ALACHUA COUNTY
BOARD OF COUNTY COMMISSIONERS

Jack Durrance Auditorium, Room 209
2nd Floor, County Administration Building
12 SE 1st Street, Gainesville

March 5, 2013 Special Meeting 130 PM

Call to Order

Adoption of Agenda

Items for Discussion

Presentations

1. Fire and Emergency Medical Services Performance Update December 2012

Amount: $0.00

Recommended Action: Adopt the Fire and Emergency Medical Services Performance Update December 2012

Commission General and Informal Discussion

Adjourn

March 5, 2013 Special Meeting 130 PM
Agenda Item #1

Title
Fire and Emergency Medical Services Performance Update December 2012

Amount
$0.00

Description
Request Adoption of the Fire and Emergency Medical Services Performance Update December 2012

Recommendation
Adopt the Fire and Emergency Medical Services Performance Update December 2012

Alternative(s)
Reject the update and direct staff

Requested By
Ed Bailey, Chief 352-384-3130

Originating Department
Fire Rescue

Attachment(s) Description
Fire and Emergency Medical Services Performance Update December 2012

Documents Requiring Action
none

Executive Summary
Emergency Services Consulting, Intl. (ESCI) prepared the 2004 Fire EMS Services Master Plan which was adopted by the Board in February 2006. The Fire Rescue Department requested and received funding during the FY12 budget process to have the Master Plan updated. The update includes elements of system performance, Fire Rescue Facilities and apparatus, organizational structure, staffing levels, and recommendations to maintain level of services (Fire and EMS).

Background
Emergency Services Consulting Intl., (ESCI) prepared the 2004 Fire EMS Services Master Plan which was subsequently adopted by the BoCC in February 2006. ESCI has updated the 2004 master Plan for current Fire Rescue delivery and staffing analysis and performance. the update also utilized population and service demand projections, community risk analysis, and projections regarding the three service class levels (urban, urban-cluster, and rural) to project future deployment of Fire and Emergency Medical Services and Department infrastructure needs.

Issues
The cost of the plan update was included in the FY12 Adopted Budget. Any costs associated with implementing the Fire and Emergency Medical Services Performance Update December 2012 will be submitted through the appropriate budget process.

Fiscal Recommendation

none

Fiscal Alternative(s)
none

Funding Sources
n/a

Account Code(s)
n/a

Attachment: Alachua County FL Final Report 01292013.pdf

Jack Durrance Auditorium, Room 209
2nd Floor, County Administration Building
12 SE 1st Street, Gainesville

Alachua County

Florida

Fire and Emergency Medical Services Performance Update

December 2012

Prepared by:
Phil Kouwe
Kent Greene
Elise Fisher

Emergency Services Consulting International

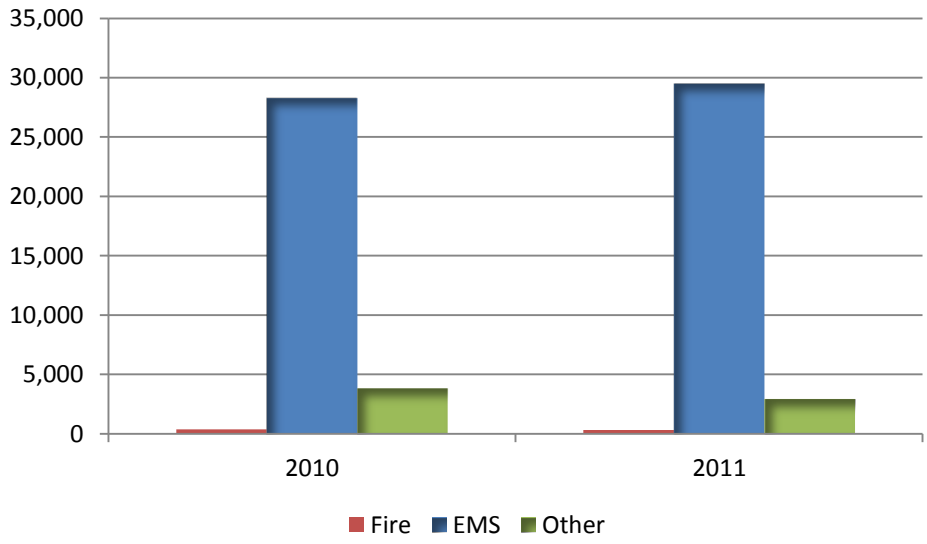
Table of Contents

Table of Figures

Executive Summary

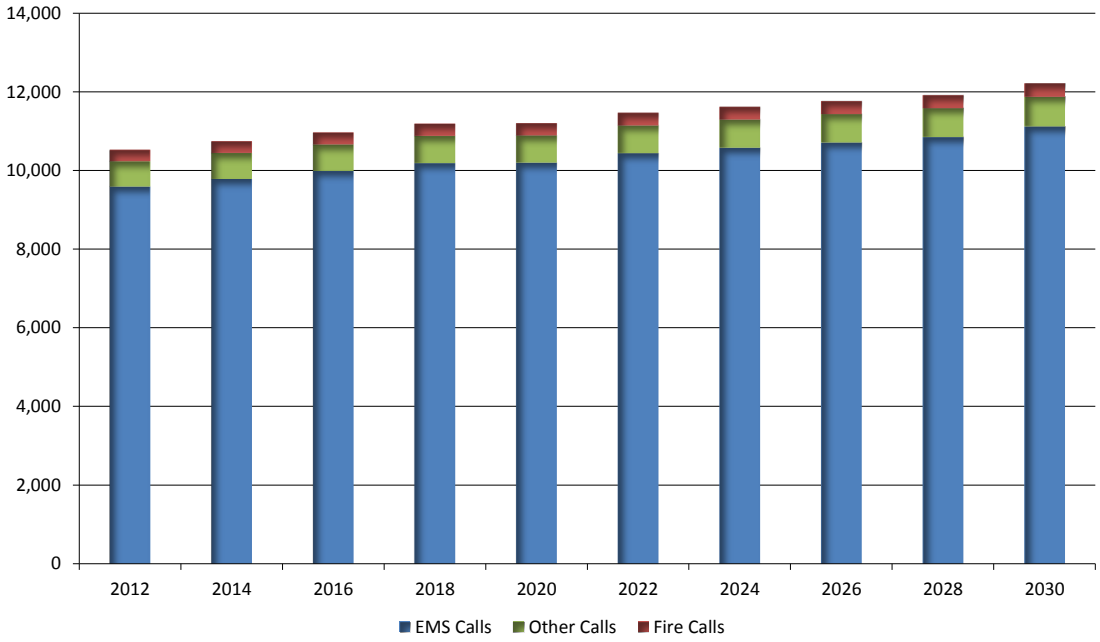
Alachua County Fire Rescue (ACFR) is a department of Alachua County, Florida. Fire and related services are provided directly by ACFR in the unincorporated area of Alachua County, as well as the municipalities of Alachua, Archer, Hawthorne, and Waldo. Fire and related services are provided indirectly in certain areas addressed through partnership contracts with other municipalities and independent volunteer fire companies within the County, and automatic "dual" response is provided in certain areas outlined in an agreement with the City of Gainesville. ACFR provides emergency medical services to the entire county, a population of 249,365 in an area of roughly 963 square miles.

As with any emergency services agency that is involved in the delivery of EMS, medical incidents comprise a vast majority of ACFR's overall workload as illustrated in the following chart.



The population within Alachua County has fluctuated; but, in general, it has grown slightly throughout the last decade. Data from the U.S. Census Bureau suggests that this growth will continue over the next two decades. Geographic population projections conducted by Traffic Analysis Zones (TAZ) were also useful in analyzing more specifically where the most significant growth is anticipated, an important factor in fire service deployment models. Figures were included in ESCI's analyses that demonstrate the geographical areas of the county in which the highest rates of population change are anticipated. **Planning should begin now to maintain the resources needed to meet the continuing demand for services throughout Alachua County.**

For purposes of this study, ESCI utilized population projections obtained through census and BEBR (Bureau of Economic and Business Research) data and multiplied these by a forecasted incident rate derived from historic incident per capita rates to identify workload potential through the year 2030. The results of the analysis are shown in the following figure.



In accordance with Alachua County Comprehensive Plan regarding level of service, ACFR has established first unit arrival response performance objectives as follows:

- Urban Service Area 4:00 at the 80th percentile
- Urban Cluster Area 6:00 at the 80th percentile
- Rural Areas 12:00 at the 80th percentile

ACFR operates from 15 facilities distributed across Alachua County. The intent of ESCI's distribution analysis is to determine not only how much *area* can be covered from the existing stations within a certain amount of time, but also how much of the historic service demand can be covered within that time. ACFR is currently meeting the urban level of service 14 percent of the time for fire (27 percent for EMS), urban cluster 45 percent of the time for fire (58 percent for EMS) and rural 79 percent of the time (91 percent for EMS) as presented in Figure 37.

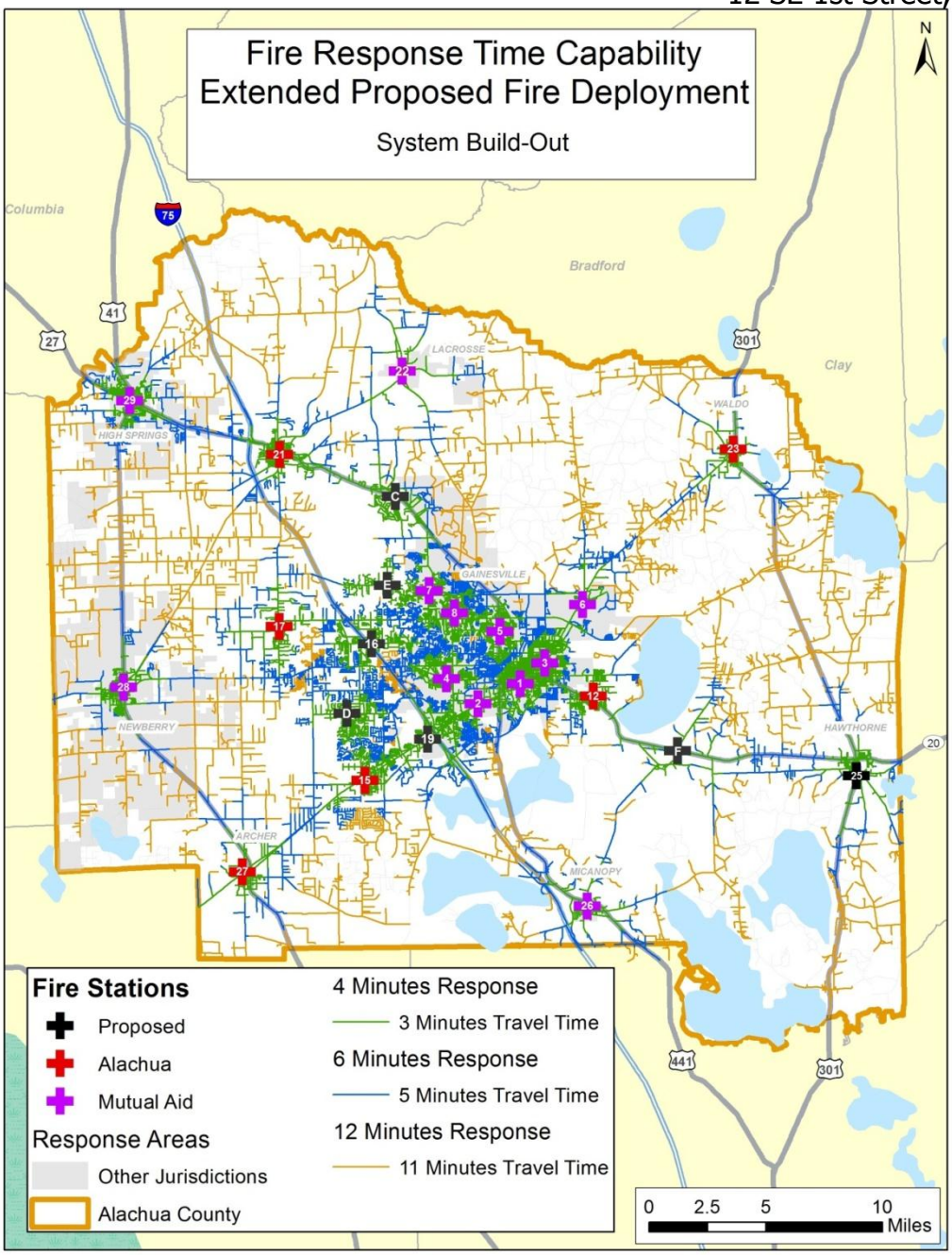
In order for ACFR to provide an urban level of service to the urban and urban cluster service delivery zones, a total of five new stations will be required: two relocations/replacements (16 and 19) and three additional stations (identified as Stations C, D, and E). Based on these recommendations, computer models suggest service demand coverage improvement in the urban, urban cluster and rural areas for both fire and EMS incidents. Actual performance will vary, since some calls occur concurrently and require a more distant response, while other calls may occur while apparatus is out of station or out of service and unavailable. Performance improvements related to call concurrency and unit availability are addressed in this report through various additions in resource quantity to accommodate areas of high demand.

In regard to the rural response zones, several scenarios were evaluated to determine optimum deployment. ESCI was asked to consider options in the event the LaCrosse fire station was eventually shut down. Continued operation of the LaCrosse location for rural responses in the north central section of the county is recommended. ESCI was also asked to evaluate the effectiveness of current Station 25 versus relocating a station into downtown Hawthorne. Coverage from the current station, while extensive, has a considerable amount of overlap with Station 12. In addition, the significant majority of Station 25's service demand is located within the city of Hawthorne. From a response time perspective, considerable improvement would be seen by locating there.

Although coverage to the service demand within the City of Hawthorne would be improved by relocating Station 25, there is also concern that such a move could result in a decreased overall level of service to the eastern side of the county if the stations operated by independent volunteer fire departments (Stations 30 and 31) were to close and cease operation at some point in the future. To this end, ESCI addressed this concern and analyzed potential station locations that could provide service to the areas currently serviced by Stations 30 and 31.

The following recommended extended deployment map shows the total distribution and travel time models for a full buildout scenario, as described below:

- A station is located in Hawthorne.
- A new station is located at Site 5 and Stations 30 and 31 are closed.
- The LaCrosse station remains open.
- Additional Stations C, D, and E and relocations of Stations 16 and 19 are completed as previously recommended.



This would result in the following modeled response time coverage for fire incidents and is the recommended deployment model.

	Urban	Urban Cluster	Rural
	4-Minute	**6-Minute**	**12-Minute**
Proposed	68.5%	93.0%	99.7%

The following figure illustrates the proposed deployment of rescues and includes four new rescues (two relocation and four additional units). A map of this proposed coverage is found in Figure 56 on page 79 of the report.

Rescue	Action
Rescue 20	Relocate to Station 21
Rescue 25	Relocate to Hawthorne
New	Station 29 – High Springs
New	Station 28 – Newberry
New	Station 26 – Micanopy
New	Station D

This would result in the following modeled response time coverage for rescue incidents and is the recommended deployment model.

	Urban	Urban Cluster	Rural
	4-Minute	6-Minute	12-Minute
Proposed	51.3%	84.2%	99.0%

While the relocation of apparatus or stations from one location to another will not require additional staffing, new stations or units added to the system will. In addition, ESCI conducted an analysis on how long rural engines had to wait for additional resources in order to assemble sufficient personnel to make a safe interior fire attack. OSHA and EPA rules, as well as Florida Statute 633, all require that at least four firefighters be available prior to entry into an area where the atmosphere is deemed immediately hazardous to life or health (IDLH). This includes structure fires and other situations where use of self-contained breathing apparatus is required. This is commonly referred to as the OSHA "Two-In, Two-Out" rule.

Since several of the rural engines are staffed with only two firefighters, they must wait for arrival of a second unit prior to initiating fire attack or entry into an IDLH situation. There are many areas of the county where only one engine can arrive within 12 minutes. Based on the staffing of the rural engines, more than eight minutes frequently passed before a second fire unit arrived on scene, thereby reducing the department's ability to effectively mitigate fire incidents where an interior attack could reduce damage and loss. For this reason, ESCI is recommending that those stations that experience the most

extended wait times for fire incidents increase unit staffing to four personnel. The affected stations would include 23, 25, and 27.

The figure below summarizes the staffing requirements of the facility and apparatus recommendations noted previously. Those rows in bold indicate where staffing is recommended to be increased to a minimum of four personnel on the engine.

Station	Primary Apparatus	DC	Lieutenant	Driver/ Operator	Firefighter	Total
Rescue 2	R	0	1	0	1	2
Rescue 3	R	0	1	0	1	2
Station 8	R	0	1	0	1	2
Station 9	R	0	1	0	1	2
Station 10	R, R	0	2	0	2	4
Station 12	E, DC	1	1	1	1	4
Station 15	E, R	0	2	1	2	5
Station 16	Q, S, R, DC	1	3	2	3	9
Station 17	E, R	0	2	1	2	5
Station 19	E, R	0	2	1	2	5
Station 21	E, R	1	2	1	2	6
Station 23	**E**	**0**	**1**	**1**	**2**	**4**
Station 25	**E, R**	**0**	**2**	**1**	**3**	**6**
Station 26*	R	0	1	0	1	2
Station 27	**E**	**0**	**1**	**1**	**2**	**4**
Station 28*	R	0	1	0	1	2
Station 29*	R	0	1	0	1	2
New Station C	E	0	1	1	1	3
New Station D	E, R	0	2	1	2	5
New Station E	E	0	1	1	1	3
New Station F (Site 5)	E	0	1	1	2	4
Shift Total		**3**	**30**	**14**	**34**	**81**
Total Deployment		**9**	**90**	**42**	**102**	**243**

*New rescue unit within current system.

The facility, apparatus and staffing recommendations result in an increase of 74 personnel. While the figure above assumes that the organization structure will remain as it is today, there is room for improvement that will result in a decreased span of control and more effective operation by realigning the classifications of certain positions to generate equality across the ranks. Currently, suppression Lieutenants and Rescue Lieutenants, although seemingly equal, have different pay scales and level of supervisory responsibility. Modifying the rank structure to implement Station Captains would allow the system to equalize the responsibilities of the Lieutenant ranks across both disciplines. The following figure outlines a recommended staffing deployment that implements the new rank structure.

Station	Primary Apparatus	DC	Captain	Lieutenant	Driver Operator	Firefighter	Total
Rescue 2	R		1	2	3	0	6
Rescue 3	R		1	2	3	0	6
Station 8	R		1	2	3	0	6
Station 9	R		1	2	3	0	6
Station 10	R, R		1	5	6	0	12
Station 12	E, DC	3	1	2	3	3	12
Station 15	E, R		1	5	6	3	15
Station 16	Q, S, R, DC	3	1	8	9	6	27
Station 17	E, R		1	5	6	3	15
Station 19	E, R		1	5	6	3	15
Station 21	Q, R		1	5	6	6	18
Station 23	E		1	2	6	6	15
Station 25	E, R		1	5	6	6	18
Station 26	R		1	2	3	0	6
Station 27	E		1	2	3	6	12
Station 28	R		1	2	3	0	6
Station 29	R		1	2	3	0	6
New Station C	E, R		1	2	3	3	9
New Station D	E, R		1	5	3	3	12
New Station E	E		1	2	3	3	9
New Station F (site 5)	E		1	2	3	3	9
Total		**6**	**21**	**69**	**90**	**54**	**240**

This deployment recommendation would not change the total overall staffing of the previously presented staffing deployment plan.

ESCI would like to thank the elected and appointed officials of Alachua County as well as the officers and staff of Alachua County Fire Rescue for their tireless efforts in bringing this project to fruition. ESCI would also like to thank the various individuals and external organizations for their input, opinions, and candid conversations throughout this process. It is ESCI's sincere hope is that the information contained in this report is utilized to its fullest extent and that the emergency services provided to the citizens of Alachua County are improved by its implementation.

Current Fire Rescue Delivery Analysis

Emergency Services Consulting International (ESCI) was engaged by Alachua County, Florida, to complete an update to the Fire and EMS Master Plan originally performed by ESCI in 2004. The original document, along with subsequent revisions and updated data and information, was used to evaluate the current deployment of Alachua County Fire and Rescue (ACFR). This document serves as the formal report of the master plan update.

System Overview

Alachua County Fire Rescue is a department of Alachua County, Florida, which is a governmental entity, formed under the laws of the State of Florida and granted authority to levy taxes. The Department's jurisdiction encompasses the entire County for emergency medical services. Fire and related services are provided directly by ACFR in the unincorporated area of Alachua County, as well as the municipalities of Alachua, Archer, Hawthorne, and Waldo. Fire and related services are provided indirectly in certain areas addressed through partnership contracts with other municipalities and independent volunteer fire companies within the County, and automatic "dual" response is provided in certain areas outlined in an agreement with the City of Gainesville. That agreement generally provides for the closest services to respond to specified areas within the City of Gainesville and contracted areas of the County.

ACFR provides emergency medical services to a population of 249,365 in an area of roughly 963 square miles. When those specific geographic areas to which ACFR provides direct, first-due fire response are considered, ACFR provides direct fire protection services to an area of roughly 342 square miles. These services are provided from 15 facilities. The Department also maintains support facilities.

There are 227 full-time individuals involved in delivering these services to the jurisdiction, including operational response personnel, administrative and management personnel, and civilian support employees. Primary staffing coverage for all emergency response is provided by on-duty career firefighters working 24-hour rotating shifts.

In addition to the emergency medical transport service and depending upon the partnership agreements with others, the department provides a variety of services including fire suppression, victim rescue, first-responder emergency medical response, operations-level hazardous materials response and code enforcement.

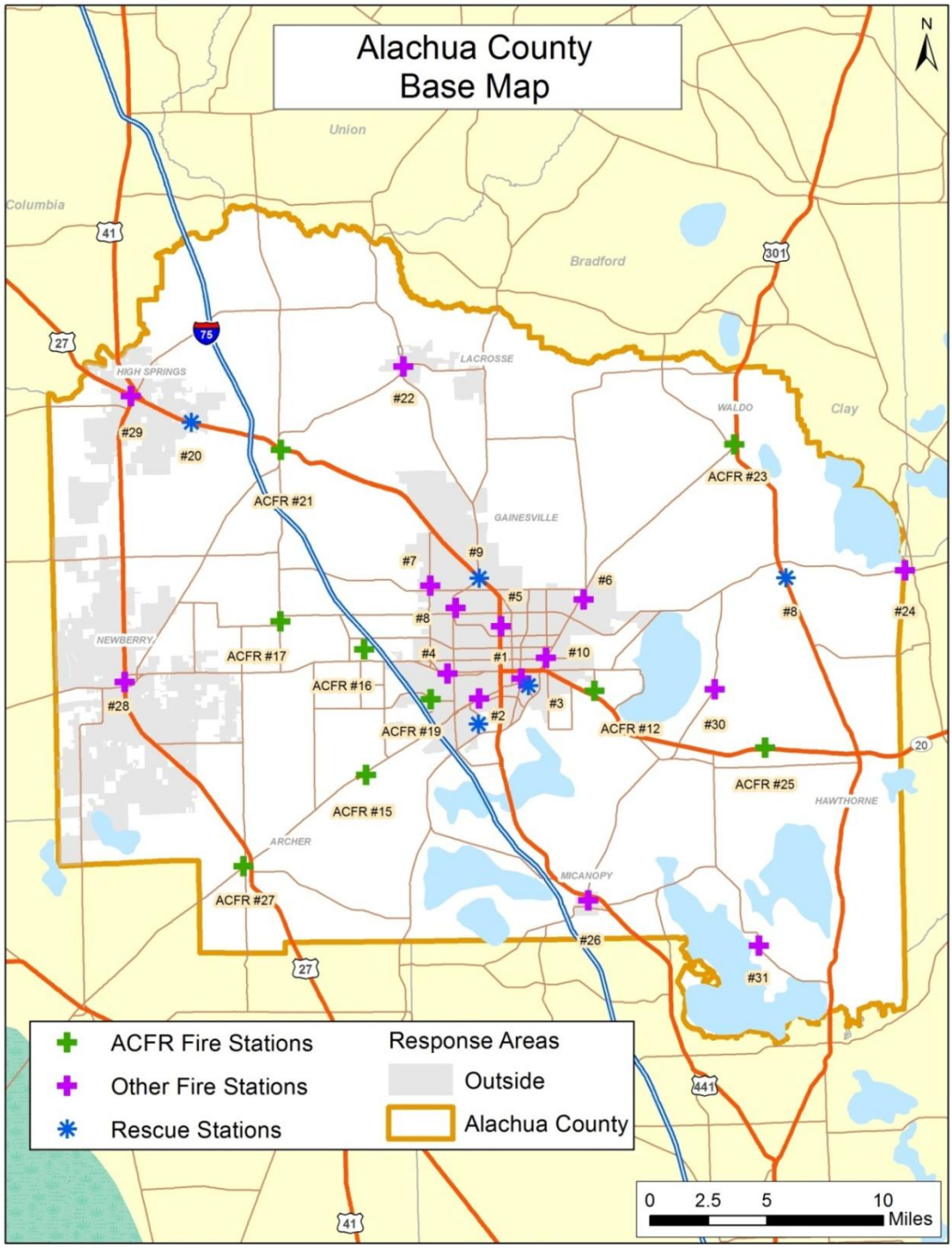
Alachua County is a political subdivision formed and established within the laws of the State of Florida. Under these laws, the County is an authorized taxing jurisdiction with the legal right to levy taxes for the purposes of providing fire and emergency services protection. The County's fire/rescue protection system is established within the County's charter and further defined in County ordinance.

Alachua County has operated under a Commission-Manager form of government since 1927. The County Commission is responsible for setting the County's budget, enacting new laws, governing land use, and appointing the County Manager and County Attorney. The Commission is comprised of five commissioners. Commissioners must reside within the district from which they are elected; however, all eligible county voters may vote for candidates to fill all five commissioner positions. The County Manager, who is appointed by the County Commission, is responsible for the operations and management of all departments of County government except those controlled by other constitutional officers. The County Manager implements the policy directives of the County Commission.

The Chief of Fire Rescue is appointed and supervised by the County Manager. The Charter defines the responsibilities and duties of the Chief of Fire Rescue and authority is delineated by ordinance.

The following figure shows Alachua County and the location of all fire and EMS facilities within its borders. The facilities operated directly by ACFR for both fire and EMS services are shown in green color and the facilities operated by ACFR for EMS response only are shown in blue. Facilities operated by other cities or independent volunteer fire departments are also shown on this map.

Figure 1: General Service Area



Capital Assets and Resources

In order for any fire rescue system to be effective, physical resources must be sufficient to handle the current and expected workload and be adequately distributed throughout the primary response area so

as to affect the quickest response possible to the greatest number of incidents. Additionally, the apparatus or vehicles used in service delivery must be reliable and sufficient in number to accommodate the anticipated workload. This section of the report will evaluate the facilities and apparatus currently in use by the department. Distribution of those resources throughout the response area will be analyzed in the next section of this report.

Facilities

Inadequate facilities for housing personnel and apparatus detract from an organization's mission. Limited space can significantly impact the available options for resource assignment, hinder the ability to maintain a well-trained workforce, and may affect member and employee morale. The primary functions that take place within the station should provide adequate and efficient space for all functions. Some examples include:

- Housing and cleaning of apparatus and equipment
- Administrative office duties where necessary
- Personnel training
- Residential living that is gender compatible for on-duty members when necessary
- Operations that include enough room for community groups and parking

While this list may seem elementary, the lack of dedicated space compromises the ability of the facility to support these functions and can detract from its primary purpose. ESCI did not conduct an in-depth engineering or architectural review of the current ACFR stations but did note any changes to facilities that have occurred since the completion of the 2004 Master Plan. The following is a summary of the 15 facilities currently operated by ACFR.

Figure 2: Facilities Summary

Station	Area	Address	Ownership
Rescue 2	**Gainesville**	**3600 SW 23 Street, Gainesville**	**Private**
Rescue 3	Gainesville	800 NE Waldo Road, Gainesville	City of Gainesville
Station 8	Unincorporated Area	5715 NE US 301, Hawthorne	ACFR
Station 9	Gainesville	5901 NW 34 Street Extension, Gainesville	ACFR
Station 10	**Gainesville**	**930 SE 5th Street, Gainesville**	**ACFR**
Station 12	Unincorporated Area	1320 SE 43 Street, Gainesville	ACFR
Station 15	**Unincorporated Area**	**7000 SW 88 Street, Gainesville**	**ACFR**
Station 16	Unincorporated Area	1600 Ft. Clarke Boulevard, Gainesville	ACFR
Station 17	**Unincorporated Area**	**3509 NW 143 Street, Gainesville**	**ACFR**
Station 19	Gainesville	2000 SW 43 Street, Gainesville	ACFR
Station 20	High Springs/Alachua	16935 NW US 441, High Springs	ACFR
Station 21	Alachua	15040 NW US 441, Alachua	City of Alachua
Station 23	**Waldo**	**14380 Earle Street, Waldo**	**ACFR**
Station 25	**Unincorporated Area**	**5606 SE 156 Street, Hawthorne**	**ACFR**
Station 27	Archer	17128 SW Archer Road, Gainesville	City of Archer

Those stations in bold within the figure above are stations that have seen either substantial change or complete replacement since the 2004 Master Plan. A more detailed evaluation of those facilities is provided below.

Rescue 2

No significant changes since the 2004 Master Plan other than the facility is now within the City of Gainesville. The fact that this is a privately owned apartment used as an emergency services facility may be a zoning issue. This facility is small and does not provide the basic requirements of a fire rescue facility. The facility does not meet current standards of a modern fire rescue facility.

Station 10
This facility was constructed since the 2004 Master Plan and houses two rescues with four personnel. The facility is adjacent to ACFR's administrative offices.

Station 15
This facility has had a structural addition since the 2004 Master Plan and now houses an engine and rescue as well as a cross-staffed brush unit and tanker.

Station 17
This facility was replaced since the 2004 Master Plan. The new location is just north of the previous and the new station resembles the Station 10 design. The station houses an engine and rescue as well as a cross-staffed brush unit and tanker.

Station 23

The City of Waldo turned over fire protection responsibilities to ACFR. ACFR now occupies the previous WFD station and staffs with ACFR personnel. This is an old structure that does not meet current standards nor comply with essential space needs of a fire rescue facility.

Station 25

This facility is a mobile home was intended to be temporary after the contract for ACFR to provide fire protection to Hawthorne was eliminated. Vehicles are not protected other than in open sheds and storage space is limited. Personnel have occupied this station for the last several years. The station currently houses one engine, one rescue, and one brush unit. The building does not meet current standards nor comply with essential space needs of a fire rescue facility.

Apparatus

In total, ACFR operates 32 primary response apparatus, not including command and support vehicles, as detailed in the following figure.

Figure 3: Heavy Operations Apparatus Complement

Apparatus Type	Primary	Reserve
Engine	8	3
Rescue/Ambulance	12	5
Quint	1	0
Heavy Rescue	1	0
Brush	7	0
Tanker	3	0
Total	**32**	**8**

Since the purpose of these apparatus is to ensure that personnel have the ability to respond to incident scenes, it is important that the vehicles are well-maintained and in good overall condition. One factor in

determining overall condition is age. Of the 40 primary response apparatus in the ACFR fleet, the average age was calculated to be 6.6 years as detailed below.

Figure 4: Average Apparatus Age by Type

Apparatus Type	Average Age
Engine	8.4
Rescue	3.6
Quint	3.0
Brush	10.6
Tanker	6.7
Overall Average	**6.6**

The front line vehicles are generally in good to excellent condition and no critical issues were identified as currently existing. Unfortunately, no piece of mechanical equipment can be expected to last forever. As a vehicle ages, repairs tend to become more frequent, parts are more difficult to obtain, and downtime for repair increases. Given the emergency mission that is so critical to the community, downtime is one of the most frequently identified reasons for apparatus replacement.

Because of the expense of fire apparatus, most communities develop replacement plans. To enable such planning, communities often turn to the accepted practice of establishing a life cycle for the apparatus that results in an anticipated replacement date for each vehicle. The communities then set aside incremental funds during the life of the vehicle so cash is available when needed. This decision is influenced by many factors:

- Actual hours of use of any specific piece of equipment can vary significantly in comparison to other similar apparatus, even within the same fire department. Attempts to shuffle like apparatus among busy and slower fire stations to distribute hours of use more evenly have proven difficult. Frequent changes in apparatus create familiarity and training challenges. In addition, certain response areas may have equipment and tool requirements that are not common to others.
- Actual hours of use, even if evenly distributed, do not necessarily equate to intensity of use. For example, a pumper making mostly emergency medical responses will not age as rapidly as a pumper with a high volume of working fire incidents that require intense use of the pump or hydraulics. However, for every hour you idle an engine, it is equivalent to driving 33 to 35 miles of wear and tear. Likewise, road mileage can also be a poor indicator of deterioration and wear.
- Technology, which is increasingly a factor in fire equipment design, becomes outdated even if the apparatus wear is not as significant. In some departments, crews at different fire stations deal with widely different technology on pumpers simply because of the age of the equipment.

These differences can be significant, affecting everything from safety and lighting systems to automated digital pump pressure controls and injection foam generation.

NFPA 1901: Standard for Automotive Fire Apparatus is a nationally recognized standard for the design, maintenance, and operation of fire suppression apparatus.[1] The issue of replacement cycles for various types of apparatus has been discussed for many years in the committee that develops the standards. In developing its latest edition, the NFPA (National Fire Protection Association) Fire Department Apparatus Committee called for a life cycle of 15 years for front-line service and five years in reserve status for engines and 15 years in front-line service and five years in reserve status for ladder trucks.

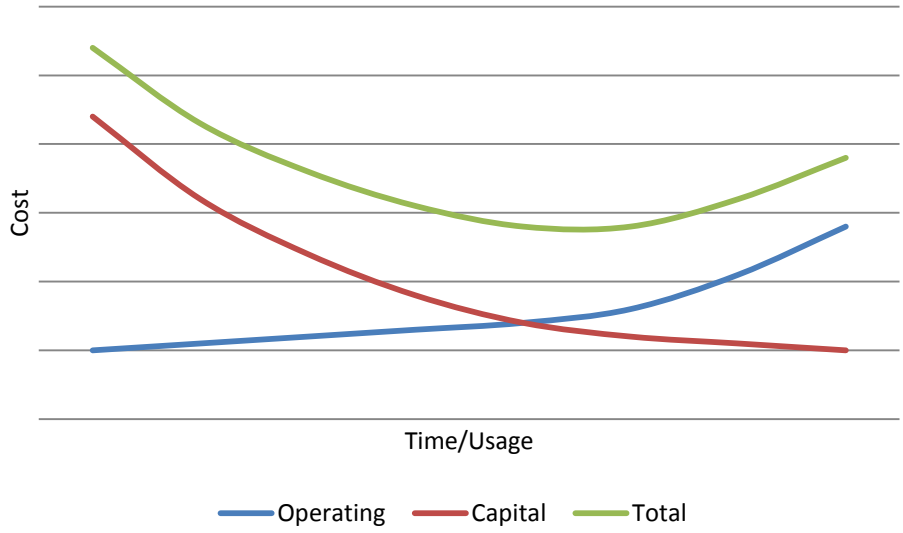
Does this mean that a fire engine cannot be effective as a front-line pumper beyond 15 years? A visit at many departments in the United States might prove otherwise. Small, volunteer fire departments with only a hundred or so calls per year often get up to 25 years from a pumper, though the technology is admittedly not up to date. Likewise, busy fire stations in some urban communities move their engines out of front-line status in as little as eight years.

The reality is that it may be best to establish a life cycle for use in the development of replacement funding for various types of apparatus; yet, apply a different method (such as a maintenance and performance review) for actually determining the replacement date in real life, thereby achieving greater cost efficiency when possible.

A conceptual model that may be used when a replacement cycle is considered is the *Economic Theory of Vehicle Replacement*. The theory states that, as a vehicle ages, the cost of capital diminishes and its operating cost increases. The combination of these two costs produces a total cost curve. The model suggests the optimal time to replace any piece of apparatus is when the operating cost begins to exceed the capital costs. This optimal time may not be a fixed point, but rather a range of time. The flat spot at the bottom of the total curve in the following figure represents the replacement window.

[1] NFPA 1901: *Standard for Automotive Fire Apparatus*, 2009 edition.

Figure 5: Economic Theory of Vehicle Replacement



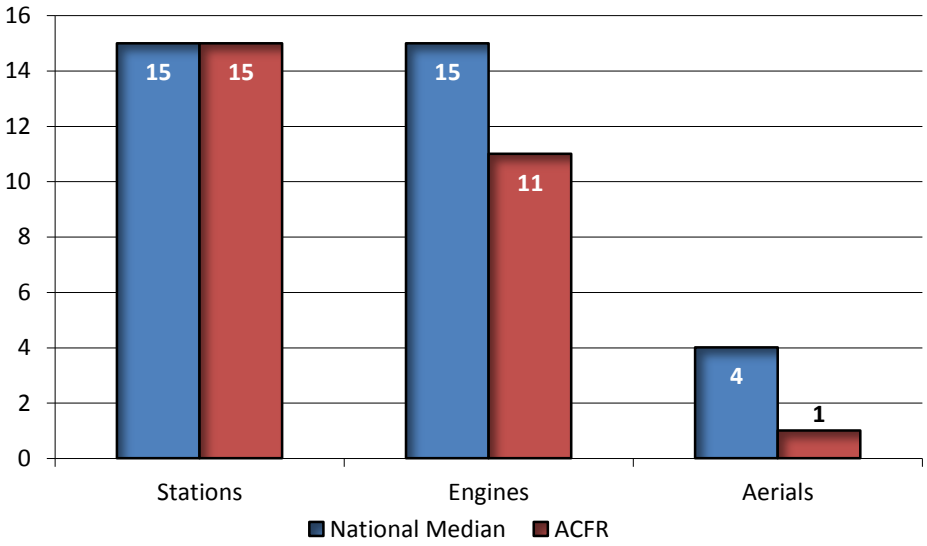
Shortening the replacement cycle to this window allows an apparatus to be replaced at optimal savings to the department. If the agency does not routinely replace equipment in a timely manner, the overall reduction in replacement spending can result in a quick increase of maintenance and repair expenditures. Officials who assume that deferring replacement purchases is a good tactic for balancing the budget need to understand two possible outcomes that may happen because of that decision:

1) Costs are transferred from the capital budget to the operating budget.
2) Such deferral may increase overall fleet costs.

Regardless of its net effect on current apparatus costs, the deferral of replacement purchases unquestionably increases future replacement spending need. As recommended in the 2004 Master Plan, **ACFR has implemented a fully funded apparatus replacement plan**. The department contributes funds equal to each vehicle's replacement cost divided by its expected life in order to have funds available when time for replacement. The department currently maintains a replacement cycle of 12 years for engines and seven years for rescues. Other vehicles are replaced on various cycles based on mileage, age, maintenance issues, and other elements.

Although raw numbers may give the reader an idea of what resources are available to ACFR, it is also important to compare those resources against other agencies of similar size. The following figure provides a comparison of ACFR's physical resources against the national median of stations, engines, and aerial apparatus.

Figure 6: Regional Comparison of Capital Resources



ACFR compares favorably to the national average for similarly sized agencies in the number of stations and engines while lagging behind in the number of engines and has far less aerial apparatus. It should be noted, however, that the data used to generate these benchmarks do not differentiate between geographical areas covered and tend to group departments based solely on population. In other words, if the entire population of Alachua County were contained within a more dense area, buildings would tend to be taller and require more aerial apparatus. As it is, the population of Alachua County is well distributed across a large geographical area that does not require such a specialized piece of apparatus.

Staffing

In simplest terms, staffing is defined "as to supply with a staff or with workers."[2] In broader terms, it involves the decisions and activities connected with selecting and training individuals for specific job functions and charging them with job responsibilities. These individuals provide the staff for an organization; in this case, ACFR.

Administrative and Support Staff

One of the primary responsibilities of a fire department's administrative and support staff is to ensure that the operational entities have the ability and means to accomplish their duties on the emergency incident. Efficient and effective administration and support are critical to the department's success. Without sufficient oversight, planning, documentation, training, and maintenance, the operational

[2] Merriam-Webster Online Dictionary, 2010.

entities of a fire department may fail any operational test. Additionally, like any other part of a fire department, administration and support require appropriate resources to function properly.

Analyzing the administrative and support positions of a fire department facilitates an understanding of the relative number of resources committed to this important function. The appropriate balance of the administrative and support components to the operational component is critical to the success of a department's mission and responsibilities.

The following figures outline the corporate, administrative, and/or support organizational structure and complement of the fire department.

Figure 7: Administrative and Support Complement

Position	Number
Fire Chief	1
Deputy Chief	1
Assistant Chief	2
Assistant Director	1
Logistics and Fire/EMS Contracts	3
Health and Safety	1
Medical Director	1
Training Captain	3
Life Safety & Internal Affairs	3
Senior Staff Assistant	3
Total	**19**

Although there is no set guide to determine the appropriate ratio of administrative and support staff to total personnel, through ESCI's experience with emergency services agencies it is common to find ratios in the range of 10 to 15 percent for those agencies not providing transport EMS services. Those agencies that do provide transport EMS, however, tend to have higher ratios of administrative and support staff to total personnel. ACFR's ratio of administrative and support staff to total personnel equals 9.6 percent.

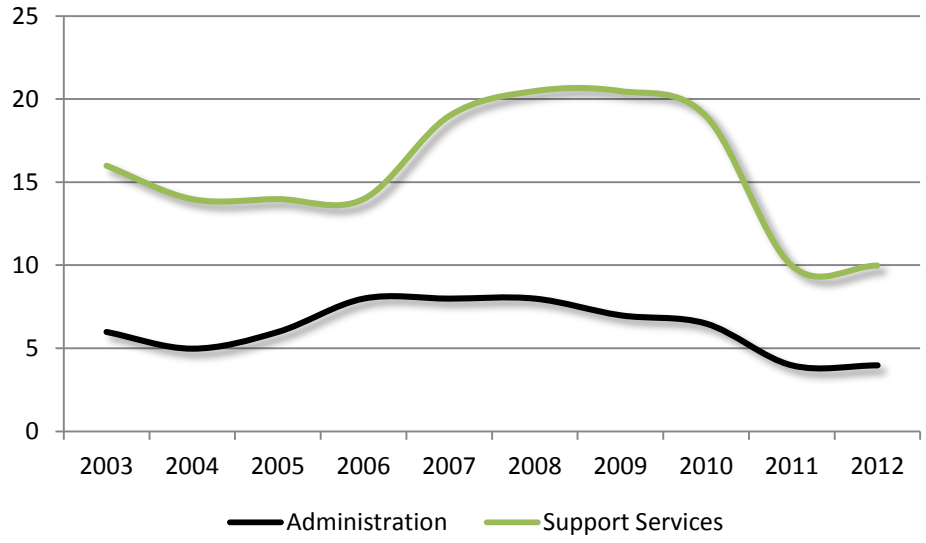
It should be noted that many fire departments are not involved in emergency management, communications, EMS billing or GIS/Support activities. These positions within ACFR account for 21 FTEs (full-time equivalents) within the current system as illustrated in the following figure.

Figure 8: Ancillary Support Personnel

Position	Number
Director of Emergency Management	1
Bureau Chief	1
Assistant Director of EM	1
EM Program Coordinator	1
GIS Analyst	1
GIS Specialist	2
GIS Technician	1
General Accountant	3
Revenue and Collections Staff	6
Information Technology Staff	2
Staff Assistant	2
Total	**21**

As stated above, these ratios are not included in any industry standard or benchmark, but it has been ESCI's experience that inadequate administrative and support personnel results in operational inefficiencies within organizations. Over the past ten years, ACFR has seen a substantial change in the number of administrative and support personnel. The figure below illustrates the volatility of these positions.

Figure 9: Administrative and Support Staff Historical Trend



Based on data provided by the department, administrative (management) positions have decreased 33.3 percent while support (clerical and other support) positions have decreased 37.5 percent over the last decade. These decreases in administrative and support services, however, were accompanied by an increase in operational staffing of 20.7 percent for rescue and 24.0 percent for suppression. Similarly, call volumes have increased 44.6 percent over the same period.

Operations Staff

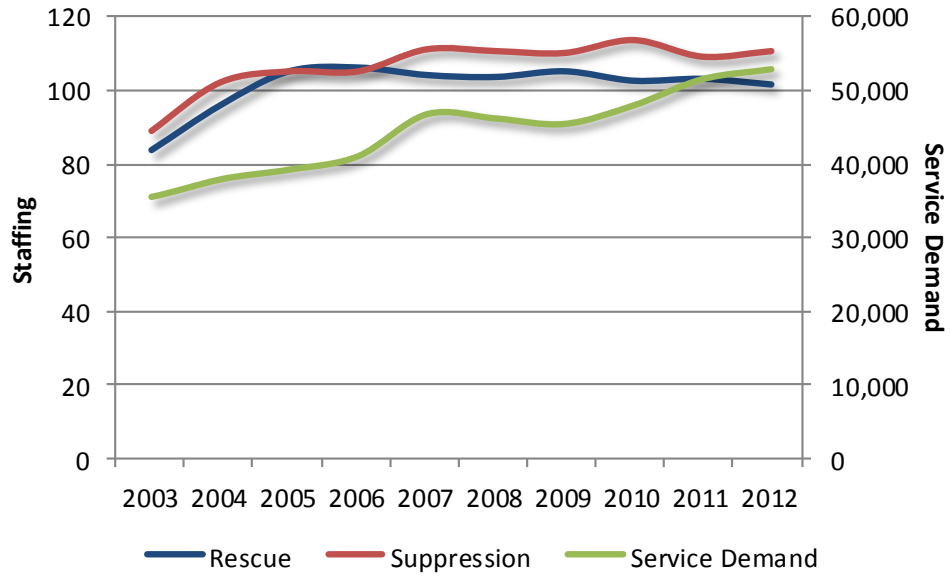
Since the 2004 Master Plan, operational staffing for ACFR has increased relative to service demand and assumption of responsibilities in new areas of the County (such as Archer, Hawthorne and Waldo). The following figure summarizes the positions on the current roster of operational personnel

Figure 10: Operations Complement

Position	Number
District Chief	6
Suppression Lieutenant	33
Rescue Lieutenant	45
Driver/Operator	35
Firefighter	69
Total	**188**

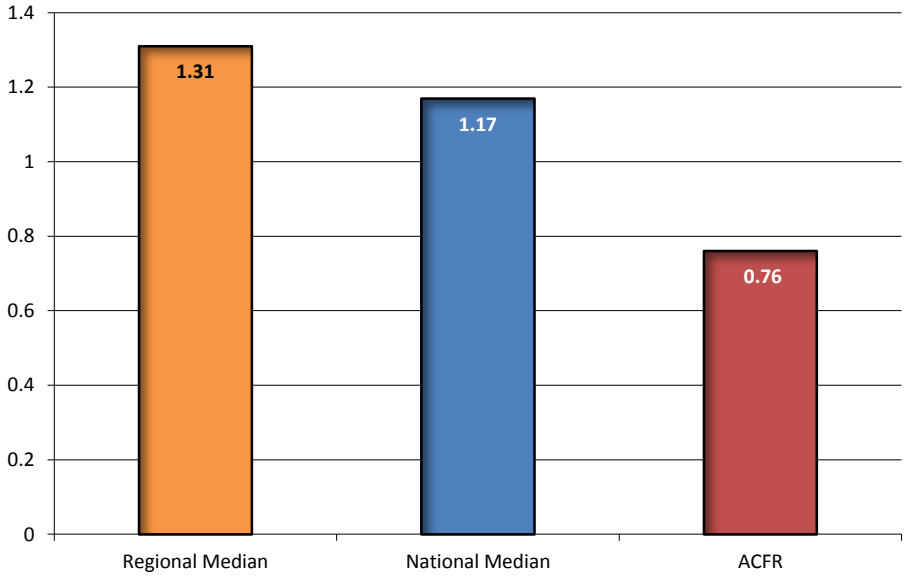
As stated previously, operational personnel have increased over the last decade by 20.7 percent for rescue personnel and 24.0 percent for suppression personnel in response to service demand increases of 44.6 percent. The following figure compares the increases in fire and rescue personnel to the increase of service demand over the last decade.

Figure 11: Operations Staff Historical Trend



Although raw number of personnel and service demand can tell one story of how a department is staffed, another useful method of determining appropriateness of staffing levels is to compare against regional and national medians. The following figure compares ACFR's operational staffing against similar departments serving similar populations within the Southeastern United States as well as across the nation.

Figure 12: Comparison of Career Firefighters per 1,000 Population[3]



Although it appears as though ACFR is understaffed, the statistics provided by the NFPA do not consider the geographic distribution of personnel. ACFR's population is distributed across a large area and has a multitude of population densities to protect. A more accurate accounting of the adequacy of personnel will be discussed through the concentration analysis in a later section of this report.

Span of Control, Staff Allocation and Distribution of Fire and EMS Staff

In communities across North America, the number of fire calls has declined over the past decade. Yet as the frequency of fires diminishes, in part due to stricter fire codes and safety education, the workload of fire departments has risen sharply; medical calls, hazardous materials calls, and every sort of household emergency is now addressed by fire departments. Therefore, as the frequency of fires has diminished, the need for a ready group of personnel has increased.

Although modern codes tend to make fires in newer structures more infrequent, today's energy-efficient construction (designed to hold heat during the winter) also tends to confine the heat of a hostile fire. In addition, research has shown that modern furnishings generally burn hotter (due to synthetics), and roofs collapse sooner because prefabricated roof trusses separate easily after a very short exposure to flame. In the 1970s, scientists at the National Institute of Standards and Technology

[3] Karter, Michael J., Steine, Gary P. *U.S. Fire Department Profile Through 2010*. National Fire Protection Association: Fire Analysis and Research Division. October 2011.

found that after a fire breaks out, building occupants had about 17 minutes to escape before being overcome by heat and smoke. Today that estimate is three minutes.[4] The necessity of firefighters arriving on the scene of a fire in the shortest span of time is more critical now than ever.

Along with a quick response, a robust, well-trained, and appropriately equipped compliment of emergency workers is needed to successfully mitigate structural fires. Too few firefighters at an emergency scene decreases effectiveness and increases the risk of injury to firefighters and civilians alike.

While many requests for emergency assistance are comparatively low risk requiring few personnel, the number emergency workers needed to mitigate a structure fire is greater. A house fire involving just one room and its contents is considered a moderate risk incident in the industry.

ACFR operates from 15 fixed facilities across Alachua County, each with career staffing. Six stations house only rescue personnel, three stations house only fire personnel, and six stations house both fire and rescue personnel. This distribution of resources is summarized in the figure below.

Figure 13: Minimum Staff Deployment

Station	Apparatus	Minimum Staffing
Rescue 2	Rescue	2
Rescue 3	Rescue	2
Station 8	Rescue	2
	Spare Engine	0
Station 9	Rescue	2
	Spare Rescue	0
Station 10	Rescue	2
	Rescue	2
Station 12	Engine	3
	District Chief	1
	Spare Rescue	0
	Brush Unit	Cross
	Tanker	Cross
Station 15	Engine	3
	Rescue	2
	Tanker	Cross

[4] National Institute of Standards and Technology, *Performance of Home Smoke Alarms, Analysis of the Response of Several Available Technologies in Residential Fire Settings,* Bukowski, Richard, et al.

Station	Apparatus	Minimum Staffing
	Brush Unit	Cross
Station 16	Quint	3
	Rescue	2
	Heavy Rescue	3
	District Chief	1
Station 17	Engine	3
	Rescue	2
	Spare Rescue	0
	Brush Unit	Cross
	Spare Rescue	0
	Tanker	Cross
Station 19	Engine	3
	Rescue	2
Station 20	Rescue	2
Station 21	Engine	3
	Spare Engine	0
	Brush Unit	Cross
	Spare Rescue	0
Station 23	Engine	2
	Brush Unit	Cross
Station 25	Engine	2
	Rescue	2
	Brush Unit	Cross
Station 27	Engine	2
	Spare Engine	0
	Brush Unit	Cross

The department's total minimum staffing is 53 including the district chiefs. This equates to a district chief supervising a total of 25 to 26 personnel each. However, each shift has 10 suppression lieutenants and 12 rescue lieutenants at the rescue stations. Although, in theory each lieutenant is of equal rank, only suppression lieutenants are tasked with station supervision.

Each lieutenant mentioned (suppression and rescue) is, on paper, considered of equal rank; this is not the case in regard to duties, responsibilities, or pay. Based on the Collective Bargaining Agreement (CBA) between Alachua County and IAFF Local 3852, suppression lieutenants are listed as a Grade 20 and have specific duties and responsibilities related to supervision of their respective stations and personnel.

Rescue lieutenants, however, are classified as a Grade 17 and have differing supervisory duties and/or responsibilities than their suppression counterparts.

Based on interviews with department personnel, this difference between suppression and rescue lieutenants has caused somewhat of a divide between these two departmental functions. The department is currently evaluating the existing organizational structure and considering reclassifying rescue lieutenants at the same grade as suppression lieutenants. This would also reduce the span of control of the district chiefs to a more manageable level.

Staffing Performance

Although a majority of ACFR's incidents are medical in nature (as will be discussed later in this report), it is necessary for the department to produce a sufficient number of personnel for fire suppression activities, particularly structure fires. The Center for Public Safety Excellence (CPSE), the organization that accredits fire departments internationally, recommends that departments conduct a tabletop critical tasking analysis to determine personnel needs for various types of incidents. The following figure illustrates an example of critical tasking based on four major risk categories.

Figure 14: Example Firefighting Personnel Needed Based on Level of Risk (Critical Tasking)[5]

Critical Task	Maximum Risk	High Risk	Moderate Risk	Low Risk
Attack line	4 (16-18*)	4	2	2
Search and rescue	4	2	2	
Ventilation	4	2	2	
Back-up line	2	3	3	
Pump operator	1	1	1	1
Water supply	1	1	1	
Utilities	1	1	1	
Command/safety	2	2	1	1#
Forcible entry	*			
Accountability	1			
Salvage	*			
Overhaul	*			
Communication	1*			
Chief's aide	1	1		
Operations officer	1			
Administration	*			
Logistics	1			
Planning		1*		
Staging		1*		
Rehabilitation	1			
Sector officers	1 (4*)			
High-rise evacuation	10-30*			
Stairwell support	10*			
Relief	*			
Investigation	*			
Totals	**25-65***	**17**	**13**	**3-4**

 # Can often be handled by the first due officer

** At maximum and high-risk fires, additional personnel may be needed*

Based on the preceding example, a typical single-family detached dwelling structure fire would require at least 13 personnel (Moderate Risk). Although ACFR maintains a minimum level of available suppression and rescue personnel, it should be understood that at any given time a large number of personnel are otherwise occupied with emergency responses, particularly EMS responses. ESCI conducted an analysis of ACFR's National Fire Incident Reporting System (NFIRS) data to determine how the department was actually producing its own personnel for structure fires. The results are presented in the following table.

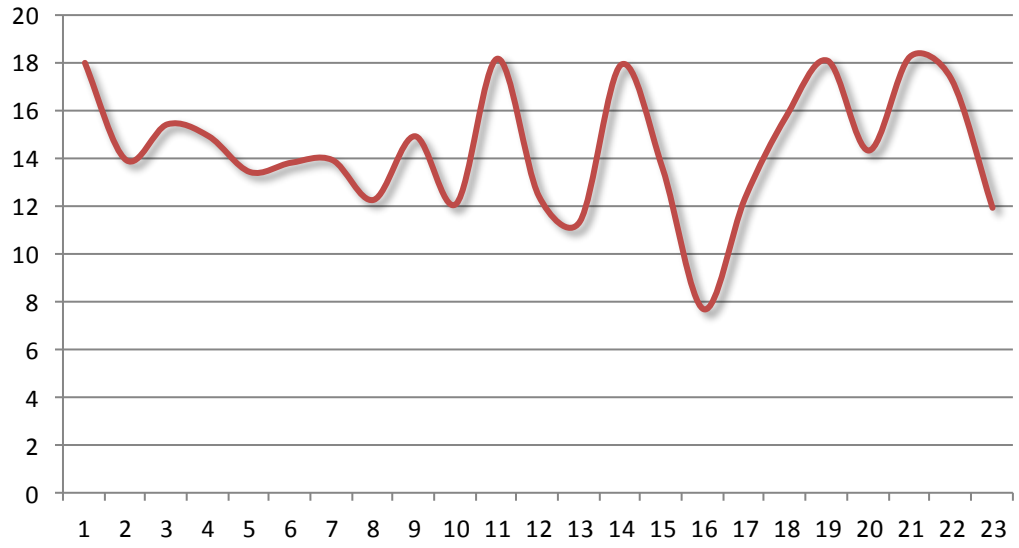
[5] Based on recommendations of the Centers for Public Safety Excellence.

Figure 15: Actual Structure Fire Staffing Performance, 2010 and 2011

Year	Average Structure Fire Staffing
2010	16.0
2011	13.0

On average, ACFR has been able to produce the recommended minimum number of suppression personnel for structure fire incidents over the last two years. As with most areas of the country, service demand will vary throughout the day within Alachua County. This could potentially impact the number of available responders for structure fires. The figure below, gleaned from the department's NFIRS data, illustrates how personnel availability fluctuates throughout the day.

Figure 16: Average Personnel by Hour of Day - Structure Fires



ACFR has the most difficulty in producing suppression personnel during the mid to late afternoon hours. This is consistent with some of the highest service demand periods for the department. ACFR should evaluate the potential of adding or realigning resources based on a dynamic deployment model that allows personnel to be flexed on and off duty based on historic service demand patterns.

Service Delivery and Performance

The delivery of fire suppression and rescue services requires efficient notification of an emergency, rapid response from well-located facilities in appropriate apparatus, and sufficient staffing following a well-practiced plan of action. This section of the report evaluates these various components and provides observations of the elements that make up the delivery of the most critical core services provided by ACFR.

Alarm Systems, Communications and Dispatch Performance

Alachua County, through the Alachua County Sheriff's Office, maintains and operates a regional communications center managed by a full-time staff and Division Commander. This center functions as the dispatch point for all fire and emergency medical calls for the entire County. In addition, the center is the coordination point for the countywide mutual aid response system.

The dispatch center is located in a separate facility from other government functions, with the exception of Emergency Management programs, and is particularly well-suited and designed for the operation of a modern communication center. Security is excellent and space is plentiful. Consoles and equipment are reasonably modern and efficient.

A formal call processing time standard has been established, and spot checks are conducted as a measure of quality control according to interviews with the staff.

Emergency Medical Dispatch (EMD) protocols and pre-arrival instructions are utilized in the center. Personnel are trained and certified in the application of the EMD protocols, as well as the APCO (Association of Public Safety Communications Officials) telecommunicator standards. Computer-aided dispatch (CAD) software is in use and has been adequately programmed to recommend multiple back-up response layers.

Dispatch takes place by "specific unit dispatch", with programmed assignment of specific apparatus quantities and types, for both Alachua County Fire Rescue and Gainesville Fire Rescue. The smaller fire departments have recently begun dispatching by unit type rather than by station. Apparatus availability for units is tracked by the software. GPS-based automatic vehicle location (AVL) is being used.

Communications are provided through a digital trunked 800 MHz radio system with 22 channels operating from five tower sites. Despite having well over 2,000 field radio units on the system, queuing

of transmissions is reported to be very rare. Station notification takes place by encoded station radio alert and voice pagers. No in-station printers or direct-line station alert systems are installed.

The dispatch center has adequate contingency plans for system failure. Back-up power is in place, spare consoles are available, and back-up transmitters function automatically. A functionally redundant dispatch site is also available, and an agreement for use of an alternate radio system (statewide mutual aid tactical channels) provides at least basic second-system redundancy. The weather resistance of the dispatch center is excellent.

This study was not intended to be an evaluation of the communications center, but rather an overview and understanding of the communications system and its capabilities as related to the efficiency of the fire and emergency medical systems. Our limited observations led us to the conclusion that the services provided by the Center were professional, efficient, and certainly comparable to similar services provided in other areas, including those provided in much larger cities.

NFPA 1221, the standard that applies to communications centers and their performance, recommends a call processing performance measure of 60 seconds when measured at the 90th percentile for emergency incidents related to fire protection and emergency medical services. The following figure shows the call processing performance of the communications center, as analyzed by ESCI on fire and EMS data provided from the computer-aided dispatch software.

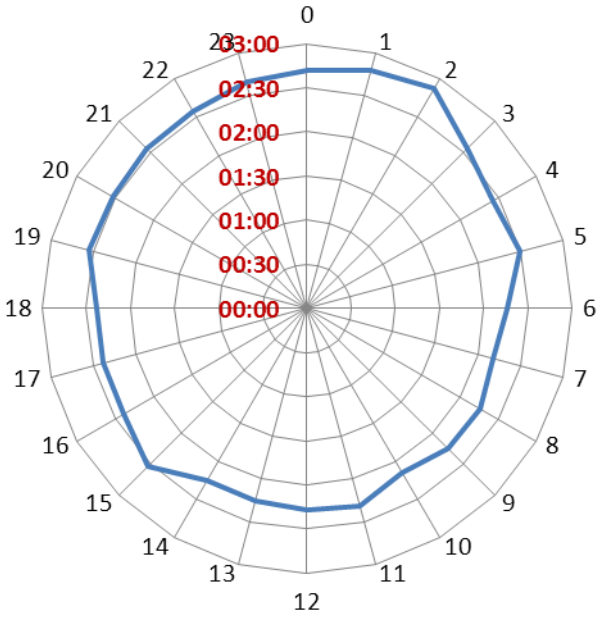
Figure 17: Call Processing Performance - 2011

	2011 Performance
Average	2:26
90th Percentile	3:48
95th Percentile	5:15
1:00 Recommendation	**5.6%**

As is obvious from this analysis, the communications center is currently missing the recommended performance objective; call processing at 1:00 when measured at the 95th percentile.[6] Another method by which to evaluate processing is temporally, as this may lead to evidence of higher service demand as the cause of delayed call processing. The following figure illustrates the average call processing time by hour of day.

[6] *NFPA 1221* recommendation for call processing time.

Figure 18: Call Processing by Hour of Day - 2011

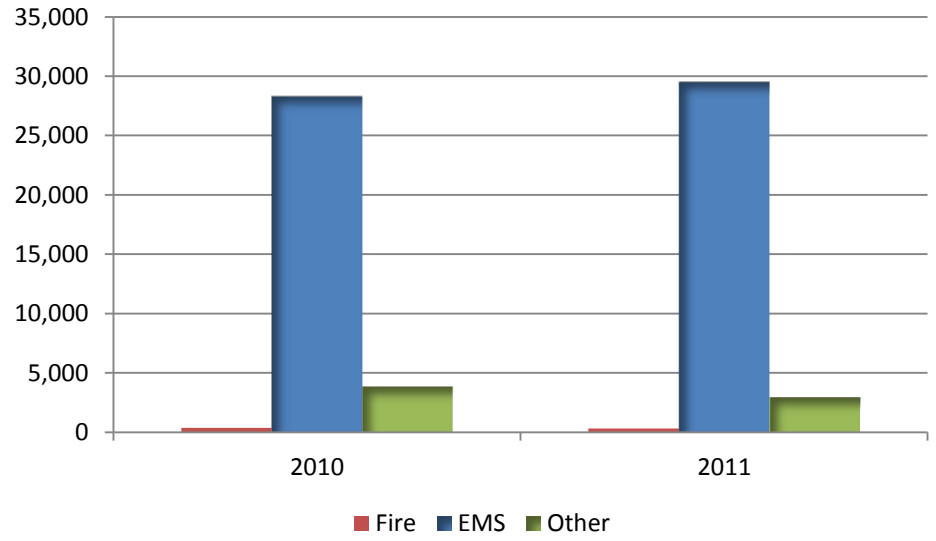


As evidenced by this figure, average call processing times are relatively stable throughout most hours of the day with a slight increase during the early morning hours, which could be indicative of the reduced staffing during that period.

Service Demand

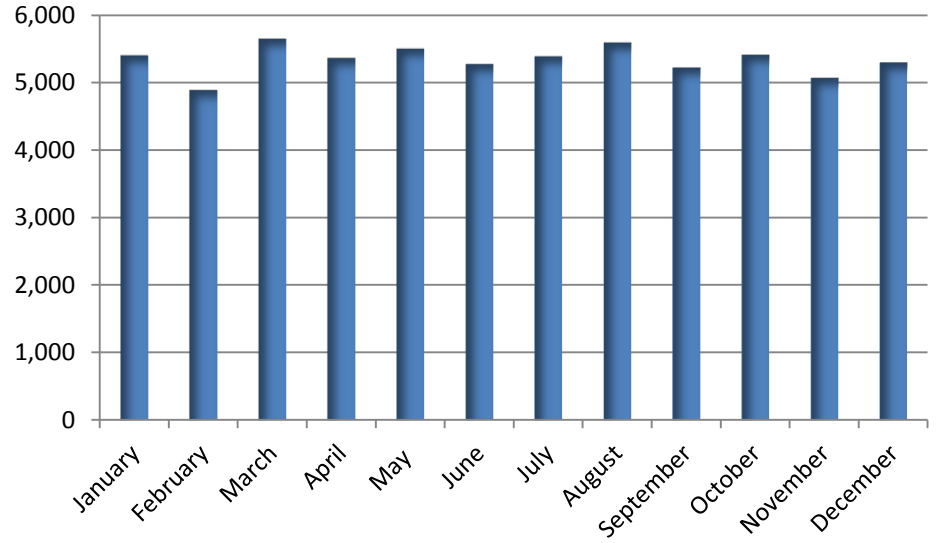
Demand is defined as the workload experienced by an emergency services organization. This workload can be emergency and/or non-emergency depending on the mission of the organization. As with any emergency services agency that is involved in the delivery of EMS, medical incidents comprise a vast majority of ACFR's overall workload as illustrated in the following chart.

Figure 19: Service Demand by Type



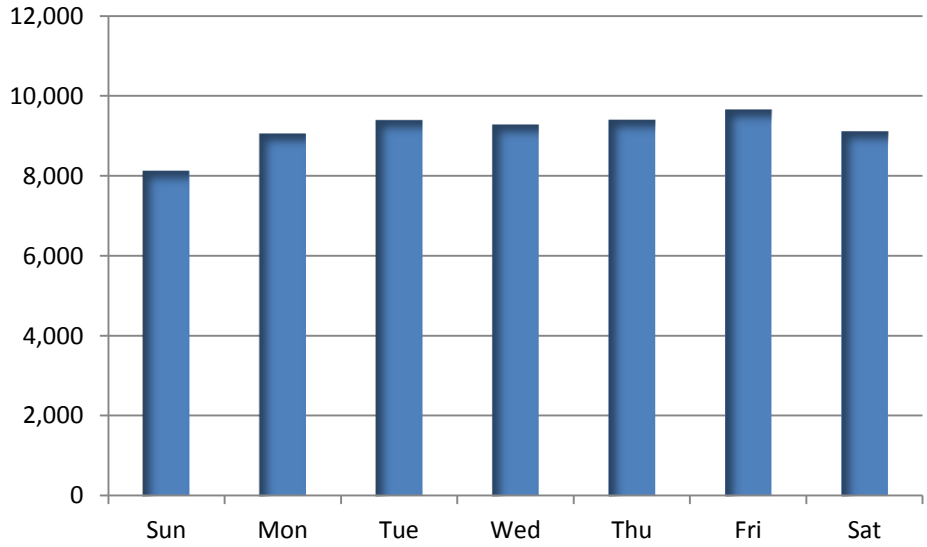
Although fire incidents are extremely low in comparison to EMS incidents within Alachua County, they have generally remained steady with 359 occurring during 2010 and 321 in 2011. Service demand is not static, and ACFR's workload varies by temporal variation. The following figures illustrate how ACFR's service demand varies by month, day of week, and hour of day in order to identify any periods of time that pose significantly different risks and hazards. ESCI begins this analysis by evaluating service demand by month.

Figure 20: Service Demand by Month



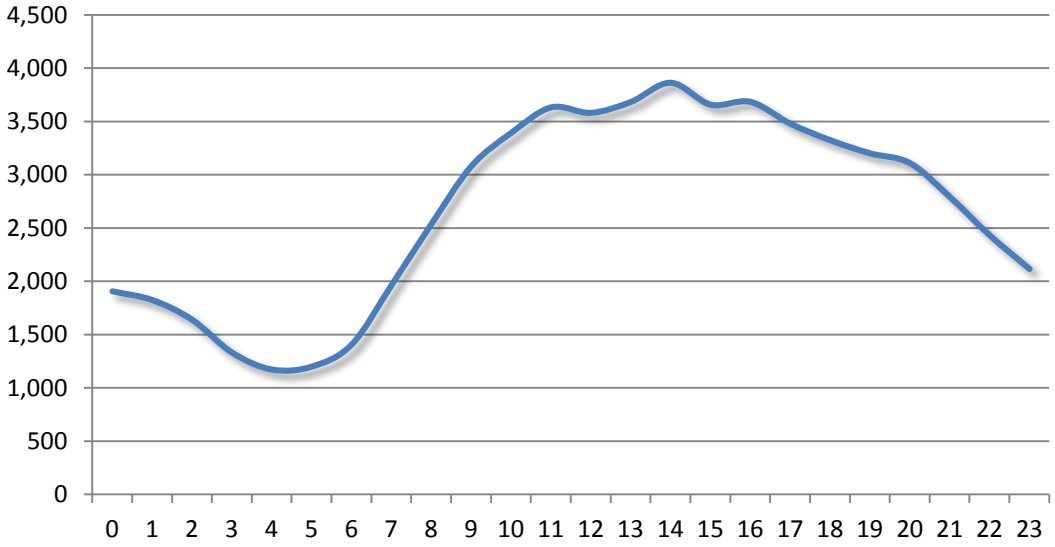
Although there are obviously certain times during any given year where service demand is higher, there are no distinguishable patterns of this demand variability in ACFR's workload. Analysis continues with a look at service demand by day of week.

Figure 21: Service Demand by Day



This analysis shows that, typically, Fridays are the department's busiest day with Sundays historically being the slowest. This is common as emergency services are predominantly driven by human activity, which tends to increase during the workweek. This is further proven by an analysis of service demand by time of day.

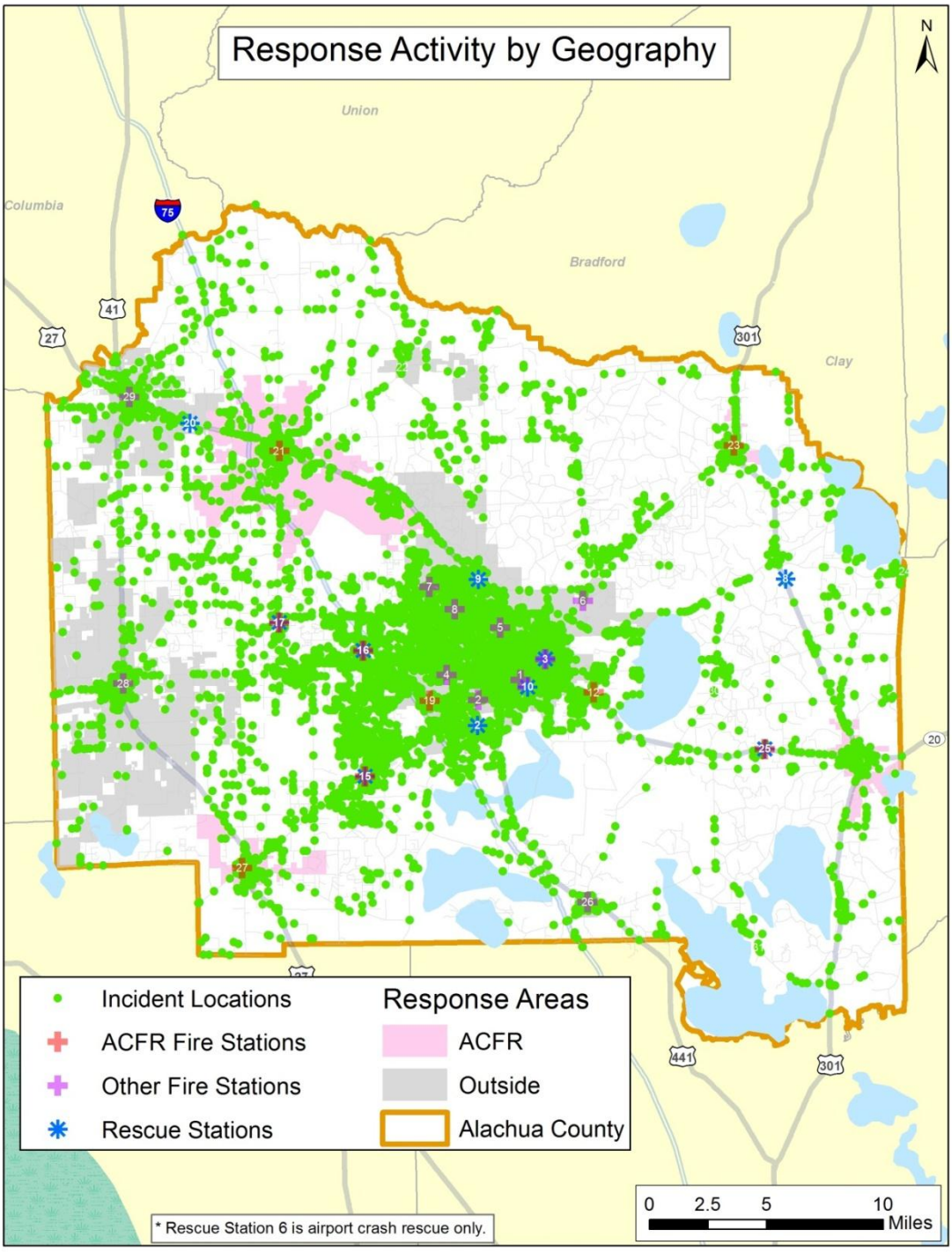
Figure 22: Service Demand by Hour of Day



As evidenced in the figure above, service demand begins to increase around 0700, peaks at mid-afternoon and tails off into the overnight hours. This bell-curve pattern of service demand is consistent with most emergency services providers across the nation.

The final evaluation of service demand is geographical. The following map illustrates total service demand for ACFR for the 24-month period of January 1, 2010, to December 31, 2011.

Figure 23: Geographical Service Demand – All Responses (Fire and EMS)



[7] Station 6 (GFD) does not respond off airport property.

Figure 24: Geographical Service Demand - Fires

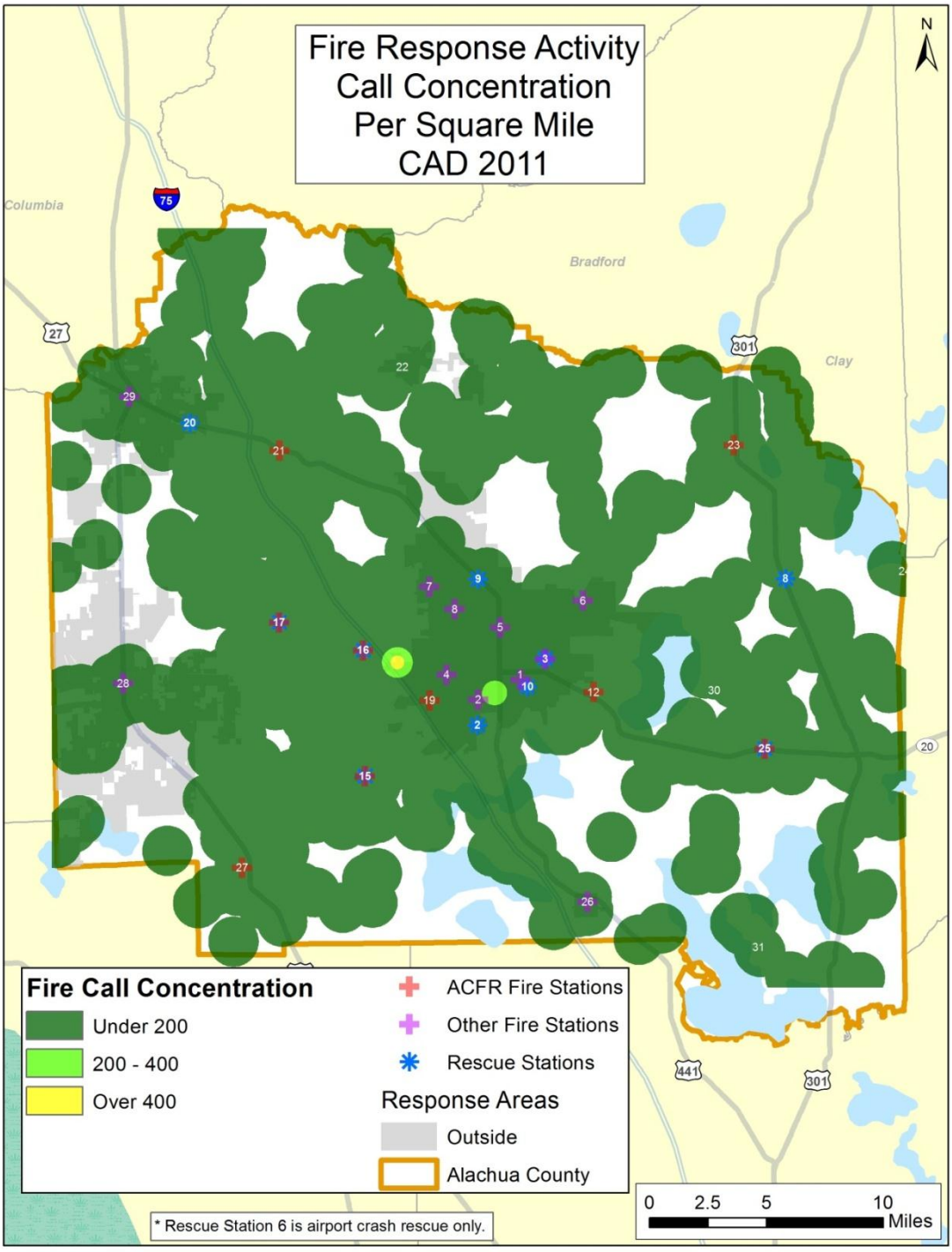
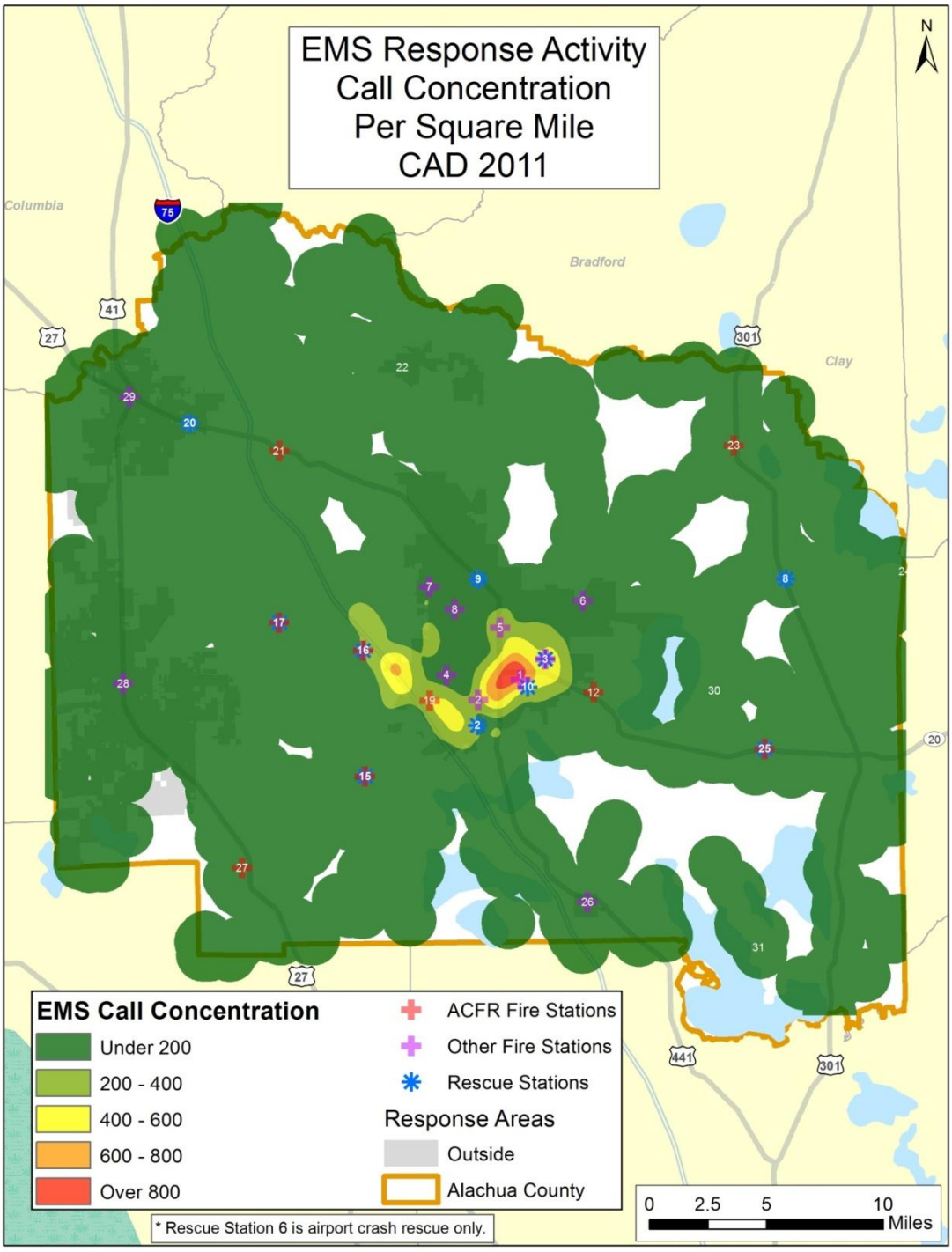


Figure 25: Geographical Service Demand - EMS/Rescue



Distribution

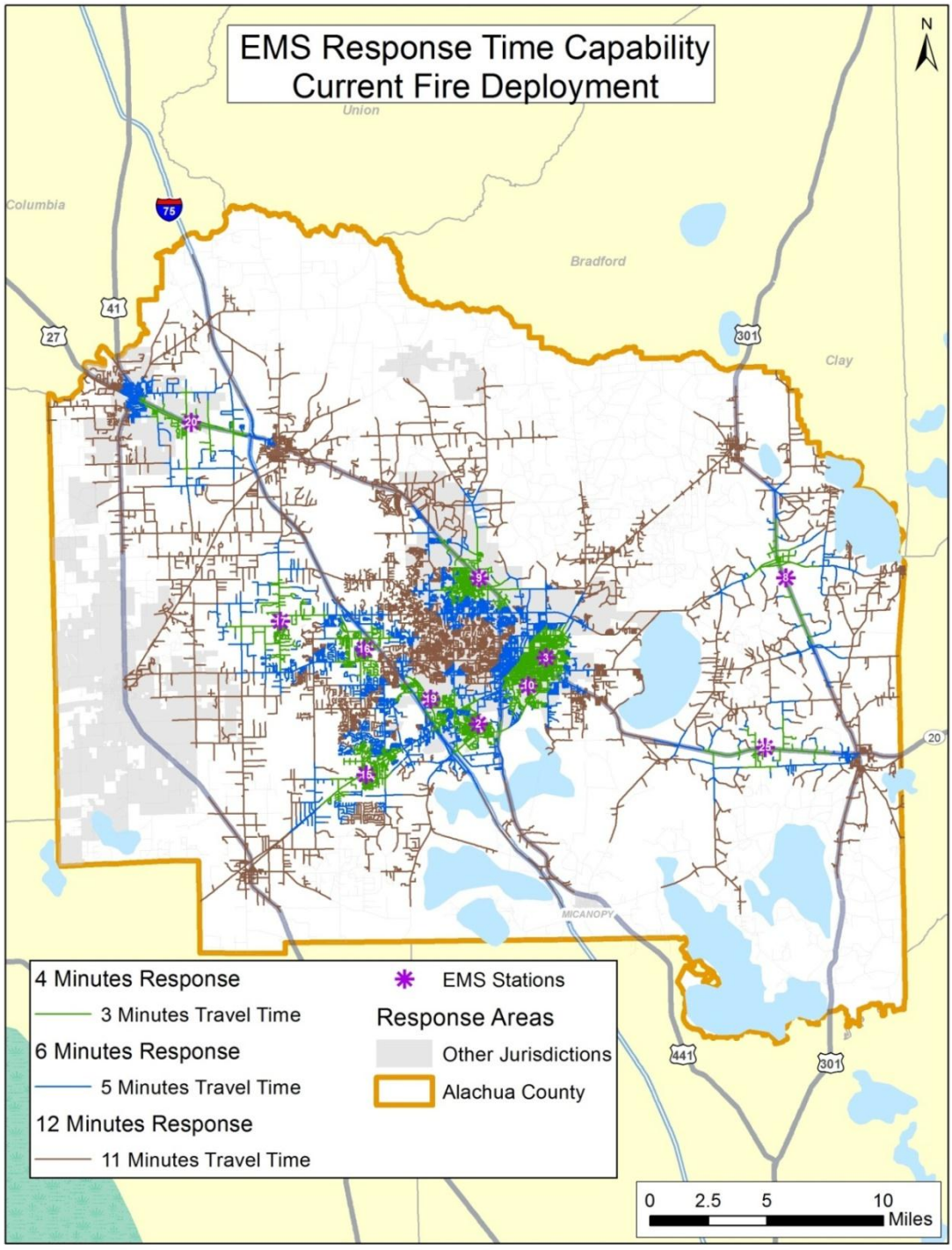
ACFR operates from 15 facilities distributed across Alachua County. There exists a certain extent of the jurisdiction that can be reached within a certain travel time from the stations regardless of staffing

patterns. That is, once a unit is en route to an incident from the current station locations, there is a certain geographic area that can be covered within specific time periods. This is known as travel time. The intent of distribution analysis is to determine not only how much *area* can be covered from the existing stations within a certain amount of time, but also how much of the historic service demand can be covered within that time.

The following map illustrates the 3, 5, and 11-minute travel model from each existing station location deploying ACFR fire units or units contracted for response. The subsequent map illustrates the 3, 5, and 11-minute travel model from each station deploying ACFR rescue units.

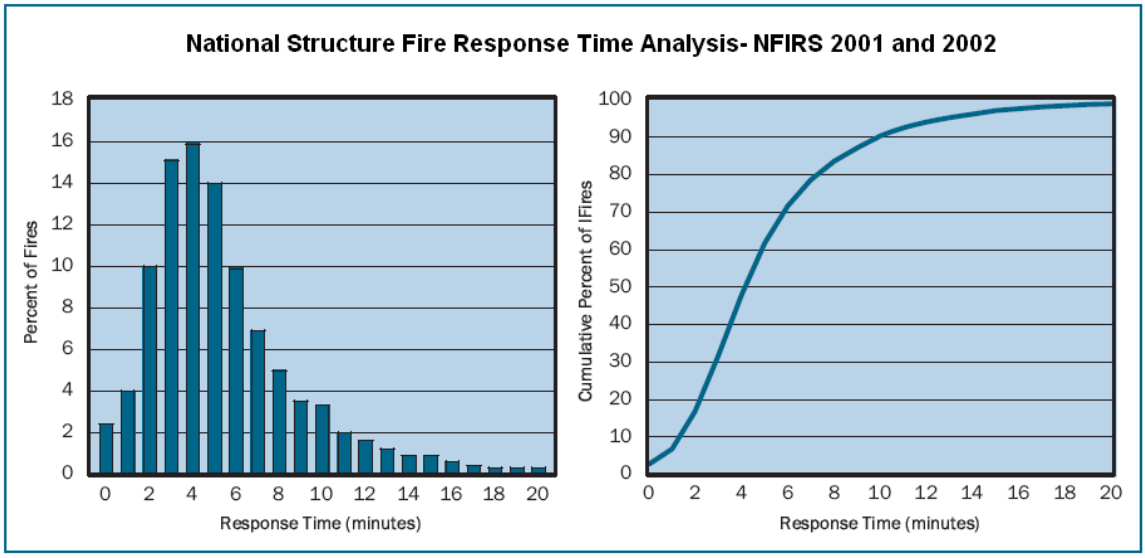
Figure 26: Travel Time Capability – Fire

Figure 27: Travel Time Capability - EMS



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[8] includes a performance objective of 240 seconds or less travel time for the arrival of the first arriving engine company in urban areas serviced by career fire departments.[9] *NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer or Combination Fire Departments* recommends a response performance objective of 9 minutes or less when measured at the 90th percentile in urban areas, 10 minutes or less in suburban areas, and 14 minutes or less in rural areas served by volunteer or combination fire departments. *NFPA 1710* does not differentiate between the various population densities and assumes that all areas served by career or mostly career fire departments, such as ACFR, will adhere to a single performance objective.

It should be understood, however, that the response performance objective set by NFPA is extremely difficult for most departments to achieve, particularly those agencies serving a variety of population densities. The following figures were excerpted from a 2006 U.S. Fire Administration document that polled departments for actual response performance and then produced the results.

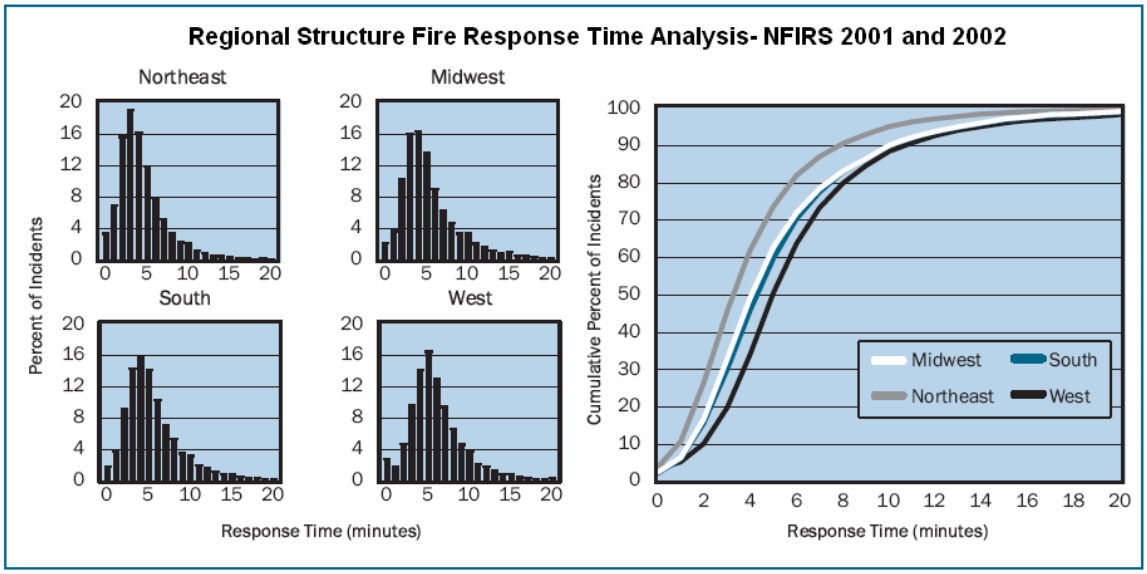


"Structure Fire Response Times"- U.S. Fire Administration/ National Data Center, January 2006

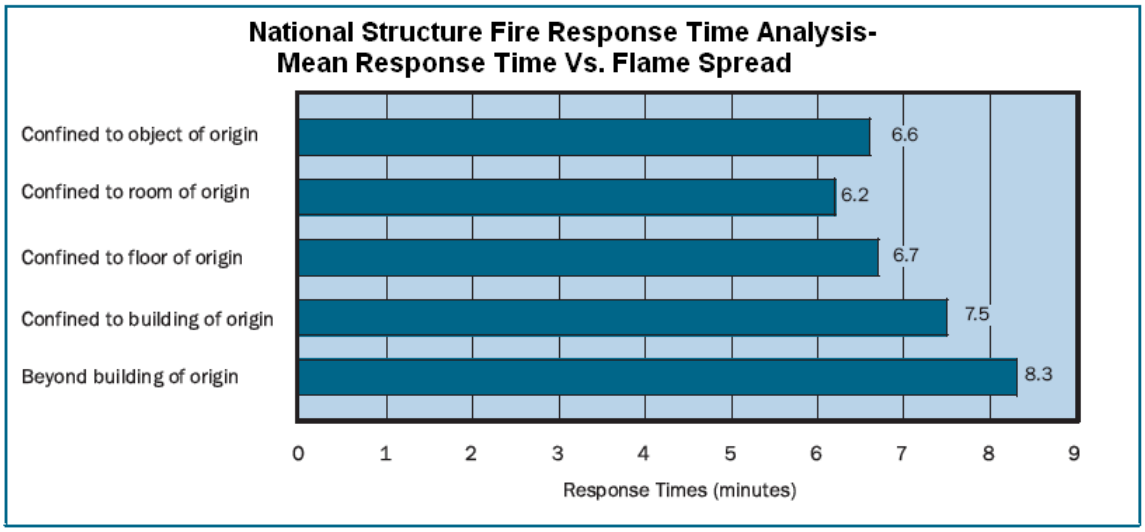
[8] *NFPA 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. (National Fire Protection Association 2010.)

[9] *NFPA 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer and Combination Fire Departments.* (National Fire Protection Association 2010.)

Nationally, the highest percentage (16 percent) of structure fires had a response time in the four-minute range. The percent of structure fires with response times of three and five minutes were not far behind at 15 percent and 14 percent, respectively. Overall, 61 percent of structure fires in 2001 and 2002 had a response time of less than six minutes.



"Structure Fire Response Times"- U.S. Fire Administration/ National Data Center, January 2006



"Structure Fire Response Times"- U.S. Fire Administration/ National Fire Data Center, January 2006; NFIRS Data 2001 and 2002

The preceding figure shows that the mean response time was lowest for fires confined to the room of origin (less than seven minutes) while fires that spread beyond the building of origin have the highest mean response time (less than nine minutes).

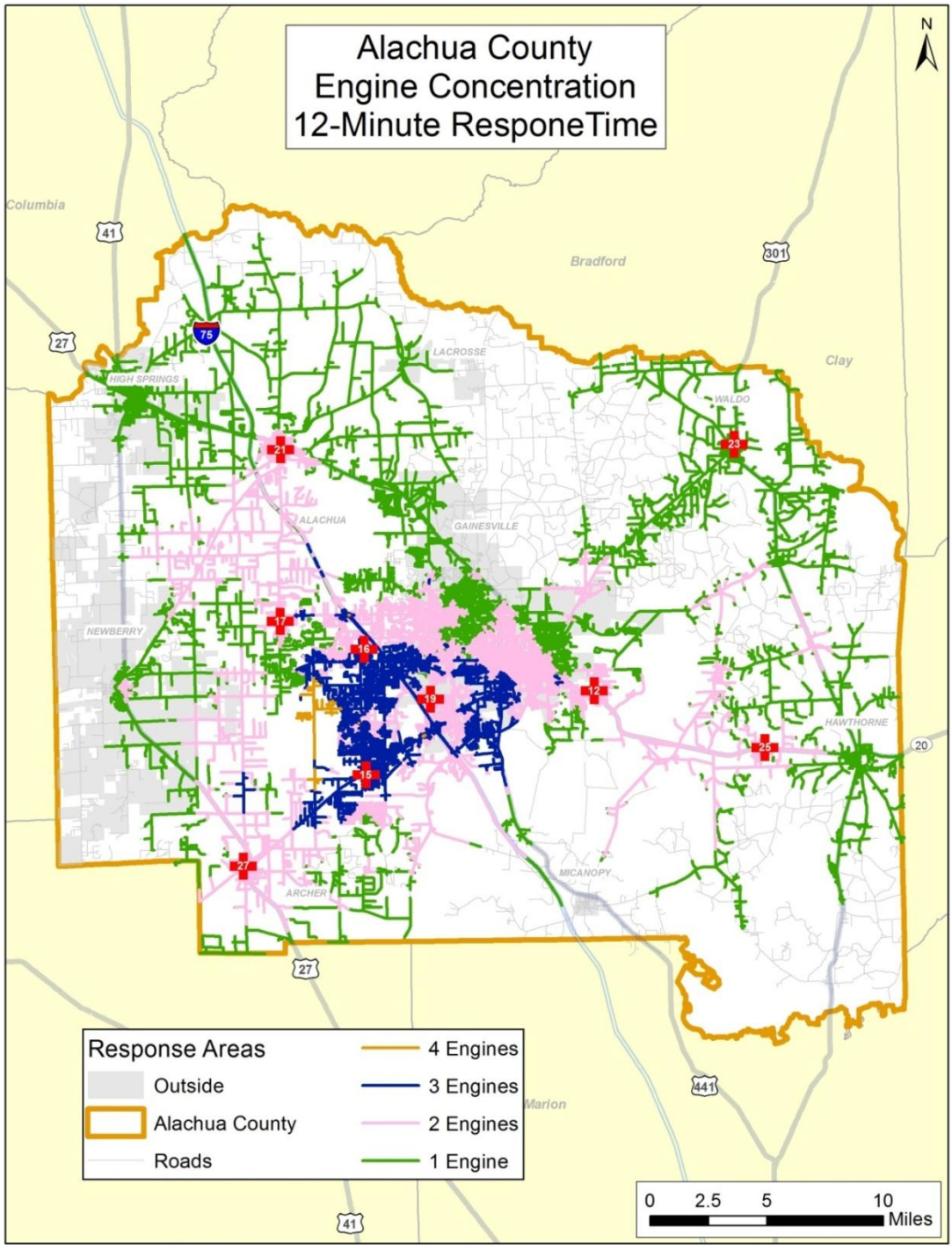
In accordance with Alachua County Comprehensive Plan regarding level of service, ACFR has established first unit arrival response performance objectives as follows:

- Urban Service Area 4:00 at the 80th percentile
- Urban Cluster Area 6:00 at the 80th percentile
- Rural Areas 12:00 at the 80th percentile

Concentration

Concentration is an analysis of the department's ability to assemble an adequate amount of resources, either personnel and/or apparatus, within a sufficient amount of time to effectively mitigate specific incidents, particularly structure fires. Concentration analysis does not consider staffing patterns and only evaluates travel time as the primary factor. The following map illustrates the ACFR's modeled concentration abilities based on a variety of criteria.

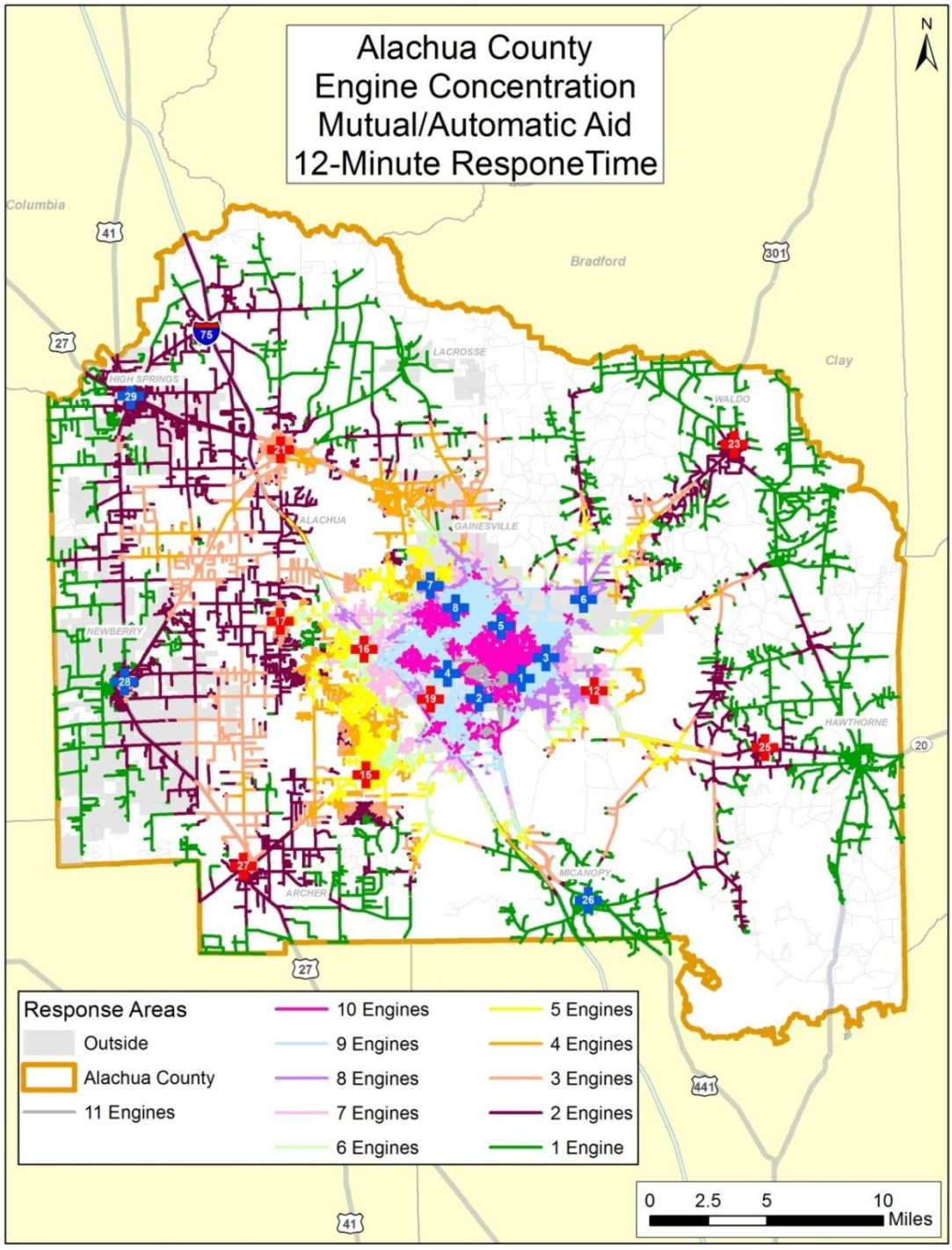
Figure 28: Effective Response Force – Fire



While the figure above illustrates that a small portion of the overall response area can receive three engines in 12 minutes or less, a substantial portion of the response area can only concentrate one engine in that amount of time; an inadequate amount of resources to combat a moderate risk incident.

Based on this analysis, ESCI conducted concentration analysis that included mutual and automatic aid apparatus as illustrated below. Only those stations with personnel on duty were included in the analysis, since those stations can be expected to initiate a response within a predictable one to two minutes. Stations manned only by on-call responders were not included due to the fact that a predictable turnout time cannot be ascertained when personnel are coming from home or work.

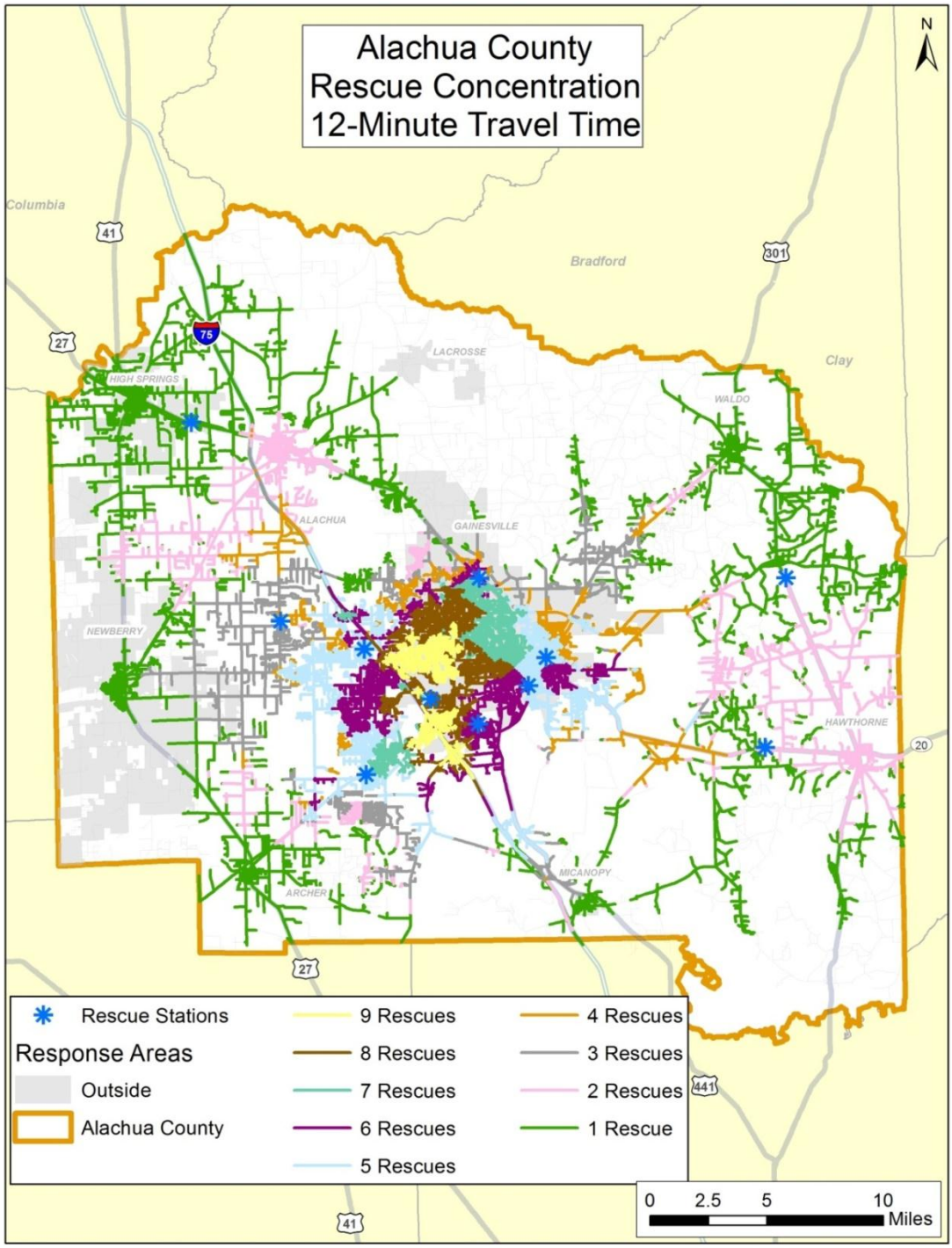
Figure 29: Effective Response Force with Mutual/Automatic Aid Departments



This analysis indicates that, with mutual and automatic aid departments, ACFR's concentration potential increases substantially. There are, however, areas around the fringe of the entire county that can still only concentrate one engine within 12 minutes of travel time from the existing stations.

Although the ability of ACFR to effectively concentrate personnel for fire suppression incidents is important, a majority of the department's workload is based on emergency medical incidents. The following figure illustrates the department's ability to concentrate EMS resources.

Figure 30: Effective Response Force - EMS



While the department is able to concentrate a significant number of EMS resources within the core of the response area, a large portion of the area (particularly in the periphery of the county) is only able to concentrate one unit within 12 minutes. Strategies to address this issue as well as fire concentration will be presented in future sections of this document.

Response Time Performance

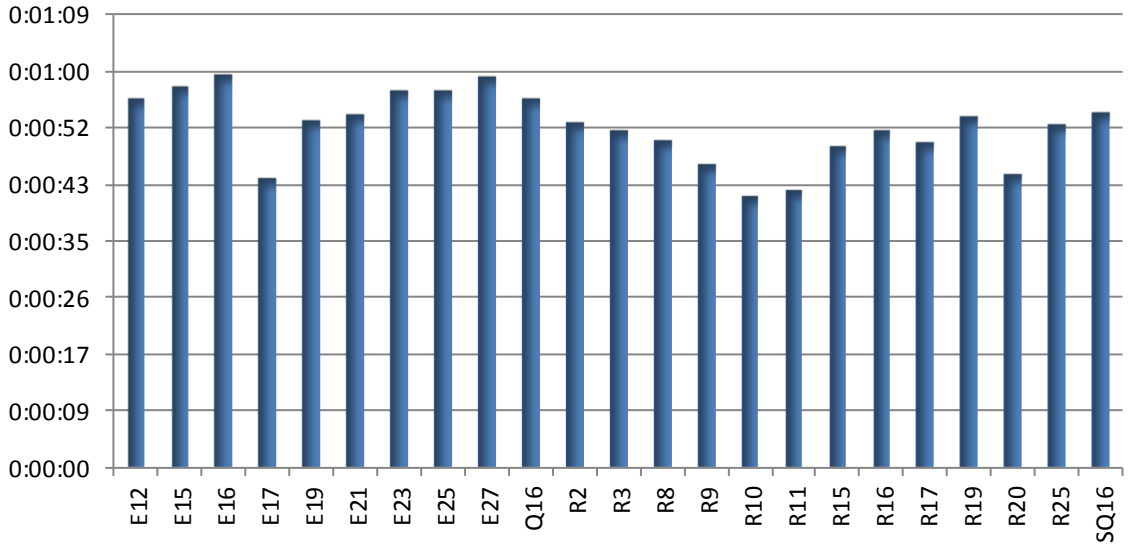
Total response time is the amount of time a resident or business waits for an apparatus to arrive at the scene of an emergency beginning when they first call 9-1-1. This process begins for the fire department once the appropriate unit is dispatched by the communications center. The period of time between dispatch and when a unit is en route to the incident is known as turnout or reflex time. The following figure illustrates ACFR's historical turnout time performance as recorded in the Computer Aided Dispatch (CAD) data supplied to ESCI.

Figure 31: Overall Turnout Time Performance

	Turnout Time
90th Percentile	1:13
1:00 Recommendation	**80.3%**

Although the figure above illustrates an overall turnout time performance along with the NFPA recommendation, it is useful to identify those units that have longer turnout times than others in an effort to correct potential issues that could affect the system as a whole. The following chart illustrates the average turnout time by primary response unit. Reserve units and non-ACFR stations and units as well as non-apparatus were removed.

Figure 32: Turnout Time Performance by Primary Unit – 2011



Engine 16 has the longest average turnout time at 1:00 while Rescues 10 and 11 have the lowest average turnout time at 0:42.

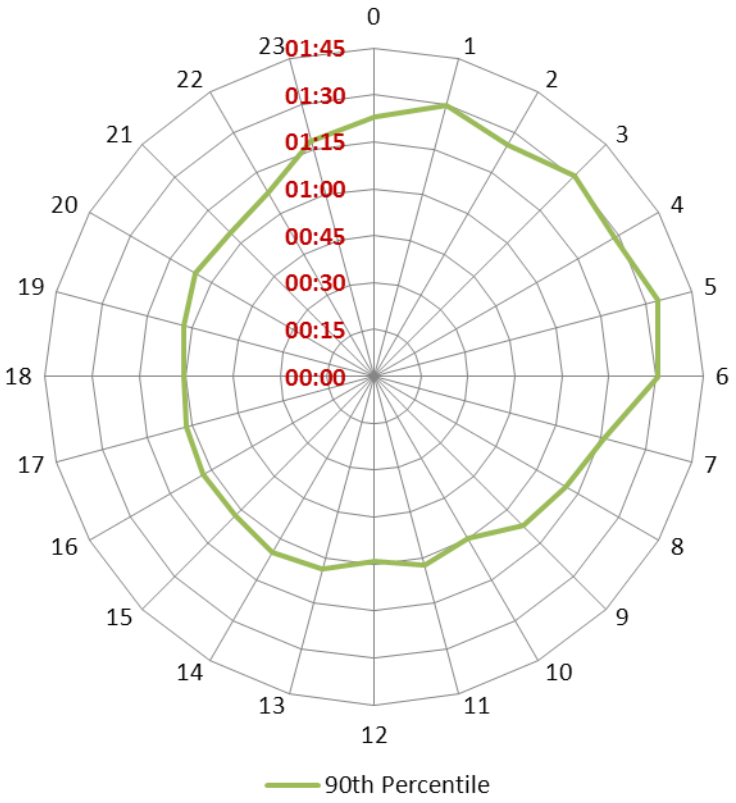
NFPA 1710 recommends that career fire departments be able to be en route to fire incidents within 80 seconds or within 60 seconds for medical incidents when measured at the 90th percentile. The figure below compares the department's performance for these separate incident types.

Figure 33: Turnout Time Performance by Incident Type - 2011

	Fire	EMS
NFPA Recommendation 90th Percentile	**1:20**	**1:00**
ACFR 90th Percentile	1:18	1:13

In many departments where turnout time is an issue, there are usually certain times of the day during which extended turnout times are common. The following figure illustrates the department's turnout time by hour of day.

Figure 34: Turnout Time by Hour of Day - 2011



As with most career emergency services organizations, ACFR's turnout times are extended during the overnight hours as personnel are awakened by the alarm and must make their way to the apparatus bays from the station living quarters. The next phase of the response time continuum is the actual travel time. Although actual travel time was not measured for this study, the overall response from dispatch to first unit arrival was analyzed.

Figure 35: Overall Emergency Response Performance - 2011

	Response Performance
80th Percentile	8:27
90th Percentile	10:39

It should be noted that the response time history noted above is an aggregate and does not differentiate responses in the urban areas with those in the suburban and rural areas. Several NFPA standards refer to various requirements and recommendations in relation to population density. This includes *NFPA*

1720, the standard that identifies performance expectations for volunteer and combination fire departments. These standards classify population density in the following zones:

Figure 36: NFPA Population Density Zones

Population per Square Mile	Class/Zone
1,000 and above	Urban
500 to 999	Suburban
Less than 500	Rural

ESCI was able to geocode each incident within the NFIRS data and compare against census tract information to determine in which population density zone each incident occurred. The resulting zone designations and response performance by zone are illustrated in the following figures.

Figure 37: Response Performance by Population Density

Response Zone	80th Percentile Response Performance	4 Minute	6 Minute	12 Minute
Urban Fire	8:45	14 Percent		
Urban EMS	7:18	27 Percent		
Urban Cluster Fire	9:37		45 Percent	
Urban Cluster EMS	7:52		58 Percent	
Rural Fire	12:17			79 Percent
Rural EMS	9:05			91 Percent

Mutual and Automatic Aid

ACFR utilizes the NIIMS-ICS incident command system adopted by the Department of Homeland Security. A countywide mutual aid system is in place, with automatic aid. In addition, a formal statewide mutual aid plan has been promulgated by the Florida Fire Chiefs' Association, including a standardized deployment scheme.

The department participates in a response agreement (FSAA – Fire Services Assistance Agreement) with the City of Gainesville, generally providing for the quickest services to respond to those areas bordering the City and the County. The response area includes both urban and suburban areas. Automatic and mutual aid within the County is facilitated within Department policies and through the Communications Center.

Jack Durrance Auditorium, Room 209
2nd Floor, County Administration Building
12 SE 1st Street, Gainesville

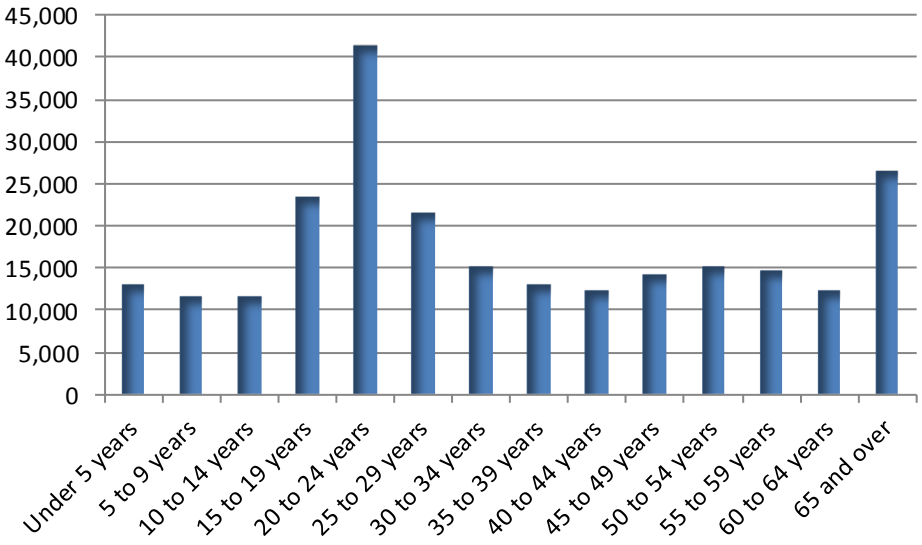
Future System Demand Projections

The process of forecasting growth within the community begins with an overview of current demographic and risk categories.

Current Population Information

According to the 2010 census, the population of Alachua County was 247,947 with 124,354 residing within the City of Gainesville, leaving 123,593 within the greater ACFR response area. This represents increase of less than 1 percent since the 2000 census when a population of 122,508 was estimated outside the City of Gainesville. Although the fire response for ACFR is confined to the areas outside the City of Gainesville and several other areas of the County, EMS is provided to the entire geographic area. Thus the entire population of Alachua County is used here to evaluate population impacts on service demand. How the population is composed by age group can have a significant effect on the service demand of an emergency services agency. The following figure distributes the population into age groups based on available census information.

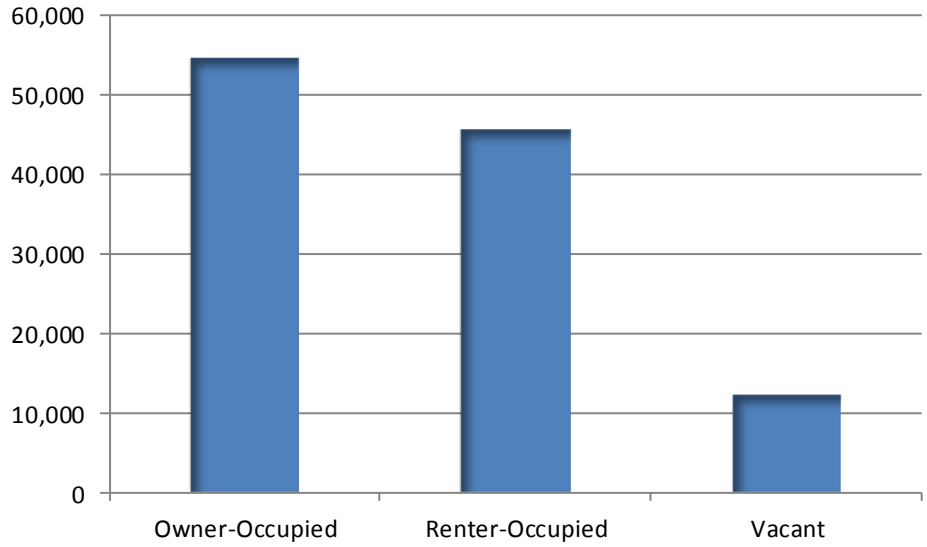
Figure 38: Population by Age – 2010



Approximately 10.8 percent of the population is 65 years of age or older and 5.3 percent of the population is under 5 years of age, placing a total of 16.1 percent of the area's population within the significant target age groups that pose the highest risk for fatalities in residential fire incidents and typically generate higher levels of medical incident service demand.

Numerous rentals and vacancies can signal economic conditions that correlate with higher rates of emergency incidents. The following figure illustrates the distribution of housing units by tenure throughout Alachua County.

Figure 39: Select Housing Characteristics

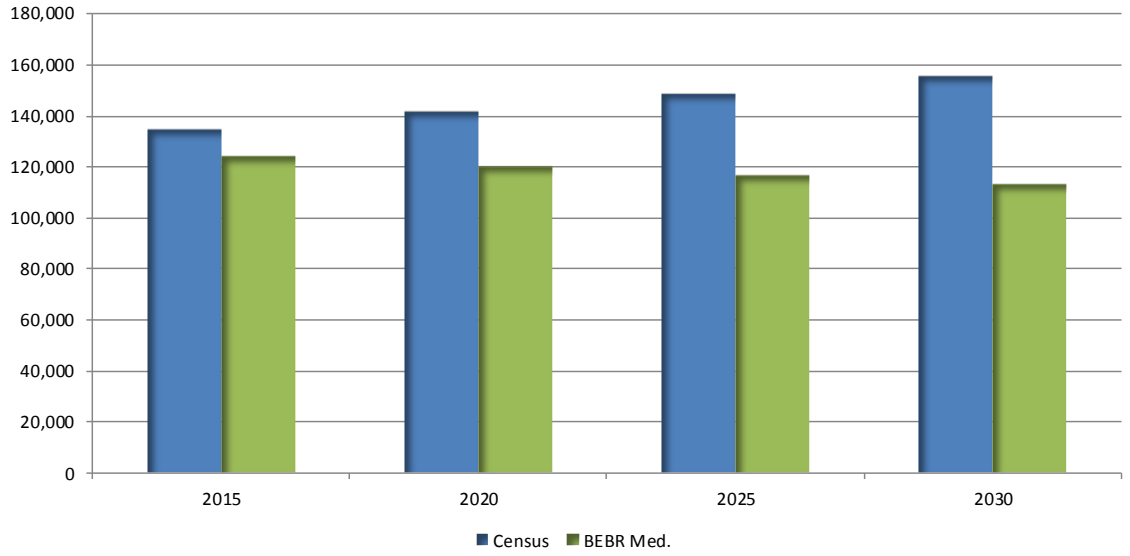


High rates of vacant properties tend to suggest depressed economic conditions, which could lead to higher demand for emergency services. The high level of owner-occupied housing indicates a stable economic environment that would tend to decrease overall demand for emergency services. As is often the case in resort areas or those geographies that contain seasonal or educational properties, the high rental rate could generate a higher than normal service demand during seasonal periods.

Population Growth Projections

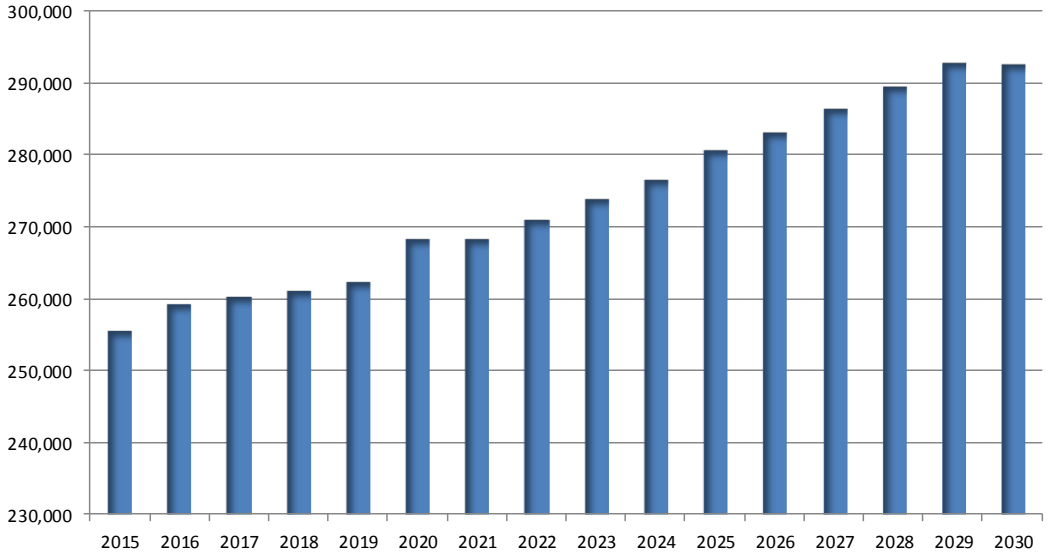
The population within Alachua County has fluctuated; but, in general, it has grown slightly throughout the last decade. Data from the U.S. Census Bureau suggests that this growth will continue over the next two decades while data extrapolated from the Bureau of Economic and Business Research (BEBR) indicates that the overall population of unincorporated Alachua County will decline over the same period primarily due, potentially, to the City of Gainesville's annexation plans. These two population forecasts are illustrated in the following figure.

Figure 40: Population Growth Projection - Outside City of Gainesville



Although the population projections outside the City of Gainesville are somewhat divergent, the overall population of Alachua County is expected to continue to increase as illustrated below. This will have an impact on the department's ability to continue to deliver emergency medical services to the county as a whole.

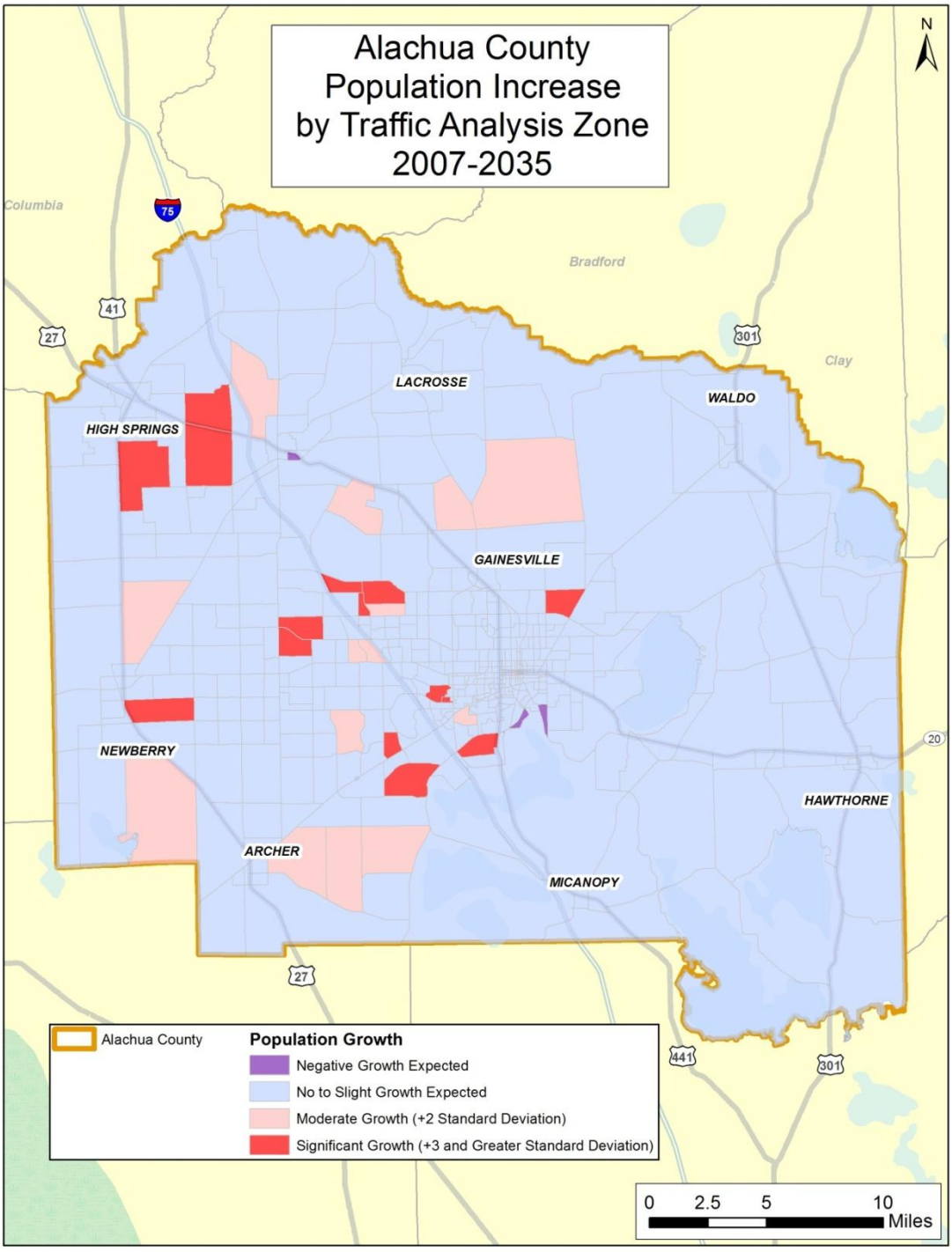
Figure 41: Overall Alachua County Growth Projection



Geographic population projections, conducted by Traffic Analysis Zones (TAZ), are also useful in analyzing more specifically where the most significant growth is anticipated, an important factor in fire

service deployment models. The following figure demonstrates the geographical areas of the county in which the highest rates of population change are anticipated. This should not be confused with population density, as it merely shows those areas where the population growth, as a ratio of current population, shows the greatest upward deviation.

Figure 42: Population Increase by Traffic Analysis Zone, 2004-2025



It is not the intent of this study to be a definitive authority for the projection of future population in the service area, but rather to base recommendations for future fire protection and emergency services needs on a reasonable association with projected service demand. Since it is known that the service

demand for emergency agencies is based almost entirely on human activity, it is important to have a population-based projection of the future size of the community. **Planning should begin now to maintain the resources needed to meet the continuing demand for services throughout Alachua County.**

Community Risk Analysis

While there are many considerations that can be assessed when evaluating a community's fire protection risks, the issues can be narrowed into two major categories. How likely is it that a fire will occur within a given area and how bad will the fire be if it does occur? The geographic community risk analysis involves the answers to both of these questions.

The first phase of the fire protection risk analysis involves statistical analysis of the risk of fire occurrence. The second involves an analysis of the consequences or community impact of a fire if it does occur.

The risk of fire occurrence can be attributed to various factors, some physical and some cultural. For instance, the physical proximity of a structure to highly combustible vegetation increases the risk of the structure being involved in fire as a result of a nearby wildland fire incident. This factor, commonly called urban-wildland interface, is why insurance costs in parts of the western U.S. are sometimes higher for such structures in comparison with other similar structures. It's a good example of a physical factor contributing to the risk of fire occurrence.

Cultural or demographic issues can play just as significant a role as physical issues. It has long been documented that the rate of structure fires per capita is highest in the southeastern United States. Not surprisingly, it can also be seen that the acceptance and use of newer, more aggressive fire and building codes was slower to develop in this same geographical area. Likewise, a higher rate of fire incidents per population is typically observed where the density of population in a given geographic area increases. Densely populated urban settings, areas with less owner-occupancy, and communities with economic blight often trend toward higher fire incident rates.

In a community with stable growth, this likelihood of fire occurrence is reasonably tracked through an analysis of fire incident experience. In the absence of significant physical or cultural change, such as major factory closings or civil unrest, the analysis of fire experience yields a fair insight into the

likelihood that a fire will occur within a given time period and within a given area. This fire incident experience analysis is provided, both statistically and graphically, in other areas of this report.

How much impact a fire is likely to have on a community is a factor involving more prediction than experience. For instance, a fire in a vacant garage has little overall impact on the economic welfare of a community while a fire in the primary facility of a city's major employer can be devastating. Even if an analysis of fire experience shows both are equally likely to occur, one fire carries far more dire consequences that the other. A complete community fire protection risk analysis must involve some process of identifying the areas within the community where a fire will have greatest negative impact.

Consequence Factors

The consequence evaluation in our community fire risk analysis takes into account several major factors in an effort to geographically identify those areas of the community where fire is likely to have greatest impact. During our community evaluation, these consequence factors are assessed and utilized in placing structures into risk categories that carry numerical weight in the overall risk analysis formula.

- Life Risk:
  Structures within a given community that present a significant risk for large loss of life are assessed a higher risk score, despite what may appear to be a smaller size. As an example, even a relatively small apartment structure with multiple families will assess as a higher risk than a comparatively large single-family dwelling. Hotels or high-rise occupancies will assess as higher risks than a commercial or light industrial occupancy. Structures used to house or assemble high-risk populations, such as elderly or disabled persons, will also assess at high risk. In general, the consequences of fire incidents in such structures can be a significant loss of life and is weighted accordingly in the risk analysis.

- Economic Impact:
  Even though the destruction of a particular property may not result in any loss of life, the impact on a community can be devastating if it has a strong effect on the economy. Loss of employment, decreased taxable value, reduction or losses of associated service industry are all examples of the negative economic impact that fire can have on a community. However, economic impact of a fire depends on the type, use, and size of the structure involved. Even total destruction of a single-family dwelling will have little overall impact on a community's economy, no matter how large the house. Likewise, loss of a single commercial entity, such as a restaurant or auto repair shop, may have an economic impact that is both temporary and limited to the local neighborhood. Loss of significant industrial facility or manufacturer, however, can cripple an entire community's economy for months or even years. The predictable economic impact, therefore, is also considered when placing structures into risk categories in the analysis.

- Resource Demand:
  The outcome of a fire incident in comparison with the resources available is somewhat predictable. For instance, a study by the National Fire Protection Association on residential

structure fires from 1994 to 1998 indicated that fatalities and dollar loss were over 85 percent lower in those incidents where the fire was contained to the room of origin. Doing so requires the proper number of firefighters and resources to arrive on the incident quickly enough to effectively deploy and contain the fire in its early stages. An ineffective number of resources or a later arrival would permit the fire to spread beyond the room of origin with predictable results. For this reason, we evaluate the approximate number of firefighters and engine companies necessary to rapidly and effectively contain a fire within given structures. The structures are generally categorized within the medium, high, or maximum range for needed resources in accordance with the resource table utilized in the International Fire Service Accreditation Congress (IFSAC) model. The quantity and density of each category within given geographical areas (in this case using zoning classes) are utilized within the overall risk formula.

Methodology

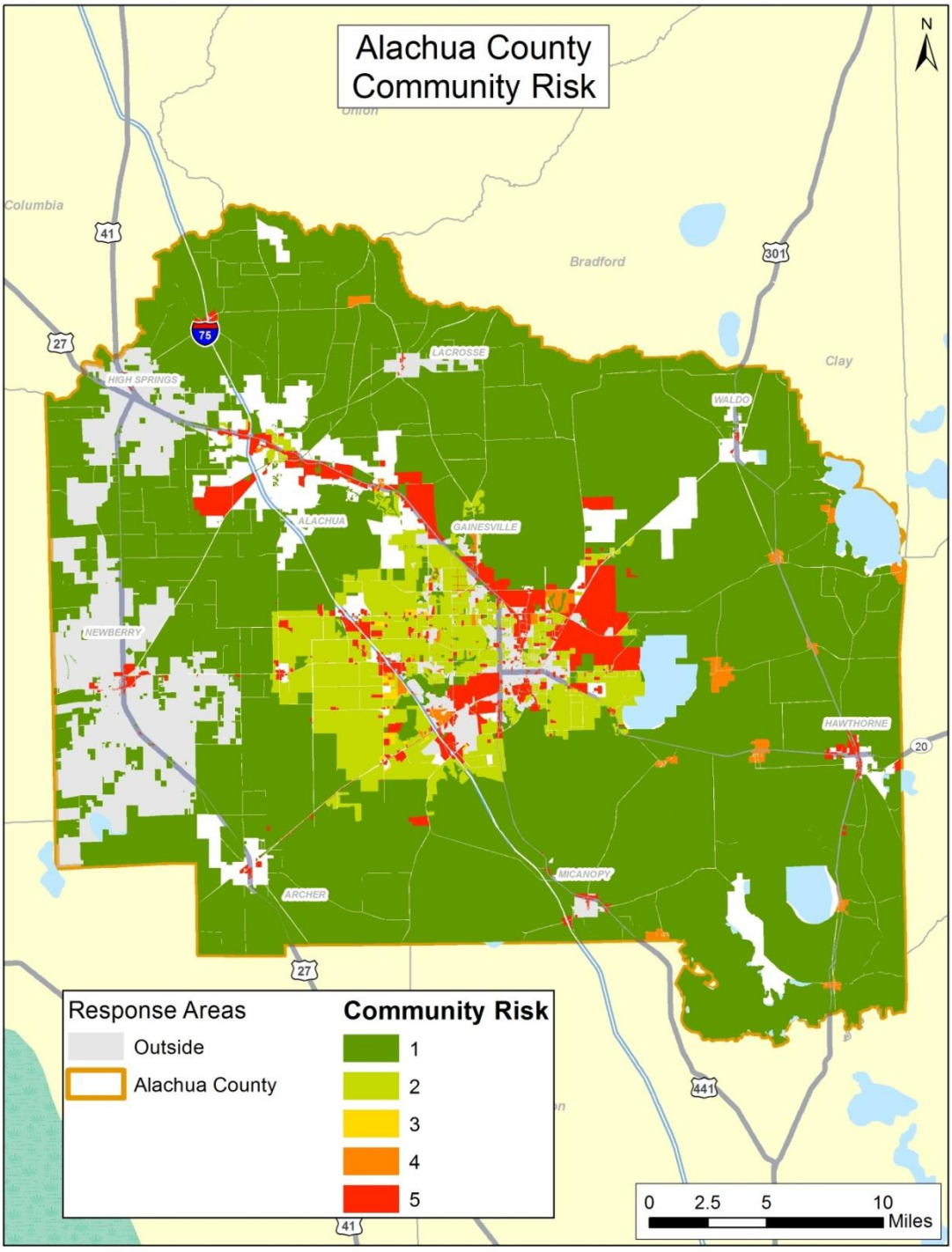
Our geographic community risk analysis begins with a basic review of the land use classifications for the area studied. Land use or zoning classifications are utilized because they are an existing regulated classification that typically involves the type, use, size, and density of structures within a given geographical boundary. As indicated earlier, these factors weigh heavily in the evaluation of both the likelihood of fire occurrence and the anticipated impact of a fire incident. By utilizing the land use classes, we take advantage of existing classifications that have already occurred and involve these factors.

Each community, however, differs slightly in the specifications for structure size, use, and density from zoning class to zoning class. Therefore, we conduct a basic review of each land use classification in existence for purposes of establishing a standard risk-density factor that is based on true counts of structures within each zoning class. This process is conducted by actually driving through, street-by-street, representative areas of the various land use classes and conducting a “windshield assessment” of structure type, use, and risk category.

These physical counts are translated into the community risk assessment using mathematical formulas and geographic information systems software (GIS). A mathematical formula is utilized that considers the number and density of structures as categorized by potential community impact, consequence factors, and resource demand. In the next step, geographic information systems (GIS) software is used to determine the precise size of the sample areas evaluated. The total risk score of each area is divided by the size of the sample area in acres to arrive at the risk density factor. In most cases, several sample areas of each zoning class are used and then averaged to increase dependability of the results. This risk density factor can be used for comparison purposes when evaluating the overall fire risk within the community by each land use class.

A graphical representation of this risk analysis can then be derived from the numerical risk factor. The following map shows each land use classification within the map area by shading that corresponds to the relative fire risk/impact in comparison with the overall community. Areas are shaded in progressive depths of green to red to indicate relative fire risk/impact.

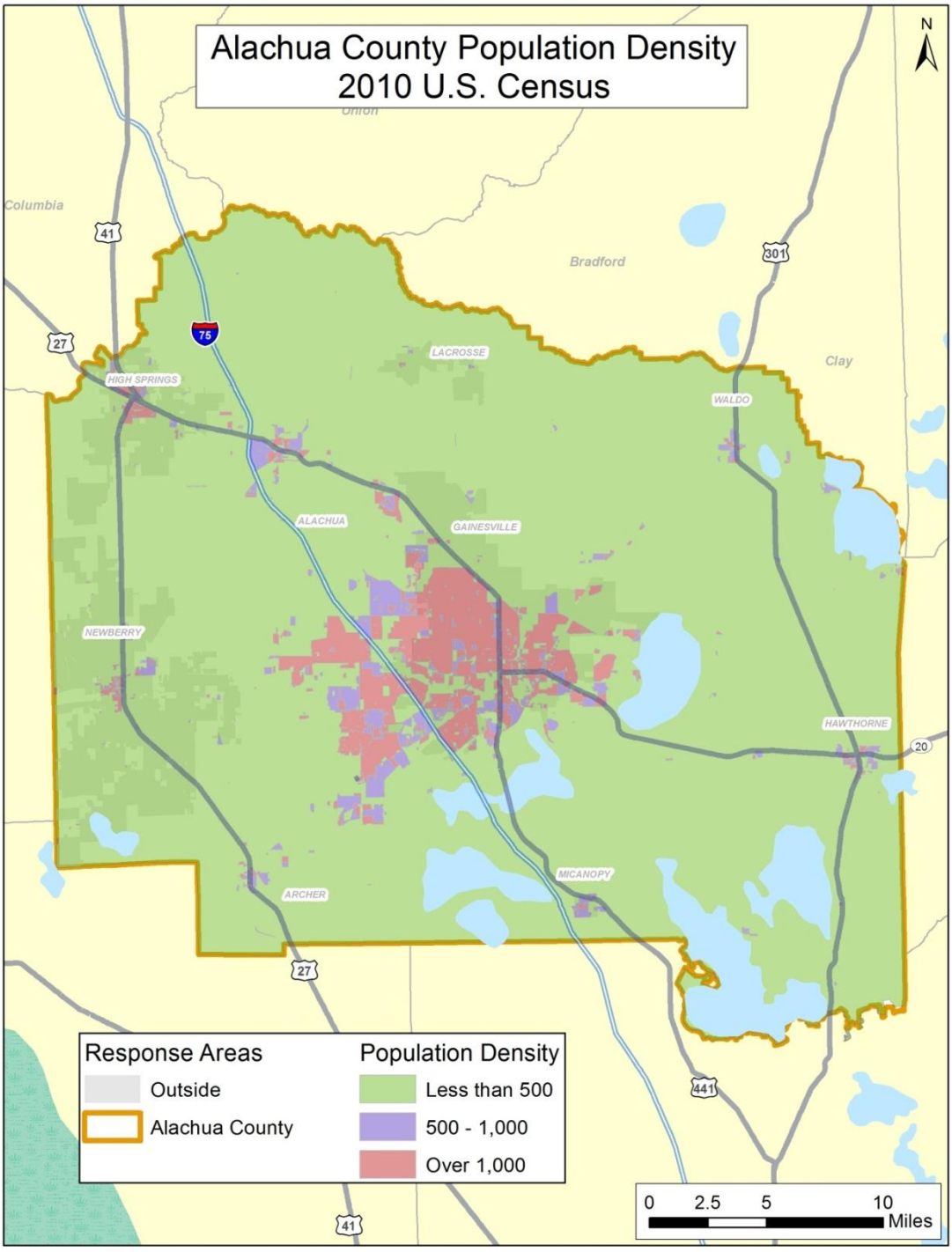
Figure 43: Community Land Use Assessment



The areas outside Gainesville contain mostly low to moderate risk properties with a scattering of high risk commercial and/or industrial areas.

Unlike medical responses that focus on human life, fire incidents are intended to protect property in addition to life. Typically, the most frequent occurrences of fires are in the more populated areas where structures are also denser. While medical responses tend to cluster around populated areas as well, the distribution of that type of demand may fluctuate based on time of day as populations move from one area to another. The following map illustrates how the varying levels of resident population density are distributed throughout Alachua County.

Figure 44: Population Density



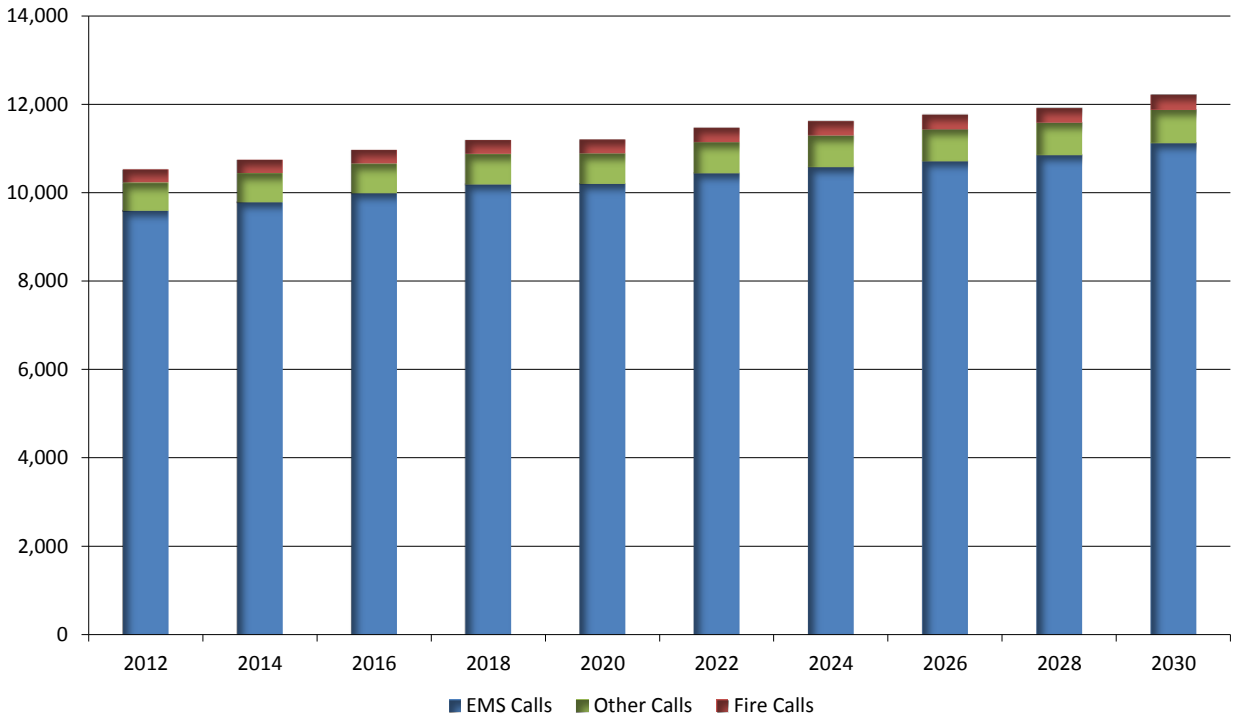
A vast majority of the area outside Gainesville has a much lower population density than the urban area. In regard to community risk, the areas of higher population density will typically generate a higher service demand than the rural areas. This has also been illustrated in the service demand analysis

section of this report. Future planning of fire rescue stations has already begun and is focused on the delivery of an equal level of service throughout the entirety of Alachua County.

Service Demand Projections

In evaluating the deployment regarding facilities, resources, and staffing, it is imperative that consideration be given to potential changes in workload that could directly affect such deployment. Any changes in service demand can require changes and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance. For purposes of this study, ESCI utilized population projections obtained through census and BEBR data and multiplied these by a forecasted incident rate derived from historic incident per capita rates to identify workload potential through the year 2030. The results of the analysis are shown in the following figure.

Figure 45: Total Workload Forecast



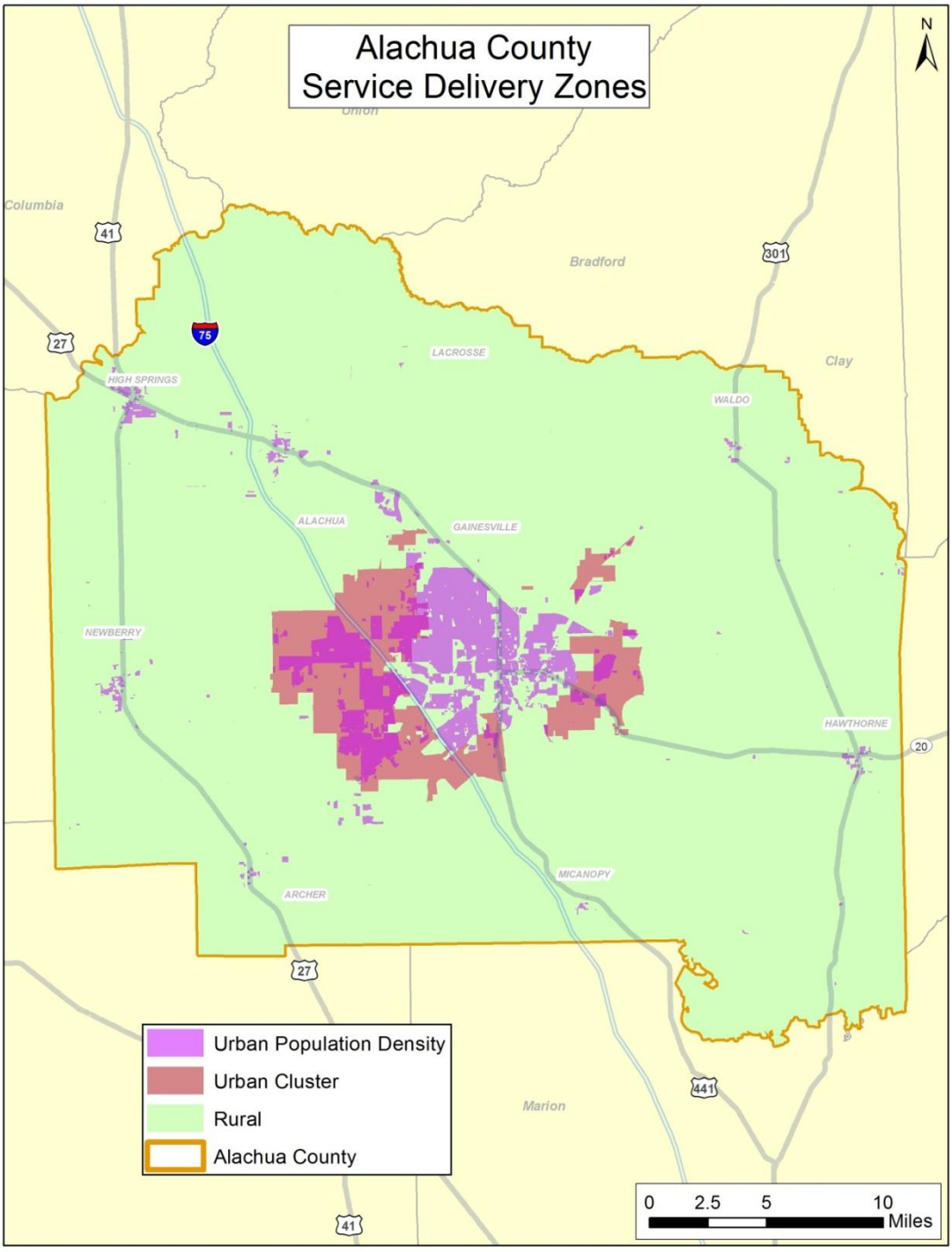
The increase in actual fire incidents is forecast to be relatively low during the study period, a reflection of trends for fire incident rates per capita and believed to be a result of improvements made in building codes and public fire education during the last several decades. EMS is expected to continue to be a predominate factor in service demand as the population ages and increases in overall numbers, while

other emergency service calls not involving actual fires are also forecast to increase, in part due to the use of automatic alarm and water flow systems.

Development of Service Delivery Zones

The current system of defining desired response performance is through the use of three classifications that are used in the County's land use planning: Urban, Urban Cluster, and Rural. These various land use plans anticipate a level of population and development that will ultimately occur. These are the best sources of information to use to plan for the deployment of resources. They are the community's plans for how population and risk will be distributed in the future. The fire and rescue agencies will need to anticipate this level of development and plan accordingly. The following map defines the urban, urban cluster, and rural zones within the county for the purpose of resource deployment planning.

Figure 46: Future Service Delivery Class Planning Zones



Given the geographic size of Alachua County, it would be unreasonable to expect an equal level of service in all three of the service delivery zones noted above. Thus, it is necessary to establish a tiered

system of service delivery performance objectives that more accurately meet the department's ability to provide service efficiently to all areas. Within the Alachua County Comprehensive Plan Section 1.2.5 Capital Improvements, a Fire Level of Service has been established in order to gauge capital facilities needs in the future. This plan as adopted identifies the following performance measures.

Figure 47: Adopted Level of Service Response Performance Objectives

Service Delivery Zone	Performance Objective	Percentage
Urban Service Area	4:00	80th
Urban Cluster	6:00	80th
Rural	12:00	80th

The County has adopted a tiered response performance objective based on population density, each measured at the 80th percentile. In other words, for the urban area, services should be delivered within four minutes at least 80 percent of the time. Similarly, the urban cluster and rural areas should receive service within 6 and 12 minutes, respectively, at least 80 percent of the time. As future service delivery models are presented in the next section of this report, these tiered performance objectives will be used to evaluate each potential strategy.

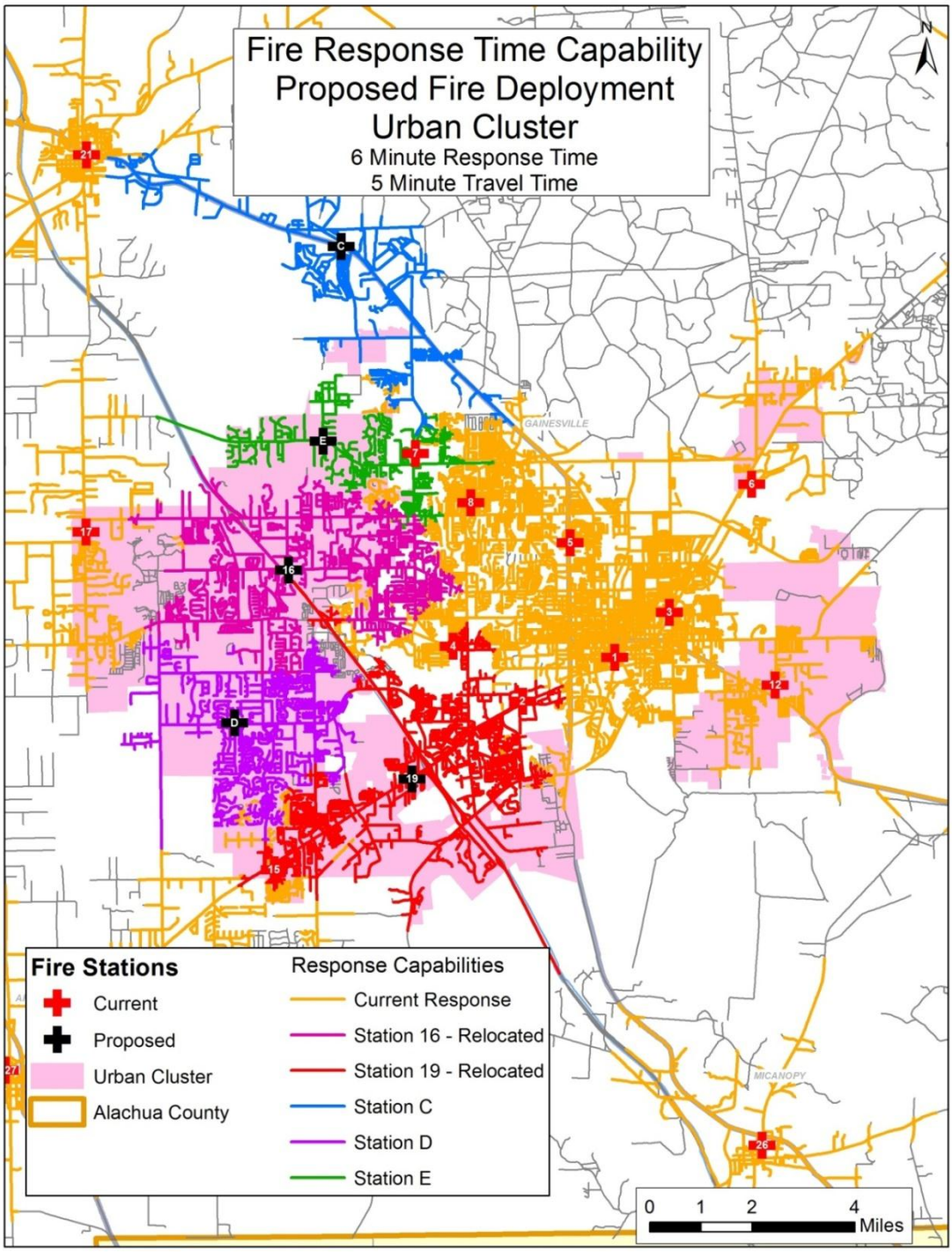
Future Service Delivery Models

Although the foregoing sections of this report focused primarily on the conditions that currently exist within the fire rescue system of Alachua County, the intent of this study is to combine that evaluation with a look into the future and provide policy makers with information necessary to carry the system forward over the next 10 to 20 years and update the previously completed master plan. This portion of the report provides recommendations related to the deployment of facilities, apparatus and personnel with a focus on future service delivery and an improvement in overall efficiency within the system.

Facilities

The current distribution of the fire and rescue stations was discussed previously in this report. This section intends to provide strategies that policy makers can use to look into the future in an effort to reduce costs and deliver emergency services to the community more efficiently while meeting the internally established performance objectives. As presented previously, there are certain areas within the current facility deployment plan that are outside the adopted performance objectives of each service delivery zone. In order to provide policymakers with information relative to closing those deficiencies, ESCI has evaluated several scenarios for future station placement. This analysis begins with the *urban* and *urban cluster* service delivery zones.

Figure 48: Urban Cluster Proposed Deployment - Fire

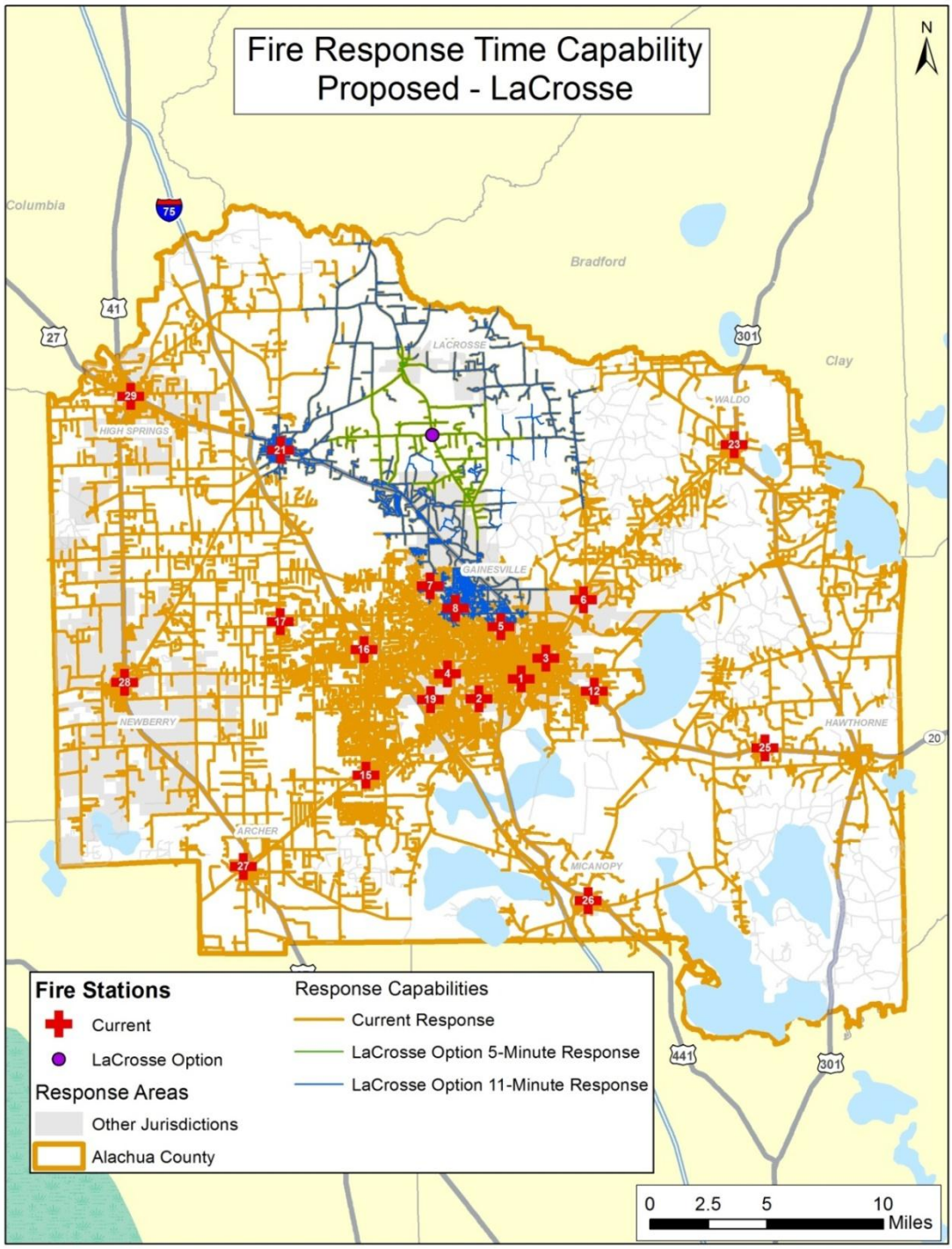


In order for ACFR to provide an urban level of service to the urban and urban cluster service delivery zones, a total of five new stations will be required; two relocations/replacements (16 and 19) and three additional stations (identified as Stations C, D, and E). Based on these recommendations, service

demand coverage at the six-minute level in the urban cluster for fire responses increases from 90.8 percent to 92.2 percent while coverage of rescue incidents increases more significantly from 78.8 percent to 84.2 percent. It should be noted that this is modeled travel time performance only with all apparatus available for a call. Actual performance will be lower, since some calls occur concurrently and require a more distant response, while other calls may occur while apparatus is out of station or out of service and unavailable. Performance improvements related to call concurrency and unit availability are addressed in this report through various additions in resource quantity to accommodate areas of high demand.

In regard to the rural response zones, several scenarios were evaluated to determine optimum deployment. ESCI was asked to consider options in the event the LaCrosse fire station was eventually shut down. The question posed was whether a single site could cover both a majority of the rural area previously currently covered by LaCrosse, as well as the area projected for coverage from Proposed Station C, which includes some urban cluster area northwest of Gainesville. The best possible site for such a station is presented in the following figure, along with the six-minute (urban cluster) and 12-minute (rural) response time models (allowing one minute for turnout time).

Figure 49: Proposed LaCrosse Station

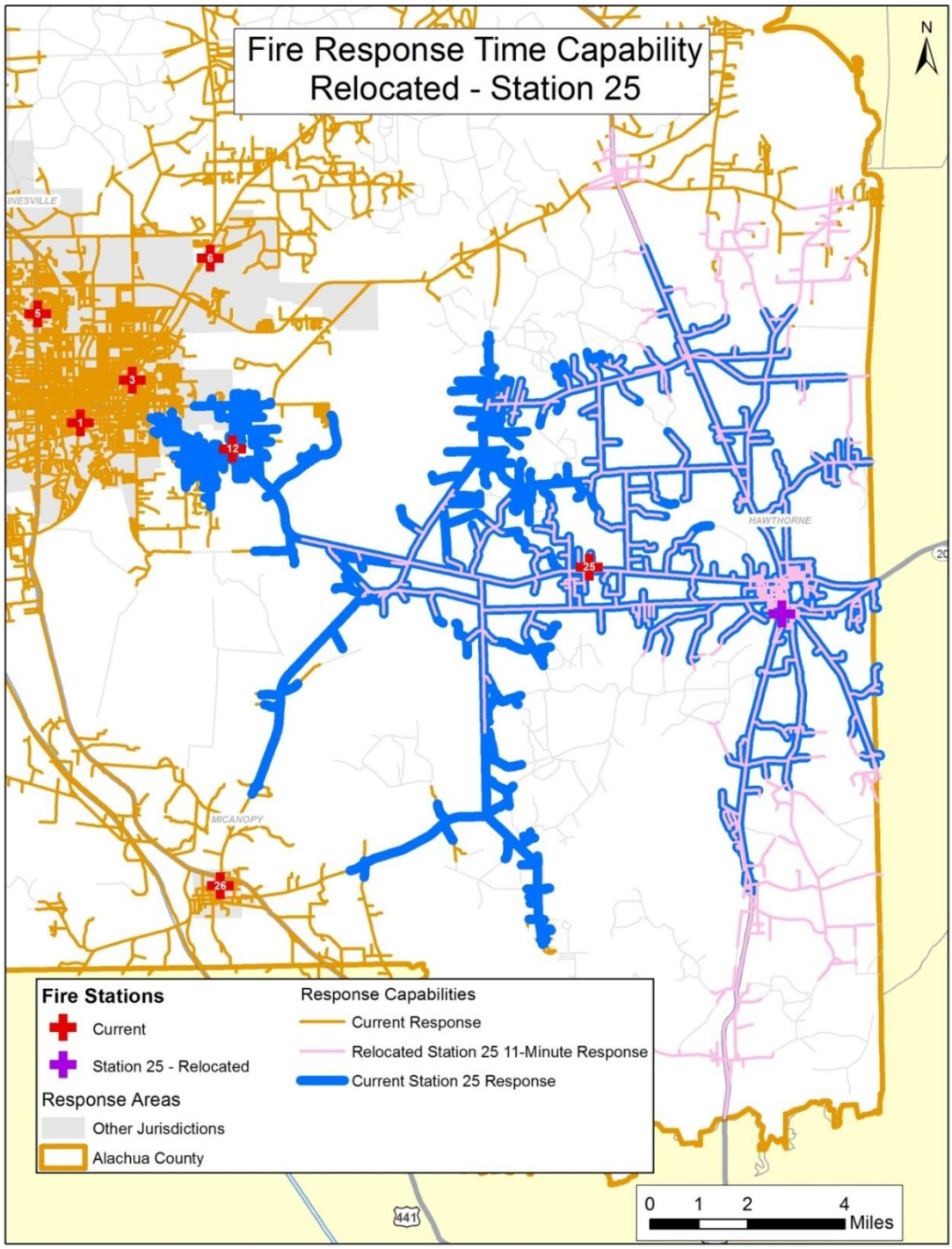


Based on this analysis, a single station at the identified location would leave a considerable amount of area and service demand anticipated to develop at urban cluster levels outside of the urban cluster response performance objective and is ***not*** recommended. Continued planning for the Station C site,

along with a LaCrosse location for rural responses in the north central section of the county, is recommended.

The second analysis of rural area coverage considers the current location of Station 25 and coverage in Hawthorne. ESCI was asked to evaluate the effectiveness of current Station 25 versus relocating a station into downtown Hawthorne. The resulting coverage is presented in the following figure, using the 12-minute response time model (allowing one minute for turnout time).

Figure 50: Proposed Relocation of Station 25



Coverage from the current station, while extensive, has a considerable amount of overlap with Station 12. In addition, the significant majority of Station 25's service demand is located within the city of Hawthorne, as indicated in the service demand density map found earlier in this report. From a

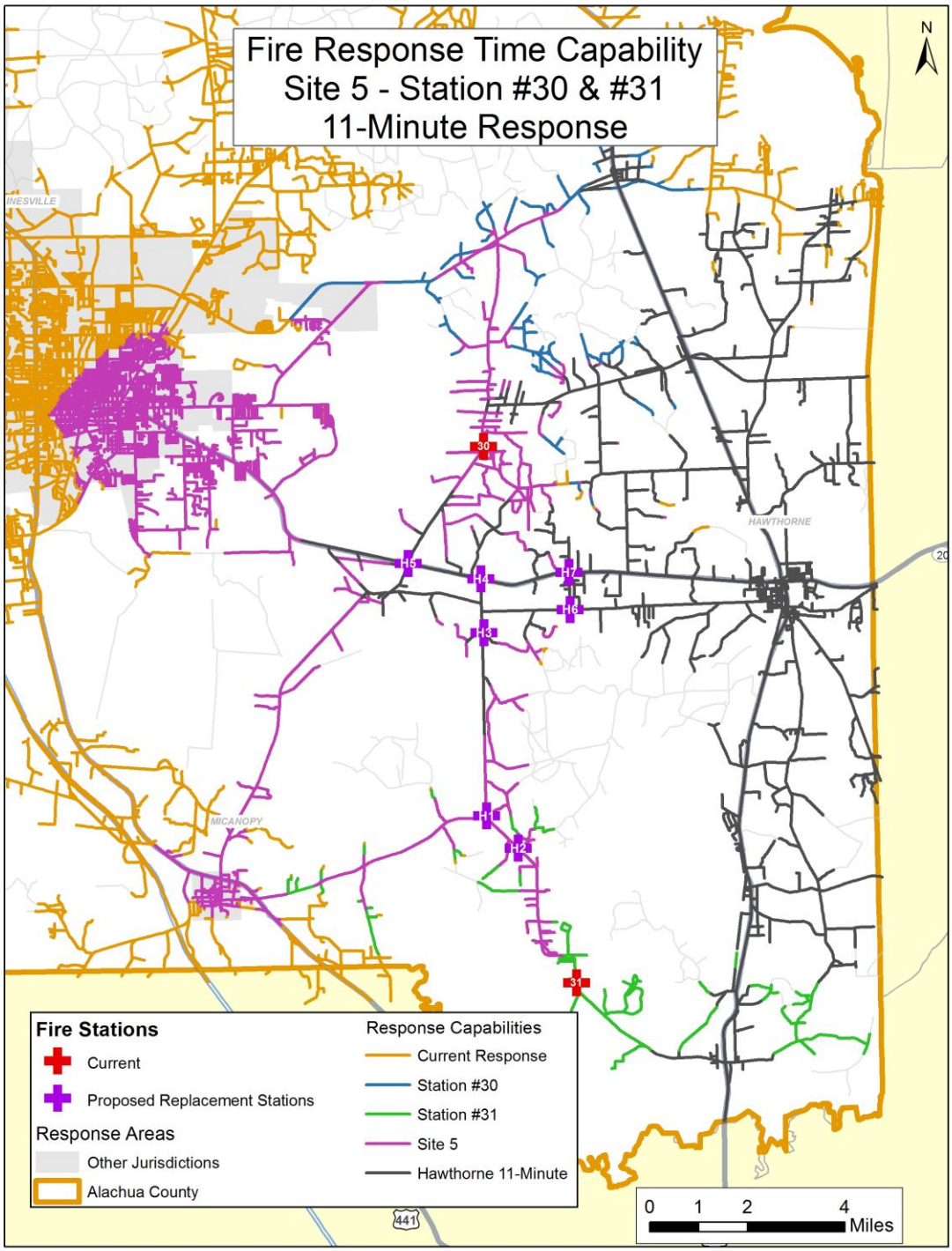
response time perspective, considerable improvement would be seen by locating there. ESCI analyzed the number of incidents covered within four incremental response time models from both the existing Station 25 location and the location of the old Hawthorne fire station. The results are shown in the following table, with, for instance, a 184 percent improvement in EMS incidents within three minutes of the fire station.

Figure 51: Site Coverage Analysis- Hawthorne vs. Station 25

	Fire				EMS				
Station	**3 Min**	**5 Min**	**7 Min**	**9 Min**	**3 Min**	**5 Min**	**7 Min**	**9 Min**	**Total**
Station 25	19	42	**77**	**118**	86	201	350	**560**	1,453
Hawthorne	**33**	**46**	61	84	**245**	**302**	**435**	480	**1,686**

Although coverage to the service demand within the City of Hawthorne would be improved by relocating Station 25, there is also concern that such a move could result in a decreased overall level of service to the eastern side of the county if the stations operated by independent volunteer fire departments (Stations 30 and 31) were to close and cease operation at some point in the future. To this end, ESCI addressed this concern and analyzed seven potential station locations that could provide service to the areas currently serviced by Stations 30 and 31.

Figure 52: Stations 30 and 31 Analysis

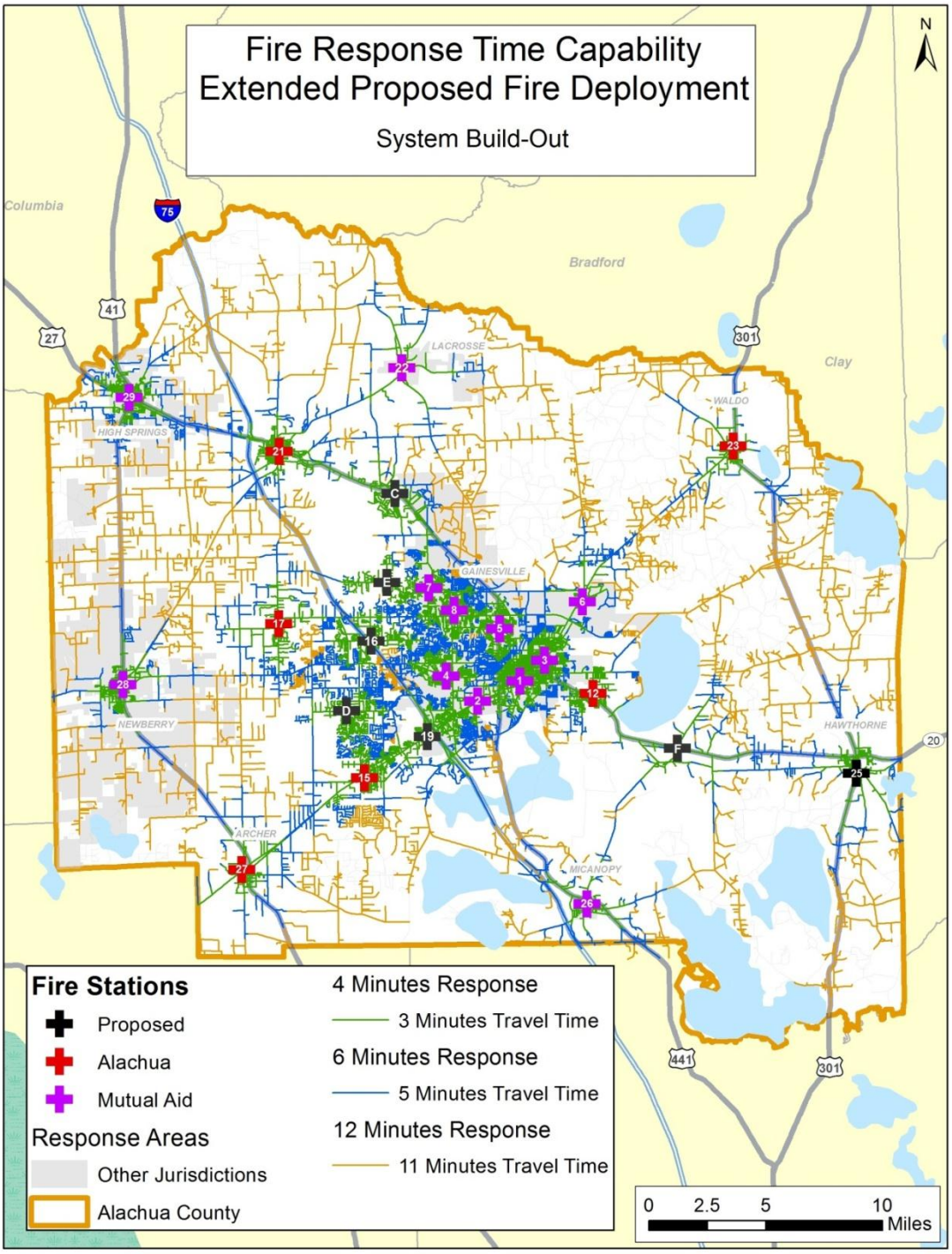


The following extended recommended deployment map shows the total distribution and travel time models for a full buildout scenario, as described below:

- A station is located in Hawthorne.

- A new station is located at Site 5 and Stations 30 and 31 are closed.
- The LaCrosse station remains open.
- Additional Stations C, D, and E and relocations of Stations 16 and 19 are completed as previously recommended.

Figure 53: Proposed Deployment - Extended Fire



Again, this deployment retains the current LaCrosse station (potentially as an ACFR asset) and adds a new station in the proximity of Highway 441 and Turkey Creek Boulevard. This would result in the following response performance improvement and is the recommended deployment model.

Figure 54: Response Performance Improvement - Extended Proposed Deployment (Fire)

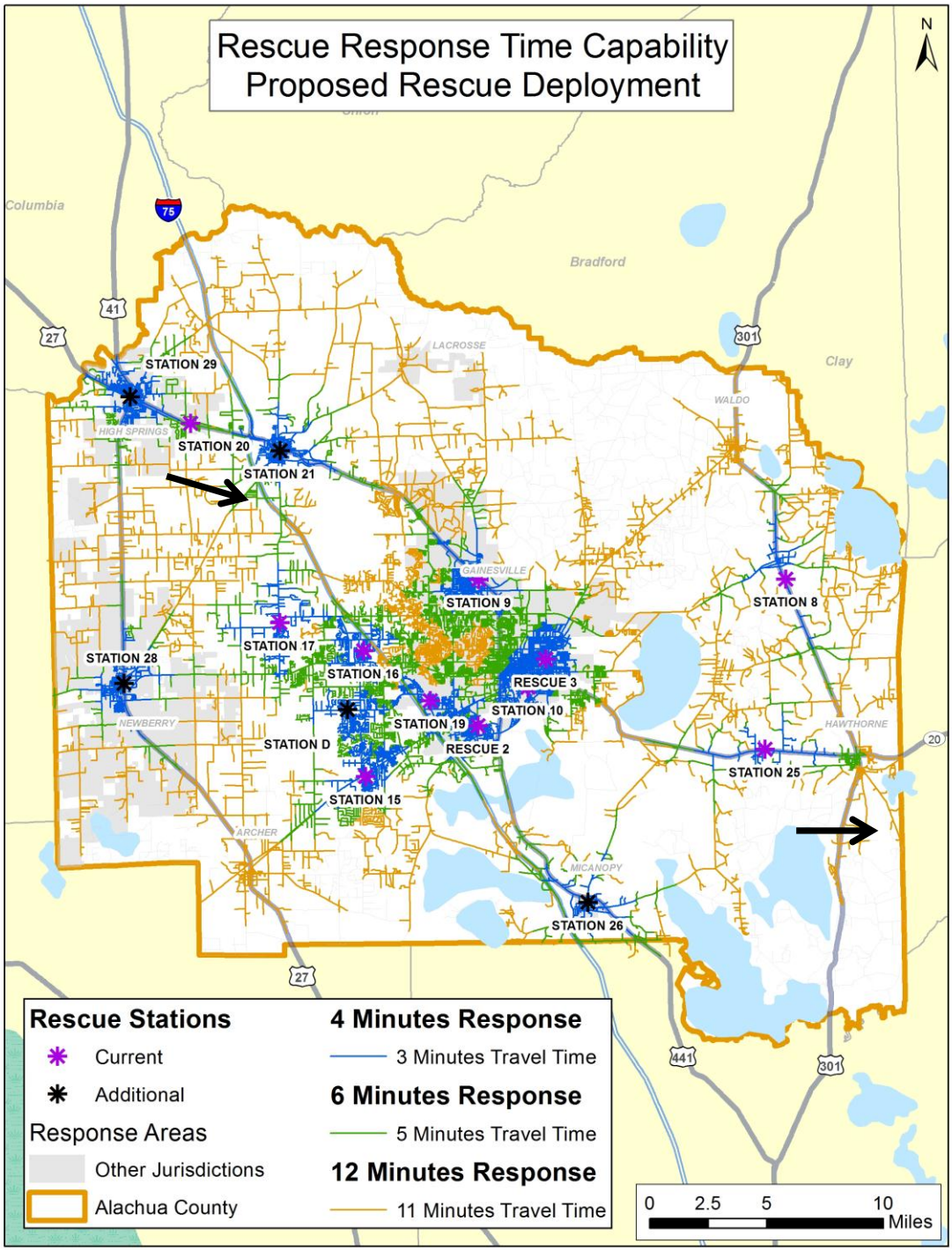
	Urban	Urban Cluster	Rural
	4-Minute	6-Minute	12-Minute
Current	66.8%	90.8%	98.9%
Proposed	68.5%	93.0%	99.7%

The most noticeable response performance improvements of the new deployment would be for medical incidents, because the plan would allow much better distribution of rescue units across Alachua County. The following figure and map illustrate the proposed deployment of rescues and includes four new rescues (two relocation and four additional units).

Figure 55: Rescue Deployment Revisions and Additions

Rescue	Action
Rescue 20	Relocate to Station 21
Rescue 25	Relocate to Hawthorne
New	Station 29 – High Springs
New	Station 28 – Newberry
New	Station 26 – Micanopy
New	Station D

Figure 56: Proposed Deployment - Rescue



Based on this proposed rescue deployment, response performance improves significantly in all areas as summarized below.

Figure 57: Response Performance Improvement - Proposed Deployment (Rescue)

	Urban	Urban Cluster	Rural
	4-Minute	6-Minute	12-Minute
Current	44.3%	78.8%	97.3%
Proposed	51.3%	84.2%	99.0%

Summary of Facilities Recommendations

Replace Rescue 2 with a new station (Also recommended in 2004 Plan)

Rescue 2 is currently operated out of a residential condominium, which in all likelihood is not zoned for operation of an emergency services unit. In addition, the space is old, cramped, and limits an efficient response by emergency personnel. The County should locate property in close proximity to the current facility for construction of a new station to ensure continued efficient deployment.

Provide Alterations to Rescue 3's Facility Owned by GFD

Rescue 3, the busiest ACFR station, is currently co-located in a GFD facility and, based on the 2004 Plan, should be relocated to an independent facility. The current location was never intended to house the number of personnel or apparatus currently deployed at this location. In addition, the rescue is parked outside in an unsecured location. The County should either relocate Rescue 3 to an independent facility in close proximity to the current location or fund modifications to the GFD facility to meet the needs of the colocation.

Replace Rescue 9 with a new station

Rescue 9 is currently operated out of a residential structure that was donated to the County. The structure is in poor condition and has been deemed as 'unsafe' by County Risk Management personnel. The County owns land adjacent to the current facility and should consider construction of a new station on that parcel.

Relocate Station 16 to 23rd Avenue NW and 83rd Street NW (Also recommended in 2004 Plan)

The relocation of Station 16 to the recommended location will move the station slightly to the north and provide better service delivery coverage to the areas northeast of Interstate 75. This relocation should be coupled with the construction of Station D for optimal performance.

Relocate Station 19 to SW 45th and Archer (Also recommended in 2004 Plan)

Station 19 is currently located within the City of Gainesville and houses an engine and a rescue unit. Since the engine must respond through the City of Gainesville to areas outside the municipal limits, relocation of this station outside the City would improve deployment efficiency.

Close Station 20

Station 20 currently houses a rescue unit that would be better utilized if relocated to Alachua and an additional rescue unit placed in High Springs.

Replace Station 21 in Alachua

Station 21 is currently in a modular facility and houses an engine only (brush Unit is cross-staffed). The station should be replaced with a more permanent facility slightly to the NW; the relocation of the rescue unit from Station 20 as well as the potential placement of a new District Chief as the system grows at this facility would require more space that is currently available.

Relocate Station 25 to Hawthorne

Station 25 is currently a modular facility and houses an engine and a rescue unit. This station should be relocated to downtown Hawthorne to improve deployment efficiency.

Construct a new station on Highway 20 at County Road 234

With the relocation of Station 25 to downtown Hawthorne, a new station at this intersection would improve overall deployment efficiency and provide service to both the Station 30 and Station 31 areas if those resources become unavailable.

Construct a new station at Highway 441 and Turkey Creek Boulevard (Station C) (Also recommended in 2004 Plan)

As identified in the previous study, this station will improve service delivery to the urban cluster area and proposed development along Highway 441 to the northwest of Gainesville. This station will not be

required if a single station strategy is chosen that will provide service to this area as well as LaCrosse as illustrated in Figure 50.

Construct a new station at 24th Avenue SW and 100th Street SW (Station D) (Also recommended in 2004 Plan)

The placement of Station D will improve service delivery to the urban cluster to the southwest of Gainesville.

Construct a new station at 63rd Boulevard NW and 71st St NW (Station E) (Also recommended in 2004 Plan)

The placement of Station E will improve service delivery to the urban cluster area to the northwest of Gainesville between Highway 441 and Interstate 75.

Apparatus

While the preceding proposed deployment options identify where fixed facilities should be, the intent of this section is to identify what types of apparatus should be located within those proposed facilities. The core mission of ACFR is to provide fire protection services to Alachua County. As such, each proposed station location would house an engine to meet that mission. Based on the extended fire deployment (Figure 51), a total of six additional engines will be needed at full plan implementation. In addition, Figure 56 suggests that four rescues be added to the system based on future deployment. These additions are summarized in the figure below.

Figure 58: Summary of Apparatus Recommendations

Station	Location	Additional Apparatus	Apparatus Fiscal Impact
Station 26	New Rescue in Micanopy	Rescue	$300,000
Station 28	New Rescue in Newberry	Rescue	$300,000
Station 29	New Rescue in High Springs	Rescue	$300,000
New East Station	Highway 20 at County Road 234	Engine	$600,000
New Station C	Highway 441 and Turkey Creek Blvd	Engine	$600,000
New Station D	24th Ave SW and 100th St SW	Engine, Rescue	$900,000
New Station E	63rd Blvd NW and 71st St NW	Engine	$600,000
	Total Fiscal Impact		**$3,600,000**

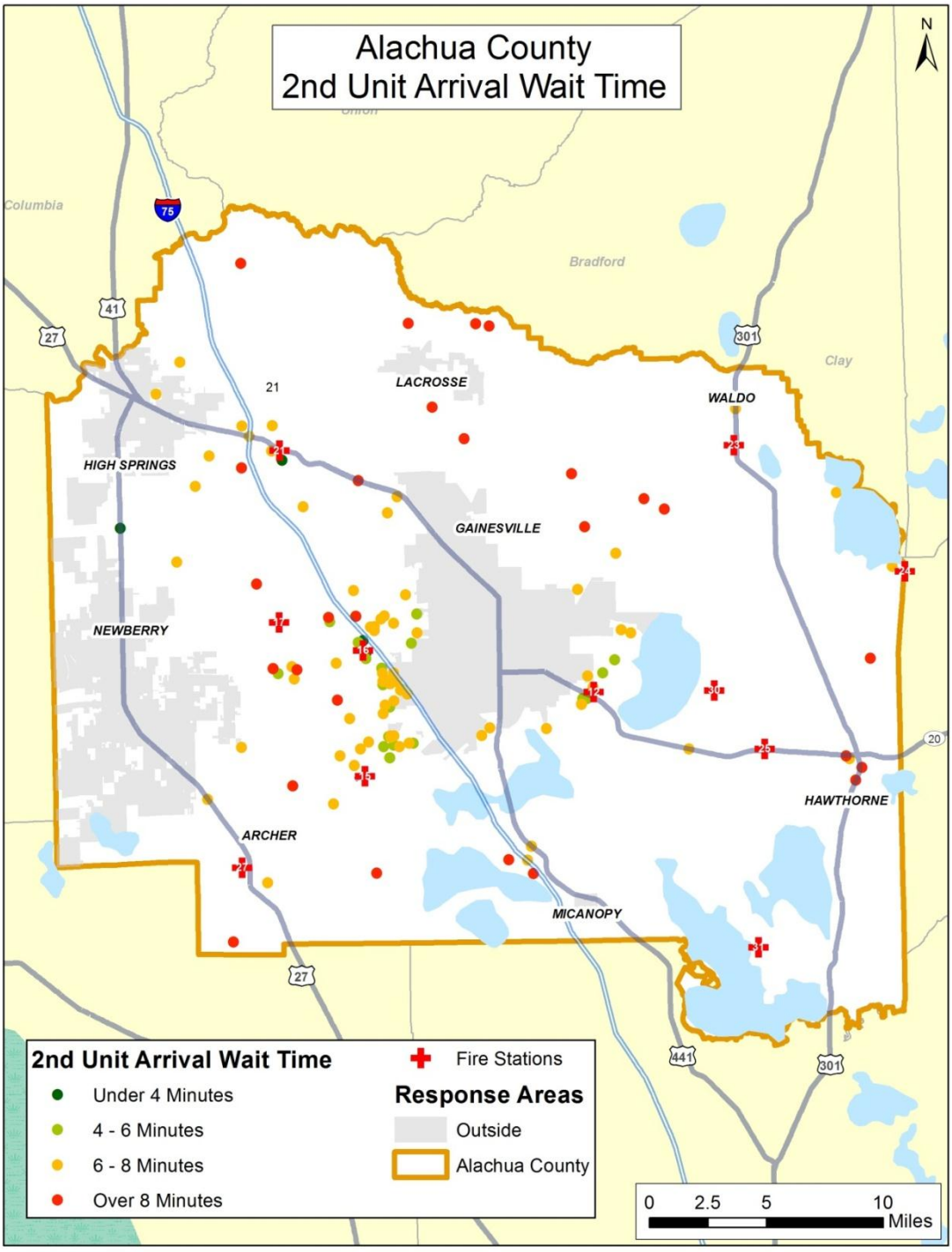
Staffing

While the relocation of apparatus or stations from one location to another will not require additional staffing, new stations or units added to the system will. In addition, ESCI conducted an analysis on how

long rural engines had to wait for additional resources in order to assemble sufficient personnel to make a safe interior fire attack. OSHA and EPA rules require that at least four firefighters be available prior to entry into an area where the atmosphere is deemed immediately hazardous to life or health (IDLH). This includes structure fires and other situations where use of self-contained breathing apparatus is required. This is commonly referred to as the OSHA "Two-In, Two-Out" rule.

Since several of the rural engines are staffed with only two firefighters, they must wait for arrival of a second unit prior to initiating fire attack or entry into an IDLH situation. There are many areas of the county where only one engine can arrive within 12 minutes, so it is important to analyze just how long these rural engines are waiting for that second unit to arrive.

Figure 59: Second Unit Wait Time Analysis



Each red mark on the map above indicates that the first arriving unit waiting more than eight minutes for the second arriving unit. Based on the staffing of the rural engines, more than eight minutes passed before a second fire unit arrived on scene, thereby reducing the department's ability to effectively

mitigate fire incidents where an interior attack could reduce damage and loss. For this reason, ESCI is recommending that those stations that experience the most extended wait times for fire incidents increase unit staffing to four personnel. The affected stations would include 23, 25, and 27.

The figure below summarizes the staffing requirements of the facility and apparatus recommendations noted previously. Those rows in bold indicate where staffing is recommended to be increased to a minimum of four personnel on the engine.

Figure 60: Summary of Staffing Recommendations (Extended Proposed Deployment) – Current Structure

Station	Primary Apparatus	DC	Lieutenant	Driver/ Operator	Firefighter	Total
Rescue 2	R	0	1	0	1	2
Rescue 3	R	0	1	0	1	2
Station 8	R	0	1	0	1	2
Station 9	R	0	1	0	1	2
Station 10	R, R	0	2	0	2	4
Station 12	E, DC	1	1	1	1	4
Station 15	E, R	0	2	1	2	5
Station 16	Q, S, R, DC	1	3	2	3	9
Station 17	E, R	0	2	1	2	5
Station 19	E, R	0	2	1	2	5
Station 21	E, R	1	2	1	2	6
Station 23	**E**	**0**	**1**	**1**	**2**	**4**
Station 25	**E, R**	**0**	**2**	**1**	**3**	**6**
Station 26*	R	0	1	0	1	2
Station 27	**E**	**0**	**1**	**1**	**2**	**4**
Station 28*	R	0	1	0	1	2
Station 29*	R	0	1	0	1	2
New Station C	E	0	1	1	1	3
New Station D	E, R	0	2	1	2	5
New Station E	E	0	1	1	1	3
New Station F (Site 5)	E	0	1	1	2	4
Shift Total		**3**	**30**	**14**	**34**	**81**
Total Deployment		**9**	**90**	**42**	**102**	**243**

*New rescue unit within current system.

The facility, apparatus and staffing recommendations result in an increase of 74 personnel. While the figure above assumes that the organization structure will remain as it is today, there is room for improvement that will result in a decrease is span of control and more effective operation by realigning the classifications of certain positions to generate equality across the ranks. Currently, suppression Lieutenants and Rescue Lieutenants, although seemingly equal, have different pay scales and level of supervisory responsibility. Modifying the rank structure to implement station Captains would allow the

system to equalize the responsibilities of the Lieutenant ranks across both disciplines. The following figure outlines a recommended staffing deployment that implements the new rank structure.

Figure 61: Summary of Staffing Recommendations (Extended Proposed Deployment) – Modified Structure

Station	Primary Apparatus	DC	Captain	Lieutenant	Driver Operator	Firefighter	Total
Rescue 2	R		1	2	3	0	6
Rescue 3	R		1	2	3	0	6
Station 8	R		1	2	3	0	6
Station 9	R		1	2	3	0	6
Station 10	R, R		1	5	6	0	12
Station 12	E, DC	3	1	2	3	3	12
Station 15	E, R		1	5	6	3	15
Station 16	Q, S, R, DC	3	1	8	9	6	27
Station 17	E, R		1	5	6	3	15
Station 19	E, R		1	5	6	3	15
Station 21	Q, R		1	5	6	6	18
Station 23	E		1	2	6	6	15
Station 25	E, R		1	5	6	6	18
Station 26	R		1	2	3	0	6
Station 27	E		1	2	3	6	12
Station 28	R		1	2	3	0	6
Station 29	R		1	2	3	0	6
New Station C	E, R		1	2	3	3	9
New Station D	E, R		1	5	3	3	12
New Station E	E		1	2	3	3	9
New Station F (site 5)	E		1	2	3	3	9
Total		**6**	**21**	**69**	**90**	**54**	**240**

This deployment recommendation would not change the total overall staffing of the previously presented staffing deployment plan.

Conclusion

The ESCI project team began collecting information concerning the fire services for Alachua County in May of 2012. The team members recognize that the report contains a large quantity of information and ESCI would like to thank the elected and appointed officials of Alachua County as well as the officers and staff of Alachua County Fire Rescue for their tireless efforts in bringing this project to fruition. ESCI would also like to thank the various individuals and external organizations for their input, opinions, and candid conversations throughout this process. It is ESCI's sincere hope is that the information contained in this report is utilized to its fullest extent and that the emergency services provided to the citizens of Alachua County are improved by its implementation.