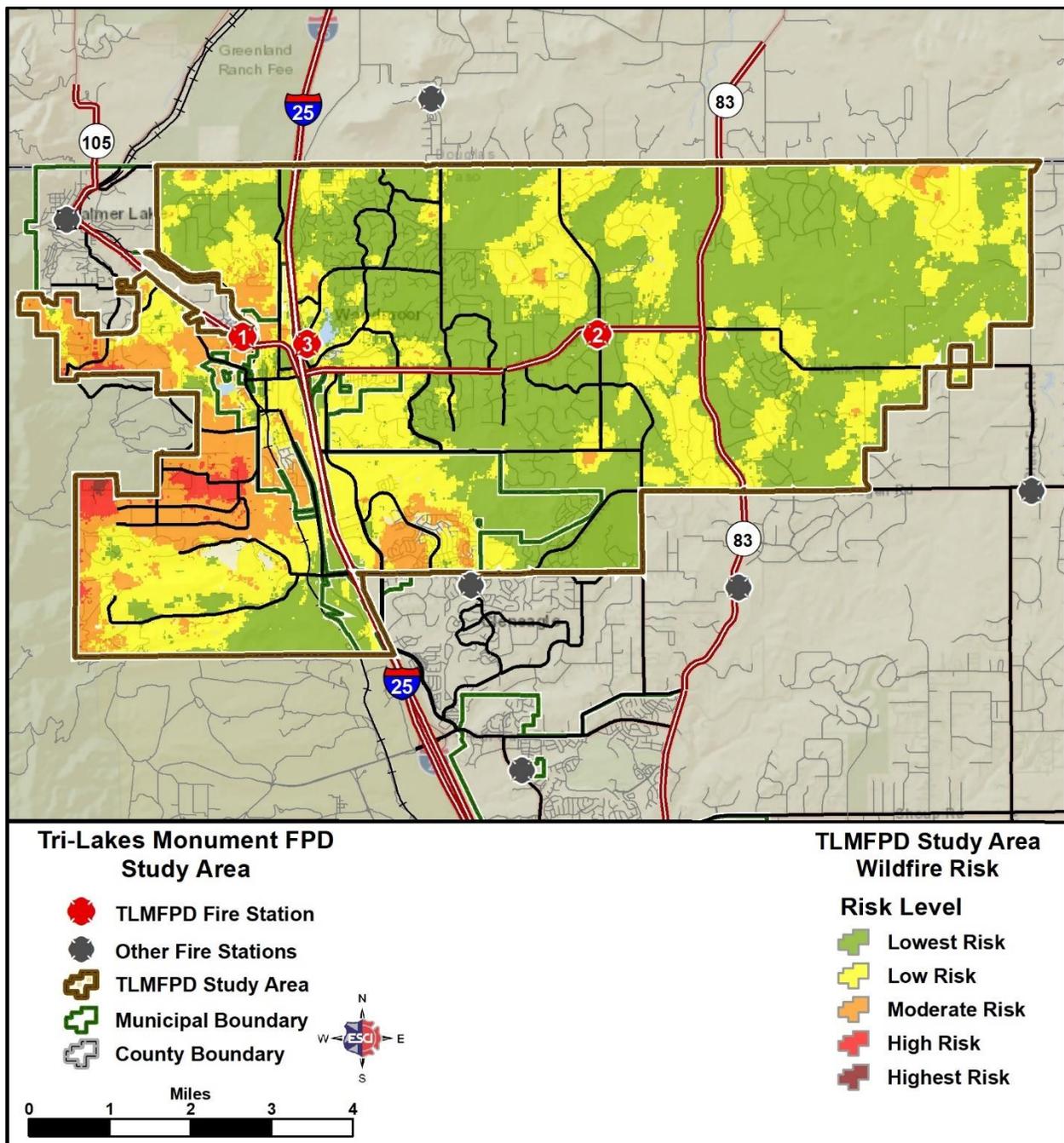
Figure 92: TLMFPD Wildland Urban Interface Risk Index



By combining WUI housing density data with flame length data (based on fuel types) it is possible to identify where the greatest potential impact to homes and people is likely to occur.

Wildfire risk represents the possibility of loss or harm occurring from a wildfire. The next figure displays the overall wildfire risk in the TLMFPD service area.

Figure 93: TLMFPD Wildfire Risk



The Wildfire Risk Index combines the components of fire probability, fire behavior, and fire effects to classify risk. Although most of the TLMFPD service area is within the WUI, based on other factors (fire behavior, topography, fuel types, etc.), the overall risk of a wildfire is lessened in some portions of the service area.

The Colorado WRAP report is intended to provide the information needed to support the following priorities:

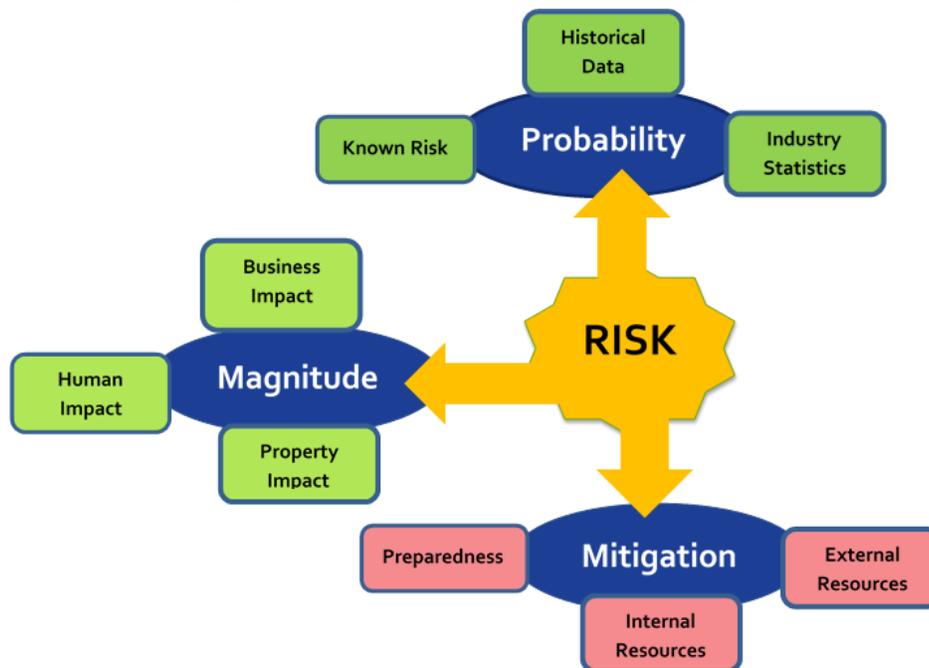
- Identify areas that are most prone to wildfire.
- Plan and prioritize hazardous fuel treatment programs.
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries.
- Increase communication with local residents and the public to address community priorities and needs.

TLMFPD should utilize the report to reduce the likelihood of a wildland urban interface fire and mitigate the negative effects should one occur.

Vulnerability Hazard Tool

A tool originally used by the healthcare field has been modified to analyze the community risk factors.²⁵ This tool requires the user to assign a simple relative rating for the following risks: structural fires, non-structural fires, medical responses, rescues, hazardous material, natural hazards, technological hazards, and human hazards. Each of these risks is considered in terms of probability, magnitude, and mitigation. To determine the probability, the fact that it is a known risk and historical data to determine how often it occurs or industry statistics are considered. The magnitude is rated by the impact on business, humans, and property. Mitigation offsets the magnitude and is based on the amount of preparedness, the resources within the department, and external resources. Severity is the magnitude less the amount of the mitigation. Community risk is the probability times the severity.

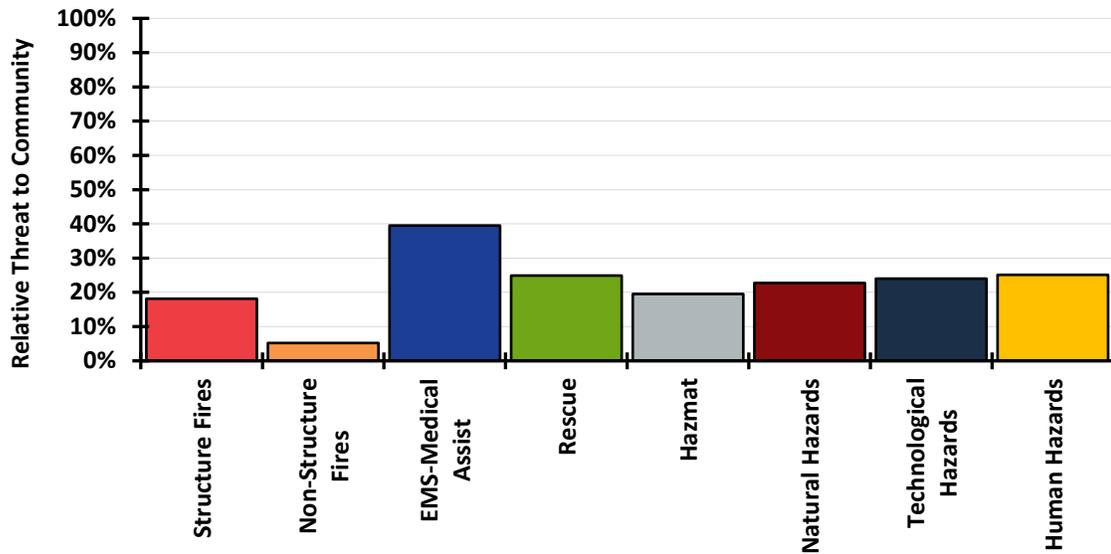
Figure 94: Vulnerability Hazard Tool Diagram



²⁵ Kaiser Foundation Health Plan, Inc.

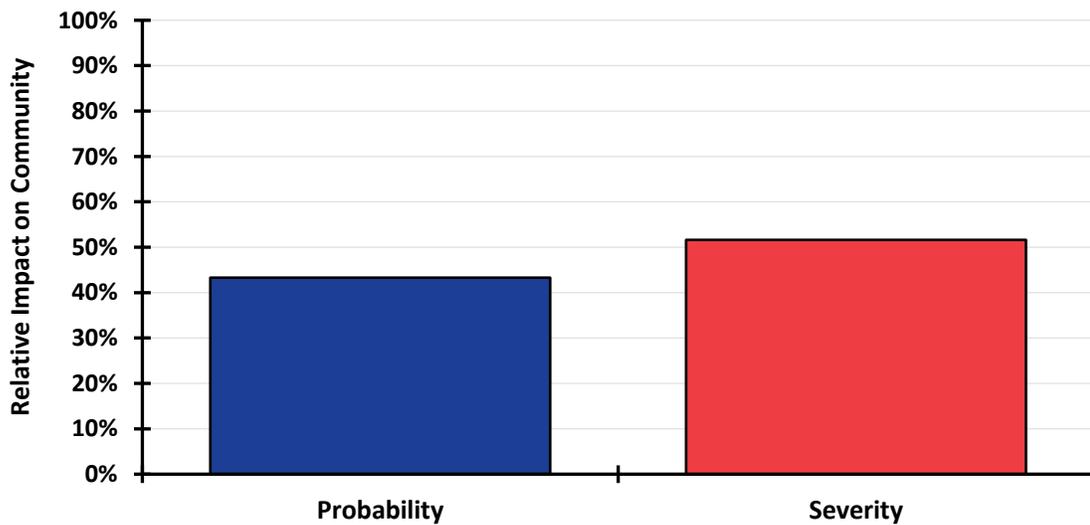
The next chart shows the relative risk of each type of hazard.

Figure 95: Relative Risk of Potential Hazards



The next figure displays the risk to the community based on both probability and severity. The chances of a hazard occurring is 43 percent. The impact to the community in relative terms of the various hazards is just over 50 percent.

Figure 96: Relative Risk of Probability and Severity



FUTURE STRATEGIES

Short and Mid-Term Strategies

To prepare for the future, TLMFPD must assure that the infrastructure of the department is solid and provides a firm foundation. The recommendations made in the Evaluation of Current Conditions section of this report are what ESCI believes are essential for building a firm foundation for the future. The recommendations made in the report are listed here for convenience. Most of these short and mid-term recommendations can be implemented relatively quickly, although some may require some work that may span 2–3 years. Some items are considerations to be made as the District grows in size and activity level. It is suggested that any dealing with potential safety concerns be made higher priority. Creating a strategic plan to accomplish these items effectively is the best approach, although some of these can be implemented by the officers responsible.

There are other recommendations that are completely new strategies or may require some time and effort to implement and are reflected in the Long-Term Strategies section with additional explanation.

Administrative/Planning/Financial

- The Board should evaluate the Fire Chief annually based on specific goals that the Board sets for the Chief.
- Implement the training component on policies through Lexipol.
- Review every policy within three years.
- Design a program to communicate vision and current status with response personnel routinely.
- Continue to educate taxpayers on the combined effects of Gallagher and TABOR amendments on the District.
- Track costs on items that the District charges fees to assure cost recovery.
- Consider creating a formal Capital Projects or Reserve Fund to track major capital expenditures such as vehicle purchases and replacements, and any building purchases.

Capital Assets

- Assure that an adequate funding strategy is established in support of the apparatus replacement schedule (see recommendation in Financial Recommendations).
- Revisit the inflation factor of two percent in the apparatus replacement schedule to assure that it is adequate.
- Develop a facility replacement plan.
- Develop a separate support equipment replacement schedule.

Planning

- Establish a more structured and formalized planning process.
- Develop and maintain effective pre-incident and special hazard planning practices.

- Continue with the development of a “run card” programmed automatic response system.
- Consider implementation of a dropped boundary dispatching approach, with adjustments, where necessary and applicable.
- Upon completion of this Master Plan, undertake a Strategic Planning process to prioritize and plan for the implementation of the findings and recommendations in this report.
- Actively engage with El Paso County Office of Emergency Management as a participant in the county’s Emergency Operations Planning efforts.
- Engage and remain closely involved in current and future emergency planning initiatives.
- Work with the LEPC to assure that all required planning and reporting needs are addressed.

Staffing

- Consider philosophical, design, and implementation changes to the EMS/Paramedic Program.
- Consider the development of a multi-jurisdictional (Northern El Paso County fire districts) FFI certification program.
- Consider re-assignment of EMS critical functions to FF/Paramedics and EMTs.
- Develop a Dynamic Recruitment Program.
 - Utilize social media with search engine optimization.
 - Conduct demographic research of similar systems.
 - Recruitment at local, regional, and state EMS conferences.

Service Delivery

- Complete standard operating guidelines (SOGs) for each riding position and activities on the fireground.
- Consider consolidation with neighboring fire districts as a long-term goal.
- Perform a feasibility study for potential district consolidations.
- Track, monitor, and report the individual components of response time.
- Work cooperatively with the dispatch center to ensure that call processing time is monitored and recorded.
- Include mutual or automatic aid resources apparatus response times into the response data tracked by the District.
- Set response time goals for urban and rural areas of the District.

EMS

- Develop an internal system to collect necessary EMS data.
- Develop internal retrospective EMS review and QA program.
- Develop a balanced EMS education program (recertification CE, statistically based CE, certifications required).

- Implement automated inventory control program.
- Enhance TLMFPD/Medical Director relationship.

Training

- Develop mandatory annual training requirements supported through the annual training calendar.
- Develop a regional MCI plan that includes an annual drill.
- Develop a regional Firefighter I training academy for new hire employees.
- Develop a balanced fire/EMS annual training schedule.
- Expand current training documentation program and include other northern El Paso County fire districts.
- Develop short, mid, and long-term strategies to address inadequate training facilities.

Fire and Life Safety

- Evaluate the use of engine and medic personnel to conduct the business inspections.
- Consider the addition of a staff member who has expertise in plans review as the District grows.

Hazardous Materials

- Purchase Level B chemical splash protection suits.
- TLMFPD should increase the amount and type of absorbent supplies to provide additional environmental defensive operations.
- Purchase four Level A vapor tight hazardous materials suits.
- Budget and send additional personnel to a hazardous materials technician course (80 hours).

Long-Term Strategies

Planning for Population Growth

Previously in this report, the growth in population and service demand that might be expected over the next ten and twenty years was analyzed. Additionally, the location of growth based on planned and zoned developments has been shown. All of that information comes to bear on developing the long-term strategies particularly the location of stations in the future. The planning of future station locations or relocation of current stations will take time to secure the prospective sites. Further, the appropriate time for building and opening a new station may be sometime in the future. That time may need to be identified through careful monitoring of response performance. This concept is addressed in the section Adopting District Response Standards.

From the analyses, it is clear that there will be greater development and larger populations which produce larger service demands. That population group over the ten-year period will be more elderly and require more emergency medical care. This demand on EMS may require an additional medic unit to transport. It may be beneficial that TLMFPD consider a community paramedic program that could supply needed healthcare without transport to a medical facility. This is discussed in the section Community Paramedic Program.

Based on the overall number of calls or predicted density, it is unlikely that multiple engine companies will be required in any one station, however in planning future stations or remodeling existing stations, sufficient bays should be contemplated to allow for ability to move equipment as needed. Special attention to the stations serving the commercial and urban areas to have at least one bay that can accommodate the size of an aerial truck or quint. Moreover, as demand for EMS grows, medic units may be required at every station.

Adopting District Response Standards

In this report, the reference for response times has been to industry standards. Specifically, NFPA 1710 and 1720 standards as they apply to urban and rural response zones determined by population densities. The District is not bound to adopt these standards but should adopt standards that are acceptable to the community and that are within the available funding for fire and emergency services. Therefore, it is up to the District Board to adopt whatever standards are reasonable. ESCI would recommend that dual response zones be adopted based on the NFPA definitions, i.e., urban and rural zones. The response times can be different as described earlier in this report. The response times in both of these zones should be monitored routinely. Monitoring the response zones will identify when response times no longer achieve the specified 80th or 90th percentile standard. As the District grows and new subdivisions develop, the times will determine if the growth has caused the percentage of response times meeting the standard to decrease. This is indication that other action may need to be taken.

Proactively, when reviewing additional subdivisions or commercial developments, the travel time can be anticipated due to the distance from the closest station. The travel times will identify areas that are outside of optimum travel time thus creating an impact on the District that will eventually cause the TLMFPD to fall below their adopted standards. Future station construction or relocation should be anticipated in this process.

Community Paramedic Program

Most EMS and fire agencies are faced with the challenges associated with individuals with limited access to health care utilizing the 911 system. Due to the increase in 911 responses, a fire/EMS system can be stretched beyond capacity and hospital transports can exceed emergency department capabilities.

One solution to this challenge is the development of a Community Paramedic Program. There are two levels of service that can be provided. The first is a response with Certified Community Paramedics who can provide expanded actions. They provide a wide range of initial health care, then under specific circumstances, refer the patient to their primary health care provider without transport to an emergency department. This enables 911 units to remain in service and limits non-acute patients from being transported to the hospital. The limitation of a Community Paramedic Program is the inability of the paramedic to prescribe medication (antibiotics, narcotics). Currently systems are being developed where tele-medicine can involve a licensed physician and, in the future, prescription medications may be possible.

A second system is a mobile integrated health model, where a Certified Community Paramedic is paired up with a mid-level clinician including nurse practitioner or physician assistant. This system offers greater medical capabilities including the ability to write a prescription.

When deciding on the level of service, a department should do extensive analysis on how to balance fiscal responsibility with services needed in a response area. Community Paramedic Programs may be a positive addition to an overall emergency response plan.

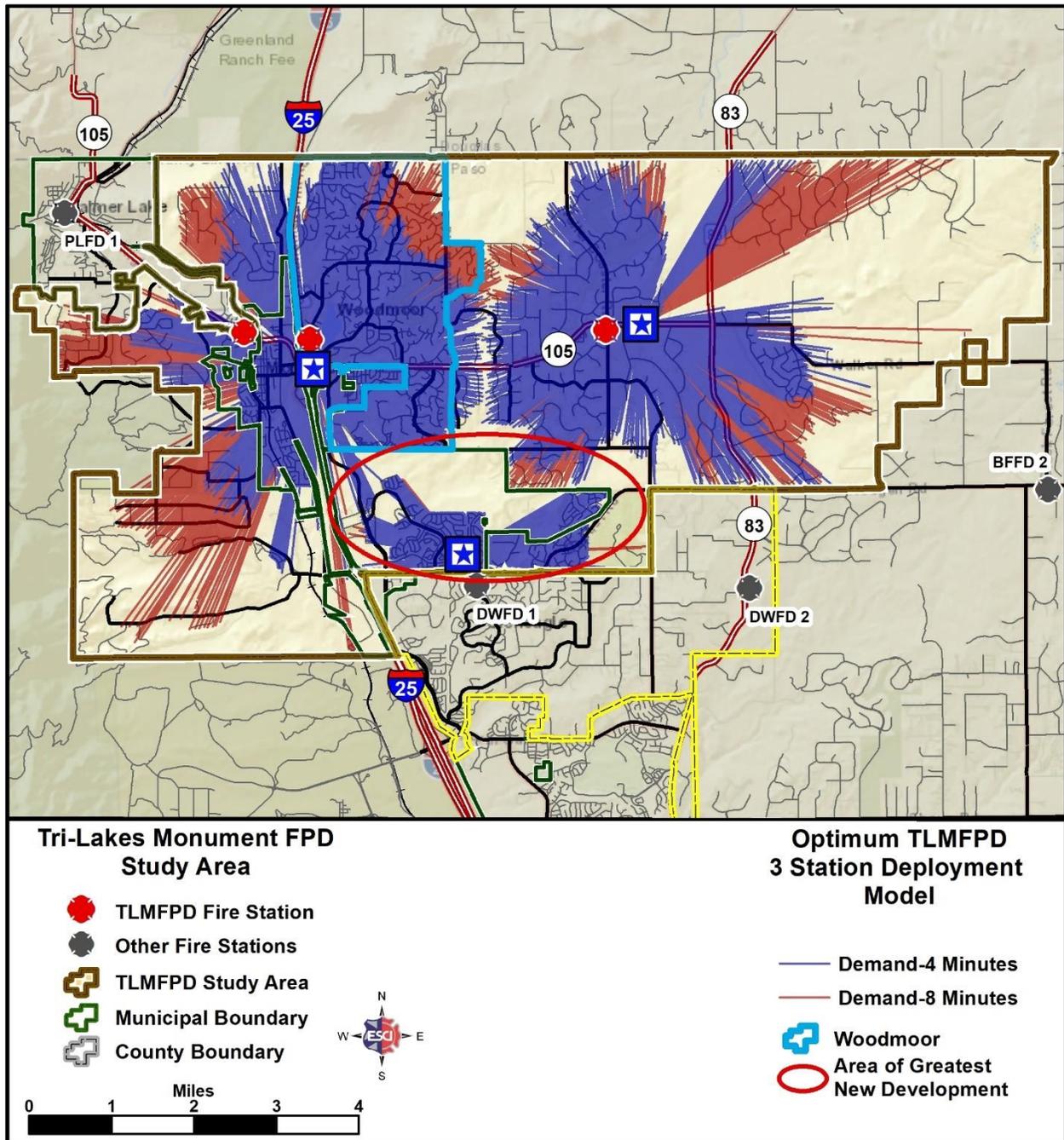
Determining Appropriate Future Station Locations

Not all of the current station locations were the result of careful planning, instead the stations were built before the departments were consolidated into the Tri-Lakes Monument FPD and before growth occurred. ESCI conducted several analyses in order to help the District determine good, if not optimum station locations.

Optimal Station Locations

One method of considering the validity of current station locations is to examine the optimal locations should the District start today with a blank slate. ESCI examined two options for consideration. The first option considers the best locations for three stations if they could be chosen today.

Figure 97: TLMFPD Optimum 3-Station Location Model



This model was developed by considering maximizing coverage to 11,597 demand points (address points) inside the TLMFPD service area and 1,700 possible station locations (including current TLMFPD stations), based on GIS intersection points from street network data. While the demand lines are straight, they represent travel time over the actual street network to an address point.

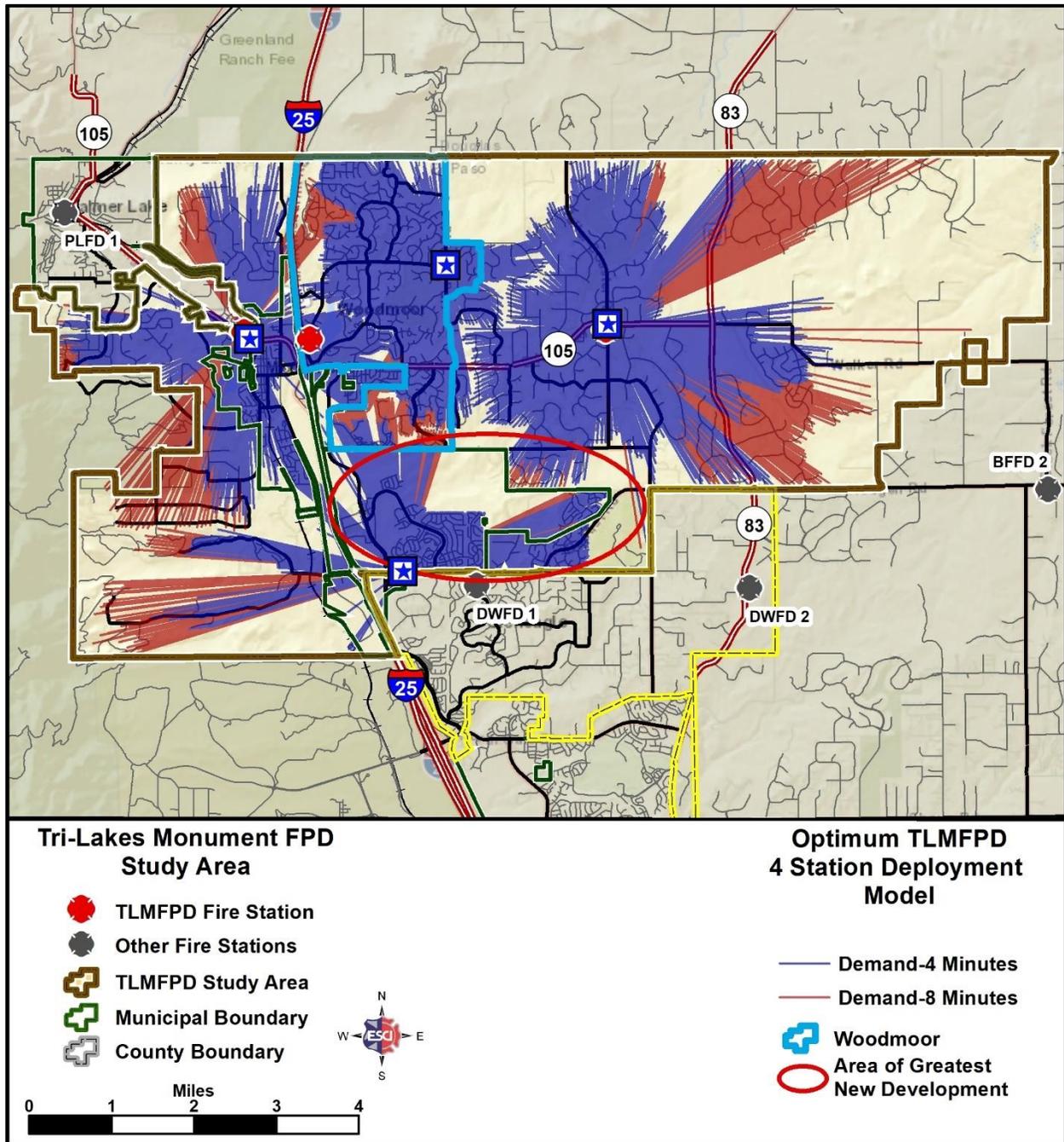
The results of the analysis were:

- 96 percent (11,179) of address points were within 8 minutes travel of the three optimum station locations; and 98 percent of FY 2018 service demand.
- 77 percent (8,911) of address points were within 4 minutes travel of the optimum station locations; and 83 percent of FY 2018 service demand.
- 88 percent of urban incidents (Monument and Woodmoor) were within 4 minutes travel of the optimum station locations.

It is important to note that Stations 2 and 3 are located very close to the optimal locations, and Donald Westcott FPD Station 1 is very close to the third optimum location. The distance that these stations are from the optimum is not worth moving a station unless there needs to be extensive remodel or relocation anyway.

The next analysis was to look at a four-station model, also determining optimum locations. The results are displayed in Figure g8.

Figure 98: TLMFPD Optimum 4-Station Location Model



This analysis was based on the same criteria used in the previous model.

The optimum four-station analysis shows that:

- 97 percent of address points (11,240) were within 8 minutes travel of the four optimal station locations; and 99 percent of FY 2018 service demand.
- 83 percent (9,557) of address points were within 4 minutes travel of the optimum station locations; and 87 percent of FY 2018 service demand.
- 91 percent of urban service demand (Monument and Woodmoor) was within 4 minutes travel of the optimum station locations.

Current station locations for Stations 1 and 2 and Donald Westcott Station 1 were very close to optimum, but Station 3 could be relocated further east. This configuration gains some advantage which is summarized in Figure 99.

Figure 99: Summarized Results of Optimized Station Locations

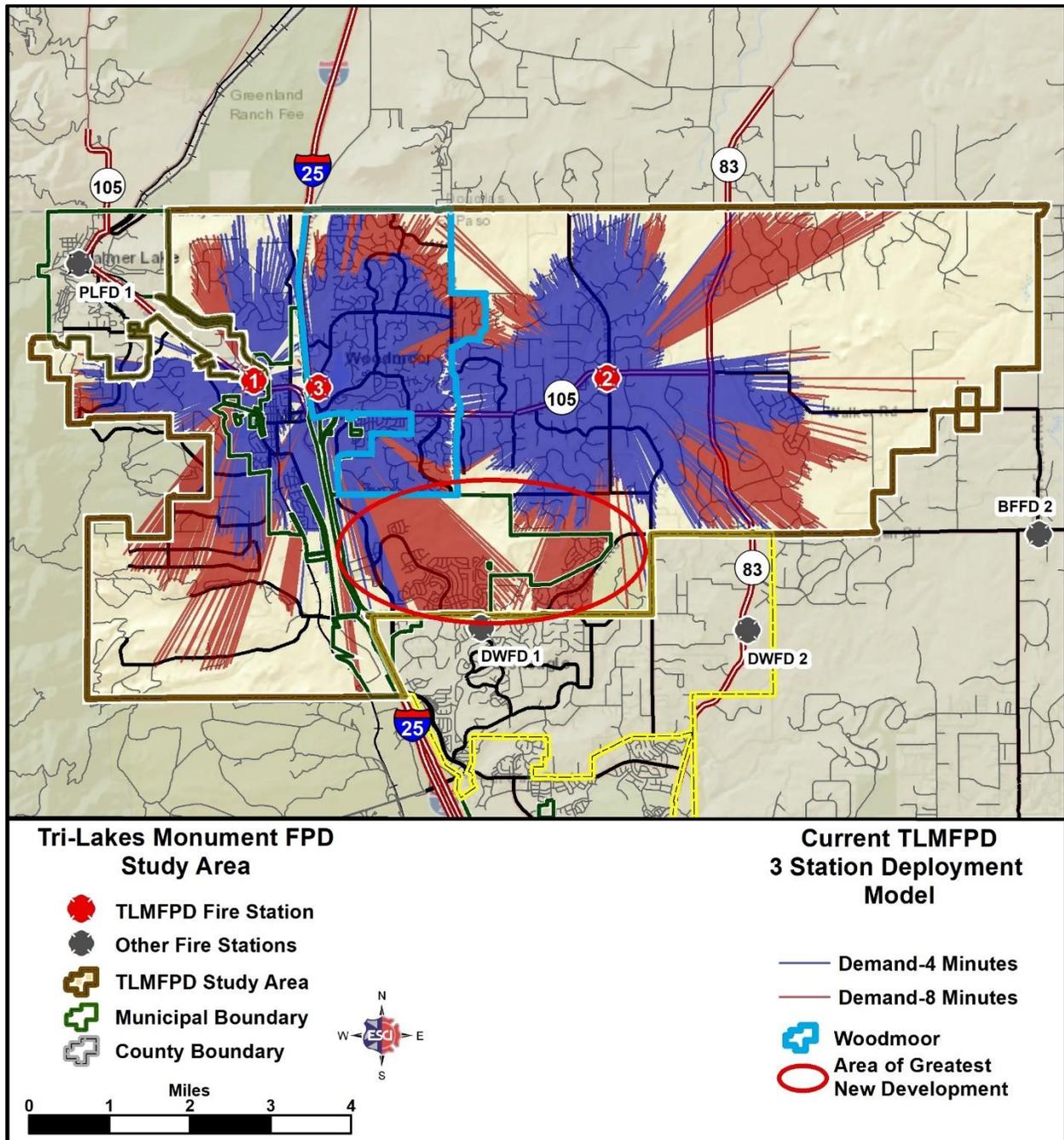
Option	Criteria	Percentage of Address Points Covered	Percentage of FY 2018 Service Demand Covered
Three Station Model	4-minute travel time	77%	83%
	8-minute travel time	96%	98%
	Urban Service Demand within 4 minutes travel time	88%	
Four Station Model	4-minute travel time	83%	87%
	8-minute travel time	97%	99%
	Urban Service Demand within 4 minutes travel time	91%	

The four-station model places the urban response zone into a category to reach over 90 percent of the possible service demand locations within a four-minute travel time which would be a NFPA 1710 recommendation. It should be noted that all address points that were used in these analyses were from currently plotted parcels. Also, there are no coverage shown in areas that have no streets or roads since there are no address points without streets, and without streets it is impossible to calculate travel times. Growth in other areas not fitting the planned zoning could skew these projections, however, based on planned development densities the response times should be similar.

Current Station Location Analysis

After considering the optimal locations ESCI examined the current station locations for functionality.

Figure 100: Existing TLMFPD Stations Location Model



Using the same parameters as the previous figures, Figure 100 evaluates the coverage provided from the current TLMFPD stations. Fifty-six percent (56%) of address points are within four minutes travel or less of a current TLMFPD station. Ninety-five percent (95%) of address points in the service area are within eight minutes travel. Sixty-five percent (65%) of 2018 service demand occurred within four minutes travel of a fire station, and approximately 97 percent of incidents were within eight minutes travel or less of a TLMFPD station. Seventy-four percent (74%) of 2018 urban service demand happened within four minutes travel of a current station location. The results are summarized in the following figure.

Figure 101: Current 3-Station Model Results

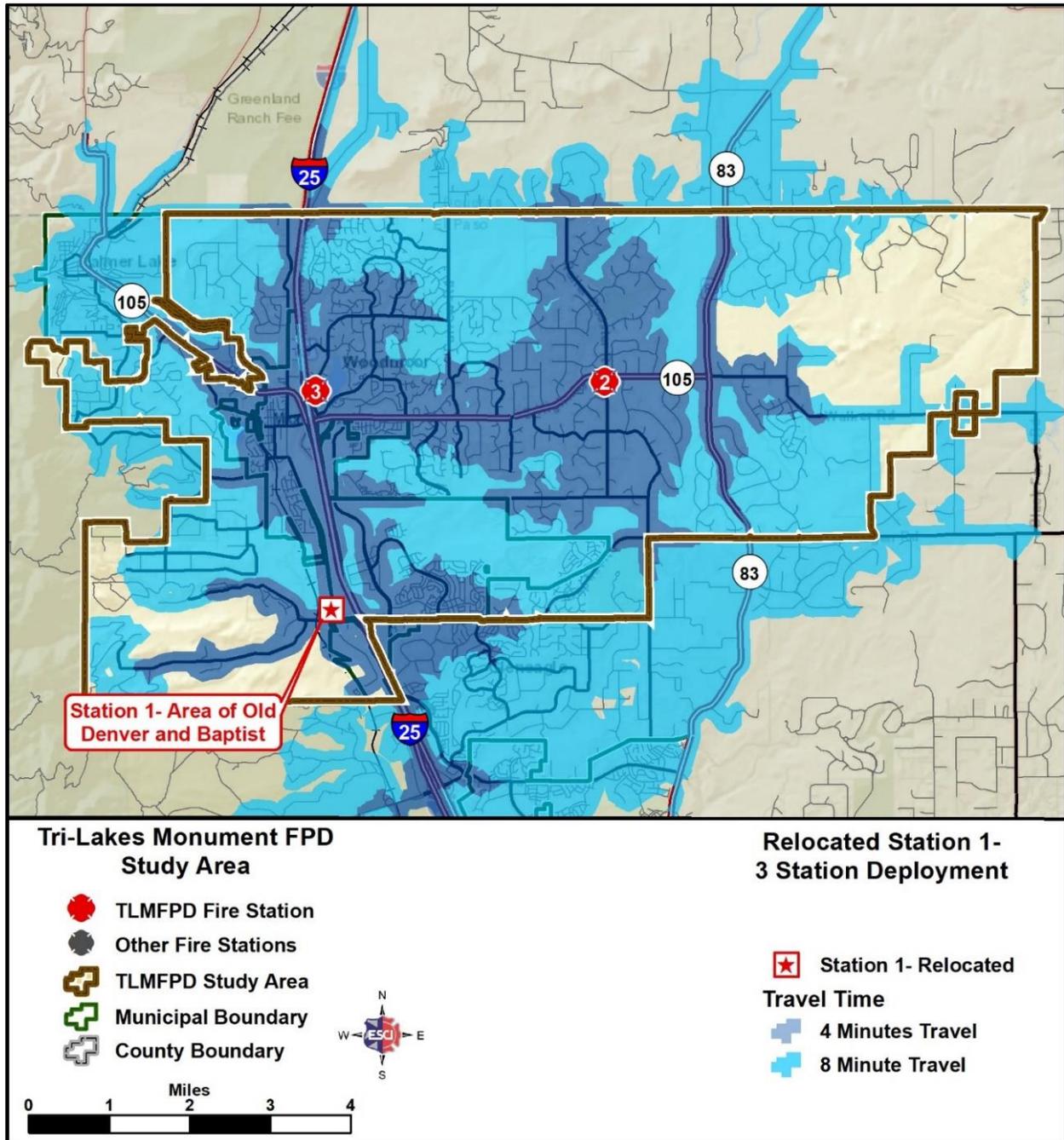
Model	Criteria	Percentage of Address Points Covered	Percentage of FY 2018 Service Demand Covered
Current 3 Station Model	4-minute travel time	56%	65%
	8-minute travel time	95%	97%
	Urban Service Demand within 4 minutes travel time	74%	

Further examination of the data in Figure 100 indicates that based on the GIS model, Station 1 is the closest station to approximately 21 percent of FY 2018 service demand, Station 2 is closest to 13 percent of incidents, and Station 3 is the closest TLMFPD station to 66 percent of FY 2018 service demand.

Relocating an Existing Station for Maximum Coverage

The next figure is a three-station coverage analysis moving Station 1 to the area of Old Denver Road and Baptist Road. This will cover the growing urban density west of Interstate 25 and east of the Interstate in Monument. Note that the 2045 PPACG population projection predicts the population of the area south of Higby Road and east of Jackson Creek Parkway increasing to over 16,000 residents by 2045.

Figure 102: Three Station Analysis—Station 1 Relocated



In the configuration shown in Figure 102, 76 percent of current service demand is within four minutes travel of a TLMFPD station compared to 65 percent with the current deployment. Utilizing a four-station model that added the new location (Old Denver and Baptist) and kept existing Station 1, only increased the coverage over the three-station model by about 2.5 percent (about 50 incidents). It is important to point out that the analyses calculate the percentage of coverage based on the location of the existing call load. For example, if areas develop in the Denver Road and Baptist Road area the new station will have a greater impact as it will cover incidents that are currently not considered.

Summarizing the Station Modeling Information

The most effective and efficient response coverage would be to implement a four-station model with Station 1 and Station 2 being in the same location or close to their present locations. These are the stations that do have some deficits for long-term sustainability as discussed in the Capital Assets— Facilities section. To keep them in their current locations would require resolving the issues of utilizing non-District property for septic, or for generator and driveway locations. The relocation of Station 3 further east in Woodmoor would increase the area served within a four-minute travel time. This is consistent with the District's desire to provide four-minute travel times in the urban density area. The best solution for the fourth station would be to utilize Donald Westcott Station 1 through a cooperative agreement or consolidation of the two districts. This station will be the closest to the heaviest growth within the TLMFPD in the future. The other option is to build another station near that area as shown in Figure 102. The construction and staffing of another station would not be efficient due to the cost of construction and on-going staffing requirements. It is ESCI's opinion that stations should serve the broadest coverage area while meeting the adopted response standard.

Training Facility Development

Hands-on training facilities are limited in the area. The only training grounds that can be used is at the Air Force Academy and can be difficult to use at times. Previously in this report, ESCI recommended that regional training be considered. It seems that the need for a training facility is a regional one, suggesting that a solution that is regionally-based is most appropriate. The pursuit of a shared, regionally-developed solution should clearly be pursued. As the area develops further, it will become increasingly more difficult to find a suitable location with the proper zoning and where it will not cause objections by nearby residents.

Further, while analysis of the feasibility and cost of such a facility is well beyond the scope of work for this project, ESCI is compelled by the importance of the subject to offer the following general observations.

Classroom instruction is an essential component of preparing emergency responders with knowledge and skills. A training facility or drill ground is a second indispensable element. Training facilities provide a controlled and safe environment to use to simulate emergencies, developing and testing the skills of emergency workers.

NFPA 1402: *Guide to Building Fire Service Training Centers*, is a standard that addresses the design and construction of facilities for fire training.²⁶ The document covers the features that should be considered when planning a fire training facility. Absent the availability of suitable training facilities, some fire departments may forego essential training.

Proficient emergency responders have confidence in their own abilities to handle the emergencies they encounter. Best practices suggest that emergency workers have regular access to training grounds for repetitive drills and to develop new skills. An effective and continuous training program results in safer, more efficient, and effective emergency operations.

Constructing a modern training facility to comply with industry standards concerning classrooms, practice grounds, training tower, live-fire building, and training props is a significant investment of capital. In addition, the on-going cost of operating and maintaining a training facility further advances the case for joint ownership.

Examples of recently constructed basic fire training facilities illustrate (Figure 103) that these facilities need not be complicated or ornate to be quite functional.

Figure 103: Sample Training Grounds



Possible Cooperative Services

Throughout the report, mention has been made to functional or complete operational consolidations. ESCI is aware that initial discussions have begun on potential consolidations or contractual service provision. It is a goal that is worthy of pursuing in the long-term if not short-term.

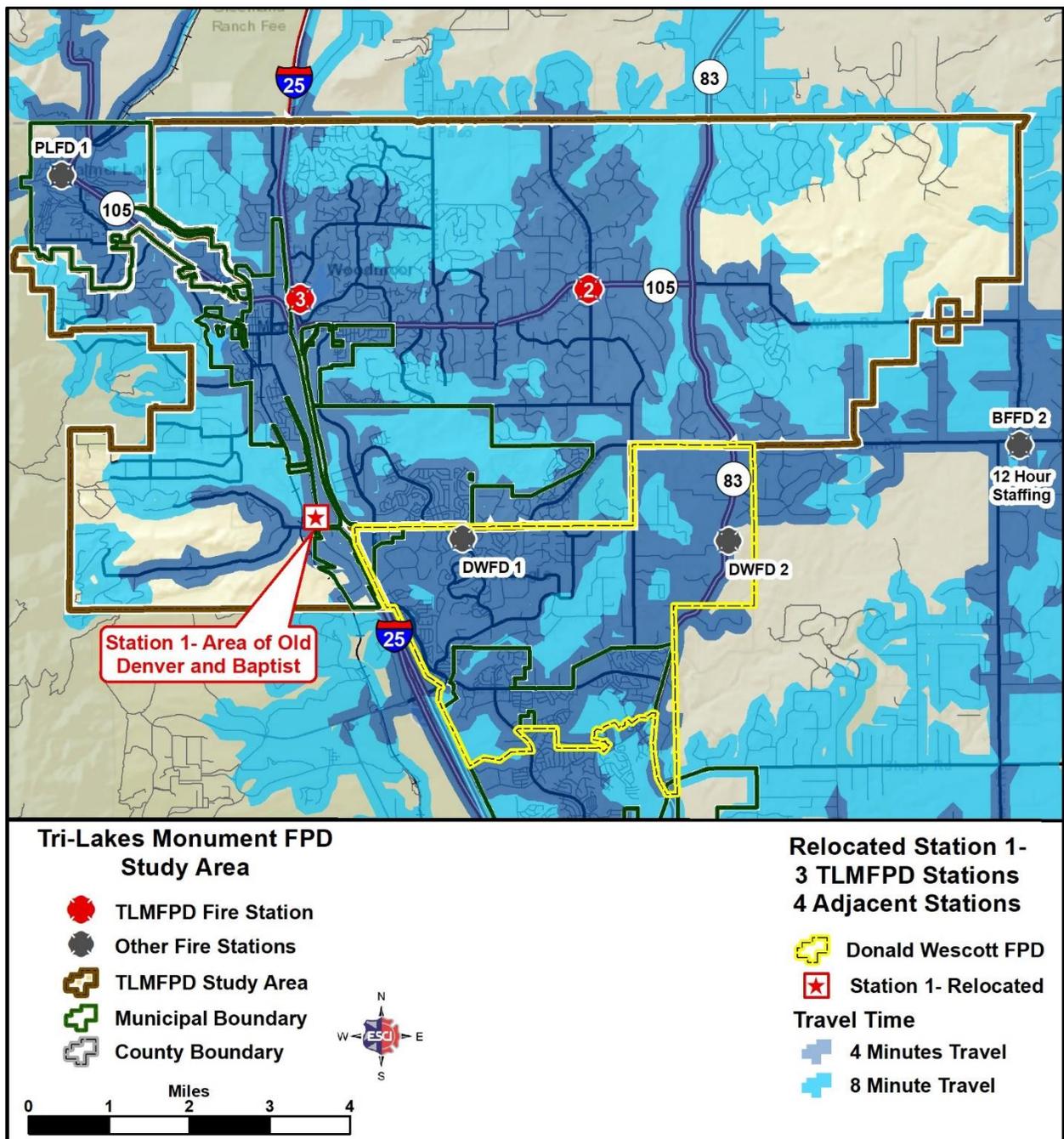
²⁶ National Fire Protection Association, Standard 1402 Guide to Building Fire Service Training Centers, 2002 Edition.

One functional cooperative service that was identified was for an emergency vehicle maintenance facility with certified EVT (Emergency Vehicle Technicians). This would fill a need in El Paso County and surrounding areas. Another is a regional training center as mentioned earlier.

There are advantages of full operational consolidations as well. Larger areas under one jurisdiction reduces redundancy in administrative staffing and overhead costs. These costs will continue to increase as each agency grows over time. The consolidation process is easier before agencies have staffed to where they will need to be in the future. This report was not meant to be a feasibility study so the details were not considered during the study, however, we have noted some advantages should TLMFPD choose to pursue these possibilities.

Figure 104 **Error! Reference source not found.** shows travel time from the Tri-Lakes Monument stations and the three adjacent fire jurisdictions with stations within 4 and 8 minutes travel of some portion of TLMFPD. It demonstrates the 4 and 8 minutes travel time coverage areas for TLMFPD existing stations with Station 1 relocated, and the neighboring fire stations of Palmer Lake FD, Donald Wescott FPD, and Black Forest FPD.

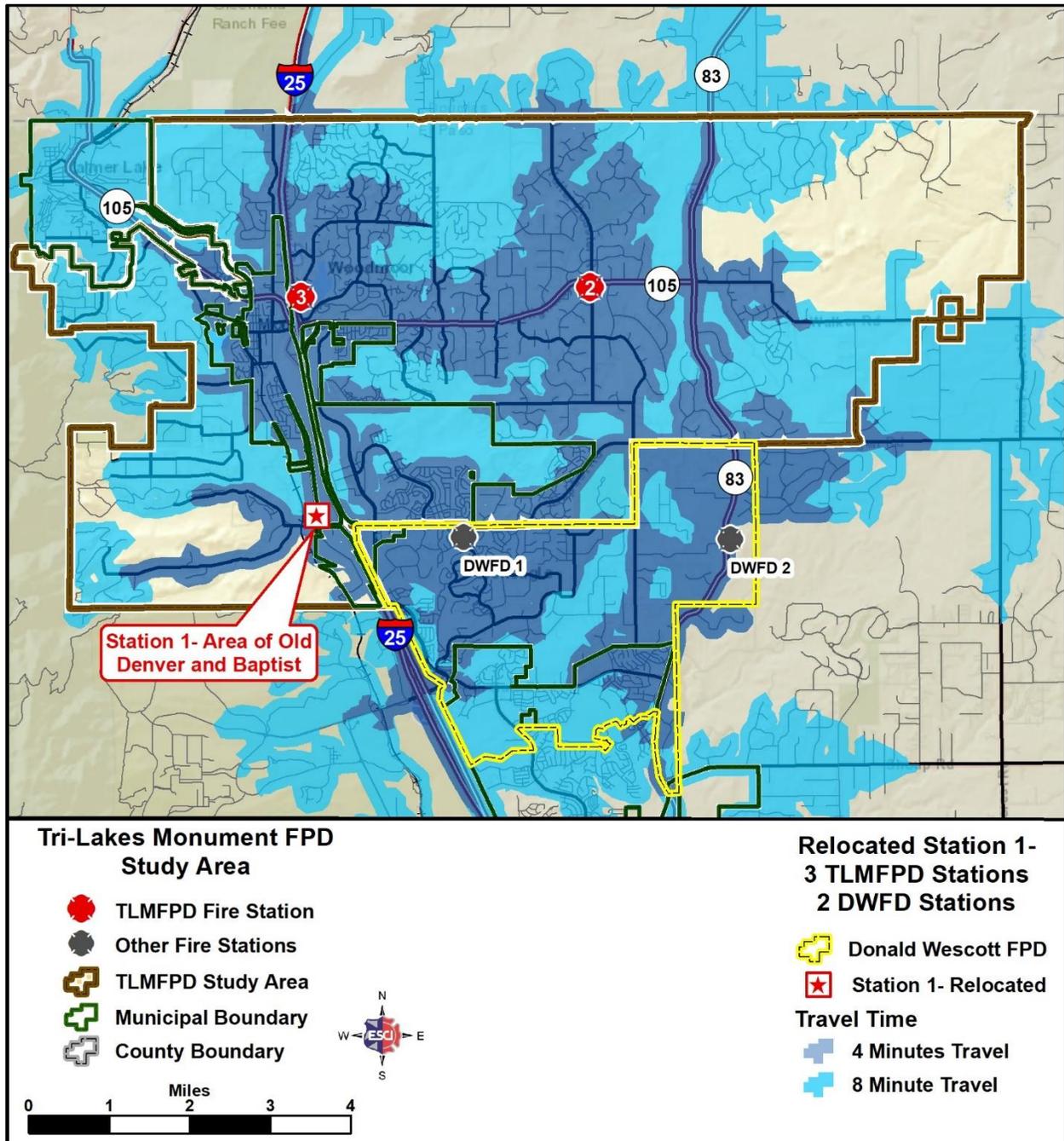
Figure 104: TLMFPD and Adjacent Fire Stations (PLFD, DWFPD, and BFFPD)



While only the TLMFPD incident locations were considered to determine coverage of current incident locations, the configuration covered 82 percent of the service demand.

In the next figure, travel time for just TLMFPD and DWFPD stations are displayed.

Figure 105: TLMFPD and DWFPD Coverage



Approximately 80 percent of TLMFPD service demand is within 4 minutes travel or less of the five stations displayed in this figure.

CONCLUSION

The Tri-Lakes Monument Fire Protection District is managing the risks well. The District is meeting the demands on the operations in a satisfactory manner. The finances of the District are in a good condition today due to the foresight of asking for and receiving a mill levy increase. The District has good facilities and apparatus.

As TLMFPD looks to the future, there are opportunities to improve the service being performed rather than being overtaken by the growth. Key is for the District to determine its desired level of response to incidents. If separate response standards are selected for urban and rural areas of the District, then two results are apparent. First, planning for increased urban densities is critical with stations strategically constructed or relocated. Second, growth with rural densities will continue to in-fill and still meet the NFPA 1720 recommended response standard.

ESCI has provided a great deal of analysis that can be used by the Board and management to decide the specific path for the future. Further recommendations have been made for improvement and meeting best practices. This Master Plan provides actionable recommendations that build the appropriate foundation for the District of the future.

Our thanks to the members of the District for their help and kind support of ESCI in preparing this report.

APPENDIX A—TABLE OF FIGURES

Figure 1: Fire Protection District Study Area 2

Figure 2: Colorado ISO Classifications 3

Figure 3: ISO Classifications Nationwide 4

Figure 4: Service Demand by NFIRS Incident Type, 2017..... 4

Figure 5: Calls for Service per 1,000 Population Comparison 5

Figure 6: Organizational Chart 7

Figure 7: Population Trends 16

Figure 8: Taxable Assessed Value for TLMFPD..... 16

Figure 9: Taxable Residential Assessed Value as Compared to Total Taxable Assessed Value for TLMFPD. 18

Figure 10: Tri-Lakes Monument Fire Protection District, Fiscal Years 2014 to 2019 Preliminary Budget 19

Figure 11: General Fund Property Tax Collection, Levied Amount and Collection Rate, 2014–2018 Estimated 19

Figure 12: Property and Specific Ownership Taxes, 2014–2019 Preliminary Budget..... 20

Figure 13: Beginning General Fund Balance, 2014–2019..... 21

Figure 14: Tri-Lakes Monument Fire Protection District Expenditures, 2014–2019 Preliminary Budget 22

Figure 15: General Fund, Expenditures By Type 23

Figure 16: General Fund, Preliminary Budget 2019 23

Figure 17: General Fund Personnel Wages and Benefits Totals 24

Figure 18: General Fund Materials/Supplies and Services, Capital and Debt Service 24

Figure 19: Cost per Capita 25

Figure 20: Cost per Call 26

Figure 21: Revenue, Expense, Net/Deficit, and End Reserve Balance—General Fund27

Figure 22: Financial Revenue Assumptions 28

Figure 23: Financial Expenditure Assumptions 29

Figure 24: Scenario—Status Quo Forecast, Trend Analysis Assessed Value Projections..... 30

Figure 25: Status Quo Scenario—General Fund Forecast31

Figure 26: Status Quo Scenario—General Fund Ending Balance 32

Figure 27: Scenario—General Fund Reserves as a % of General Fund Expenditures33

Figure 28: Scenario—Status Quo Forecast Add Capital Reserve Fund33

Figure 29: Scenario—Forecast, General Fund Add a Capital Reserve Fund..... 34

Figure 30: Ending Fund Balance General Fund and Capital Reserve Fund.....35

Figure 31: General Fund Reserves as a Percentage of Expenditures35

Figure 32: Best Practices in Financial Management37

Figure 33: Capital Assets per 1,000 Population 38

Figure 34: Station 1 39

Figure 35: Station 2 40

Figure 36: Station 3 41

Figure 37: Major Apparatus Inventory 42

Figure 38: Vehicle Service Lives..... 43

Figure 44: TLMFPD Historical Service Demand, July 2016–July 2018 56

Figure 45: Percentage of Incidents by Category, 2016–201857

Figure 46: Service Demand by NFIRS Incident Type, July 2016–July 201857

Figure 47: TLMFPD Service Demand by Month of the Year, FY 2018 58

Figure 48: TLMFPD Service Demand by Day of the Week, FY 2018..... 58

Figure 49: TLMFPD Service Demand by Hour of Day, FY 2018 59

Figure 50: TLMFPD Geographic Service Demand (Incidents per Square Mile), FY 2018 60

Figure 51: TLMFPD Geographic Service Demand and Fire Incidents, FY 2018 61

Figure 52: TLMFPD Service Area and Adjacent Fire Jurisdictions 62

Figure 53: TLMFPD Study Area Population Density, 2010 Census Blocks 63

Figure 54: TLMFPD Engine Distribution per ISO Criteria 65

Figure 55: TLMFPD Aerial Apparatus Distribution per ISO Criteria..... 66

Figure 56: TLMFPD Travel Time Model–Four, Eight, and Twelve Minutes Travel 67

Figure 57: TLMFPD Travel Time Model (Includes Aid Stations)–Four, Eight, and 12 Minutes 69

Figure 58: TLMFPD Travel Time Model (Includes Aid Stations) and FY 2018 Service Demand70

Figure 59: TLMFPD Mutual/Automatic Aid, July 2016–July 2018.....71

Figure 60: TLMFPD Study Area Station Concentration (Includes Aid Stations)–8 Minutes Travel Time72

Figure 61: TLMFPD Study Area Station Concentration (Includes Aid Stations)–12 Minutes Travel Time73

Figure 62: TLMFPD Concurrent Incidents, FY 2017 and FY 2018 74

Figure 63: TLMFPD Unit Hour Utilization, FY 2017 and FY 201875

Figure 64: TLMFPD Resource Drawdown, FY 2017 and FY 2018.....75

Figure 65: NFPA 1710 Response Performance Criteria 76

Figure 66: NFPA 1720 Staffing and Response Time Recommendations 76

Figure 67: TLMFPD Emergency Response Time Frequency, July 2016–July 201878

Figure 68: TLMFPD Emergency Response Performance—Components of Response Time, July 2016–July 2018 79

Figure 69: TLMFPD Emergency Turnout Time Performance by Incident Category, July 2016–July 2018..... 80

Figure 70: TLMFPD Emergency Travel Time Performance by Station Area, July 2016–2018 81

Figure 71: TLMFPD Emergency Response Time Performance by Station Area, July 2016–July 2018 82

Figure 72: TLMFPD Travel Time and Response Performance by Population Density, July 2016–July 2018 .. 82

Figure 73: TLMFPD Emergency Response Time Performance by Incident Category, July 2016–July 2018... 83

Figure 74: TLMFPD Response Performance by Arrival Order, July 2016–July 2018..... 84

Figure 75: Training Hours 92

Figure 76: Training vs. Incident Comparison..... 93

Figure 77: Steps for Developing CRR Plan 96

Figure 78: Fire Prevention Program Components..... 98

Figure 79: Recommended Fire Inspection Frequencies..... 99

Figure 80: Data Set and Quality Management Criteria 104

Figure 81: Example of Balanced EMS Training Schedule105

Figure 82: TLMFPD Growth Projections 109

Figure 83: Historical Service Demand110

Figure 84: Projected Service Demand 110

Figure 85: El Paso County Demographics for Ages Between 45 to 84 in 2018..... 111

Figure 86: El Paso County Aging Population 111

Figure 87: Growth Development112

Figure 88: TLMFPD Urban and Rural Risk Zones114

Figure 89: TLMFPD Risk by Current Land Use 115

Figure 90: TLMFPD Risk by Current Zoning116

Figure 91: TLMFPD Wildland Urban Interface (WUI)118

Figure 92: TLMFPD Wildland Urban Interface Risk Index119

Figure 93: TLMFPD Wildfire Risk..... 120

Figure 94: Vulnerability Hazard Tool Diagram.....121

Figure 95: Relative Risk of Potential Hazards 122

Figure 96: Relative Risk of Probability and Severity 122

Figure 97: TLMFPD Optimum 3-Station Location Model..... 128

Figure 98: TLMFPD Optimum 4-Station Location Model130

Figure 99: Summarized Results of Optimized Station Locations.....131

Figure 100: Existing TLMFPD Stations Location Model132

Figure 101: Current 3-Station Model Results133

Figure 102: Three Station Analysis—Station 1 Relocated134

Figure 103: Sample Training Grounds.....136

Figure 104: TLMFPD and Adjacent Fire Stations (PLFD, DWFPD, and BFFPD).....138

Figure 105: TLMFPD and DWFPD Coverage.....139

Figure 106: Sample Non-Structure Fire Critical Tasking145

Figure 107: Sample Hazardous Materials Incident Critical Tasking145

Figure 108: Sample Motor Vehicle Collision with Entrapment Critical Tasking..... 146

Figure 109: Example Structure Fire-Interior Attack Critical Tasking 146

Figure 110: Example Emergency Medical Incident Critical Tasking..... 146

Figure 111: Example EMS Incident-Cardiac Arrest Incident Critical Tasking 146

APPENDIX B—CRITICAL TASK ANALYSIS

The ultimate goal of any emergency service delivery system is to provide sufficient resources (personnel, apparatus, and equipment) to the scene of an incident in time to take effective action to minimize the impacts of the emergency. This need applies to fires, medical emergencies, and any other emergency situation to which the fire department responds.

As the actual or potential risk increases for any particular emergency, the need for higher numbers of personnel and apparatus also increases. With each type of incident and corresponding risk, specific critical tasks need to be accomplished. Each critical task requires the capability to accomplish it, i.e., trained personnel, appropriate apparatus, or specific equipment. From this list of critical tasks, a response model can be created setting the number of personnel and apparatus required to control the incident. This will differ from one department to another depending on resources available. Once the responses are set for the type of call and risk level, a validation of the response should be conducted. Each scenario is normally run multiple times, with a variety of fire companies, to validate and verify observations and times.

To further validate the analysis process, results are compared with records from actual working fires and similar incidents from previous years. Overall results are reviewed to determine if the actions taken within the early minutes of an incident resulted in a stop-loss or not, and if additional resources were required. The critical task analysis process demonstrates the rate in which the current deployment plan results in stopping loss a high percentage of time within initial critical time goals.

The following figures are provided as an example of critical tasking for various types of calls, both fire and non-fire related. The number of critical tasking lists will depend on the types of risk within the jurisdiction.

Figure 106: Sample Non-Structure Fire Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Primary Attack Line	2
Total	4

Figure 107: Sample Hazardous Materials Incident Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Primary Attack Line	2
Back-Up Line	2
Support Personnel	7
Total	13

Figure 108: Sample Motor Vehicle Collision with Entrapment Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Primary Attack Line	2
Extrication	3
Patient Care	2
Total	9

Figure 109: Example Structure Fire-Interior Attack Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Water Supply ²⁷	1
Primary Attack Line	2
Back-Up Line	2
Rapid Intervention Team (RIT)	2
Ventilation	2
Search and Rescue	2
Utilities/Exposures	2
Total	15

Figure 110: Example Emergency Medical Incident Critical Tasking

Task	Personnel
Ambulance Transport	2
First Responder	4
Total	6

Figure 111: Example EMS Incident-Cardiac Arrest Incident Critical Tasking

Task	Personnel
Direct Patient Care (Command)	1
CPR	2
ALS Patient Care	2
Transport (Driver)	1
Total	6

²⁷ Additional personnel required for rural water supply operations using water tenders for water supply.