City of Graham
City Council Meeting Agenda
July 9, 2024

6:00 p.m. | City Hall | 201 South Main Street | Graham, NC

CALL TO ORDER: Mayor Jennifer Talley

INVOCATION & PLEDGE OF ALLEGIANCE

CONSENT AGENDA:

a. To approve the June 11, 2024, Council Meeting and sealed Closed Session minutes.

b. To approve the Property Management Policy for ARPA Project Funding Compliance for accepting and expending funds for applicable projects.

c. To approve a Resolution adopting the 2023 Local Water Supply Plan (LWSP). The State has completed its review of the 2023 LWSP for the City's water system and has found that it meets the minimum criteria established in N.C.G.S. 143-355(I).

d. To approve tax releases in the amount of $247.98.

NEW BUSINESS:

1. **PRESENTATION – FIRE STATION LOCATION ANALYSIS**

   City Council will receive a presentation of the 2024 Fire Station Location Analysis prepared by North Carolina Fire Chief Consulting.

PUBLIC COMMENT PERIOD

CITY STAFF COMMENTS

CITY COUNCIL COMMENTS

CLOSED SESSION:

City Council will consider going into closed session pursuant to N.C.G.S. 143-318.11(a)(5) to consider the purchase of 1076, 1100, and 1134 Town Branch Road adjacent to Bill Cooke Park parcel numbers 147644, 147738, and 147739 (owned by Susan Teer Lambert & Cathy Teer Evans) for the intended use of park and recreational facilities.

ADJOURN

City of Graham
City Council Meeting Minutes
June 11, 2024

The City Council of the City of Graham held a regularly scheduled meeting at 6:00 p.m. on June 11, 2024, in the Council Chamber, City Hall Municipal Building at 201 South Main Street, Graham, NC.

Council Members Present:
Mayor Jennifer Talley
Mayor Pro Tem Ricky Hall
Council Member Bobby Chin
Council Member Joey Parsons
Council Member Bonnie Whitaker

Staff Present:
Megan Garner, City Manager
Aaron Holland, Assistant City Manager
Bryan Coleman, City Attorney
Bob Ward, City Attorney
Renee Ward, City Clerk

CALL TO ORDER: Mayor Jennifer Talley

INVOCATION & PLEDGE OF ALLEGIANCE

Council Member Parsons gave the invocation and all stood for the Pledge of Allegiance.

CONSENT AGENDA:

a. To approve the May 14, 2024, Council Meeting and sealed Closed Session minutes and the May 21, 2024, Special Meeting Budget Workshop minutes.

b. To approve a Budget Project Ordinance in the amount of $897,066.75 for the Banks and McBride Water and Sewer improvements.

CAPITAL PROJECT ORDINANCE
BANKS & MCBRIDE IMPROVEMENTS PROJECT

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF GRAHAM, NORTH CAROLINA, that pursuant to Section 13.2, Chapter 159 of the General Statutes of North Carolina, the following Capital Project Ordinance is hereby adopted:

Section 1. The Project authorized is Banks & McBride Improvements Project.

Section 2. The officials of the City of Graham are hereby directed to proceed with this project within the terms of the project. Staff is authorized to execute change orders within the budget ordinance.

Section 3. The following revenues are anticipated to be available to the City to complete the project:

Proceeds from Retained Earnings – Water/Sewer	$ 897,066.75

		$ 27,933.25
(Expended)		
	TOTAL	$ 925,000

Section 4. The following amounts are appropriated for this project:

Professional Services		$ 925,000
	TOTAL	$ 925,000

Section 5. The Finance Director shall report on the financial status of this project as directed by the City Council and will inform the Council of any unusual occurrences.

Section 6. Copies of this project ordinance shall be made available to the City Manager and the Finance Director for direction in carrying out this project.

Section 7. This ordinance shall take effect upon passage.

This the 11th day of June 2024.

c. To approve a Services Agreement between the City of Graham and Ward & Coleman, Attorneys at Law, for legal services effective July 1, 2024.

d. To approve a budget amendment increasing the Wastewater Capital Outlay by $55,000 from $45,000 to $100,000 for the additional removal of solids from the plant.

CITY OF GRAHAM

BUDGET AMENDMENT ORDINANCE
2023-2024

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF GRAHAM THAT
THE 2023 - 2024 BUDGET ORDINANCE SHALL BE AND IS HEREBY AMENDED AS FOLLOWS:

Section 1.
EXPENDITURES

DEPARTMENT/ACCOUNT	APPROVED	AMENDED	INCREASE	(DECREASE)	INCREASE (DECREASE)
Wastewater - Capital Outlay	45,000.00	100,000.00	55,000.00		55,000.00
	45,000.00	**100,000.00**	**55,000.00**	-	**55,000.00**

Section 2.
REVENUES

	APPROVED	AMENDED	INCREASE	(DECREASE)	INCREASE (DECREASE)
Fund Balance Appropriation	$794,625.00	$849,625.00	55,000.00		55,000.00
	794,625.00	**849,625.00**	**55,000.00**	-	**55,000.00**

Adopted this 11th day of May 2024.

e. To approve an interlocal agreement between the City of Graham and Alamance County for occupancy tax collection.

Mr. Tom Boney, Alamance News inquired about Item c stating, at the last meeting, it was decided the attorneys would be municipal employment and asked if there had been a decision against the attorneys being employees.

City Manager Megan Garner stated the agreement changed them from contract legal services to part-time contract employees.

Mayor Talley asked if any notices went out to those affected by occupancy tax.

City Manager Garner stated she was not certain if TDA had sent information out but her office could notify all affected businesses.

Mayor Talley asked for Airbnbs to be included and asked about the collection process.

City Manager Garner stated the interlocal agreement would allow Alamance County to collect Graham's 3% while collecting the County's 3%. She stated the County would collect the funds and disperse to the TDA who would then disperse to the appropriate municipalities.

Mayor Pro Tem Hall motioned to approve the Consent Agenda items, seconded by Council Member Chin. The motion passed unanimously.

PUBLIC HEARING:

ITEM 1: ADOPTION - FY2024-2025 BUDGET

A public hearing has been scheduled to consider the adoption of the Fiscal Year 2024-2025 Budget Ordinance, the 2024-2025 Pay Plan, and the 2024-2025 Rates and Fee Schedule.

Council opened the public hearing and the following spoke:

Tom Boney, Alamance News, asked if anything had changed from what the manager presented last month.

City Manager Garner stated since the Budget Work Session held in May, there was only one change, an increase of $3,000. She stated $1,500 would go to the Historical Museum Board and $1,500 to the Historic Resources Commission. She stated before the funds could be dispersed, the boards would have to come before the Council and present its intended use.

Mayor Talley inquired about the inspection fees.

City Manager Garner stated these fees are generated from inspections in the Public Works Department from developers. She stated this fee was not meant to be a money maker for the City of Graham and staff was not trying to sling fees at developers, but were already going significantly in the hole.

Council Member Whitaker stated she had no problem with how the fees were stated in the schedule as presented.

Mayor Talley suggested passing the fee as stated and asked to revisit it in six months to determine if the fees had curbed the expense of staff going out repeatedly to the same site.

Closed the public hearing:

Motion by Mayor Pro Tem Hall to close the public hearing, seconded by Council Member Chin. The motion passed unanimously.

The Council thanked City Manager Garner for all the hard work in delivering a great budget.

Mayor Pro Tem Hall motioned to approve the FY 2024-25 Budget Ordinance, 2024-25 Pay Plan, and the 2024-25 Rates and Fee Schedule, seconded by Council Member Whitaker. The motion passed unanimously.

Budget Ordinance
FY 2024-2025

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF GRAHAM, NORTH CAROLINA:

Section l. The following amounts are hereby appropriated in the General Fund for the operation of City Government; its activities and capital improvements for the Fiscal Year beginning July 1, 2024, and ending June 30, 2025, in accordance with the Chart of Accounts heretofore established for the City:

Department	Recommend
Tourism	$ 79,000
City Council	$ 56,350
Administration	$ 798,270
Information Technology	$ 560,178
Finance	$ 450,642
Public Buildings	$ 172,400
Police	$ 6,596,342
Fire	$ 2,074,465
Inspections	$ 875,126
Traffic Engineering	$ 28,800
Streets & Highways	$ 1,859,226
Street Lights	$ 206,000
City Garage	$ 1,320,506
Sanitation	$ 1,653,912
Recreation	$ 1,094,784
Lake	$ 394,136
Athletic Facilities	$ 404,271
Property Maintenance	$ 935,367
Non-Departmental	$ 1,091,575
	$ 20,651,350

Section 2. It is estimated that the following revenues will be available in the General Fund for the Fiscal Year beginning July 1, 2024, and ending June 30, 2025.

Ad Valorem Taxes	$	7,030,000
Investment Earnings	$	215,000
Miscellaneous	$	727,900
Other Taxes/License	$	500
Occupancy Tax	$	79,000
Permits/Fees	$	590,000
Restricted Governmental	$	1,026,000
Sales/Services	$	2,078,668
Unrestricted Governmental	$	7,745,000
Fund Balance	$	1,159,282
Grand Total	**$**	**20,651,350**

Section 3. The following amounts are hereby appropriated in the Water and Sewer Fund for its operations, activities, and capital improvements for the Fiscal Year beginning July 1, 2024, and ending June 30, 2025, in accordance with the Chart of Accounts heretofore established for the City:

Water and Sewer Billing	$ 675,700
Water and Sewer Distribution	$ 2,819,837
Maintenance and Lift Stations	$ 314,734
Water Treatment Plant	$ 3,494,354
Wastewater Treatment Plant	$ 2,265,103
Non-Departmental	$ 2,680,172
Fund Total	**$12,249,900**

Section 4. It is estimated that the following revenues will be available in the Water and Sewer Fund for the Fiscal Year beginning July 1, 2024 and ending June 30, 2025.

Services	$ 10,739,000
Operating	$ 765,100
Non-Operating	$ 403,500
Other	$ 342,300
Fund Total	**$ 12,249,900**

Section 5. The following amounts are hereby anticipated and appropriated for the City's Special Funds**:**

	Revenues	Expenditures
Federal Drug Monies	100	100
State Drug Monies	100	100
ARPA Local Fiscal Recovery Fund (Revenue Replacement)	4,986,340	4,986,340
ARPA Enabled Projects	4,908,621	4,908,621
Truby Drive Repair Project	200,000	200,000
10" Water Main Replacement	17,250,000	17,250,000
Boyd Creek Pump Station	3,962,000	3,962,000
Old Field Outfall	2,955,000	2,955,000
WWTP Upgrade	84,649,290	84,649,290
Water Line Inventory & Assessment	400,000	400,000
Boyd Creek Watershed Point Repair	500,000	500,000
Long and Albright Improvements Project	904,860	904,860
Banks and McBride Improvements	925,000	925,000
TOTALS:	**121,641,311**	**121,641,311**

Section 6. There is hereby levied a tax at the rate of $.2899 per one hundred dollars ($100.00) of valuation of property as listed for taxes as of January 1, 2024, for the purpose of raising the Revenue listed as "Ad Valorem Taxes" in Section 2. Such rates are based on an estimated total valuation of property for the purposes of taxation of $2,255,702,271 (100% valuation) with an anticipated collection rate of 95%.

Section 7. The City of Graham Capital Improvement Plan 2025-2034 for Water and Sewer Fund and 2025-2029 for all other funds is hereby approved and amended per the appropriations for improvements contained herein. For the purpose of tracking capital items, there shall be a threshold of $5,000.

Section 8. Copies of this Ordinance shall be furnished to the City Manager and the Finance Officer to be kept on file by them for their direction in the disbursement of City Funds.

Adopted this 11th day of June 2024.

OLD BUSINESS:

ITEM 2: DOWNTOWN ENHANCEMENT GRANT POTENTIAL PROJECTS

The City of Graham was recently awarded a Directed Grant through the State for $600,000. The City Council will consider potential projects for the Downtown Enhancement Grant Scope of Work. (Tabled from the May 14, 2024, City Council Meeting)

City Manager Garner stated this item was continued from the May meeting. She stated there were items in the agenda packet that could be considered as options for the directed grant of $600,000, that must be spent in the downtown area. She stated City Council received notification that Duke Energy had installed an LED bulb and the before and after pictures were sent to the Council. She stated staff had checked with the State and the scope of work for this funding is preferred to be submitted by the end of this fiscal year, June 30, 2024.

Mayor Talley asked staff to research through Duke Energy for any available grants when changing to LED lights.

Public Works Director Robertson stated he would contact Duke Energy but was not sure since the City was increasing the wattage.

Mayor Talley asked the Council if they were okay with selecting new lighting as one of the projects. The council stated yes.

Mayor Talley asked if the Council was okay with the hanging basket project.

Council Member Whitaker asked who would maintain the baskets.

City Manager Garner stated there were two quotes from two landscaping companies to maintain baskets on hangers and the City would need to provide them on the light poles. The quoted time frame would be 20 to 30 weeks per year with low-maintenance flowers and the cost would be between $43,000 and $50,000 per year for baskets on the metal poles.

Council Member Whitaker stated that was a lot of money.

After further discussions on the maintenance of flower baskets, Mayor Talley asked the Council about funding pedestrian crosswalk improvements since she specifically asked that a portion of the money be used for crosswalks. Council agreed.

Council Member Parsons inquired about money left over to use towards the repair of the Sesquicentennial Park and inquired about painting the light poles downtown.

Mayor Talley stated that was not what the grant money was intended to be used for and that painting the light poles was too expensive. She stated she would speak with Duke Energy and believed they should maintain its products.

Mayor Pro Tem Hall inquired about project number 4, resurfacing Elm Street downtown.

Mayor Talley asked where was this street on the resurfacing schedule.

Public Works Director Robertson stated it was still three or four years before it was scheduled.

Mayor Talley asked if there were flowers that would not need watering every day. She stated the baskets would have a dramatic appearance in the downtown. She stated the most important was pedestrian crosswalks due to safety. She stated she requested this grant to reinstall the crosswalks before the resurfacing and if additional money was left over the flower baskets could be considered. She stated the lighting was brought up by staff and would improve safety at night.

Council Member Whitaker agreed.

Council Member Parsons stated he was okay with the crosswalks, lighting, and hanging baskets if it was cost-effective. He stated until we hear back from Duken Energy we will not know if we could even have baskets.

Council Member Chin stated if we could not do the hanging baskets why not replace trees?

Motion by Mayor Pro Tem Hall for a downtown street light upgrade, pedestrian crosswalk improvements, and possibly tree replacements and hanging baskets pending permission and funding, seconded by Council Member Parsons. The motion passed unanimously.

ITEM 3: GRAHAM-MEBANE LAKE COMPREHENSIVE MASTER PLAN

City Council will consider approving the Graham-Mebane Lake Comprehensive Master Plan to allow for various grants including state-funded Parks and Recreation Trust Fund, Land and Water Conservation Fund, and Accessible Parks grants. (Tabled from the May 14, 2024, City Council Meeting)

Brian Faucette, Recreation and Parks Director, stated on page 12 there should be a correction. Section 14-129 should read “Boating” and not fishing.

Council Member Chin stated it was a well-written plan.

Mayor Talley stated the lake could be a revenue center for the City and over the past several years, improvements had been made at the lake such as the building where you check in and check out, bathrooms are now ADA compliant, and a new kayak launch.

Mr. Faucette stated the kayak launch had dramatically increased revenue. He stated the motor boat launching was the second-highest revenue-producing section on the water. He stated the new extended boat launch with additional docks between the ramps should begin construction in late October or November so operations would be least affected.

Mayor Talley stated the plan was very well written and thanked Mr. Faucette for his feedback.

Motion by Council Member Whitaker to approve the Graham-Mebane Lake Comprehensive Plan, seconded by Mayor Pro Tem Hall. The motion passed unanimously.

NEW BUSINESS:

ITEM 4: BOARDS & COMMISSIONS - APPOINTMENTS

City Council will consider appointments to Graham's Boards and Commissions.

Appearance Commission/Tree Board
Bernadette Konzelmann — Requests Reappointment
Zipporah Clark Baldwin — Requests Reappointment
Vacancies – 2
Applicant: Ally Villiard

Graham Historical Museum Board
John Harrington — Requests Reappointment
Vacancies – 1
No Applications

Graham Housing Authority
Robert Sykes — Requests Reappointment
Applicant: Chris Howe

Historic Resources Commission
Karen Chin — Requests Reappointment
Vacancies – 4
Applicants: Ally Villiard

Planning Board/Board of Adjustment
Vacancies - 1
Applicant: Chris Howe

Recreation Commission
Vacancies - 2
Applicant: Ally Villiard
(Laurie Pickard has requested to be reappointed)

Mayor Talley asked to readvertise all boards to solicit additional applicants.

Council Member Parson asked to consider reducing the HRC from a seven-member board to a five-member board and place it on next month's agenda.

Mayor Pro Tem Hall asked for the Council to consider moving away from appointing the same person to multiple boards.

Council Member Parsons stated he understood, but when you are spread thin it is hard to fill positions.

Motion by Mayor Talley to appoint the following, seconded by Council Member Chin. The motion passed unanimously.

Appearance Commission/Tree Board

Bernadette Konzelmann	Reappointed
Zipporah Clark Baldwin	Reappointed
Ally Villiard	Appointed

Three-year term expiring June 30, 2027
One vacancy remains.

Graham Historical Museum Board

John Harrington	Reappointed

Three-year term expiring June 30, 2027
One vacancy remains.

Graham Housing Authority

Robert Sykes	Reappointed

Five-year term expiring June 30, 2029

Historic Resources Commission

Karen Chin	Reappointed

Four-year term expiring June 30, 2028
Four vacancies remain.

Recreation Commission

Laurie Pickard	Reappointed

Three-year term expiring June 30, 2027
One vacancy remains.

Mayor Talley asked the City Clerk to readvertise all boards with existing vacancies to get additional applicants.

PUBLIC COMMENT PERIOD

Mr. Griffin McClure, 622 Johnson Avenue, spoke about the Sesquicentennial Park and asked that the Council consider keeping the park green and as a public space. He asked the Council to talk to the businesses not represented on the Council to determine what they want.

Mayor Talley stated that repairing the park would be costly and was now a safety issue.

Tom Boney, Alamance News, spoke about Mayor Talley's statement about going to Raleigh herself and getting a grant and on whose direction and guidelines she acted. He talked about having an issue of committing to certain criteria and a particular way the money could be spent.

Mr. David Bradley, 215 College Street, Graham, asked for assistance in clearing his name stating he was falsely accused of taking an item.

Ms. Renee Russell, downtown business owner, talked about her proposal for downtown wayfinding signs. She also asked that the Sesquicentennial Park stay a green space.

Amy Wilkinson, The Main Line, and Cheryl Rich, Sandy & Company, thanked the Council for moving the Slice of Summer event. They shared that their business did great during the event. Ms. Wilkinson asked the Council to keep the Sesquicentennial Park where it was.

CITY STAFF COMMENTS

No comments

CITY COUNCIL COMMENTS

No comments

CLOSED SESSION:

City Council will consider going into closed session pursuant to N.C.G.S. 143-318.11(a)(6) to discuss personnel and pursuant to N.C.G.S. 143-318.11(a)(5) to consider the purchase of 1076, 1100, and 1134 Town Branch Road adjacent to Bill Cooke Park parcel numbers 147644, 147738, and 147739 (owned by Susan Teer Lambert & Cathy Teer Evans) for the intended use of park and recreational facilities.

Motion by Council Member Whitaker to go into closed session, seconded by Mayor Pro Tem Hall. The motion passed unanimously.

Motion by Council Member Whitaker to come out of closed session, seconded by Mayor Pro Tem Hall. The motion passed unanimously.

RETURN TO OPEN SESSION:

Motion by Council Member Whitaker to come back to open session, seconded by Council Member Parsons. The motion passed unanimously.

Mayor Talley stated the Council discussed a 6.2% salary increase for the City Attorneys in closed session.

Motion by Mayor Talley to approve a 6.2% salary increase, seconded by Mayor Pro Tem Hall. The motion passed unanimously.

ADJOURN

Motion by Council Member Whitaker, seconded by Council Member Chin. The motion passed unanimously. The meeting adjourned at 8:45 p.m.

Renee M. Ward, CMC
City Clerk

STAFF REPORT

SUBJECT:	PROPERTY MANAGEMENT POLICY ADOPTION
PREPARED BY:	AARON HOLLAND, ASSISTANT CITY MANAGER

REQUESTED ACTION:

Approve the Property Management Policy for ARPA Project Funding Compliance.

BACKGROUND/SUMMARY:

On March 11, 2021, the American Rescue Plan Act (ARPA) was signed into law. This bill included direct financial assistance to local governments that have faced revenue losses and added safety expenses in dealing with the COVID-19 pandemic as well as making investments in water, sewer, and broadband infrastructure.

As part of the compliance for accepting and expending these funds for applicable projects, municipalities would need to have and/or adopt policies in accordance with the NC Department of Environmental Quality checklist. The City does not currently have a Property Management Policy on file and would need to approve the following policy to maintain compliance.

FISCAL IMPACT:

N/A

STAFF RECOMMENDATION:

Approval. The UNC School of Governments provides sample policies for templates. Staff and attorneys have reviewed the following language.

SUGGESTED MOTION(S)

I move we approve the Property Management Policy for ARPA Project Funding Compliance.

City of Graham

Property Management Policy

WHEREAS the CITY OF GRAHAM, has received an allocation of funds from the Coronavirus State and Local Fiscal Recovery Funds of H.R. 1319 American Rescue Plan Act of 2021 (ARP/CSLFRF); and

WHEREAS the funds may be used for projects within these categories, to the extent authorized by State law.

1. Support COVID-19 public health expenditures, by funding COVID-19 mitigation and prevention efforts, medical expenses, behavioral healthcare, preventing and responding to violence, and certain public health and safety staff;
2. Address negative economic impacts caused by the public health emergency, including economic harms to households, small businesses, non-profits, impacted industries, and the public sector;
3. Replace lost public sector revenue, using this funding to provide government services to the extent of the reduction in revenue experienced due to the pandemic;
4. Provide premium pay for essential workers, offering additional support to those who have borne and will bear the greatest health risks because of their service in critical infrastructure sectors; and,
5. Invest in water, sewer, and broadband infrastructure, making necessary investments to improve access to clean drinking water, support vital wastewater and stormwater infrastructure, and expand access to broadband internet; and

WHEREAS the ARP/CSLFRF are subject to the provisions of the federal Uniform Grant Guidance, 2 CFR Sect. 200 (UG), as provided in the Assistance Listing; and

WHEREAS the Compliance and Reporting Guidance for the State and Local Fiscal Recovery Funds (v4.1 June 2022) provides, in relevant part:

> **Equipment and Real Property Management.** Any purchase of equipment or real property with SLFRF funds must be consistent with the Uniform Guidance at 2 CFR Part 200, Subpart D. Equipment and real property acquired under this program must be used for the originally authorized purpose. Consistent with 2 CFR 200.311 and 2 CFR 200.313, any equipment or real property acquired using SLFRF funds shall vest in the non-Federal entity. Any acquisition and maintenance of equipment or real property must also comply with relevant laws and regulations.

WHEREAS Subpart D of the UG dictates title, use, management, and disposal of real property, equipment, and supplies acquired in whole or in part with ARP/CSLFRF funds;

BE IT RESOLVED that the governing board of the CITY OF GRAHAM hereby adopts and enacts the following Uniform Guidance Property Management Policy for the expenditure of ARP/CSLFRF funds.

Property Standards for Real Property, Equipment, and Supplies Acquired with American Rescue Plan Act of 2021 Coronavirus State and Local Fiscal Recovery Funds

I. Policy Overview

Title 2 U.S. Code of Federal Regulations Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, commonly called Uniform Guidance (UG), specifically Subpart D, details post award requirements related to property management of property acquired or updated, in whole or in part, with funds from the Coronavirus State and Local Fiscal Recovery Funds of H.R. 1319 American Rescue Plan Act of 2021 (ARP/CSLFRF).

2 CFR 200.311 through 2 CFR 200.316, as modified by US Treasury ARP/CSLFRF Final Rule FAQs 13.15 & 13.16, detail property standards related to the expenditure of ARP/CLSFRF funds. The CITY OF GRAHAM, hereinafter City, shall adhere to all applicable property standards, as detailed below. **Note that pursuant to ARP/CSLFRF Final Rule FAQ 13.15, the Uniform Guidance property standards do not apply to real property, equipment, or supplies purchased or improved with Revenue Replacement ARP/CSLFRF funds.**

II. Definitions

The definitions in 2 CFR 200.1 apply to this policy, including the following:

Computing Devices: Machines used to acquire, store, analyze, process, and publish data and other information electronically, including accessories (or "peripherals") for printing, transmitting, and receiving, or storing electronic information. See also the definitions of supplies and information technology systems in this section.

Equipment: Tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost that equals or exceeds the lesser of the capitalization level established by the City for financial statement purposes, or $5,000.

Information Technology Systems: Computing devices, ancillary equipment, software, firmware, and similar procedures, services (including support services), and related resources. See also the definitions of computing devices and equipment in this section.

Intangible Property: Property having no physical existence, such as trademarks, copyrights, patents, patent applications, and property, such as loans, notes and other debt instruments, lease agreements, stock, and other instruments of property ownership (whether the property is tangible or intangible).

Real Property: Land, including land improvements, structures, and appurtenances thereto, but excludes moveable machinery and equipment.

Personal Property: Property other than real property. It may be tangible, having physical existence, or intangible.

Property: Real property or personal property.

Supplies: All tangible personal property other than those described in the definition of equipment in this section. A computing device is a supply if the acquisition cost is less than the lesser of the capitalization level established by the local government for financial statement purposes or $5,000, regardless of the length of its useful life. See also the definitions of computing devices and equipment in this section.

III. Real Property

Title to Real Property. Title to real property acquired or improved with ARP/CSLFRF funds vests with the City. 2 CFR 200.311(a).

Use of Real Property. During the period of performance of the ARP/CSLFRF award, the City may use real property purchased or improved with ARP/CSLFRF funds for a purpose other than the purpose for which it was purchased or improved if such other purpose is also consistent with the ARP/CSLFRF eligible use requirements.

If the City changes the use of the real property to an ineligible use or sells the real property prior to the end of the period of performance, then it must follow the disposition procedures detailed in the Disposition of Real Property section below.

After the period of performance of the ARP/CSLFRF award, the City must use the real property consistent with the purpose for which it was purchased or improved or for any other eligible purpose in the same category as the purpose reported to US Treasury as of the final reporting period, as set forth in the table below:

Category	**Use Requirements**
Public Health and Assistance to Households and Individuals	Property, supplies, or equipment last reported as being used to respond to the public health impacts of the public health emergency, as outlined in 31 CFR 35.6(b)(3)(i), or being used for the provision of services to households provided in 31 CFR 35.6(b)(3)(ii)(A), are authorized to fulfill any eligible use of funds provided in these subparagraphs of the Final Rule.
Assistance to Small Businesses, Nonprofits, and Impacted Industries	Property, supplies, or equipment last reported as being used for the provision of services to small businesses, nonprofits, and impacted industries outlined in 31 CFR 35.6(b)(3)(ii)(B)-(D) are authorized to fulfill any eligible use of funds outlined in the public health and negative economic impacts eligible use category.
Water, Sewer, or Broadband Infrastructure	Property, supplies, or equipment last reported as being used to make investments in water, sewer, or broadband infrastructure pursuant to 31 CFR 35.6(e) are authorized to fulfill any eligible use of funds outlined in the water, sewer, and broadband infrastructure eligible use category.
Government Services/Revenue Loss	N/A
Premium Pay	N/A

If the real property's use shifts outside the parameters of the eligible purpose according to this table after the period of performance, then the City (and any subrecipients) must follow the disposition procedures in the Disposition of Real Property section below.

The City is responsible for being able to substantiate its determination on whether the use of the real property is authorized and maintain a record of that determination in accordance with the requirements set forth in the financial assistance agreement accepted in connection with the ARP/CSLFRF award.

The City is not required to seek or obtain the approval of the US Treasury prior to changing the use within the parameters of these authorized purposes.

Insurance of Real Property. The City must provide the equivalent insurance coverage for real property acquired or improved with ARP/CSLFRF funds as provided to property owned by the City. 2 CFR 200.310.

No Encumbrance of Real Property. The City may not encumber the real property unless authorized by the US Treasury. 2 CFR 200.311(b).

Disposition of Real Property. If the City changes the use of real property to an ineligible use, sells the asset during the period of performance of the ARP/CSLFRF award, or changes the use of the asset outside the eligible category after the period of performance ends, then the City must obtain disposition instructions from US Treasury. The instructions must provide for one of the following alternatives:

1. The City retains title after compensating the US Treasury. The amount paid to the US Treasury will be computed by applying the US Treasury's percentage of participation in the cost of the original purchase (and costs of any improvements) to the fair market value of the property. However, in those situations where the City is disposing of real property acquired or improved with ARP/CSLFRF funds and acquiring replacement real property under the ARP/CSLFRF, the net proceeds from the disposition may be used as an offset to the cost of the replacement property.
2. The City sells the property and compensates the US Treasury. The amount due to the US Treasury will be calculated by applying the US Treasury's percentage of participation in the cost of the original purchase (and cost of any improvements) to the proceeds of the sale after deduction of any actual and reasonable selling and fixing-up expenses. If the ARP/CSLFRF award has not been closed out, the net proceeds from the sale may be offset against the original cost of the property. When the City is directed to sell property, sales procedures must be followed that provide for competition to the extent practicable and result in the highest possible return.
3. The City transfers title to the US Treasury or a third party designated/approved by the US Treasury. The City is entitled to be paid an amount calculated by applying the City's percentage of participation in the purchase of the real property (and cost of any improvements) to the current fair market value of the property. 2 CFR 200.311(c).

IV. Equipment

Title to Equipment. Title to equipment acquired or improved with ARP/CSLFRF funds vests with the City. 2 CFR 200.313(a).

Use of Equipment. During the period of performance of the ARP/CSLFRF award, the City may use equipment purchased or improved with ARP/CSLFRF funds for a purpose other than the purpose for which it was purchased or improved if such other purpose is also consistent with the ARP/CSLFRF eligible use requirements.

If the City changes the use of equipment to an ineligible use or sells the equipment prior to the end of the period of performance, then it must follow the disposition procedures detailed in the Disposition of Equipment section below.

After the period of performance of the ARP/CSLFRF award, the City must use equipment consistent with the purpose for which it was purchased or improved or for any other eligible purpose in the same category as the purpose reported to the US Treasury as of the final reporting period, as set forth in the table below:

Category	**Use Requirements**
Public Health and Assistance to Households and Individuals	Property, supplies, or equipment last reported as being used to respond to the public health impacts of the public health emergency, as outlined in 31 CFR 35.6(b)(3)(i), or being used for the provision of services to households provided in 31 CFR 35.6(b)(3)(ii)(A), are authorized to fulfill any eligible use of funds provided in these subparagraphs of the Final Rule.
Assistance to Small Businesses, Nonprofits, and Impacted Industries	Property, supplies, or equipment last reported as being used for the provision of services to small businesses, nonprofits, and impacted industries outlined in 31 CFR 35.6(b)(3)(ii)(B)-(D) are authorized to fulfill any eligible use of funds outlined in the public health and negative economic impacts eligible use category.
Water, Sewer, or Broadband Infrastructure	Property, supplies, or equipment last reported as being used to make investments in water, sewer, or broadband infrastructure pursuant to 31 CFR 35.6(e) are authorized to fulfill any eligible use of funds outlined in the water, sewer, and broadband infrastructure eligible use category.
Government Services/Revenue Loss	N/A
Premium Pay	N/A

If the equipment's use shifts outside the parameters of the eligible purpose according to this table after the period of performance, then the City (and any subrecipients) must follow the disposition procedures in the Disposition of Equipment section below.

The City is responsible for being able to substantiate its determination on whether the use of equipment is authorized and maintain a record of that determination in accordance with the

requirements set forth in the financial assistance agreement accepted in connection with the ARP/CSLFRF award.

The City is not required to seek or obtain the approval of the US Treasury prior to changing the use within the parameters of these authorized purposes.

During the time that equipment is used on the project for which it was acquired, the City must also make equipment available for use on other projects or programs currently or previously supported by the Federal Government, provided that such use will not interfere with the work on the project for which it was originally acquired. First preference for other use must be given to other programs or projects supported by US Treasury and second preference must be given to programs or projects under Federal awards from other Federal awarding agencies. Use for non-federally-funded programs or projects is also permissible. User fees should be considered if appropriate. 2 CFR 200.313(c)(2).

Noncompetition. The City must not use equipment acquired with the ARP/CSLFRF funds to provide services for a fee that is less than private companies charge for equivalent services unless specifically authorized by Federal statute for as long as the Federal Government retains an interest in the equipment. 2 CFR 200.313(c)(3).

No Encumbrance. The City may not encumber the equipment without approval of the US Treasury. 2 CFR 200.313(a)(2).

Replacement Equipment. When acquiring replacement equipment, the City may use the equipment to be replaced as a trade-in or sell the property and use the proceeds to offset the cost of the replacement property. 2 CFR 200.313(c)(4).

Management of Equipment. The City will manage equipment (including replacement equipment) acquired in whole or in part with ARP/CSLFRF funds according to the following requirements.

1. The City will maintain sufficient records that include:
    a) A description of the property.
    b) A serial number or other identification number.
    c) The source of funding for the property, including the Federal Award Identification Number (FAIN),
    d) Who holds the title?
    e) The acquisition date.
    f) Cost of the property.
    g) Percentage of Federal participation in the project costs for the Federal award under which the property was acquired.
    h) The location, use, and condition of the property.
    i) Any ultimate disposition data including the date of disposal and sale price of the property.
2. The City will conduct a physical inventory of the property and reconcile results with its property records at least once every two years.

3. The City will develop a control system to ensure adequate safeguards to prevent loss, damage, or theft of the property. Any loss, damage, or theft will be investigated by the City.
4. The City will develop and implement adequate maintenance procedures to keep the property in good condition.
5. If the City is authorized or required to sell the property, it will establish proper sales procedures to ensure the highest possible return, in accordance with state and federal law.

Insurance of Equipment. The City must provide the equivalent insurance coverage for equipment acquired or improved with ARP/CSLFRF funds as provided to property owned by the City. 2 CFR 200.310.

Disposition of Equipment. If the City changes the use of the equipment to an ineligible use or sells the equipment during the period of performance of the ARP/CSLFRF award or changes the use of the equipment outside the eligible category after the period of performance ends, then the City may either make the equipment available for use in other activities funded by a Federal agency, with priority given to activities funded by US Treasury, dispose of the equipment according to instructions from US Treasury, or follow the procedures below. 2 CFR 200.313(e).

1. Equipment with a per-item fair market value of less than $5,000 may be retained, sold, or transferred by the City, in accordance with state law, with no additional responsibility to the US Treasury;
2. If no disposal instructions are received from US Treasury, equipment with a per-item fair market value of greater than $5,000 may be retained or sold by the City. The City must establish proper sales procedures, in accordance with state law, to ensure the highest possible return. The City must reimburse the US Treasury for its federal share. Specifically, the US Treasury is entitled to an amount calculated by multiplying the current market value or proceeds from sale by the ARP/CSLFRF funding percentage of participation in the cost of the original purchase. If the equipment is sold, US Treasury may permit the City to deduct and retain from the Federal share $500 or ten percent of the proceeds, whichever is less, for its selling and handling expenses.
3. Equipment may be transferred to the US Treasury or a third party designated by the US Treasury in return for compensation to the City for its attributable compensation for its attributable percentage of the current fair market value of the property.

V. Supplies

Title to Supplies. Title to supplies acquired with ARP/CSLFRF funds vests with the City upon acquisition. 2 CFR 200.314(a).

Use of Supplies. During the period of performance of the ARP/CSLFRF award, the City may use supplies purchased or improved with ARP/CSLFRF funds for a purpose other than the purpose for which it was purchased or improved if such other purpose is also consistent with the ARP/CSLFRF eligible use requirements.

If the City changes the use of supplies to an ineligible use or sells the supplies prior to the end of the period of performance, then it must follow the disposition procedures detailed in the Disposition of Supplies section below.

After the period of performance of the ARP/CSLFRF award, the City must use supplies consistent with the purpose for which they were purchased or improved or for any other eligible purpose in the same category as the purpose reported to the US Treasury as of the final reporting period, as set forth in the table below:

Category	**Use Requirements**
Public Health and Assistance to Households and Individuals	Property, supplies, or equipment last reported as being used to respond to the public health impacts of the public health emergency, as outlined in 31 CFR 35.6(b)(3)(i), or being used for the provision of services to households provided in 31 CFR 35.6(b)(3)(ii)(A), are authorized to fulfill any eligible use of funds provided in these subparagraphs of the Final Rule.
Assistance to Small Businesses, Nonprofits, and Impacted Industries	Property, supplies, or equipment last reported as being used for the provision of services to small businesses, nonprofits, and impacted industries outlined in 31 CFR 35.6(b)(3)(ii)(B)-(D) are authorized to fulfill any eligible use of funds outlined in the public health and negative economic impacts eligible use category.
Water, Sewer, or Broadband Infrastructure	Property, supplies, or equipment last reported as being used to make investments in water, sewer, or broadband infrastructure pursuant to 31 CFR 35.6(e) are authorized to fulfill any eligible use of funds outlined in the water, sewer, and broadband infrastructure eligible use category.
Government Services/Revenue Loss	N/A
Premium Pay	N/A

If the supplies use shift outside the parameters of the eligible purpose according to this table after the period of performance, then the City (and any subrecipients) must follow the disposition procedures in the Disposition of Supplies section below.

The City is responsible for being able to substantiate its determination on whether the use of supplies is authorized and maintain a record of that determination in accordance with the requirements set forth in the financial assistance agreement accepted in connection with the ARP/CSLFRF award.

The City is not required to seek or obtain the approval of the US Treasury prior to changing the use within the parameters of these authorized purposes.

Noncompetition. As long as the Federal Government retains an interest in the supplies, the City must not use supplies acquired under the ARP/CSLFRF to provide services to other organizations for a fee that is less than private companies charge for equivalent services, unless specifically authorized by Federal statute. 2 CFR 200.314(b).

Disposition of Supplies. If there is a residual inventory of unused supplies exceeding $5,000 in total aggregate value upon termination or completion of the project and the supplies are not needed for any other Federal award, the non-federal entity must retain the supplies for use on other activities or sell them, but must, in either case, compensate the Federal Government for its share. The amount of compensation must be computed in the same manner as for equipment. 2 CFR 200.314(a).

VI. Property Trust Relationship

Real property, equipment, and intangible property, that are acquired or improved with ARP/CSLFRF funds must be held in trust by the City as trustee for the beneficiaries of the project or program under which the property was acquired or improved. US Treasury may require the City to record liens or other appropriate notices of record to indicate that personal or real property has been acquired or improved with a Federal award and that use and disposition conditions apply to the property. 2 CFR 200.316.

VII. Implementation of Policy

CITY MANAGER OR DESIGNEE shall adopt procedures to track all real property, equipment, and supplies (collectively, property) acquired or improved in whole or in part with ARP/CLSFRF funds. At a minimum, those procedures must address the following:

- Ensure proper insurance of property.
- Document proper use of property.
- Working with FINANCE DIRECTOR, record and maintain required data records for equipment.
- Conduct periodic inventories of equipment, at least every two years.
- Create processes for replacement and disposition of property.
- Establish other internal controls to safeguard and properly maintain property.

Adopted this 9th day of July 2024.

_____

Mayor Jennifer Talley

ATTEST:

_____

City Clerk Renee M. Ward

STAFF REPORT

SUBJECT:	2023 LOCAL WATER SUPPLY PLAN
PREPARED BY:	AARON HOLLAND, ASSISTANT CITY MANAGER

REQUESTED ACTION

Approve the resolution adopting the 2023 Local Water Supply Plan.

BACKGROUND/SUMMARY

State law requires that all water systems establish a Local Water Supply Plan (LWSP) and update the plan at least every five (5) years. LWSPs require a water system to evaluate its water sources and capacity, distribution and collections system, and current and future demands.

The State has completed its review of the 2023 LWSP for the City's water system and has found that it meets the minimum criteria established in NCGS 143-355(l). For the LWSP to be considered compliant, the City Council must approve a resolution adopting the 2023 LWSP.

Graham's 2023 LWSP can be viewed from the Planning/Local Water Supply Plans link at www.ncwater.org.

FISCAL IMPACT

None.

STAFF RECOMMENDATION

Approval.

SUGGESTED MOTION(S)

I move we approve the Resolution adopting the 2023 Local Water Supply Plan.

RESOLUTION APPROVING CITY OF GRAHAM 2023 LOCAL WATER SUPPLY PLAN

WHEREAS, North Carolina General Statute 143-355(l) requires that each unit of local government that provides public water services or plans to provide such services shall, either individually or together with other such units of local government and large community water systems, prepare and submit a Local Water Supply Plan; and

WHEREAS, as required by the statute and in the interests of sound local planning, a Local Water Supply Plan for the City of Graham has been developed and submitted to the City Council for approval; and

WHEREAS, the City Council finds that the Local Water Supply Plan is in accordance with the provisions of North Carolina General Statute 143-355(l) and that it will provide appropriate guidance for the future management of water supplies for the City of Graham, as well as useful information to the Department of Environmental Quality for the development of a state water supply plan as required by statute;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Graham that the Local Water Supply Plan entitled City of Graham 2023 Local Water Supply Plan Update, dated March 28, 2024, is hereby approved and shall be submitted to the Department of Environmental Quality, Division of Water Resources; and

BE IT FURTHER RESOLVED that the City Council intends that this plan shall be revised to reflect changes in relevant data and projections at least once every five years or as otherwise requested by the Department, in accordance with the statute and sound planning practice.

This the 9th day of July, 2024.

Name: Jennifer Talley
Mayor

Signature: _____

ATTEST:

CITY OF GRAHAM

RELEASE ACCOUNTS

JUNE

ACCT #	YEAR	NAME	REASON FOR RELEASE	AMOUNT RELEASED
11288	2023	SALEM LEASING CORP	IRP REGISTERED IN IREDELL COUNTY	$247.98

TOTAL RELEASES ***$247.98***

STAFF REPORT

SUBJECT:	PRESENTATION OF FIRE STATION LOCATION ANALYSIS
PREPARED BY:	CHIEF TOMMY COLE

REQUESTED ACTION:

Presentation of 2024 Fire Station Location Analysis prepared by NC Fire Chief Consulting.

BACKGROUND/SUMMARY:

In December 2020, the City of Graham engaged NC Fire Chief Consulting to conduct a comprehensive analysis to assess the need for additional fire stations in the city. This initial analysis provided critical insights into standards of coverage, personnel requirements, and future apparatus options necessary to ensure effective fire protection services.

Recognizing the importance of this issue, the Graham City Council prioritized the establishment of a new satellite fire station as one of their top goals for 2024. To align with this goal and account for significant changes in the city, NC Fire Chief Consulting was re-engaged in December 2023 to update the original report.

Since 2020, Graham has experienced unprecedented growth, making it an increasingly attractive place to live and raise a family. This rapid expansion underscores the urgency of enhancing our fire protection infrastructure. The updated report from NC Fire Chief Consulting reflects current needs and identifies priority locations for future fire stations to better serve our growing community.

This updated analysis is crucial for strategic planning and resource allocation to ensure the safety and well-being of Graham's residents. The report outlines the necessary steps to address the evolving fire protection needs in light of the city's growth, and sets the stage for implementing a robust fire protection strategy in the coming years.

FISCAL IMPACT:

Multi-year project for potential fire station construction and hiring personnel to staff the fire station.

STAFF RECOMMENDATION:

Staff recommends to Council that the 2024 Fire Station Location Analysis, conducted by NC Fire Chief Consulting, be accepted to provide a clear, strategic roadmap for the placement of satellite fire stations, ensuring that the growing needs of our community are met effectively. This roadmap will enable the City of Graham to enhance its fire service delivery, reduce response times, and improve the overall safety and well-being of its residents.

SUGGESTED MOTION(S):

FIRE STATION LOCATION ANALYSIS

June

2024

City of Graham/Graham Fire Dept.

Graham, North Carolina

A Progressive Local Government Initiative Compiled & Presented by NC Fire Chief Consulting

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Approved Scope of Work and Project Disclaimer:

NCFCC 2024 Graham Fire Department Fire Station Location Analysis

1. **1. GIS Analysis of Graham Fire Stations Relative to Potential Needs and Re-Deployment Options**

Current Conditions/Benchmarking Analysis

- Update the base map with the fire protection service area, city area, and fire stations.
- Update drive time map using updated roads database, based on NFPA 1710, and identifying gaps and redundancies.
- Update Service demand heat map depicting the amount reached by drive time and classifying demand levels into risk rankings. This will use recent incident data from the past immediate 3-5 years.
- Update Residential population density map (previous was before 2020 census data finalized), classified into risk rankings.
- Update changes to Land use/Zoning risk classification analysis, classified into risk rankings.

Future Station Planning

- Future deployment scenarios are measured against an updated scored combined matrix of population risk, demand risk and land use risk.
- Current fire stations score as a benchmark for the following scenarios:
    - Keeping the current Headquarters fire station in place "anchored" for consideration of ONE other fire station location selected by the geographic intelligent technology and methodology described.

GIS Deliverables:

*All work is data dependent and, at times, require concomitant analyses to perform.

***** Electronic file images as .jpeg or .png format.

2. **Data Analysis of RMS**

Conduct an analysis of available data from Fireworks Software for 3 to 5 years with full reporting capability using a supplied data model from NC Fire Chiefs Consulting. Based on conversations with the agency, this requires the agency to complete a data conversion/integration from ESO to Fireworks to capture NFIRS data prior to July 2023. Determine a baseline level of performance for Graham Fire Department and compare that to the benchmark performance for

emergency events at the 90th percentile. Note that the outcomes will be reflected in the data/information that NCFCC is provided.

3. **Review Compilation of Data and Construct Observations and Recommendations Report for the Fire Chief and City Manager.**

Based upon the GIS analysis and data analysis, the NCFCC team will develop and prepare a report of recommendations for use by Graham to assist in making informed decisions in assessing effective and efficient fire station locations in the short-term & long-term. This report will focus on an executive summary of key points and take-aways.

Project Disclaimer:

This project has been conducted upon the written request of the Graham Fire Department in conjunction with the City of Graham. The sole intent of this project is to improve, advance and strengthen the fire protection service delivery system in Graham, Alamance County, and the State of North Carolina. Persons involved in this report have contributed for the purposes of providing information, professional observations and recommendations to the county and town elected officials, management, and the fire service leadership. Recommendations included in this report are based upon professional experience and understanding of current fire and rescue service best practices. Examples and references in the document are for informational purposes only. Information contained within this document is not intended to be comprehensive, and recommendations are based on limited information available at this time. As with any project based on a snapshot in time, additional facts, local issues and/or changes in the facts could alter the conclusions and recommendations in this document. This document is solely to be utilized by local government and fire service officials for long-term planning purposes. It should not be utilized for any other purpose. No warranties or guarantees (express or implied) are provided. While this document will hopefully assist local officials in their deliberative and long-term planning process, it should be recognized that there are many local issues that may impact the ultimate decisions and what works for a particular jurisdiction. The ultimate decision-making lies with the appropriate local government and fire officials.

It should also be noted that design guidance criteria for this project utilized the municipal response model for a four-minute response because the City of Graham is evolving into that model with the proposed/planned development.

Project Executive Summary:

As many North Carolina communities grow and demands for public services grow, changes and modifications are often needed in service delivery systems, including fire station facilities and infrastructure that are necessary to support essential, core public safety services. When dynamics change, the infrastructure and systems must enable and support essential functions. These "growing pains" are a natural progression of the maturity cycle of a local government unit and are not unique to Graham. The significant growth projected for Graham in the coming years is significant.

However, the Graham Fire Department is aware of the changing environment and has proactively stepped forward to implement progressive measures to effectively manage that growth and transition, such as initiating an independent, third-party, strategic analysis of optimum locations for fire stations in the Graham community as well as analysis of response data. Graham selected North Carolina Fire Chief Consulting (NCFCC) to assist them in this critical endeavor. NCFCC focuses on strengthening the fire service in North Carolina and serves as the exclusive fire consulting provider for the North Carolina League of Municipalities.

For a look back in history, the City of Graham conducted a fire station location analysis in 2020. However, the parameters of that analysis were based on existing city-owned properties. In the past four years, there has been significant growth in Graham, the fire department has enhanced emergency dispatch services and Graham is now utilizing a more modern incident reporting system. In addition, this analysis captures all planned development for future projections. Also, for this 2024 analysis, the fire station location computer modeling is open to the entire district and is not restricted by city-owned properties.

Overall, Purpose and General Methodology:

The core purpose of this initiative was to evaluate the **overall needs for future fire stations within the City of Graham and the Graham extraterritorial area of Alamance County.** The focus was to evaluate the demonstrated performance of the Graham Fire Department with the current resources and fire stations and project how that level of service would improve with the addition of subsequent fire stations. Graham projects significant growth and promises to continue to grow at a steady rate in the foreseeable future. A long-term plan for fire station facility needs will enable Graham leadership to properly plan for future capital needs to ensure that people served by the Graham Fire Department receive timely emergency responses to fire and rescue calls for service.

To accomplish these important tasks, NCFCC evaluated the last almost **three years of emergency incident response records** of the Graham Fire Department utilizing PowerPivot technology to determine the levels of service that the fire department has been able to successfully provide their community. NCFCC developed a dynamic statistical analysis of incident data for the Graham Fire Department to determine the level of service that the department can provide at the 90th percentile (based on population density), or simply what level of service can the department provide 90 percent of the time that someone dials 9-1-1 and needs emergency assistance.

From an emergency response standards perspective, Graham's population density of over 1,579 people per square mile places Graham in the "urban" category. The next level down would be the "suburban" density of 500-1000 people per square mile. Although Graham Fire Department is a combination fire department (a hybrid of both career and volunteer firefighters), the national consensus standards have the same expected performance levels for urban areas, which is used in this analysis.

Furthermore, NCFCC utilized state-of-the-art **geographical information computer systems** (GIS) that compile enormous amounts of geospatial data from Graham and Alamance County and process that data to develop models and design systems to make these determinations. The computer system is designed around insurance services office rating systems and fire service industry standards and best practices. From all available data, a comprehensive vulnerability risk index (VRI score) for each area of the Graham community is established, which helps determine station needs and the most optimal distribution for fire station locations.

All the above data was comprehensively reviewed by NCFCC's well-experienced team of long tenured and highly experienced fire chiefs who have worked extensively with fire protection service delivery systems, fire operations, fire station location and construction, fire fighter staffing and fire service management for many years. Certain specific recommendations have been noted within the report, and supplemental information is included in the appendix of this comprehensive report.

Emergency Response Records Analysis:

In the thirty-three months of data that NCFCC reviewed, a focus was placed on the emergency responses for data analysis. Over this review period, representing 6,774 incidents, there has been an **annual increase in the demand for services** since COVID in FY 20-21 and the workload and call volume for the Graham Fire Department is trending in an upward direction. Rescue and medical emergencies representing approximately 73% of all emergency responses.

Due to significant planned growth of the City of Graham, measurement of the emergency responses for the Graham Fire Department are measured against a **national consensus standard** – 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*". Within this national consensus industry standard, response times are recognized in fractile format at 90% of all responses and not averages because the percentages much more accurately reflect the actual level of service that is provided to the residents that are served and protected by the fire department.

Call Processing time (answering the 9-1-1 call and dispatching Graham Fire) is reflected at 1 minutes, 44 seconds, or less, on 90% of the 5,781 calls that were able to be analyzed. The trend is that call processing times are improving. The goal of 1 minute for call processing was met 46.14% of the total events.

Turnout time (or the time it takes from receiving the emergency call until wheels on the fire apparatus turning forward) for the first arriving Graham unit is 1 minute, 57 seconds, or less, on the available 4,184 emergency responses. The turnout time goal of 1 minute, 20 seconds, or less, was met on 77.68% of incidents.

Travel time (or the time it takes the fire apparatus to respond by roadways) for the first responding Graham Fire unit on 4,193 emergency responses was 5 minutes, 16 seconds, or less, on 90% of those events. The department's goal, based upon national industry standards, is 4 minutes. That 4-minute travel time goal was met on 76.46% on these 6,774 emergency response incidents.

When evaluating the **total response time** (the combination of call processing, turnout, and travel time) for all risks for the first unit arriving from the Graham Fire Department, the data reflects that the above three segments took 7 minutes, 49 seconds, or less, on 90% of the incidents. The following statement would be the most credible measure to explain to the public the actual demonstrated level of service from the time that a 9-1-1 call is placed until the first Graham Fire Department unit arrives – **7 minutes, 49 seconds, or less, 90% of the time**. In comparison to the national consensus standard, the Graham Fire Department is meeting the total response time goal of 6 minutes, 20 seconds, or less, 76.01% of the time, rather than 90%.

The difference between the actual demonstrated response times and the desired response times is recognized as the **response time "gap"**. Improvement efforts within this report are focused on reducing the "gap". Data analysis of this incident review period indicate that Graham's "gap" is 1 minute, 29 seconds for total response time. This is derived from the benchmark of 6 minutes, 20 seconds at the 90th percentile (including call processing time, turnout time, and travel time)

contrasted with Graham's demonstrated performance of 7 minutes, 49 seconds at the 90th percentile.

Graham averages 200 incidents monthly. The busiest 8 hours for the fire department are between 10am and 6pm. **Overlap of incidents** is an important consideration. Approximately 7.84% of incidents overlapped with the previous incident. This means that multiple emergency calls are occurring simultaneously. Graham should continuously keep a focus on overlapping calls as this number is increasing with the significant growth in Graham.

Geographical Information Services (GIS) Analysis:

The assessment team conducted a comprehensive analysis utilizing state-of-the-art geographical information services (GIS) systems to map and analyze all available data, including demand for services, land use risk assessment, coverage distance, travel time coverage, an evaluation of current station locations and comparison of national fire service industry service delivery standards.

The Graham Fire Department provides services currently from one fire station to cover the **10.5 square mile municipal area and the Graham extraterritorial jurisdiction unincorporated area**. The primary fire station is in the central Graham municipal area. Eventually, the geographic area will demand three (3) fire stations for coverage.

There are several developments that are already approved and others that are planned for the City of Graham. **Population is expected to increase by over 4,500** people (a 26% increase) and with this additional growth, it is projected that the **workload/call volume for Graham Fire will increase by 3,000 calls (27%)** for the combined residential and commercial growth. It is important to note that over 2.1 million square feet of commercial space is planned. Commercial properties will further create additional hazards and risks for the fire department to mitigate and demand higher numbers of firefighters responding. The demand timeframe will be dependent upon completion of the developments. Emergency call volume increase as population increases.

To properly locate fire stations, several dynamics must be considered such as incident demand, population, and structural risk. Covering incidents alone would not consider the structural risk associated with property within the town. The population alone ignores commercial property (no residents but higher risk), and both summon the fire department more than others. To find the optimal location or locations of fire stations to meet response time objectives, elemental aspects of future population, land use risk, and incident demand are combined after equalizing each aspect into five sets of weighted data from least to most. A ¼

mile hexagonal grid was digitally constructed and overlaid atop the response area. The combined elemental scores were applied to the hexagonal areas to create a Vulnerability Risk Index (VRI) score for each area of the matrix.

Utilizing a four-minute municipal response time for a standard, **future demand for services will principally follow the population.** As the population of the new developments increase, emergency incidents will increase as well, following where population density increases. Modeling for future fire stations utilized a **four-minute travel time for 90% of emergency incidents goal for service delivery.**

Based upon this travel model, utilizing the one current fire station located within the city, the VRI score coverage for Graham Fire is currently 34%. The VRI score goal for most communities is to reach a 90% VRI score (or higher). **Hence, there is a significant VRI coverage gap of 56%.** This score indicates the need for additional fire stations to achieve a municipal level of fire protection service. The current single fire station was determined to be the "anchor" fire station for purposes of this study, meaning that it was not considered for relocation. Several models were then analyzed.

Optimal Locations to Reach an Improved VRI Score District Wide:

With optimal fire service infrastructure and a four-minute travel time, communities can reach a 90% or greater VRI score. Graham is currently at 34%. Two fire stations, optimally located, are projected to eventually increase Graham's VRI score to 66%. Collectively, **these additional two (2) fire stations raise the district wide score to approximately 66% of the available VRI rating**. It is important to note that the modeling was utilizing a four-minute travel time for this placement.

Adding a second fire station in the interest area of **Cherry Lane and Jimmie Kerr Road** was selected to most optimally increase Graham's coverage VRI score. This projected station was modeled to **improve the VRI score by 20%,** raising the city's overall score to 54%. When adding automatic aid with response from the City of Mebane (with their new planned fire station), the VRI rating increases to as high as 66%.

To further improve the level of fire and rescue services in Graham, a third fire station in the interest area of **South Graham Park** was identified. Adding this third fire station could improve the overall VRI rating for Graham to 81% (utilizing automatic aid from Mebane's new planned fire station). This would represent an additional 15% improvement to the rating and place Graham much closer to coverage at the 90th percentile.

Alternative Sites:

In consideration of these two additional fire stations, there is city-owned property near both the optimal station location sites. For the fire station need on the eastern side of the city (Cherry Lane and Jimmie Kerr Road) the **Graham Regional Park** could offer a comparable VRI rating. **A loss of only 2%** in the VRI rating is calculated if the fire station were to shift from Cherry Land and Jimmy Kerr Road to Graham Regional Park.

Regarding the fire station need for the western side of the city, either the **South Graham Park** property or the city owned property at Rogers Road and Moore Street provide viable opportunities that lessen the optimal VRI coverage by only 1%.

There are tangible and intangible advantages to locating fire stations on existing city property to make higher use of the property. However, from a technical perspective, the delta between the modeling optimum locations and the nearby city-owned properties accumulate to a loss of only 3% for both fire stations. **This minimal adverse impact makes potential re-locations a viable option for consideration.**

Additional Future Fire Service Funding Considerations:

As fire and rescue services operational and capital costs increase, it is further recommended that the City of Graham and Alamance County evaluate any potential unincorporated areas that the Graham Fire Department could provide the closest fire station response to. Providing services in the unincorporated area (such as the Graham ETJ) could be through a newly created fire protection service district, which would generate additional funding for the City of Graham to help support increasing costs for fire services. A **cost share analysis between the City of Graham and Alamance County** using multiple variables would be necessary to ensure that the cost structure between the city and the unincorporated area served is balanced. Typically, five or more factors are used in that calculation, such as population, call volume/workload, property valuation, total square miles, total road miles, square footage, and others. This type of analysis ensures that the city and the unincorporated area are paying for a properly proportional amount of necessary costs of providing fire and rescue services and that one or the other are not out of sync and supplementing the other's duties and obligations to provide core public safety services. The cost share formula is dynamic and should be evaluated annually, adjusting rates accordingly against the costs to provide essential services.

Next Steps:

The next steps for this process will be for the City of Graham to review the data and information contained within this report as well as the recommendations contained herein. **Capital improvement funding** will be needed when conditions will allow to move forward with fire station construction by Graham for the next fire station facility. Also, operations funding needs to be secured when conditions will allow for additional firefighter staffing and apparatus acquisition in the capital improvement plan.

Regarding order of placement of the two (2) fire stations needed within the district, **priority/timing should be placed on the areas where the expanded development will be occurring most quickly**. The easternmost station provides the greatest increase in the overall VRI score in this analysis. However, the westernmost fire station impacts more residential properties. It is recognized that the timelines for development can shift, so frequent review of the data will be essential to keeping the data driving these decisions accurate.

Typically, the fire station construction process takes about two years, from initiation of the project to actual operation of the fire station serving the community. Recent experience in North Carolina has shown that post-COVID, the fire station construction timeline has extended by up to a year due to supply chain challenges and the labor market. The same core issues have increased fire apparatus delivery times to two or three years from the date of order.

Given the significant and projected growth in Graham and that this analysis depicts multiple components needed on the journey to improving the overall service delivery level (using the VRI scoring), Graham should conduct a periodic review of the analysis within this report and periodically refresh the key data with each component to ensure that current and relevant data is being used by decision makers with the most up-to-date information available at the time.

The entire NCFCC team sincerely appreciates the opportunity to provide this vital information to the City of Graham and the Graham Fire Department. We humbly and sincerely thank everyone who supported this progressive initiative and express our honor to serve in this beneficial capacity of continuous improvement.

SECTION 1: RESPONSE DATA ANALYSIS

Preface:

Origin of Data

The analysis in this report was created from data exported from the department's fire records management system (FRMS), EPR Fireworks. The department gave NC Fire Chief's Consulting access to this system where a query was created containing select data fields and exported as a .csv file format. This data was used in a data model tool provided by NC Fire Chief Consulting. The data was limited to incident and unit data to show trends in demand of services and evaluate demonstrated response time performance to establish a baseline for future comparison.

The date range of the data is August 1st, 2021, to April 30th, 2024, 33 full months of incidents. During this timeframe, the department changed FRMS twice, resulting in two separate data movements from one RMS system to another. Some of the data imported into the current ERP Fireworks database was via a method which did not contain the 911 PSAP time or the apparatus enroute time. (NFIRS Transaction file) These are required to calculate certain time segments in the response time analysis. Although this was not most records, some areas of analysis will contain a smaller dataset than other sections. All sections still contain ample records to determine a baseline for the select time segment.

All incidents were evaluated for the purpose of showing demand, a total of 6,774 incidents. For response time analysis, only the first arriving unit indicating an "Emergency" response in their unit report was used. Some records from the older RMS systems did not have this value and therefore the blank value was used also. Those records tagged as non-emergency were excluded. In addition, only incident responses where the "Aid Type" did not indicate aid given were used, excluding responses outside the department's jurisdiction. **This yields 5,989 first arriving unit responses** where a response time (dispatch to arrive) could be calculated.

Quality of Data

Despite the multiple systems and multiple conversions of data, the quality in respect of chronological order of unit-response timestamps was good. 2,856-unit records (25%) were missing an enroute time but had an arrival time. This is a result of data conversion issue where the unit ID was missing or not the same, preventing the import of updated enroute times from updating the individual record. 208 incident records (3.10%) were missing a PSAP time. All of these were excluded from their respective evaluation.

Key Findings – Summary:

Demand of Services:

The Graham Fire Department experiences a need for their services approximately **6.6 times daily**. Averaging almost 200 incidents per month, the department's demand is **medical related on 73%** of those incidents, assisting EMS with cardiac, breathing difficulty, rescues and similar. Fires, service calls, fire alarms, weather events and other types make up the remaining 27%. Their demand is **highest between 10am and 6pm** and more incidents occur during the weekday than the weekend.

For most incidents, the department mitigates the incident risk with resources, both staff and equipment, from their single station. For incidents requiring more resources than the department possess, the department depends on neighboring departments for aid, which is approximately 5 % of incidents. It returns their neighbors need, giving aid on 1.26% of incidents. As a single station department with limited staff, overlapping incidents can lead to undesirable outcomes if the department's resources are busy on another incidents. **Overlapping incidents occur on 8%** of incidents.

Response Times:

Call processing times over the last 33 months have been steadily improving but may not reflect the actual time to process the call from the moment the 911 call was answered until the first fire department unit was dispatched. This is due to the way the department's 911 center transfers incidents from one PSAP to another and the way the PSAP's dispatch application timestamps spawned events from one service to another (EMS to Fire). The data suggest the 911 center **processes incidents within 01 minute and 44 seconds on 90%** of events and **meets the goal of 1 minute on 46.14%** of those.

Turnout times were noted to have a negative change around June 2023 where turnout times of the first arriving unit increased. It is uncertain as to the reason but based on how it affected travel time in a similar, but opposite fashion it may be due to some technology implementation. The data suggest **turnout is accomplished within 01 minute and 57 seconds on 90%** of the first arriving unit. The **goal of 01 minute 20 seconds was met 77.86%.**

Travel Times were noted to have positive change around July 2023 where an improvement was made. This may be due to the same contributor that caused the decrease in performance in turnout times. The data suggests that the travel time of the first arriving unit is **accomplished within 5 minutes and 16 seconds on 90% of incidents**. The **goal of 4 minutes was accomplished 76.46%.**

Total Response Time The department established a **goal of 06:20 and has demonstrated their ability to meet that goal 76.01%** of emergency incidents. The **actual time at the 90th percentile is 07:49, a gap of 01:29**

Travel time analysis conducted at the fire demand zone level shows several zones, with significant demand, not meeting their goals for travel time. Those include GR5B, GR4C, GRH3, GR6B, and GR6C.

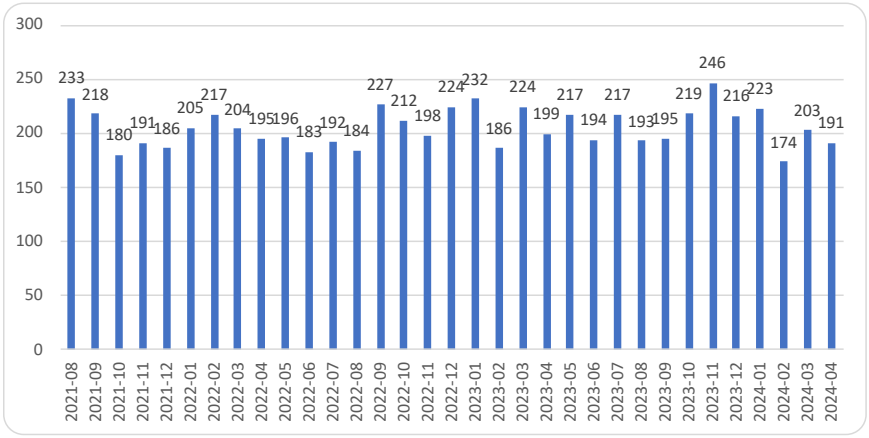
Staffing:
The department average responses with between 2 and 3 firefighters on their 3 engines.

Demand of Services:

Day-to-Day Demand

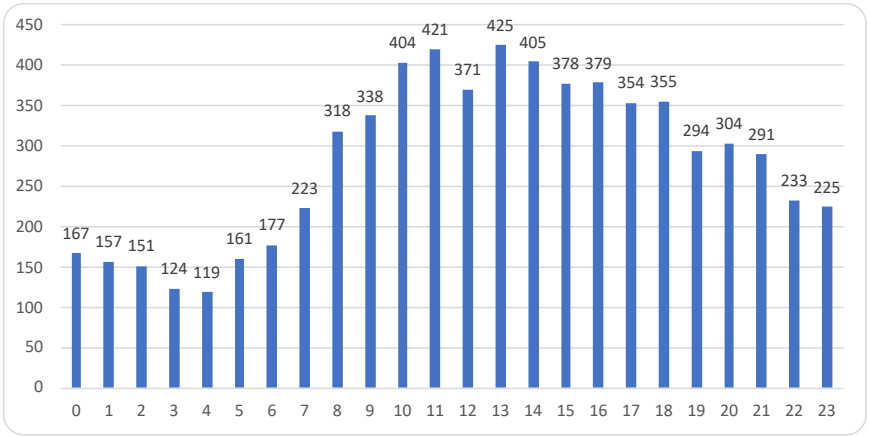
Based on the 33 months evaluated, The Graham Fire Department **averages 200 incidents monthly, 6.64 daily**. Friday is the busiest day. 1 pm is the busiest hour. **10am to 6pm is the busiest 8-hour period.** The monthly trend is relatively steady across the months with no remarkable notations in either direction.

Figure 1: Demand by Month



Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Grand Total
21/22		233	218	180	191	186	205	217	204	195	196	183	2,208
22/23	192	184	227	212	198	224	232	186	224	199	217	194	2,489
23/24	217	193	195	219	246	216	223	174	203	191			2,077
Grand Total	**409**	**610**	**640**	**611**	**635**	**626**	**660**	**577**	**631**	**585**	**413**	**377**	**6,774**

Figure 2: Demand by Alarm Hour



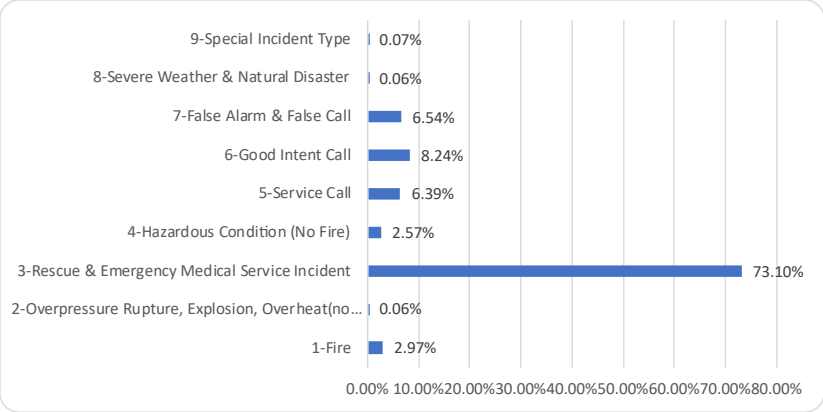
Like most fire departments nationwide, the demand for the fire department services is higher during the day peaking at 1pm, gradually decreasing toward the evening hours with a peak low at 4am. During the awaking hours for most of the population, the demand for fire department services increases after the 4am low with a steady climb until midday. The color chart below represents these hours and days of the week. The thick border in the total column represents the 8 hours of peak activity, 10am to 6pm.

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
0	22	29	23	26	19	21	27	167
1	27	29	27	13	20	16	25	157
2	27	23	18	25	14	17	27	151
3	34	23	22	5	10	13	17	124
4	17	15	9	12	18	22	26	119
5	24	30	18	17	24	22	26	161
6	27	20	27	21	30	30	22	177
7	23	31	31	34	39	37	28	223
8	33	59	41	46	56	43	40	318
9	44	48	50	50	56	49	41	338
10	47	57	65	69	58	59	49	404
11	36	76	59	66	74	65	45	421
12	38	61	50	48	61	54	59	371
13	44	60	62	76	65	66	52	425
14	50	67	64	50	67	57	50	405
15	40	57	64	59	49	66	43	378
16	49	54	61	53	59	62	41	379
17	55	55	45	56	49	56	38	354
18	47	45	44	51	55	61	52	355
19	50	39	55	40	28	49	33	294
20	41	45	50	35	43	44	46	304
21	42	43	40	34	41	47	44	291
22	34	29	33	28	38	43	28	233
23	28	35	26	30	33	42	31	225
Total	**879**	**1,030**	**984**	**944**	**1,006**	**1,041**	**890**	**6,774**

Demand by NFIRS Categories and Incident Type

The National Fire Incident Reporting System (NFIRS) classifies incidents by an incident type. Incident types are classified in one of nine categories. The Graham Fire Department highest demand is **the medical category at 73.10%. Fires, of all types, make up 2.97%** of incidents.

Figure 3: Demand by NFIRS Category



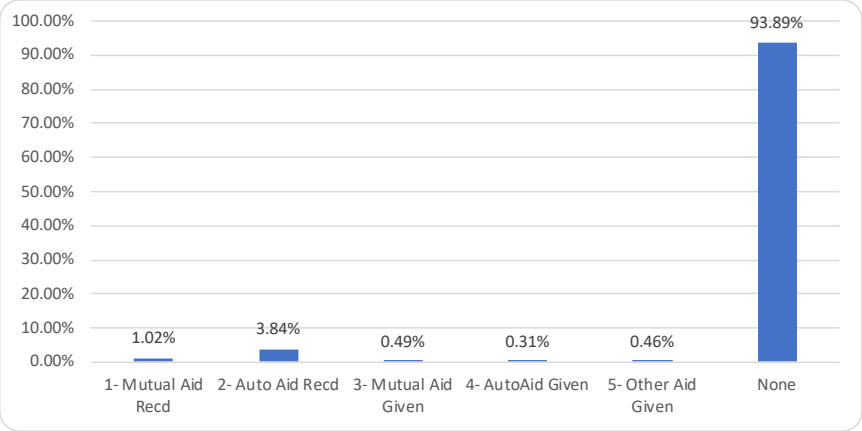
The top fifteen (by count) of the incident types make up 94% of all incidents The 321 – EMS Call is the leading incident type at 39.50%. Structure Fires were less than 1% of the dataset.

NFIRS - Incident Type / Description	Count	%
321-EMS call, excluding vehicle accident with injury	2,676	39.50%
311-Medical assist, assist EMS crew	1,725	25.47%
553-Public service	379	5.59%
322-Motor vehicle accident with injuries	328	4.84%
611-Dispatched & canceled en route	308	4.55%
745-Alarm system activation, no fire - unintentional	274	4.04%
324-Motor vehicle accident with no injuries.	196	2.89%
600-Good intent call, other	133	1.96%
412-Gas leak (natural gas or LPG)	70	1.03%
622-No incident found on arrival at dispatch address	58	0.86%
111-Building fire	47	0.69%
743-Smoke detector activation, no fire - unintentional	46	0.68%
131-Passenger vehicle fire	44	0.65%
651-Smoke scare, odor of smoke	43	0.63%
735-Alarm system sounded due to malfunction	42	0.62%

Demand by Aid Type

Each fire record requires information as to the type of aid given or received, if any. Based on the records, 94% of the incidents are completed without aid given or received. The department receives aid, more than it gives aid. Aid received resulted in 4.86% of the incidents. Aid Given resulted in 1.26% of total incidents.

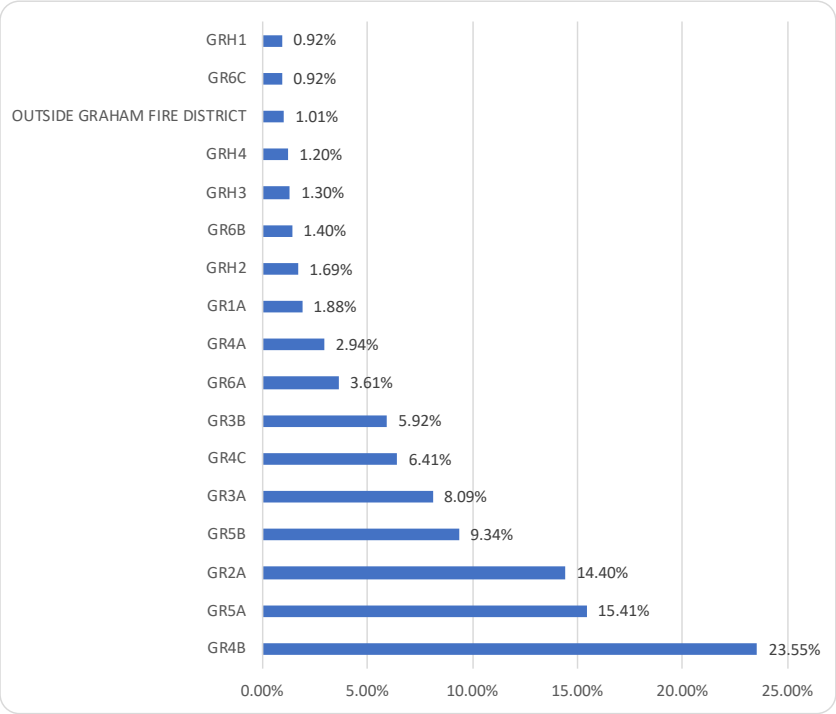
Figure 4: Demand by Aid Type



Demand by Fire Zone

The department has created zones within their response area. The zones are polygons that represent geographical areas which receive the same type of response order from their mutual and auto aid stations. The zones also allow a smaller area of analysis in respect to demand and response performance. In the Graham dataset, this information is seen from 07/01/203, forward providing enough records to determine the area with greater demand. The graph below represents this and shows the fire demand zone with the highest demand is "GRB4" with 23.55% during the period. This area is south of the I-40/I-85 interstate.

Figure 5: Demand by Fire Demand Zone



Overlapping Incidents

Defined as a second incident dispatched before the prior incident has cleared, overlapping events for a department with limited resources can elongate response time from aid departments and have a negative impact on changing outcomes. **Approximately 7.84% of incidents overlapped** with the previous incident, based on the 33-months of data. **Tuesday** has more events overlap than any other, and the **11am to 12pm more than any other hour**. Over the period, the monthly percentage has ranged from 3.54% to 13.56%, a relatively steady trend.

Figure 6: Overlapping Incidents by Alarm Hour

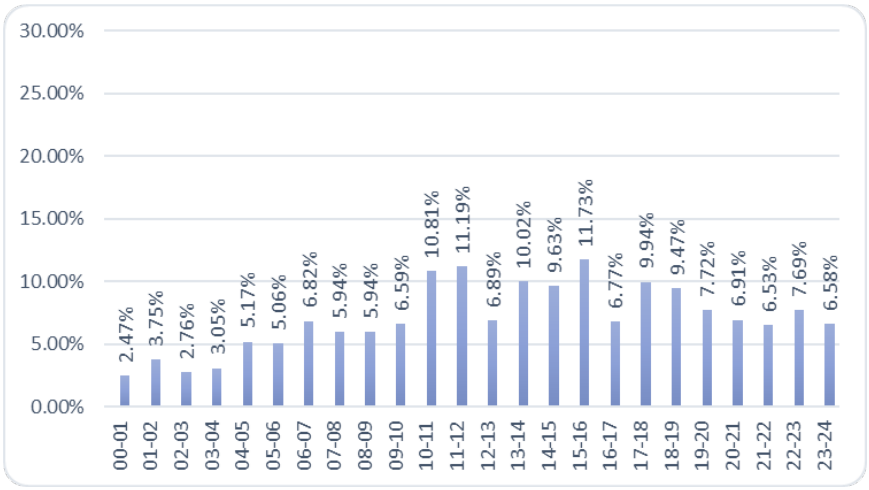
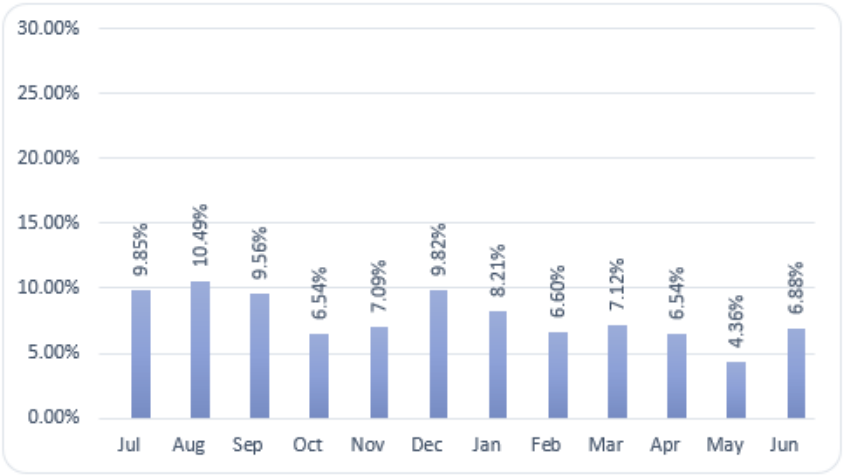


Figure 7: Overlapping Incidents by Month



Response Performance:

Total Response Time is the duration of time, measured from the receipt of the 911 call in the Public Safety Answering Point (PSAP) until the first fire department unit arrives on the scene of the incident. Total response time should be measured for the first-arriving unit and the arrival of the full alarm, or the declared effective response force, if possible. This time element can be broken into the following time segments.

Call Processing Time – the elapsed time from event receipt at the PSAP to the dispatching of the first unit.
Turnout Time – the elapsed time from notification of the fire department from the 911 center until a fire unit has forward moment (wheels turning).
Travel Time – the elapsed time from the unit's turnout to the arrival at the incident address (wheels stopped).
Response Time - the elapsed time from when a unit is dispatched until the first unit arrives**.** (Turnout + Travel)
Total Response Time – the time elapsed from receipt at the PSAP until arrival of the unit on scene. (Call Processing + Turnout + Travel)

The fire department will typically evaluate and focus on response time, since call processing time is normally the responsibility of the 911 center. Call processing is equally important because it plays a key role in the total response time and the outcome of those served and protected. Because of this, the department should always analyze this information, if possible, and build relationships with the 911 center to develop a continuous improvement plan, using standards, best practices, or local approved goals as the benchmark.

Evaluation of response times should only evaluate those responses in the department's primary jurisdiction, excluding: those events where mutual/auto aid was given to other departments, non-emergency response, and justified outliers.

Benchmark, Baseline and Gaps:

Baseline Demonstrated Response Performance

Although the National Fire Protection Association (NFPA) 1710 document provides response time benchmarks, fire departments often measure a baseline or demonstrated performance, in terms of total response time. The difference between the benchmark and baseline is referred to as the gap and a gap analysis should be performed periodically to determine future needs and highlight performance improvements that have been made.

Although NFPA establishes different benchmarks for different event types, for a comprehensive look at all events (risk), the following were used:

1:00 for call processing time, 1:20 for turnout time, 4:00 for travel time; 5:20 for response time (turnout and travel), a total of 6:20 minutes total response time.

The chart below represents the 33-month period and responses within the jurisdiction, determined by excluding the auto and mutual aid given events. Outliers and canceled events were also excluded. This chart represents the 3,994 incidents which contained all four timestamps; PSAP received, dispatched, enroute and arrive.

Figure 8: Performance of Response Time Segments

Benchmark - Response Time Goals

Percentile	Call Processing	Turnout	Travel	Response Time	Total Response Time
90%	0:01:00	0:01:20	0:04:00	0:05:00	0:06:20

Baseline - Demonstrated Performance

Count	Call Processing	Turnout	Travel	Response Time	Total Response Time
3,994	00:01:44	00:01:58	00:05:15	00:06:26	00:07:49

Compliance - % Baseline meets Benchmark

Count	Call Processing	Turnout	Travel	Response Time	Total Response Time
3,994	47.20%	77.37%	76.79%	75.81%	76.19%

Gap Analysis - Baseline minus Benchmark

	Call Processing	Turnout	Travel	Response Time	Total Response Time
	00:00:44	00:00:38	00:01:15	00:01:26	00:01:29

With this information, a demonstrated performance statement or baseline statement for the all-risk hazard which can be written as such:

Based on the 33-month evaluation period, the Graham Fire Department has demonstrated the ability to respond to **90 percent of all events (all risk hazard) within 07 minutes and 49 seconds**, or less, from the receipt of the event in the 911 center until the first fire department unit arrived.

The next sections will analyze each time segment and evaluate against the benchmark performance goals established by the department. The number of records evaluated may differ from the chart above because of some missing timestamps in select areas of evaluation.

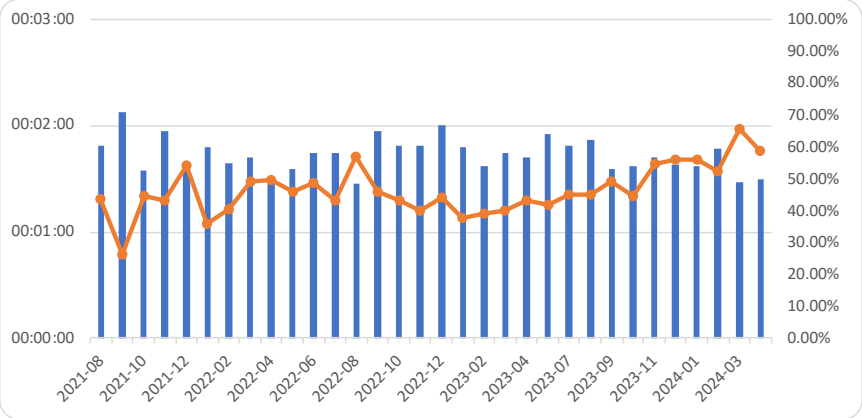
Call Processing Time:

Call Processing over the Period

During the 33-month period, the changes from one RMS to another resulted in some records without a PSAP time, the time the call was received in the 911 center. This prevents the analysis of the call processing time. The evaluation of call processing time here excluded any records missing the PSAP time in addition to outliers, defined as call processing exceeding 6 minutes in duration. The final record count evaluated for call processing was 5,781 incidents.

Accomplished performance is **01 minute and 44 seconds at the 90th percentile.** With a benchmark goal of 1 minute, the 911 center has met that goal on **46.14%** of incidents.

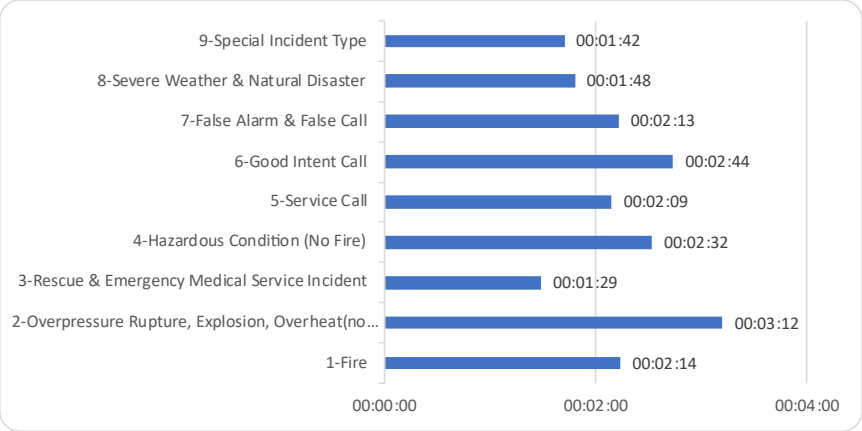
Figure 9: Call Processing Time by Month



Call Processing by Incident Types

When evaluating the processing time by type of event, the medical incident type stands out more than others with far less processing time. Because the 911 center is using Central Square One Solution CAD, this is most like the result of missed call processing time before the incident is spawned to the fire service for dispatch. In this specific CAD, incidents which start as a medical event and eventually get spawned to a separate fire event, do not carry the original time received into the fire incident. The RMS system then only records the time the incident was received from that spawning. This can lead to a significant amount of time lost and shorten the medical call processing evaluation.

Figure 10: Call Processing by NFIRS Category



The chart below contains the top 15 incident types, by count. Medical incident types clearly have a shorter duration for call processing.

Figure 11: Call Processing by Incident Type (top 15)

NFIRS Incident Type	Count	CP	Goal Met
321-EMS call, excluding vehicle accident with injury	2,526	00:01:25	56.01%
311-Medical assist, assist EMS crew	1,597	00:01:29	50.00%
322-Motor vehicle accident with injuries	291	00:01:57	35.79%
553-Public service	249	00:02:03	46.27%
745-Alarm system activation, no fire - unintentional	234	00:02:08	11.76%
324-Motor vehicle accident with no injuries.	164	00:01:47	34.13%
600-Good intent call, other	105	00:02:56	25.93%
412-Gas leak (natural gas or LPG)	64	00:02:19	20.31%
622-No incident found on arrival at dispatch address	52	00:02:37	24.07%
735-Alarm system sounded due to malfunction	38	00:02:40	10.53%
131-Passenger vehicle fire	36	00:01:46	22.22%
111-Building fire	36	00:02:26	27.50%
743-Smoke detector activation, no fire - unintentional	34	00:01:57	11.43%
651-Smoke scare, odor of smoke	34	00:03:08	11.76%
611-Dispatched & canceled en route	30	00:02:00	46.67%
Grand Total	**5,490**	**00:01:40**	**47.50%**

Call Processing by Alarm Hour

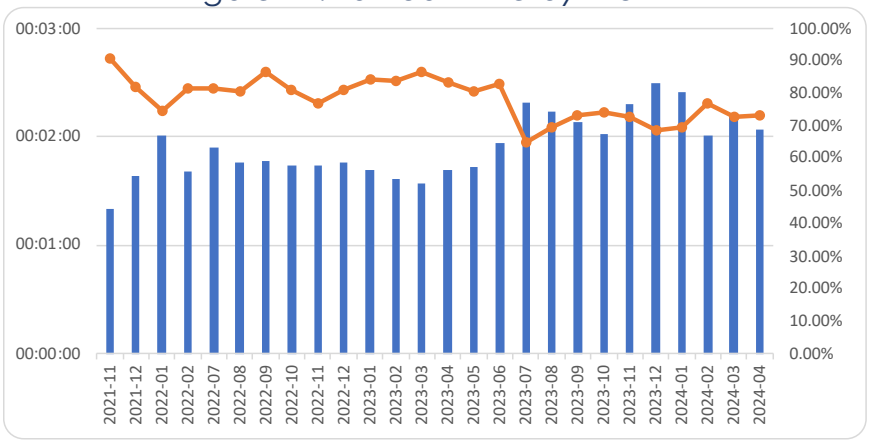
Over the 24-hr period, incidents are processed and dispatched within a similar amount of time with some improvements during the nighttime hours when demand is less.

Turnout Time:

Turnout Time over the Period

This analysis of turnout time has only evaluated the first arriving unit, where the indicated an emergency traffic response and the incident occurred at a location where the record indicated no mutual, or auto aid was given. This yielded 4,184 incidents to evaluate over the 33-month period. The **goal, of 01 minute and 20 seconds**, has been **met on 77.68%** of these incidents with **an overall time of 01:57 at the 90th percentile**. In June 2023, there is notable decrease in turnout performance which continues through the evaluation period. The travel time sees the opposite effect during the same period, suggesting the enroute timestamping has been delayed with no other changes. This may have been due to the implementation of automation within the MCT application known as "auto-enroute" based on movement and speed, automatically triggering the enroute timestamp. The actual reason has not been verified.

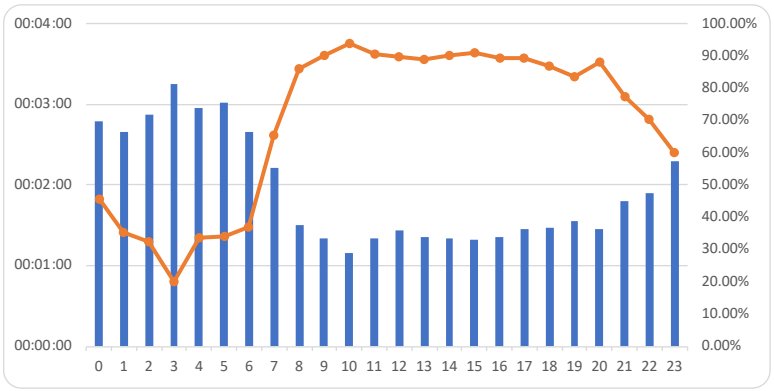
Figure 12: Turnout Time by Month



Turnout by Alarm Hour

The department follows the industry trend of increased turnout during the nighttime hours when firefighters are asleep and lower turnout during daylight hours. The 3am hour has the highest turnout time at 03 minutes 15 seconds. Compliance percentages drop to 20% during that hour as well.

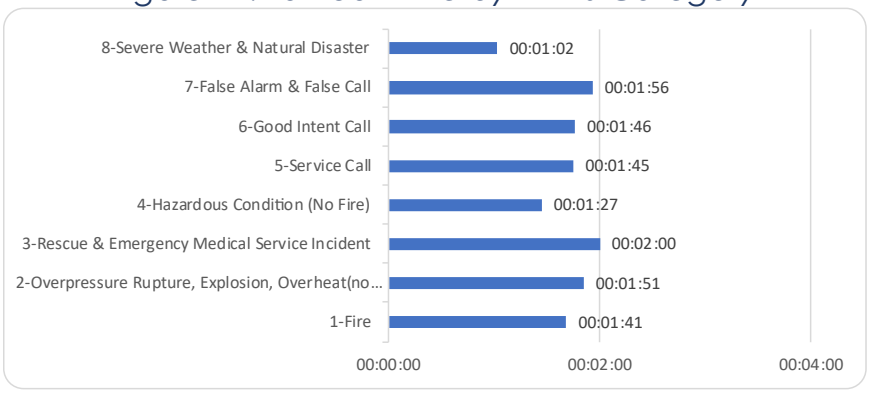
Figure 13: Turnout by Alarm Hour



Turnout by Incident Types

Certain incident types are expected to take longer than others to turn out due to the donning of fire gear before departure. Depending on the department's policy, select rescue events could require this same gear such as motor vehicle crashes and fire alarms. The data shows the opposite with turnout time for medical incidents and motor vehicle accidents with more turn-out time than fires.

Figure 14: Turnout Time by NFIRS Category



NFIRS Incident Type	Count	TO	Goal Met %
321-EMS call, excluding vehicle accident with injury	1,833	00:01:54	78.51%
311-Medical assist, assist EMS crew	1,165	00:02:17	68.58%
322-Motor vehicle accident with injuries	195	00:01:05	94.87%
745-Alarm system activation, no fire - unintentional	163	00:01:52	81.60%
553-Public service	154	00:01:44	84.42%
324-Motor vehicle accident with no injuries.	134	00:01:29	88.81%
600-Good intent call, other	89	00:01:40	83.15%
412-Gas leak (natural gas or LPG)	54	00:01:17	90.74%
622-No incident found on arrival at dispatch address	43	00:02:01	81.40%
651-Smoke scare, odor of smoke	33	00:02:11	81.82%
131-Passenger vehicle fire	26	00:02:12	80.77%
743-Smoke detector activation, no fire - unintentional	24	00:02:18	54.17%
611-Dispatched & canceled en route	21	00:01:27	80.95%
111-Building fire	20	00:01:58	85.00%
735-Alarm system sounded due to malfunction	19	00:02:02	84.21%
Grand Total	**3,973**	**00:01:58**	**77.37%**

Turnout Time by the Shift

Evaluating ENG10, ENG20 and ENG30, for all response types (emergency and non-emergency) and all arrival sequences, there are minor differences in shift performance related to turn out. B and C shift are very similar, while A shift has a longer turnout.

Figure 15: Turnout Times by Shift

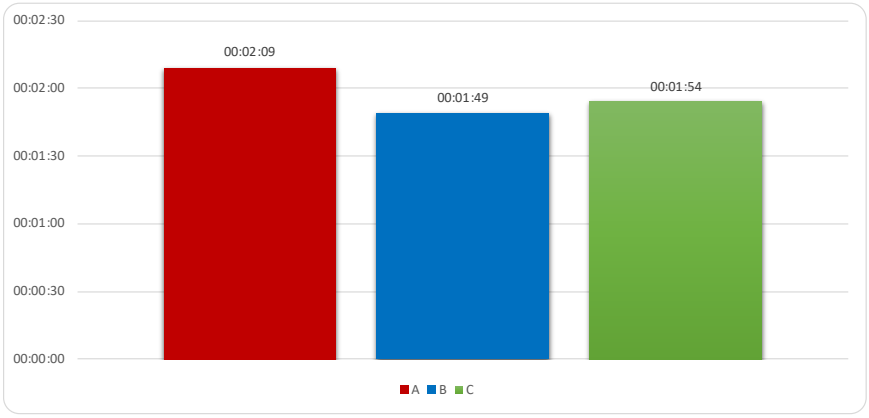
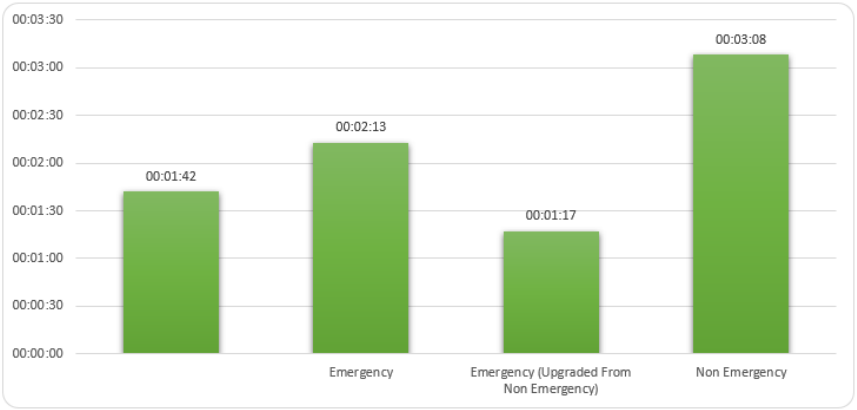


Figure 16: Turnout Times by Response Mode



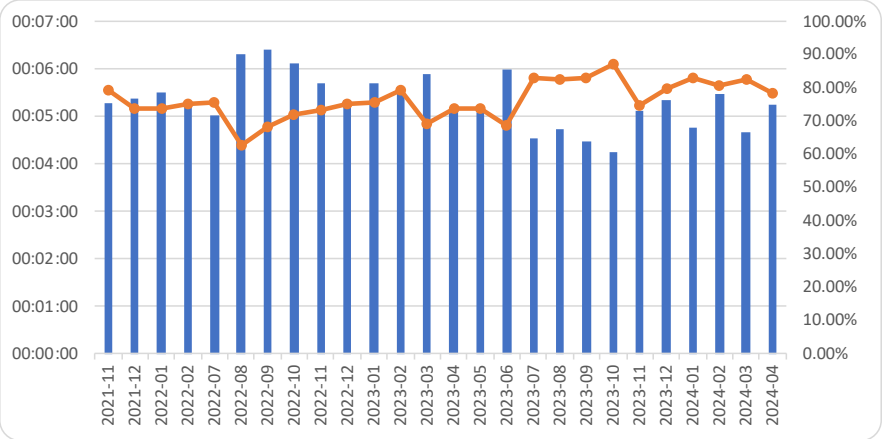
Travel Time:

Travel Time over the Period

This section evaluates the first arriving unit only. Exclusions were 1st arriving units with missing enroute times, where a travel time could not be calculated. The unit must have marked emergency response (or blank response) in the response mode section of the unit report. This generated 4,193-unit response to evaluate for travel time of the first arriving unit. The **goal of 4 minutes** for the first arriving unit was **met 76.46%** of events and the **overall travel time was 05:16** at the 90th percentile.

A notable increase in performance and compliance around the July 2023 month is consistent with the change in the turnout time.

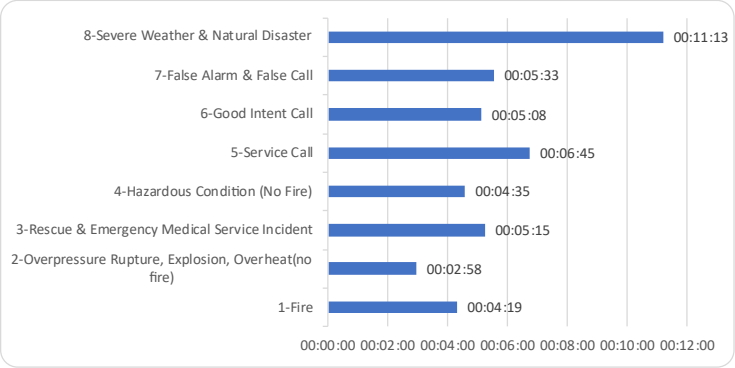
Figure 17: Travel Time by Month



Travel Time by Incident Type

Select circumstances can affect travel time such as weather and traffic. Weather related incidents contribute to the longest travel time for the department followed by service calls.

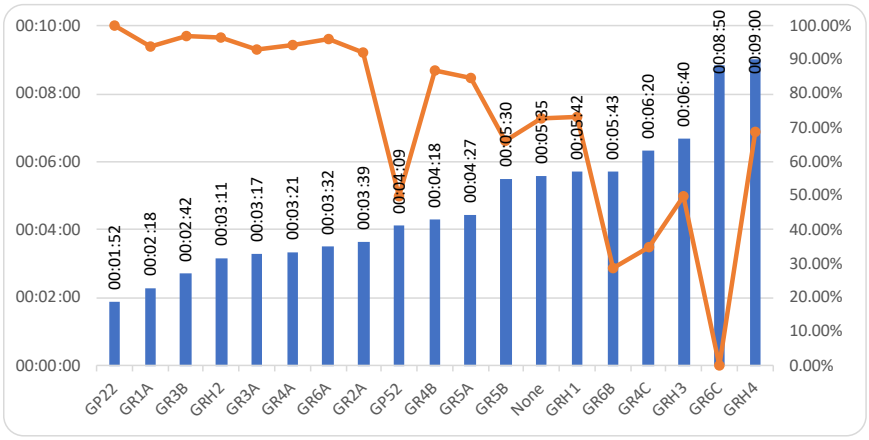
Figure 18: Travel Time by NFIRS Category



Travel Time by Fire Demand Zone

Evaluating travel time inside the first due area of each fire station's response area can help to understand correct station placement. When travel times in those defined areas are not meeting the goal, further evaluation of the "why" must be done, looking to determine if reliability, due to concurrent calls, is an issue. Other factors should be considered like available unit status, and location of the unit at the time of dispatch.

Figure 19: Travel Time by FDZ



Fire demand zones are smaller geographical areas and allow a deeper look at potential trouble related to response times. By evaluating the travel time only, turnout time is not a factor. As a reminder, the Graham dataset contained FDZ information from 07/01/2023, forward but allows a look at potential issues. GR5B and GR4C rank high in demand but have compliance less than 70% in meeting the travel time goal.

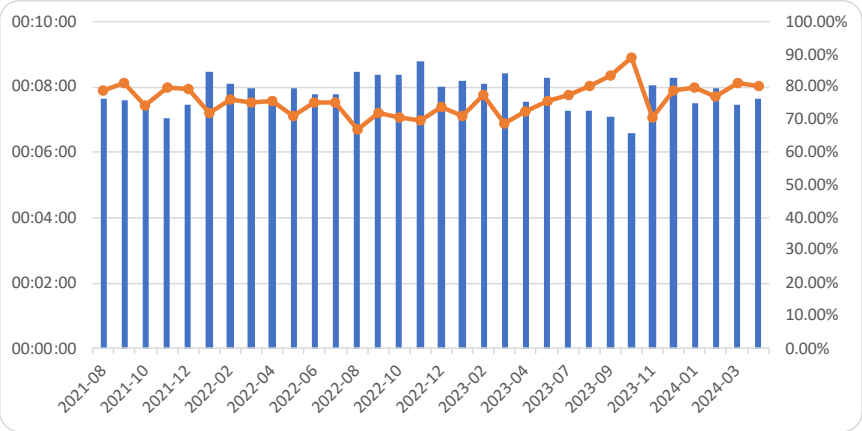
FDZ	Count	Travel	Goal Met
GR4B	386	00:04:18	86.79%
GR5A	280	00:04:27	84.64%
GR2A	275	00:03:39	92.00%
GR5B	154	00:05:30	66.23%
GR3A	140	00:03:17	92.86%
GR4C	112	00:06:20	34.82%
GR3B	99	00:02:42	96.97%
GR6A	54	00:03:32	96.30%
GR4A	53	00:03:21	94.34%
GR1A	33	00:02:18	93.94%
GRH2	29	00:03:11	96.55%
GRH3	24	00:06:40	50.00%
GR6B	21	00:05:43	28.57%
GRH4	16	00:09:00	68.75%
GR6C	16	00:08:50	0.00%
GRH1	15	00:05:42	73.33%
GP52	2	00:04:09	50.00%
GP22	1	00:01:52	100.00%

Total Response Time:

Total Response Time for the Period

Total Response Time represents the combination of all three individual time segments and is a good indication of how long the 911 caller waits for the first arriving unit from the fire department. The department established a **goal of 06:20** and has demonstrated their ability to **meet that goal 76.01%** of emergency incidents. **The actual time at the 90th percentile is 07:49**, a gap of 01:29

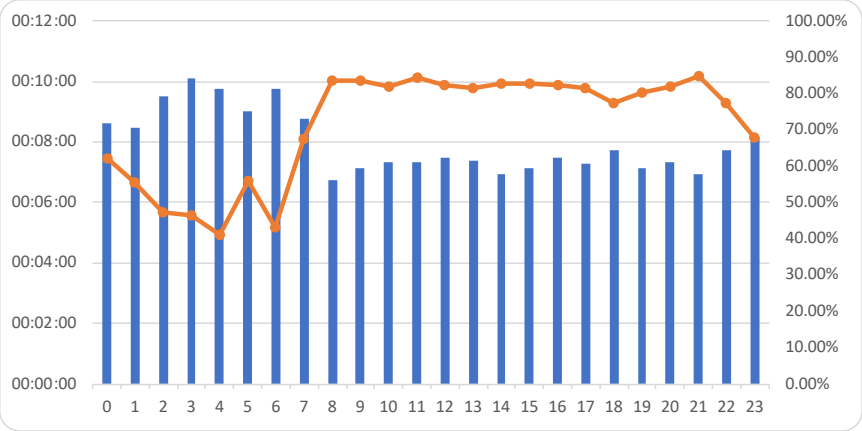
Figure 20: Total Response Time by Month



Total Response Time by Alarm Hour

By the alarm hour, elongated turnout time during the nighttime hours can be seen to affect total response time.

Figure 21: Total Response Time by Alarm Hour



Total Response Time by Incident Types

Although the overall response time was 07:49, the fire category demonstrated better response times and higher percentage of compliance with the goals. Fires had a total response time of 06:56 and met the goal at 85.37%. Medical related incidents had a total response time of 07:40 and met the goal at 77.28%.

The top 15 incident types are shown on the second graph, representing 95% of all incidents. The 311- medical assist incident type, with 1,602, has higher response time than other medical related incidents in the category.

Figure 22: Total Response Time by NFIRS

NFIRS Category/Description	TRT	Count	Goal Met %
1-Fire	00:06:56	159	85.37%
2-Overpressure Rupture, Explosion, Overheat(no fire)	00:05:12	4	100.00%
3-Rescue & Emergency Medical Service Incident	00:07:40	4,601	77.28%
4-Hazardous Condition (No Fire)	00:07:36	142	69.72%
5-Service Call	00:10:24	281	62.72%
6-Good Intent Call	00:07:47	227	76.72%
7-False Alarm & False Call	00:08:08	373	68.07%
8-Severe Weather & Natural Disaster	00:14:01	3	66.67%
9-Special Incident Type	00:03:37	3	100.00%
Grand Total	**00:07:49**	**5,793**	**76.01%**

NFIRS Incident Type (Top 15)	TRT	Count	Goal Met %
321-EMS call, excluding vehicle accident with injury	00:07:06	2,526	82.96%
311-Medical assist, assist EMS crew	00:08:34	1,602	66.77%
322-Motor vehicle accident with injuries	00:07:04	291	84.62%
553-Public service	00:10:32	253	62.16%
745-Alarm system activation, no fire - unintentional	00:08:06	234	69.75%
324-Motor vehicle accident with no injuries.	00:08:02	164	79.04%
600-Good intent call, other	00:07:46	105	81.48%
412-Gas leak (natural gas or LPG)	00:07:07	64	78.13%
622-No incident found on arrival at dispatch address	00:08:26	52	74.07%
735-Alarm system sounded due to malfunction	00:07:53	38	65.79%
131-Passenger vehicle fire	00:06:25	36	88.89%
111-Building fire	00:05:35	36	100.00%
743-Smoke detector activation, no fire - unintentional	00:08:33	35	69.44%
651-Smoke scare, odor of smoke	00:07:47	35	62.86%
611-Dispatched & canceled en route	00:07:42	30	83.33%

Effective Response Force Evaluation

An Effective Response Force (ERF) is determined by the fire department once they have analyzed their risk in the community and completed a critical task analysis of each risk type to determine what resources are needed in respect to apparatus and staff counts. The deployment and arrival of those resources should have time-based goals associated with each, and an objective of assembling the ERF in minimal time to mitigate the incident and assist in changing to a more positive outcome.

The Graham Fire Department's FRMS system collects assisting aid department's unit information including timestamps and staff count making it possible to measure an ERF, even when the department relies on mutual or auto aid.

The following chart represents 46 NFIRS-defined structure fires within the 33-month period (Incident Types: 111,112,120,121,122,123), within the AHJ, where units that arrived traveled emergency traffic. A count of 15 firefighters was used as the ERF. Of the 46 incidents, only 5 incidents had 15 firefighters arrive. Incidents not arriving at the ERF could be an indication the incident did not require the resources and responding units were canceled before arrival.

Figure 23: Structure Fire Effective Response Force

Enter ERF # here->		15	Baseline@ 90th percentile	Benchmark	Gap
Call Processing Time (CP)	nth = 46	Pickup to Dispatch	**0:01:55**	0:01:00	0:00:55
Turnout Time (TO)		Turnout 1st Arriving Unit	**0:02:50**	0:01:20	0:01:30
Travel Time (Trv)		Travel Time 1st Arriving	**0:03:07**	0:04:00	Goal Met
	nth = 5	Travel Time ERF Unit	**0:31:27**	0:08:00	0:23:27
Total Response Time (TRT)		Total Response Time 1st Arriving Unit (CP,TO,Trv)	**0:04:20**	0:06:20	Goal Met
	nth = 5	Total Response Time ERF Unit (CP,TO,Trv)	**0:32:08**	0:10:20	0:21:48

Unit Staffing Counts:

Based on the incident reports and the staff members assigned to the responding unit, an average staff count yielded the following over the 33-month period. The data suggests a minimum staffing of 2 is trying to be maintained on all engines, truck, and squad.

Although the overall average for each unit is less than 3, evaluating to number of times per staff count, it appears a staff count of 3 or more occurs on 57.05% of incidents for Engine 10, the department's 1st out engine.

Unit Type | ID	D Count	Avg Staff
Chief officer Car		
Fire Chief	15	1.07
Engine		
Engine	24	2.88
Engine 10	4,177	2.67
Engine 20	93	2.17
Engine 30	767	2.26
Support apparatus, other		
SQ10	130	1.01
Truck or aerial		
Truck 10	439	2.17
Grand Total	**4,757**	**2.52**

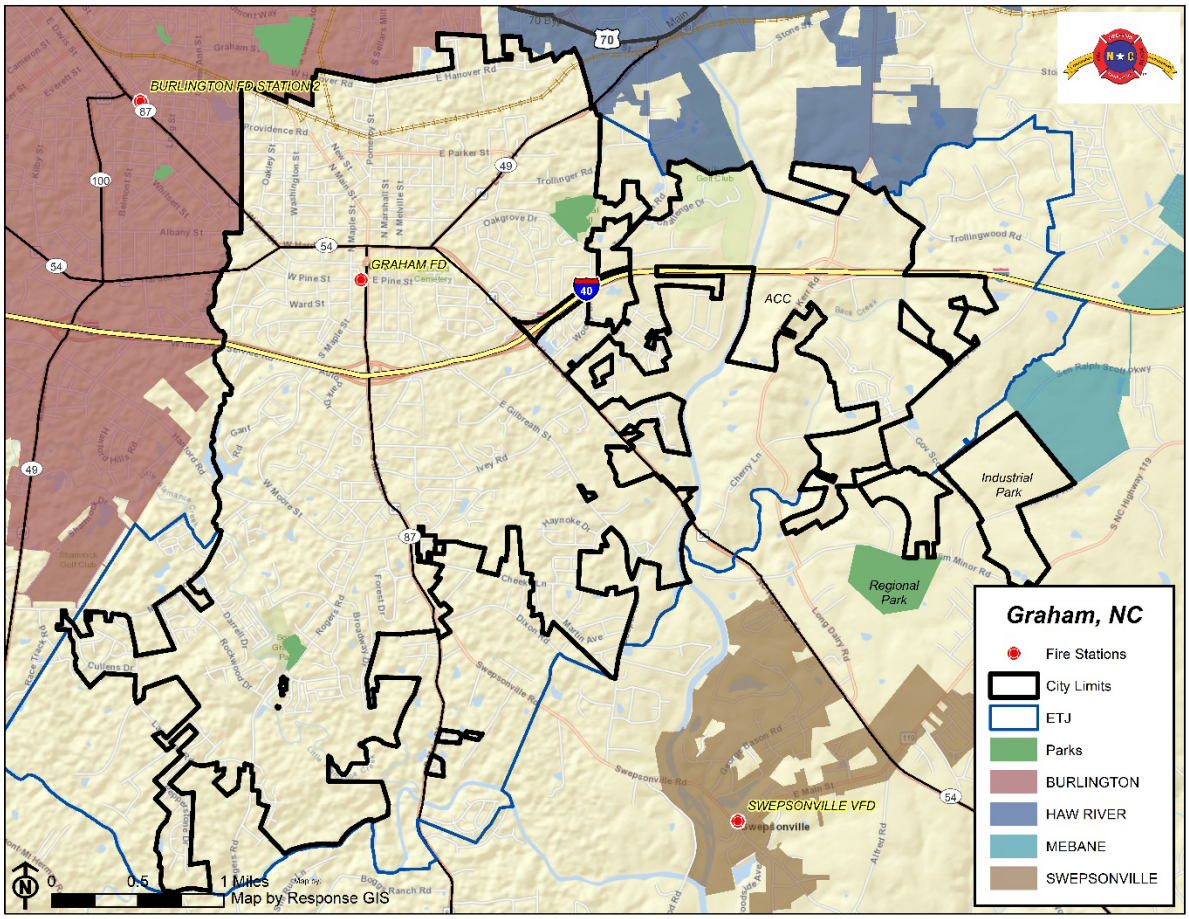
Unit ID | Staff Count	D Count	D Count Inc #
Engine 10		
1	18	0.43%
2	1,776	42.52%
3	1,998	47.83%
4	348	8.33%
5	34	0.81%
6	3	0.07%
Engine 20		
1	12	12.90%
2	57	61.29%
3	21	22.58%
4	2	2.15%
5	1	1.08%
Engine 30		
1	48	6.26%
2	530	69.10%
3	136	17.73%
4	50	6.52%
5	3	0.39%
SQ10		
1	129	99.23%
2	1	0.77%
Truck 10		
1	21	4.78%
2	338	76.99%
3	66	15.03%
4	13	2.96%
5	1	0.23%

SECTION 2: GEOGRAPHICAL INFORMATION SYSTEMS (GIS) ANALYSIS

Introduction

The Graham Fire Department provides fire rescue services to the city that is also the seat of Alamance County, NC. The city is approximately 10.5 square miles with an estimated 17,273 residents according to the US Census Bureau's 2019 estimates. There is also an extra-territorial jurisdiction (ETJ) that extends south and east from the current city limits. Being the county seat as well as have three interchanges along I-40/85 corridor brings many more people to Graham on a given day. The three interchanges have the expected array of hotels, restaurants, and other commercial businesses. Off the easternmost interchange, over the Haw River, is the Alamance Community College and to the southeast is the industrial park that currently serves a Walmart and a Lidl's Distribution center.

Figure 24 Current City Area and Fire Stations



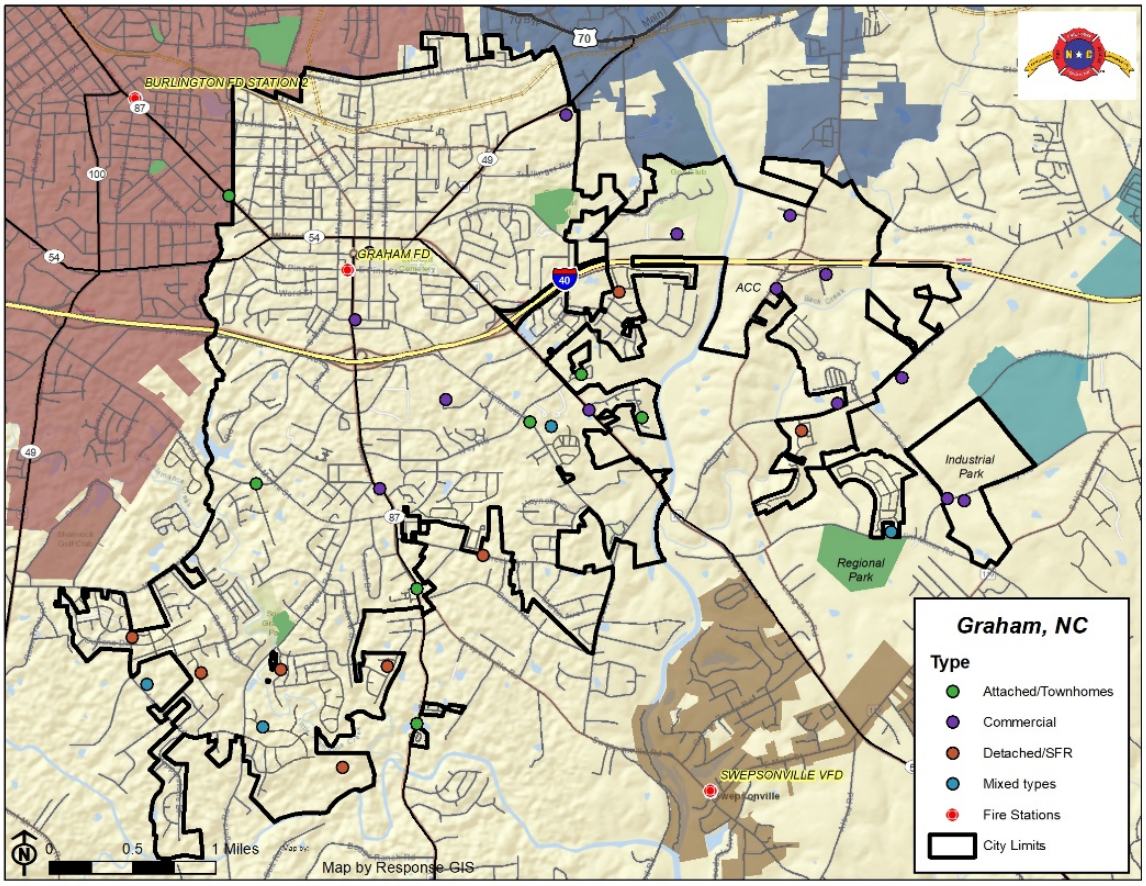
Currently, the fire department operates out of one location in the heart of downtown, north of the interstate. Development to the south of the interstate has been growing due to access to the highways as well as the growth of the industrial park. This study, at the request of the fire department, seeks to evaluate an

optimal site for a possible second fire station and the effect upon the delivery of services within the City of Graham as well as the ETJ in case of annexation of property into the city limits. The following map shows the city limits, the ETJ, the fire station, as well as roads and other features.

Planned Development

Identified by the fire department, there are several projects both planned and approved that will impact the fire service.

Figure 25: Planned Developments and Fire Station Locations



With development comes increased population and demand for fire services. Population is expected to increase by over 4,500 (>26%) at build-out when the units are multiplied by the census bureau's population per household of 2.26[1]. Demand for service is expected to increase by over 3,000 calls (>27%) when the utilization rate of .24 is applied to estimated additional population.

[1] Except Whitford Cove & Hanford Landing where 1.7 was used (senior)

Name	Type	Units	Est Residents	Est Incidents
Bethany Townhomes	Attached/Townhomes	61	138	33
CherryCreek	Detached/SFR	185	418	101
Council Creek	Detached/SFR	92	208	50
Graham Springs	Detached/SFR	95	215	52
Hanford Landing	Attached/Townhomes	70	126	30
LacyFarms	Detached/SFR	191	432	104
Meadows ofGraham	Attached/Townhomes	68	154	37
MeadowviewGlenn	Detached/SFR	28	63	15
MiddlefieldTowns	Attached/Townhomes	32	72	17
Riley's Meadow	Mixed types	386	872	211
Riverwalk, Phase 3	Attached/Townhomes	28	63	15
Roger Springs	Detached/SFR	157	355	86
Sagecroft	Mixed types	166	375	91
Shamrock, Phase 4	Mixed types	25	57	14
Stillhouse Farms	Detached/SFR	110	249	60
Sunset Landing	Attached/Townhomes	42	95	23
Valor Ridge	Detached/SFR	70	158	38
Whitford Cove	Attached/Townhomes	44	75	18
Windsor Oakmont	Mixed types	176	398	96
	TOTALS	**2,026**	**4,522**	**1,093**

While commercial developments have no residents, there are foreseeable employees in these facilities and these developments carry higher risk to the community in fire loss due to the employment and tax base. Commercial utilization of existing properties is lower than for residential areas but with automated fire detection systems can generate additional alarm calls. Over 2.1 million square feet of space is planned.

Name	Type	Units	Est Residents	Est Incidents
ACC C-Store	Commercial	5,110	-	5
106 North Commercial/Apartment	Commercial	28,766	-	27
Cherry Lane Industrial	Commercial	700,000	-	652
Cherry Lane Industrial	Commercial	282,000	-	263
112 E Gilbreath	Commercial	2,024	-	2
Goodwill	Commercial	13,267	-	12
Pureflow	Commercial	40,000	-	37
Alamance Ridge Phase 2	Commercial	297,657	-	277
	Commercial		-	-
Truby Industrial	Commercial	575,837	-	537
Sterigenics	Commercial	70,000	-	65
Eagle Rock Concrete	Commercial		-	-
E Harden Shopping Center	Commercial	19,600	-	18
Baldwin Road Industrial	Commercial	70,000	-	65
	TOTALS	**2,104,261**	**-**	**1,961**

The timeline/timeline for the above planned development would be at build out.

Figure 26: New Development Estimated Population

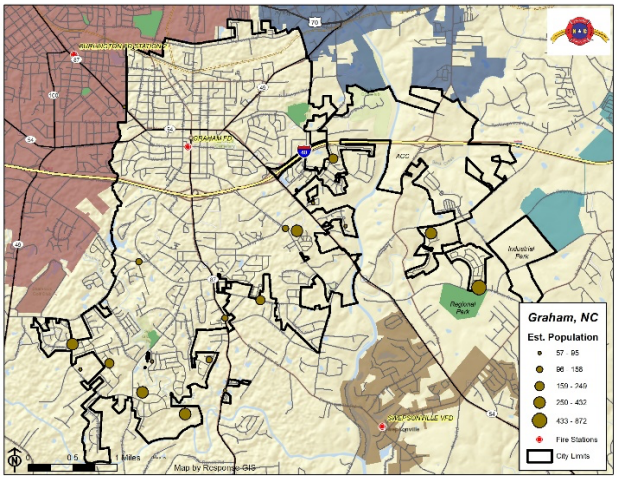
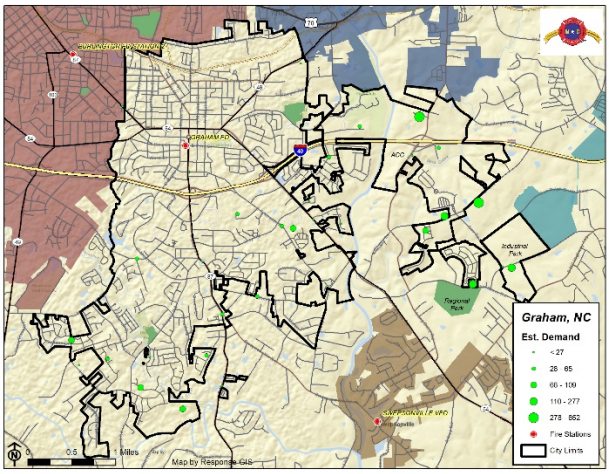


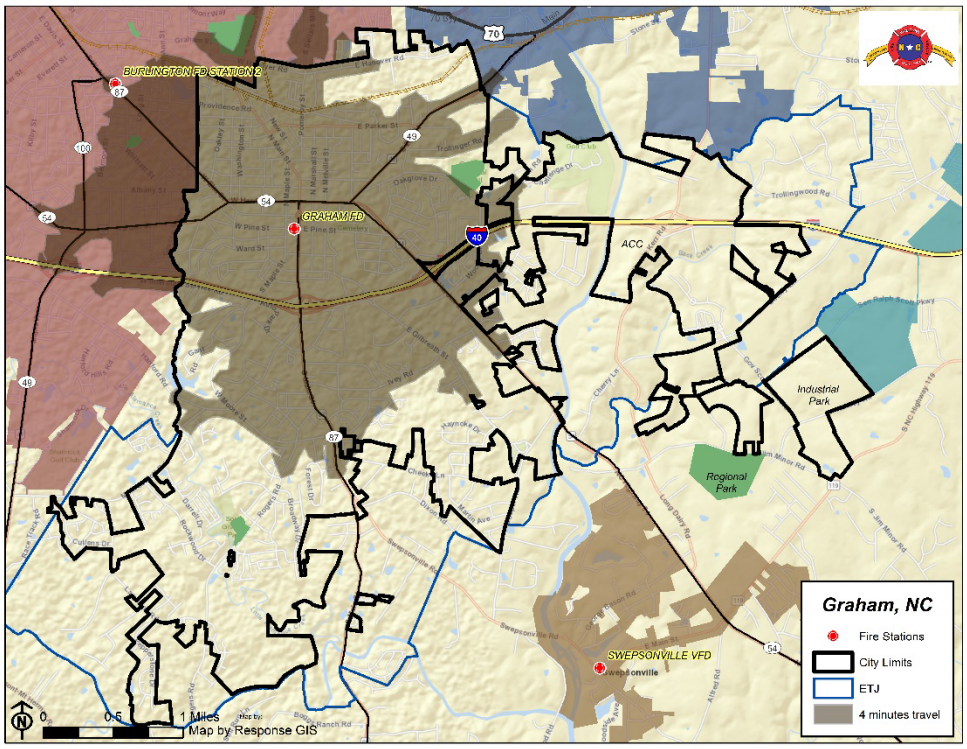
Figure 27: New Development Estimated Incidents



Time Coverage

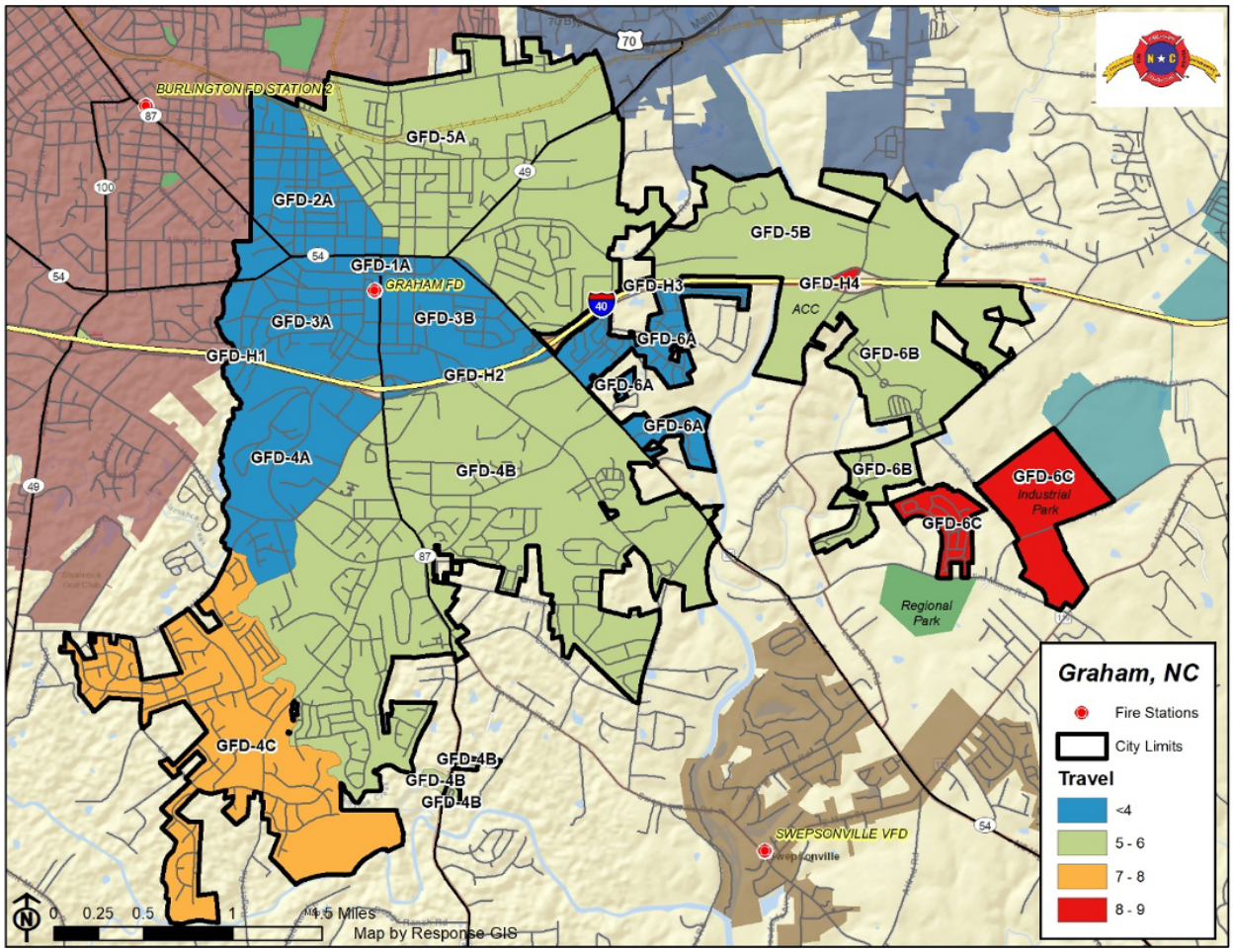
The most important element to the citizens is the time it takes to receive help in an emergency. The following map represents the extent of a modelled travel time using the street network, posted speed limits, and the restrictions in place, if any. While turns, intersection crossings such as traffic lights, and at-grade railroad crossings are time reduced, uncontrollable events such as weather, detours, and traffic congestion are not. The fire department has directed the study team to use the industry standard four-minute travel time to assess coverage in this report.

Figure 28: Travel Time Coverage



Note that there are planned developments that currently require the longest travel time to reach.

Figure 29: Travel Time by Response Zone



Coverage Analysis Methodology

To assess the coverage of the current locations of the fire stations, many measures can be tabulated from street mileage to square miles, population, events, address points, property use, traffic volume counts, etc. These multiple results would vary depending on the measure and the impact on the fire service. For instance, mileage assumes development. This is not true; streets simply provide a means to development. There are miles of open fields along a roadway which is why area coverage is also discouraged. What is needed is one methodology that levels the playing field of measures that impact the fire service the most and create an index of vulnerability to evaluate coverage. The goal is to provide the most risk coverage.

Population

There are three elements that impact the fire service the most. First is population because areas of higher amounts correlate with more demand for services. Additionally, these are residential taxpayers funding the fire department services. The following map shows the estimated future population after developmental impact.

Figure 30: Current Population Density

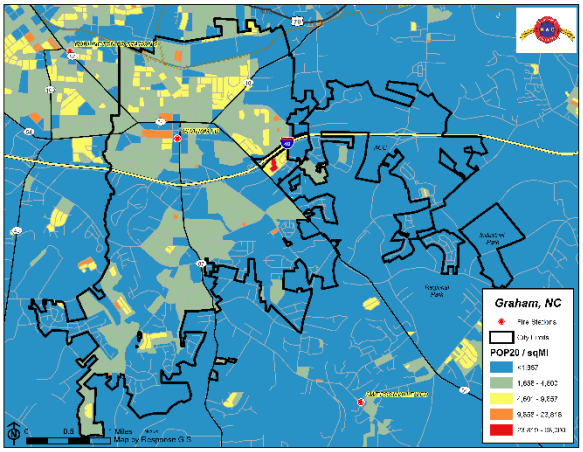
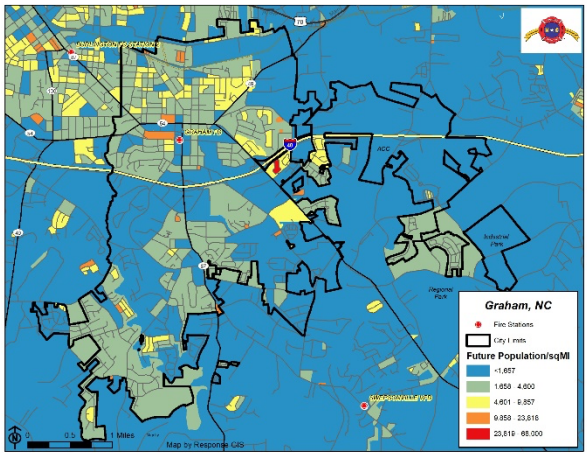


Figure 31: Future Population Density



The higher concentrations of population are near the central core of the fire district. It is expected that population density will grow to the east and south. A drawback of examining population coverage alone is that it does not consider the risk that commercial and industrial properties (with no residential population) pose to a community.

Land Use Risk

Secondly, the use of land related to the structures and stockpiles vary in size and type. Some uses of land pose more risk to a community than others, such as a single-family home versus a chemical storage facility. Because of the myriad of uses, a macro analysis of risk based upon future land use in the City and county is employed in the methodology.

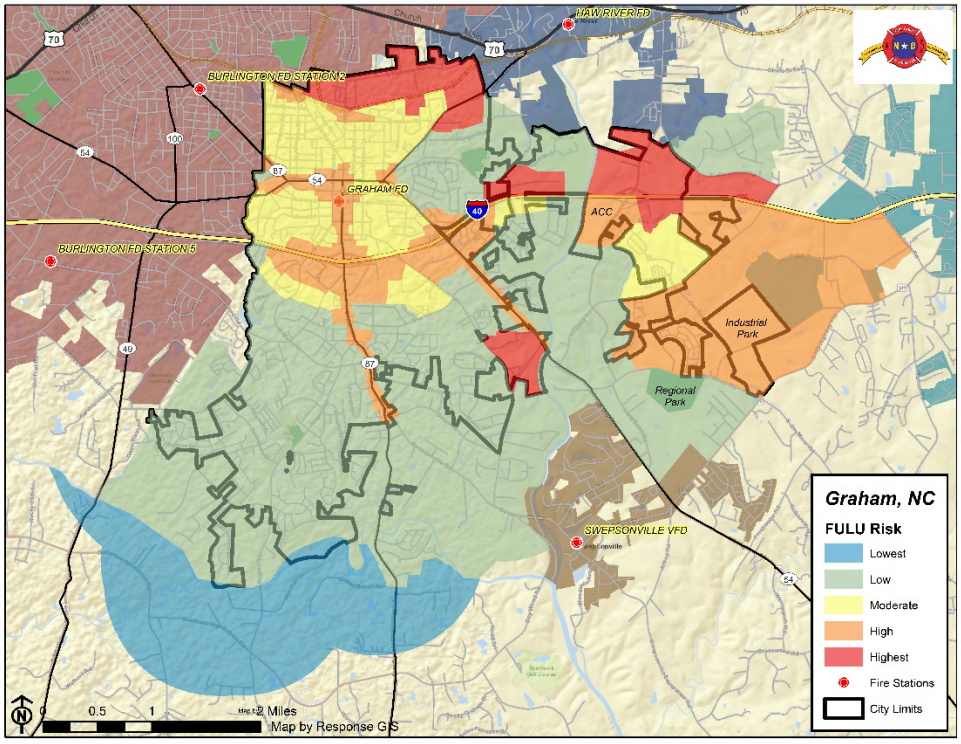
The types of uses pose differing risks to a community. Some may be a point of public assembly; others may be a facility that contains hazardous materials for its processes. Others are homes, that if lost to a fire is tragic to the owner and family. A loss of a structure that employs 300 residents is a greater overall impact loss to the community. The study team defines risk level as follows with some examples noted:

Risk Category Criteria

1. Lowest - Wide separation of single-family dwellings and farmland.
2. Low - Single-family dwellings with a separation of at least 100 feet between buildings.
3. Moderate - Commercial and light industrial facilities, small shopping centers, and high-density, low-rise residential buildings.
4. High - High-rise hotels and residential buildings, large shopping centers, and industrial complexes.
5. Highest - Refineries, large industry, lumber yards, and propane storage facilities.

These risk levels were applied to the future land use data provided in the resulting map.

Figure 29: Future Land Use Risk



Most of the areas have low or moderate risk levels. Risk increases out from the city core as the result of planned developments.

Demand for Services

Thirdly, the demand for services although do correlate with higher population, can also be driven by non-residential commercial facilities like nursing homes, higher educational, and public facilities such as airports, and transportation terminals. Highly congested and unimproved intersections can also drive service demand for the fire service. Because of these factors, the demand for services is also a major element in coverage analysis. The following maps demonstrates where the demand for services is the most intense based upon the fire department's raw incident data currently and where demand changes can be expected due to development.

Figure 30: Current Service Demand Density

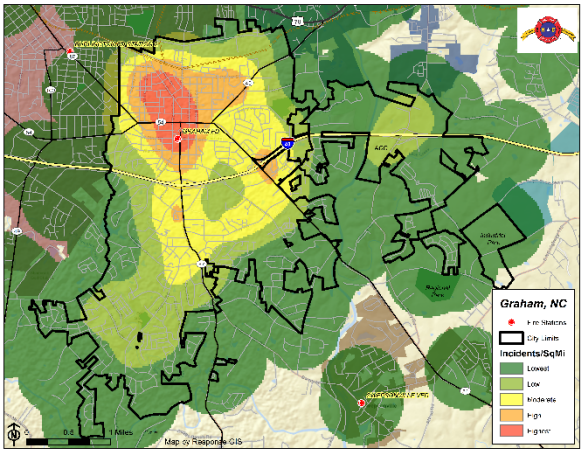
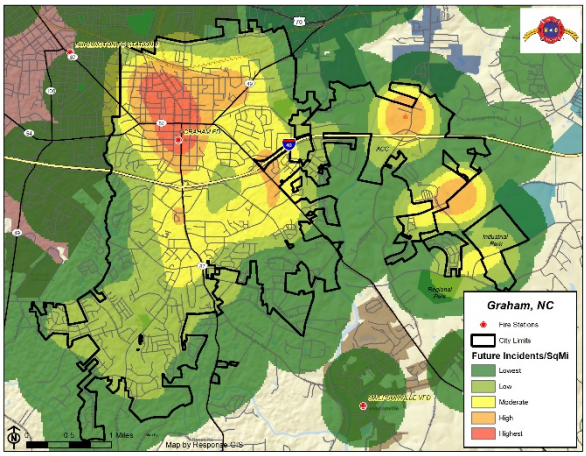


Figure 31: Future Service Demand



Much of the demand is concentrated where higher population density is located currently and where higher density planned developments to be built out in the future. The current station can reach 78% of the current demand for service within four minutes of travel from the station. This figure reduces to 68% when applied to future estimated demand.

Vulnerability Risk Index

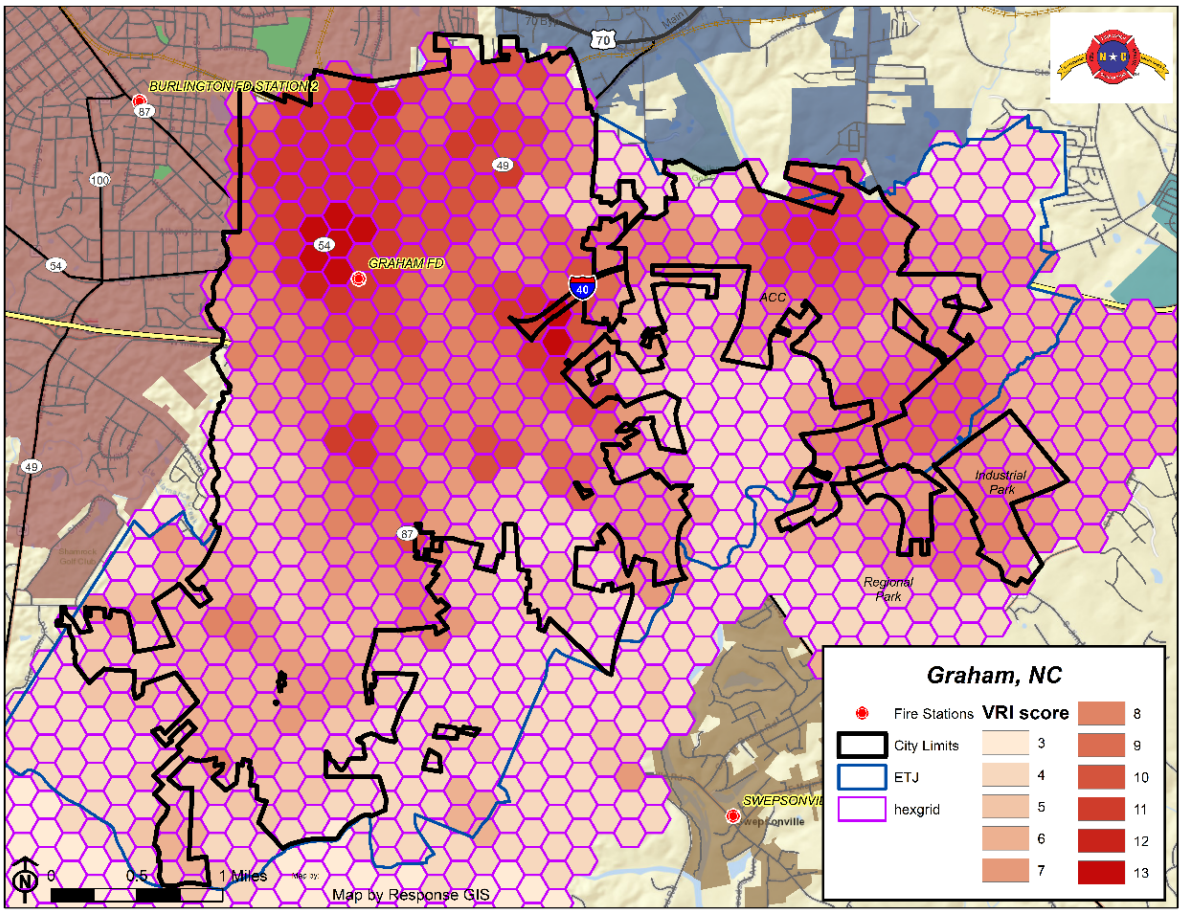
To measure the coverage adequacy by the fire station, travel time extents, the elemental aspects of population, land use risk, and demand for services are combined after equalizing each aspect into five sets of data from least to most (1-5). A ½ mile hexagonal grid was digitally constructed and overlaid atop the fire service area. The combined elemental scores were applied to the hexagonal areas to create a Vulnerability Risk Index (VRI). The lowest score would be a 3, while the highest score possible would be a 15.

Figure 32: VRI Scoring

Population per Sqmi	Score	Land Use Risk	Score	Incidents per Sqmi	Score	Total Score
Highest	5	Highest	5	Highest	5	15
High	4	High	4	High	4	12
Moderate	3	Moderate	3	Moderate	3	9
Low	2	Low	2	Low	2	6
Lowest	1	Lowest	1	Lowest	1	3

The following map shows geographically where the scores are higher or lower.

Figure 33: VRI Scores

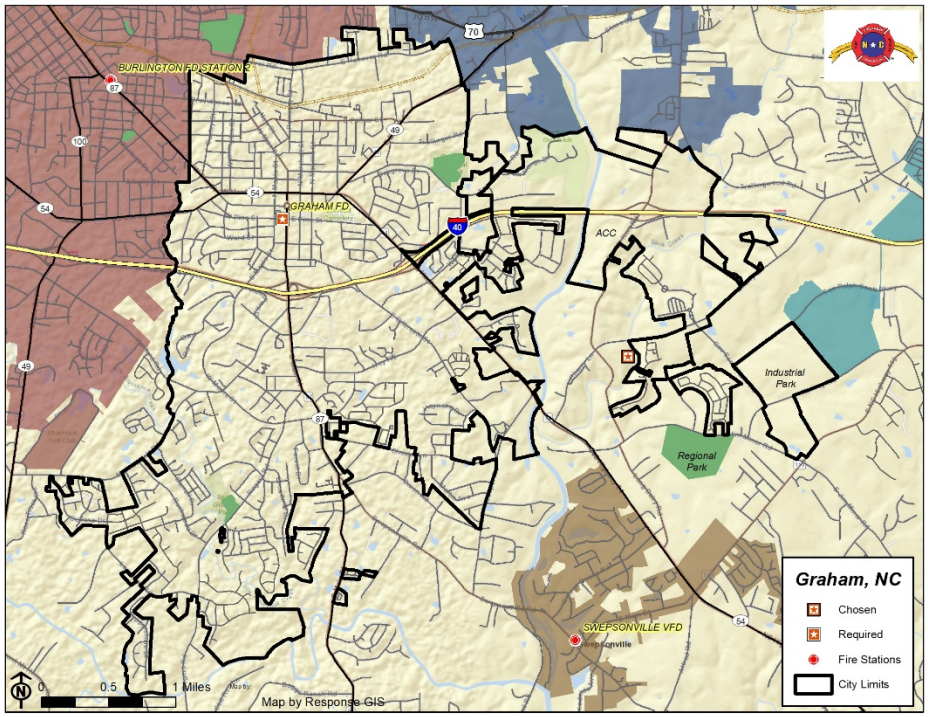


From the current Graham Fire Station, the coverage of the VRI score using the four-minute travel time models is 34%. The geographic intelligence in the model locates fire stations to optimize the VRI score given the limitations of the travel time and the inputs of the model either by coverage share or number of stations requested.

Scenario A: Optimal Second Station Location within Planned Development

Using the current station and not considering the locations of neighboring auto/mutual aid fire stations, an optimal area was chosen by the geographic technology using a four-minute travel time. The following map shows these locations.

Figure 34: Scenario A



The area near the intersection of Cherry Lane and Jimmie Kerr Road was chosen as the optimal site for the second station increasing the VRI score Coverage by 20% to **54%**.

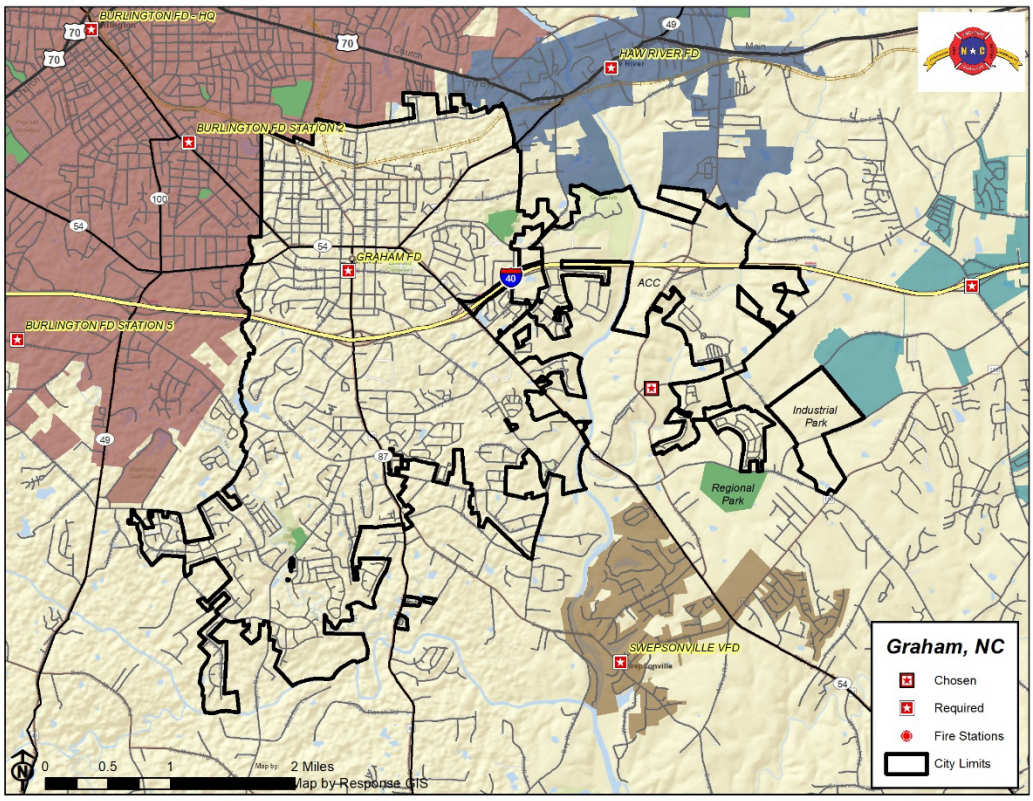
* Swepsonville automatic aid is included.

* Assistance from EM Holt and Mebane is not included.

Scenario B: Optimal Second Station Location with Aid Stations.

Building upon scenario A, the following scenario finds the optimal second station given the presence of neighboring fire stations including the proposed Mebane Station 4 near the planned Buc-ee's Site at Exit 152 of the interstate highway.

Figure 35: Scenario B



EM Holt VFD was not included in this analysis. The VRI coverage increased 17% compared to the benchmark score coverage of 49%, to reach 66%. The same area was selected for the Graham Fire Station 2.

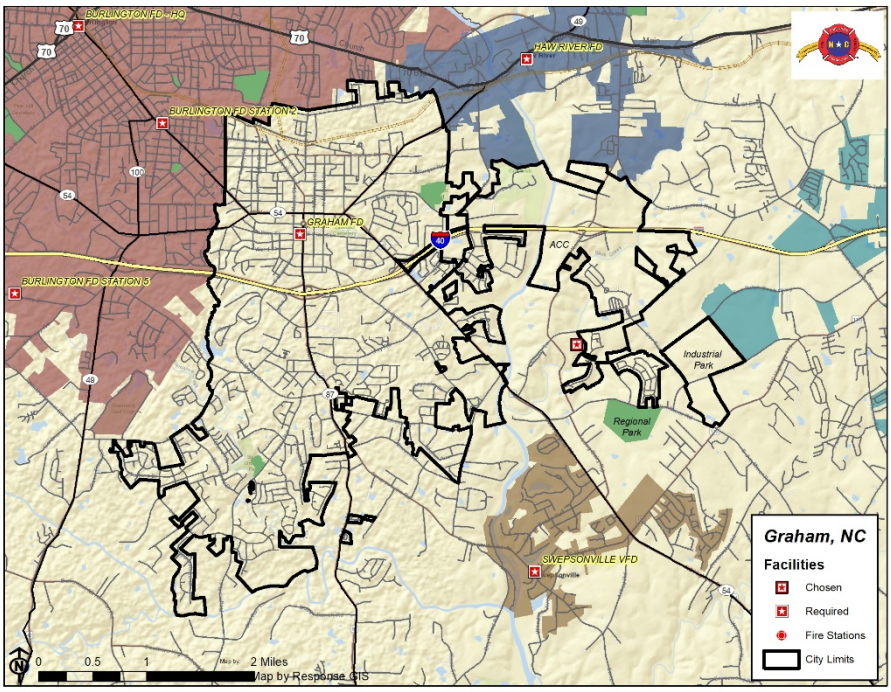
* Swepsonville and new Mebane Station 4 automatic aid is included.

* Assistance from EM Holt is not included.

Scenario C- Optimal Second Station Location with Aid Stations Adjusted

This scenario mirrors Scenario B but removes the planned Mebane Station 4 in the case it is not constructed and alters the optimal location for Graham Fire Station 2.

Figure 36: Scenario C



Again, the same area was selected for Graham Fire Station 2 increasing the benchmark coverage of 42% by 18% to reach 60% VRI score coverage.

* Swepsonville and new Mebane Station 4 automatic aid is included.

* Assistance from EM Holt and Mebane Station 4 automatic aid is not included.

Summary

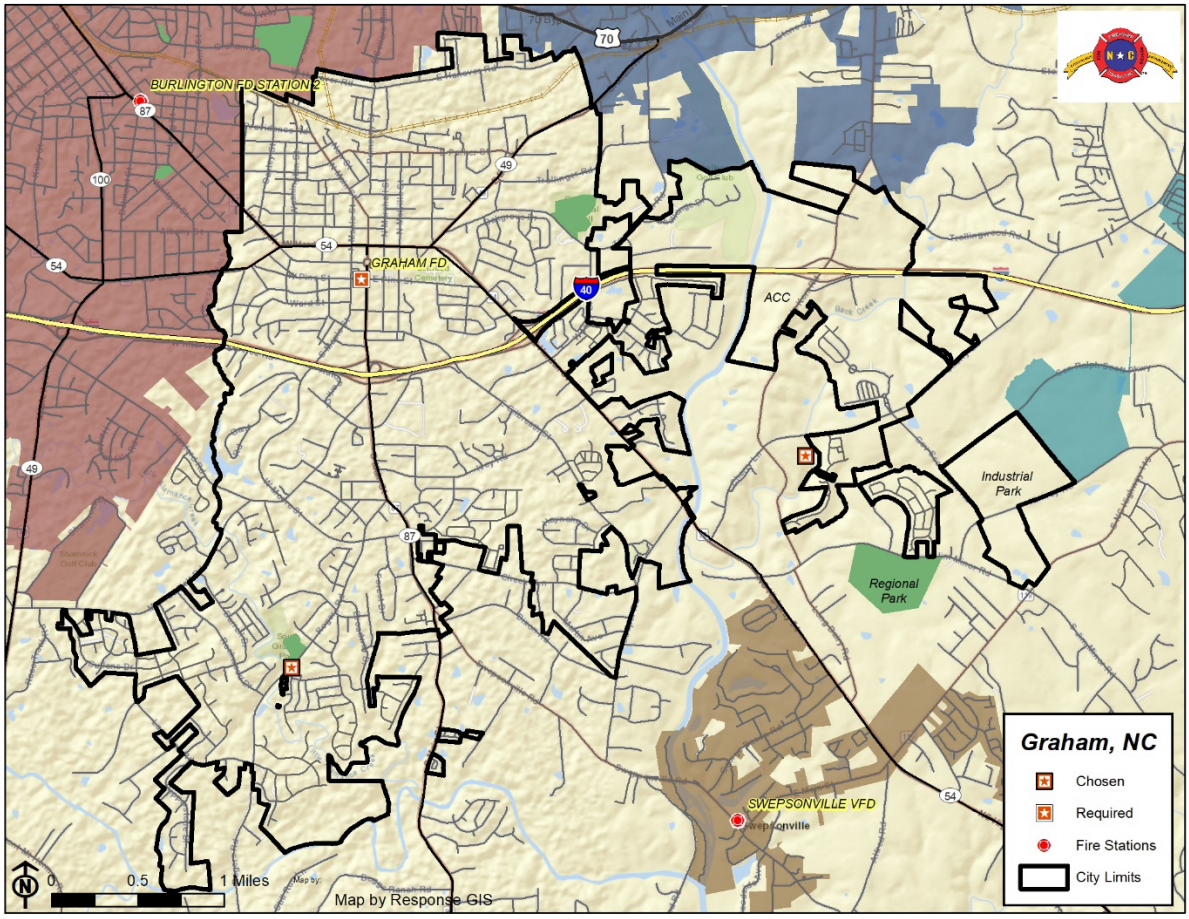
Given the cost of land acquisition, design, construction, apparatus, and staffing, it is recommended that the Graham Fire Department focus on the station area recommended in this analysis of Cherry Lane and Jimmie Kerr Road as all three scenarios selected it. The table summarizes the coverage statistics.

Scenario	Description	Notes	Coverage	%Change
A	Benchmark	No Aid	34%	
	With Optimal 2nd Station		54%	20%
B	Benchmark wAA	Aid **includes Mebane 4**/	49%	
	With Optimal 2nd Station	no EM holt	66%	17%
C	Benchmark wAA	Aid but **No Mebane 4**/ No	42%	
	With Optimal 2nd Station	EM Holt	60%	18%

Third Station Scenarios

After an initial draft review, it was determined that a third site for a fire station should also be sought for future planning purposes. Three additional scenarios were conducted like the ones discussed previously except two additional stations to the currently sole city fire station were inputted into the computer modeling. All three scenarios chose the same site near the South Graham Park on Rogers Road for optimal placement.

Figure 40: Third Station Scenario Site Selection



Current city owned properties were used for comparison purposes. All results are in the following table:

Scenario	Description	Notes	Coverage	%Change	Total%Change
A1	Benchmark	No Aid	34%		
	With Optimal 2nd Station		54%	20%	
	With Optimal 3rd Station		69%	15%	35%
B1	Benchmark wAA	Aid **includes Mebane 4/** no EM holt	49%		
	With Optimal 2nd Station		66%	17%	
	With Optimal 3rd Station		81%	15%	32%
C1	Benchmark wAA	Aid but **No Mebane 4/** No EM Holt	42%		
	With Optimal 2nd Station		60%	18%	
	With Optimal 3rd Station		75%	15%	33%
D1	Benchmark	No Aid	34%		
	Regional Park		52%	18%	
	Rogers Rd /Moore St		66%	14%	32%

A third station naturally improves the overall coverage of the VRI score. There is minimal loss locating at the city owned properties if needed.

Figure 37: City Owned Sites

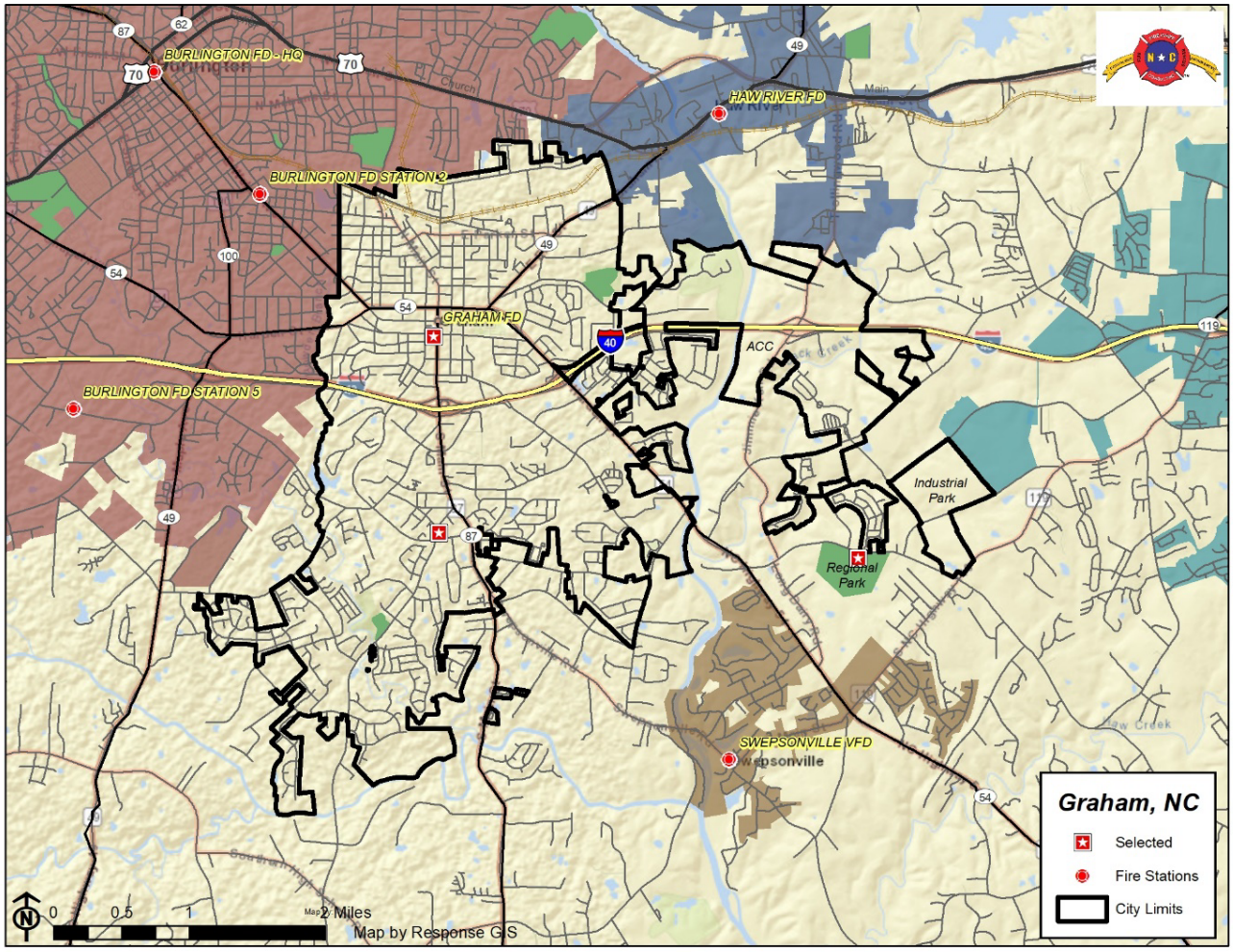


Figure 38: Area of Southeast Station

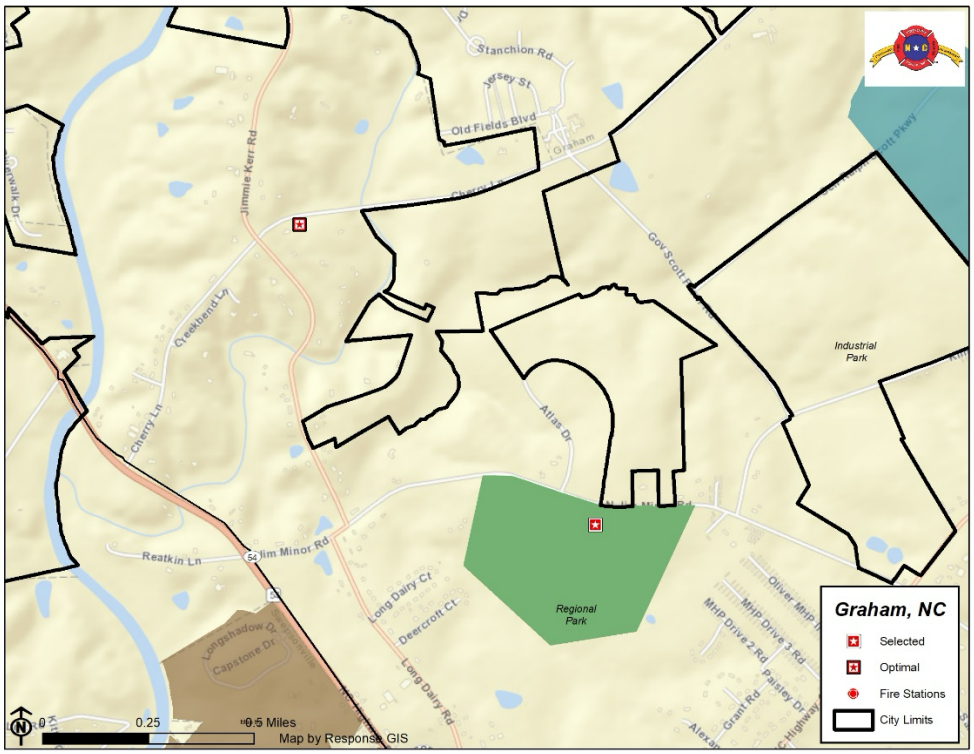
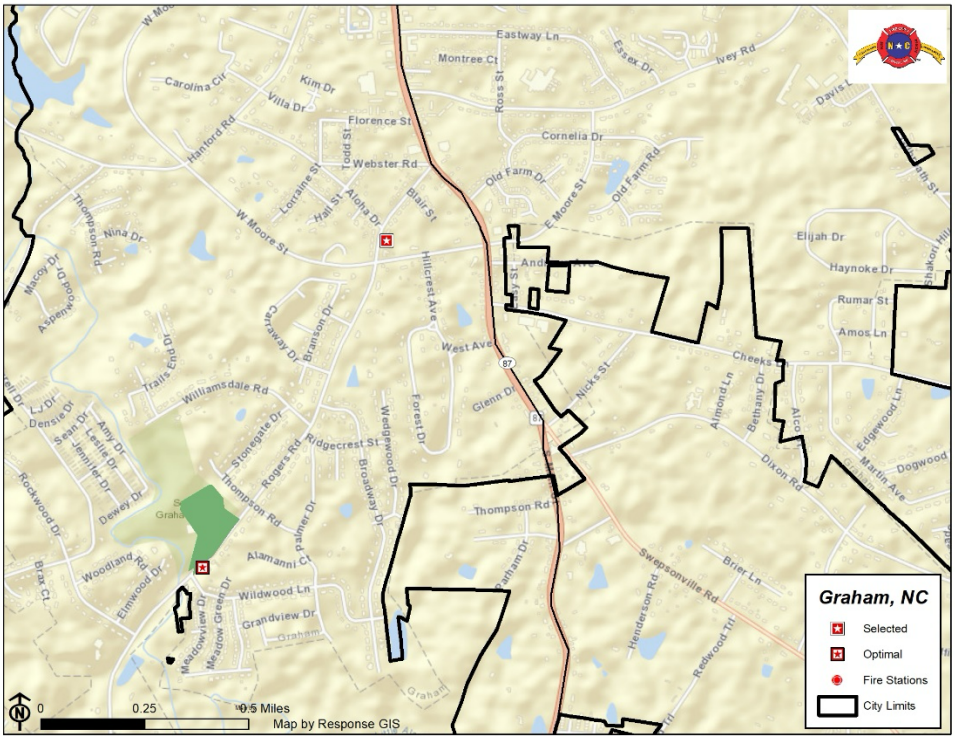


Figure 39: Area of Southwest Station



SECTION 3: APPENDIX DOCUMENTS

Appendix A – Summary of Additional Observations and Recommendations for Graham Fire

1. Dependent upon decisions made by the City of Graham related to the recommendations in the GIS section of this report, the City of Graham should be establishing capital improvement plans for fire station construction for $10-12 million, a new fire apparatus (if needed) at $900,000 or more and additional staffing to ensure that four Graham personnel staff the apparatus that will go into the future fire station, planning for 15 additional positions at ranks requested by the Graham Fire Chief.

2. It is recommended that engagement of an architect for the facility should be considered. The fire department and the town will need to decide if they want to follow traditional construction or consider the design/build model.

3. Depending on the timeline, it is recommended that the City of Graham should also consider the process that they want to utilize in constructing the next fire station. To best facilitate those needs in the current construction climate, it is recommended that Graham consider putting out a request for qualifications (RFQ) and utilizing a Construction Manager at Risk (CMAR) process that is frequently utilized by local governments in North Carolina. This CMAR model is often used to help expedite the process.

4. The Construction Manager at Risk (CMAR) is a delivery method that entails a commitment by the Construction Manager (CM) to deliver the project within a Guaranteed Maximum Price (GMP) which is based on the construction documents and specifications at the time of the GMP plus any reasonably inferred items or tasks. The CMAR provides professional services and acts as a consultant to the owner in the design development and construction phases. Often, the CMAR also provides some of the actual construction of the project depending on the availability of bidders and the expertise the company has. In addition to acting in the owner's interest, the CMAR must manage and control construction costs to not exceed the GMP because contractually any costs exceeding the GMP that are not change orders are the financial liability of the CMAR.

5. Generally, the CMAR will give the Owner a GMP prior to bidding the project. Included in this GMP is a contingency line item to take care of bid overages, reasonably inferred items and other project related items that may arise during construction. By giving the owner the GMP prior to bids, the CMAR assumes the risk of bids coming in higher as he is contractually bound to deliver the project per the plans and specifications and any additional allowances as defined in his GMP.

6. Furthermore, an option could be packaged with this RFQ as an option to enable the selected provider to also design a master facility plan for the fire stations. Combining this work together could save time and money.

7. As construction activity increases, it is important to note that attention to the current firefighter staffing level is needed in advance of the operation of the next new fire station for Graham. The hazards and risks in Graham are already increasing in concert with the growth. Currently, Graham Fire operates with a small core of career firefighters on duty as daily minimum staffing. The balance of the necessary firefighters responding into the City of Graham and Graham ETJ unincorporated fire district are primarily coming from often off duty chief officers, volunteer response and automatic aid/mutual aid assistance from other fire departments. Approximately 17 firefighters are needed on scene of any residential structure fire as an effective (and safe) firefighting force. Significantly more firefighters are needed on scene for commercial building fires. It is recommended that Graham Fire increase their daily minimum staffing as soon as conditions will allow.

Appendix B – Abbreviated Report Executive Summary:

As North Carolina communities experience growth, the demand for public services, including fire protection, increases. Graham, like many other communities, faces the challenge of adapting its infrastructure to support essential public safety services amidst significant growth projections. In response, the Graham Fire Department has proactively undertaken measures to manage this growth effectively.

To address the evolving needs, Graham initiated an independent analysis of optimal fire station locations, selecting North Carolina Fire Chief Consulting (NCFCC) for their expertise. Unlike previous analyses restricted to city-owned properties, this assessment considers all planned developments within Graham and the surrounding area.

The core purpose of this initiative was to evaluate the current and future needs for fire stations in Graham and its extraterritorial area. NCFCC utilized advanced technology and statistical analysis to assess the fire department's performance and determine optimal locations for future stations. By evaluating emergency incident response records and utilizing GIS technology, NCFCC developed a comprehensive Vulnerability Risk Index (VRI) to identify areas in need of additional fire stations.

The analysis, reviewed by experienced fire chiefs, provides specific recommendations for future fire station locations and considerations for operational and capital costs. The report emphasizes the importance of proactive planning to ensure timely emergency responses as the community continues to grow.

Moving forward, the City of Graham will review the findings and plan for capital improvements and operational enhancements. Priority will be given to areas experiencing rapid development, with regular reviews to ensure data-driven decisions.

In conclusion, the analysis provides essential insights to guide Graham's fire service planning, ensuring efficient emergency response as the community evolves.

Emergency Response Records Analysis

During the thirty-three-month review period, NCFCC analyzed 6,774 emergency incidents, revealing a notable increase in demand for services, especially since the onset of the COVID-19 pandemic in FY 20-21. Rescue and medical emergencies constituting approximately 73% of all emergency responses.

To gauge performance, the Graham Fire Department's emergency responses are measured against the NFPA 1710 standard, which recognizes response times in

fractile format at 90% of all responses. Key metrics include call processing time, turnout time, travel time, and total response time.

Call processing time, including answering the 9-1-1 call and dispatching Graham Fire, averages 1 minute and 44 seconds, meeting the goal of 1 minute or less in 46.14% of events.

Turnout time, the duration from receiving the emergency call until the fire apparatus begins moving, averages 1 minute and 57 seconds, meeting the goal of 1 minute and 20 seconds or less in 77.68% of incidents.

Travel time, the duration for the first responding unit to reach the scene, averages 5 minutes and 16 seconds, meeting the goal of 4 minutes or less in 76.46% of incidents.

The total response time, encompassing call processing, turnout, and travel time, averages 7 minutes and 49 seconds, meeting the NFPA 1710 standard of 6 minutes and 20 seconds or less in 76.01% of cases.

Despite meeting response time goals, there is a recognized response time "gap" of 1 minute and 29 seconds, indicating room for improvement. Addressing this gap is a key focus of improvement efforts outlined in the report.

Graham Fire Department handles an average of 200 incidents monthly, with the busiest period occurring between 10 am and 6 pm. Approximately 7.84% of incidents overlap with previous ones, highlighting the importance of managing overlapping calls, particularly with Graham's significant growth.

Continuous monitoring and improvement in response strategies are crucial as Graham experiences growth and evolving emergency response needs.

Geographical Information Services (GIS) Analysis

The assessment team utilized advanced geographical information services (GIS) systems to comprehensively analyze data, including demand for services, land use risk assessment, coverage distance, travel time, and evaluation of current station locations. The goal was to determine the optimal locations for future fire stations in Graham to meet response time objectives.

Currently, the Graham Fire Department serves a 10.5 square mile municipal area and the extraterritorial jurisdiction unincorporated area from one primary fire station located in the central municipal area. However, with projected growth, the geographic area will require three fire stations for adequate coverage.

Projected population growth in Graham, with over 4,500 additional residents (a 26% increase), is expected to increase the workload and call volume for the Graham Fire Department by 27%, including a significant amount of commercial space. To

determine optimal station locations, various factors such as incident demand, population density, and structural risk were considered.

Utilizing a four-minute travel time for 90% of emergency incidents as a standard, a Vulnerability Risk Index (VRI) score was calculated. Currently, Graham Fire's VRI score coverage is 34%, indicating a significant gap in coverage.

To improve coverage, two additional fire stations were proposed. A second station at Cherry Lane and Jimmie Kerr Road could increase Graham's overall VRI score to 54%, with potential further improvement to 66% with automatic aid from the City of Mebane. A third station in the South Graham Park area could raise the overall VRI rating to 81% with automatic aid.

Alternative sites for these stations, including city-owned properties, were considered. While there are advantages to locating stations on existing city property, the impact on VRI coverage from potential relocations is minimal, suggesting relocation as a viable option.

Additionally, it's recommended that the City of Graham have discussion with Alamance County about creating a fire protection service district for the City of Graham ETJ to help fund the expanding fire protection costs. It is recommended to conduct a cost share analysis with Alamance County to ensure balanced cost distribution for fire and rescue services, considering factors such as population, call volume, property valuation, and square footage.

In conclusion, the GIS analysis provides valuable insights for future fire station placement, ensuring optimal coverage and efficient service delivery in Graham's growing community.

Next Steps

The next steps outlined for the City of Graham involve a thorough review of the report and its recommendations, securing capital improvement funding for fire station construction, and ensuring operational funding for additional firefighter staffing and apparatus acquisition. Priority for the placement of the two needed fire stations should be based on the areas of fastest development, with a recognition that development timelines can shift.

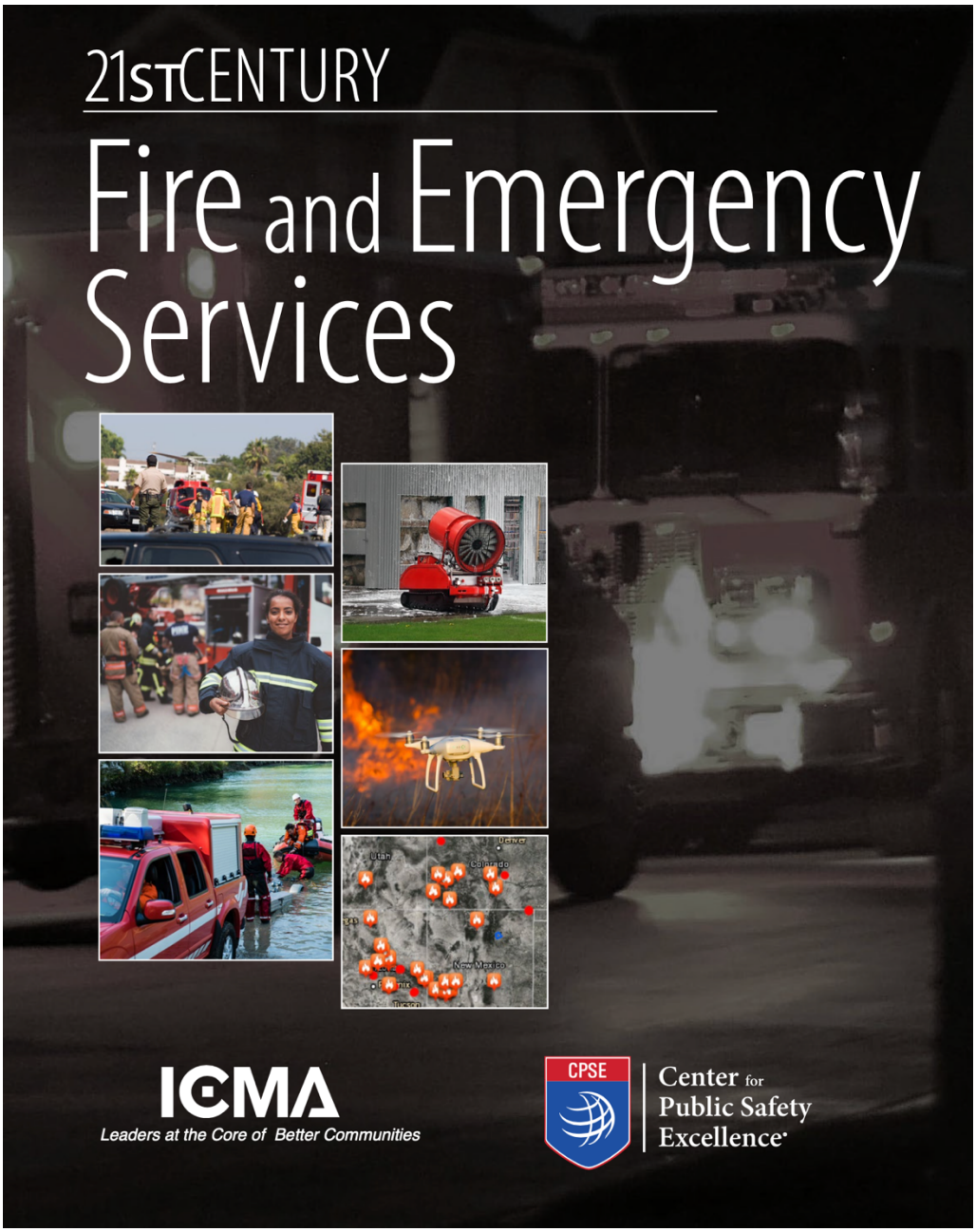
Considering recent challenges in construction timelines due to supply chain issues and labor market constraints post-COVID, the City of Graham should anticipate potential delays in the construction of fire stations and delivery of fire apparatus. Periodic review of the analysis and data within the report is recommended to ensure decision-makers have the most up-to-date information available.

The NCFCC team expresses gratitude for the opportunity to contribute to this initiative and emphasizes the importance of continuous improvement in service delivery for the City of Graham and the Graham Fire Department.

Note: The above abbreviated summary of the executive summary is provided through artificial intelligence. We recognize the executive summary in this report is lengthy and this version is provided in the appendix only for reference purposes if so desired.

Appendix C – 21st Century Fire and Emergency Services:

Below are excerpts from the 21st Century Fire and Emergency Services that are relative to this review for the City of Graham.



CRITICAL ISSUE E:
PARTNERSHIPS

A partnership is often thought to be a form of business, where two or more people come together to share ownership, responsibility, and profits from a given business venture. In every community across our nation, a partnership exists between the fire and emergency services and the general public that is built upon a shared commitment to the health and safety of its residents. The fire and emergency services are in an enviable position in communities, as they are well positioned to be the hub of service provision for many supporting services already found within their community, and that align with organization's core mission. The importance of this has been clearly proven during homeland security threats, through the interagency cooperation, intelligence sharing, and joint response to those events by law enforcement and the fire and emergency services. There are significant opportunities to create partnerships with allied health care, mental and behavioral health providers, and various social service agencies to leverage the talents of each agency with a focus on improving service to the community. Too often agencies respond multiple times to the same individual who calls 911 as their only known access for assistance, when the need is truly not an emergency, but could be met by another service provider in the community. Over the next 30 years, the fire and emergency services will need to partner with related service providers to create a local response network that can provide a host of services under the umbrella of a multifaceted organization, if it hopes to meet the needs of the community served.

Initiative 1: **Acknowledge the need to work with a wide range of partners to serve the community and develop local strategies to create new approaches to providing services more effectively.**

Strategies:

1. Inventory and leverage the allied services (law enforcement, health, social services, non-governmental organizations) in the community to provide more effective and efficient services.
2. Partner with insurers and health providers to innovate existing response strategies, improve patient outcomes, and reduce system costs.

Initiative 2: Promote a symbiotic relationship with other internal departments and outside agencies that are routinely allied responders to an incident.

Strategies:

1. Routinely meet, train, develop standardized operational response plans, and share real-time intelligence of what is happening in communities with allied responders to increase response capability and coordination during a homeland security event.
2. Develop goals and outcomes with a wide array of agency stakeholders, both internally and externally, to meet the objective of providing for a safe and healthy community.
3. Promote regular communication between all stakeholders on strategic issues, while continuing to handle operational issues through the established chain of command.
4. Develop opportunities for stakeholders to appreciate the roles and responsibilities of all other stakeholders toward better alignment of service delivery.

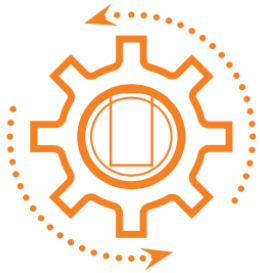
Initiative 3: Continue to expand community emergency response capabilities.

Strategies:

1. Promote individual and neighborhood self-sufficiency though existing programs (e.g. community emergency response teams, the radio amateur civil emergency service, volunteers in patrol, and senior Medicare patrol volunteers) to create greater resiliency in the community.
2. Focus on creating personal accountability in preparation for community-wide emergencies.
3. Identify and support community functions that are critical for recovering from and adapting to community-wide disasters.

CRITICAL ISSUE F:
SUSTAINABILITY

Sustainability is often defined as meeting the needs of the present without compromising the ability of future generations to meet their needs. The concept of sustainability has three pillars: economic, environmental, and social. If we look through the lens of local government today, there are reasons to be concerned that local government may not be sustainable in the future. Many agencies across the United States are struggling with the cost to provide services at the levels needed to meet a growing population, an aging population, and a population with changing service demands. Those cost pressures are exacerbated by unfunded pension costs along with and the cost to maintain and replace aging infrastructure and response vehicles. Shifting responsibilities from federal and state governments to the local level have forced many local governments to provide new services. These factors have placed tremendous strain on local government to balance ever growing service demands with funding available within their jurisdiction. This will be an on-going issue and will necessitate doing business differently in the future, not only in the fire and emergency services but throughout all services provided by local government as well.



The volunteer fire service has struggled in the last decade in many parts of the United States to recruit and retain enough volunteers to provide adequate services. With the mission of providing services to more than 70 percent of U.S. jurisdictions, volunteer recruitment and retention is becoming a national problem.

Today business, government, and society are learning from the science of change that they must recreate themselves even when they would like to believe the old way of business will go on forever. As Peter Drucker put it, "the best way to predict the future is to create it." The future of the fire and emergency services will rest upon those who are in it. If the fire and emergency services hope to sustain itself in the future, it must be willing to redesign itself and address the issues that are having a negative impact on the service today. Failure to address these issues will lead to what author Max Bazerman calls "predictable surprises." Predictable surprises are those events or outcomes that catch us by surprise, yet both were predictable and preventable. If this occurs, the fire and emergency services will be placed at risk to continue to be the community's safety net. Ultimately, local government will be faced with making difficult choices about how to provide the services needed and the level of services to be provided. That is why the issue of sustainability is so important and must be addressed now, rather than being left to the next generation of leaders to resolve.

Initiative 1: Address aging fire and emergency services vehicles and building structures.

Strategies:

1. Establish a comprehensive building renewal and replacement plan and provide the needed funding to address the short- and long-term community needs.
2. Urge the architectural profession and equipment manufacturing industry to anticipate and plan for the future designs needed by the fire and emergency services to address changes in response and deployment methods, building constructions, building densities, road infrastructure, and SMART cities and SMART building design.

Initiative 2: Reconsider and revamp current deployment methods.

Strategies:

1. Ensure response protocols and opportunities for consolidation are explored to ensure effectiveness of service delivery is balanced with cost efficiency.
2. Adopt staffing models based on statistically known call demand factors, such as time of day, special events, and seasonal changes while maintaining an adequate baseline deployment required to meet the health and safety needs of the community and employees.
3. Evaluate consolidation of seldom used specialty and single-purpose pieces of equipment to maintain effective cost management and capacity of those services for the threat environment that exists within the jurisdiction.
4. Develop a better understanding of community needs and their changing demands for services so as to modify the service delivery model(s) to meet them.

Initiative 3: Develop sustainable pension model.

Strategy:

1. Promote collaboration between labor groups, local government, and state government to ensure existing pension financial commitments are met while ensuring adequate service levels within the communities being served.

Initiative 4: Adopt and implement a community risk reduction strategy

Strategies:

1. Embrace a comprehensive strategy to minimize incidents and, if an incident does occur, to minimize the impact on the people, the community, and the emergency responder.
2. Adopt the concepts outlined in "Vision 20/20 – National Strategies for Fire Loss Prevention," and incorporate these recommendations into the daily agency operation to minimize the impacts to the community and emergency responders.
3. Develop strategies locally and nationally that reduce risk through proper vegetation management, designing new fixed fire protection systems that can be used in wildland urban interface, and zoning changes that prohibit building in the wildland urban interface.
4. Embrace the use of fire sprinkler technology in all buildings through the rapid adoption of codes and ordinances at the federal, state, and local government levels to dramatically reduce the incidence of deadly and costly fires. .
5. Urge the sprinkler industry to develop a more cost-effective means to retrofit existing buildings with sprinklers or other fire suppressant technology.
6. Develop standards and a tiered code methodology that would support a phased in retrofit plan for existing buildings.

Initiative 5: Improve resource allocation by focusing on the outcomes trying to be achieved.

Strategy:

1. Evaluate resource allocation using department response data.
2. Alter deployment methods to assure better outcomes and desired services levels for communities including EMS, community paramedicine, or increased prevention efforts.

Initiative 6: Examine fixed costs associated with current delivery models and associated contracts.

Strategy:

1. Negotiate labor contracts with the flexibility to promote innovation in service delivery and servicing models, while still providing a fair and equitable wage, benefit, and pension package for the workforce that is economically sustainable.

Initiative 7: Explore public/private partnership opportunities.

Strategies:

1. Solicit success stories and best practices of effective public/private partnerships related to capital investments and operating costs.
2. Create, maintain, and regularly update a national repository of best practices available to all agencies at no cost.

Initiative 8: Research strategies to assist communities in sustaining their volunteer fire and emergency services or, if needed, how to transition to a new model.

Strategy:

1. Champion the establishment of a federal commission to develop a national plan of action to ensure volunteer fire and emergency services agencies remain viable in the future.

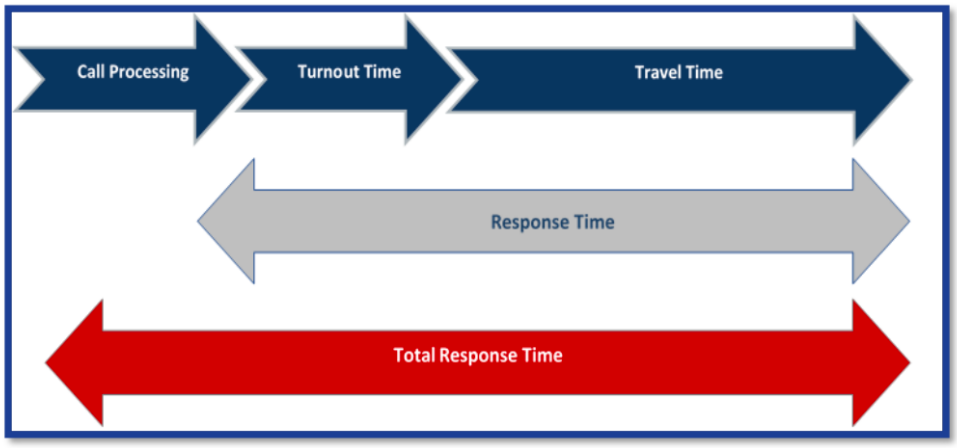
Initiative 9: Dramatically revamp the fire and emergency services education and training model to provide the needed skill sets, knowledge, and abilities required for the anticipated changes in the future and to remain current with the application of emerging technologies.

Strategy:

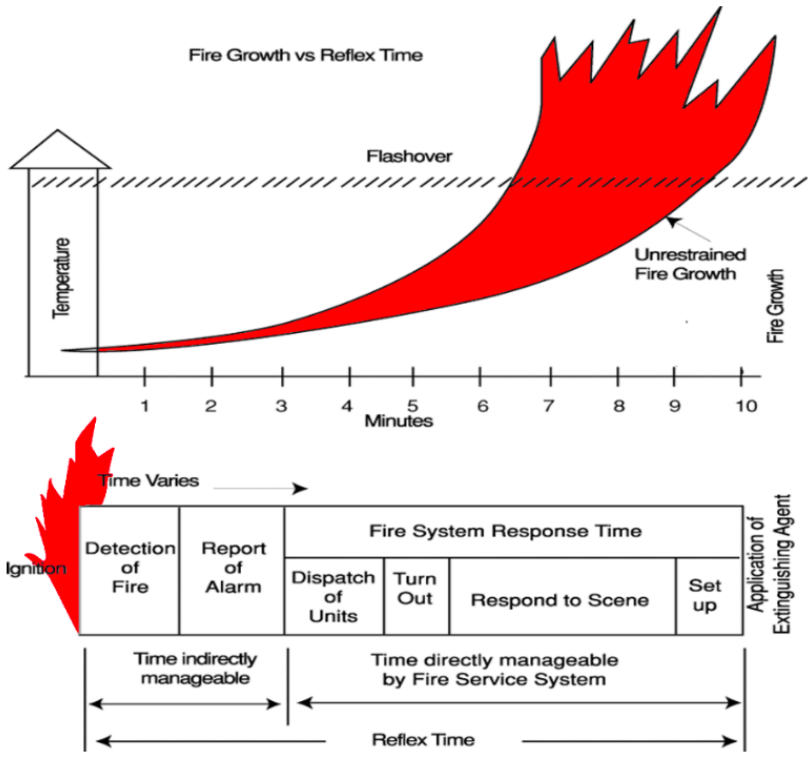
1. Urge academic institutions to develop the means to speed up their course development model and to be able to quickly adapt and develop new courses that will be required to sustain the needed workforce skill sets.
2. Encourage academia to use of state-of-the-art technology to meet the educational learning styles of future generations.

Appendix D – Select Fire Service Visual Data Points Applicable to the Graham Station Analysis:

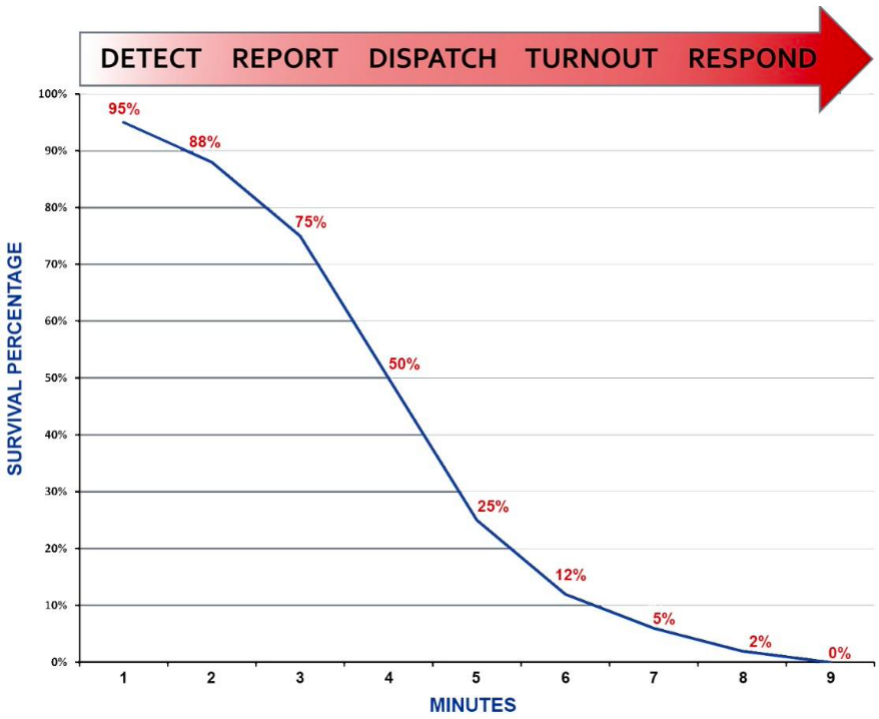
Total Response Time Continuum:



Fire Growth and Reflex Time:



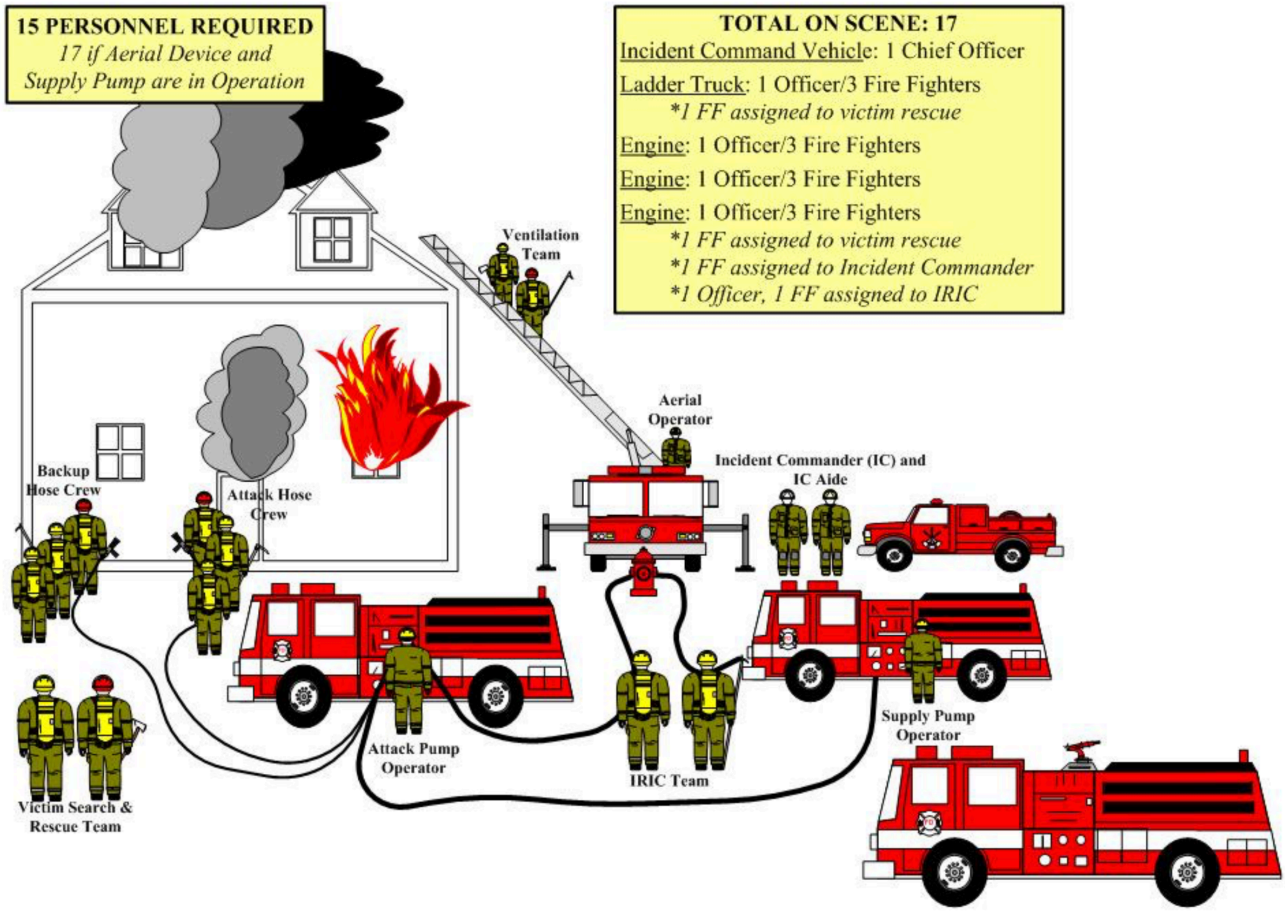
Cardiac Arrest Event Sequence:



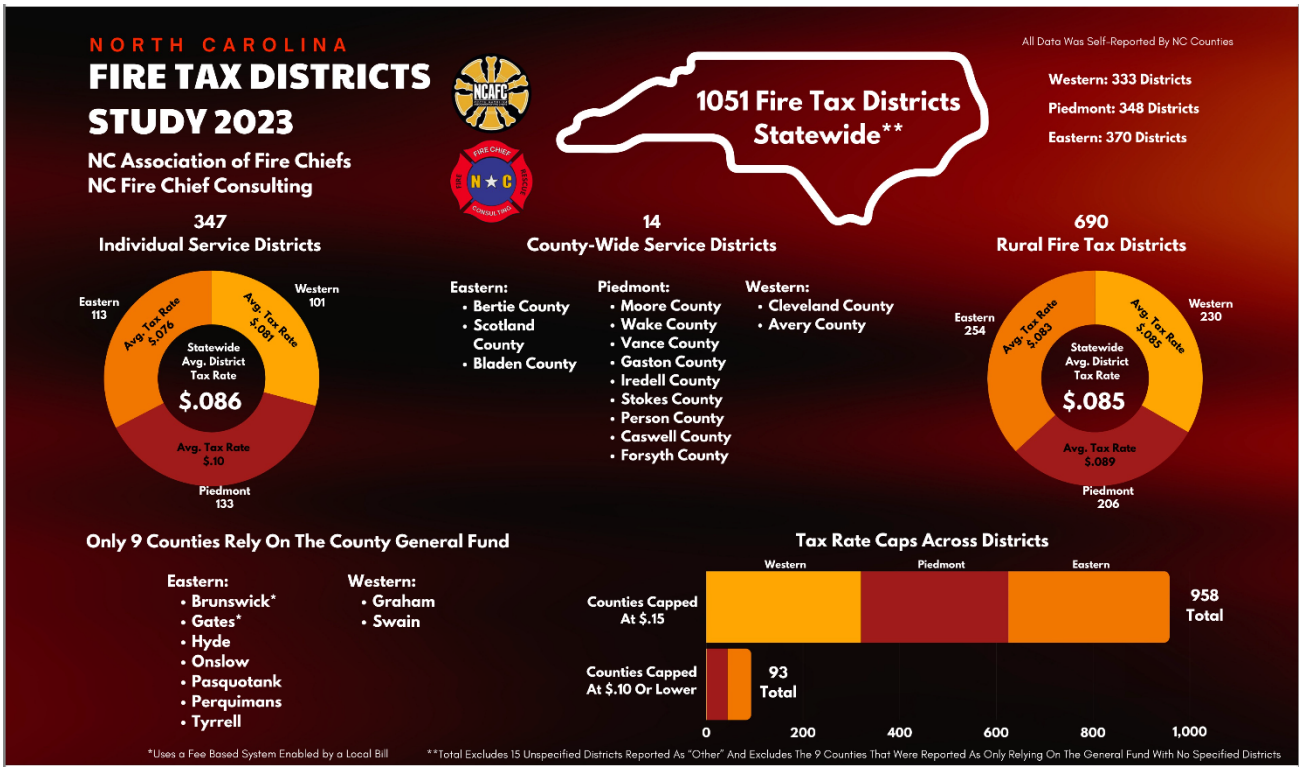
NFPA 1710 (Urban Areas) Initial Full Alarm Assignments:

2,000 SF Residential Structure Fire		Open-Air Shopping Center (13,000 SF to 196,000 SF)		1,200 SF Apartment (3-story garden apartment)	
Incident Commander	1	Incident Commander	2	Incident Commander	2
Water Supply Operator	1	Water Supply Operators	2	Water Supply Operators	2
2 Application Hose Lines	4	3 Application Hose Lines	6	3 Application Hose Lines	6
1 Support Member per line	2	1 Support Member per line	3	1 Support Member per line	3
Victim Search and Rescue Team	2	Victim Search and Rescue Team	4	Victim Search and Rescue Team	4
Ground Ladder Deployment	2	Ground Ladder Deployment	4	Ground Ladder Deployment	4
Aerial Device Operator	1	Aerial Device Operator	1	Aerial Device Operator	1
Rapid Intervention Crew	4	Rapid Intervention Crew	4	Rapid Intervention Crew	4
		EMS Care	2	EMS Care Crew	2
Total	**17**	**Total**	**28**	**Total**	**28**

Visual of Firefighter Staffing Necessary at a Structure Fire Per the Consensus Standard for Areas with an Urban Population Density:



FY 23-24 Fire Service District and Rural Fire District Tax Rate Information for North Carolina.



Appendix E – Service Delivery Model Considerations:

NORTH CAROLINA TOWN MANAGER GENERAL GUIDANCE ON DEVELOPING FIRE AND RESCUE SERVICE DELIVERY LEVELS

Performance Modeling for Typical Residential Structure Fire Response
Assistance to Local Jurisdictions in Establishing Their Desired Level of Service

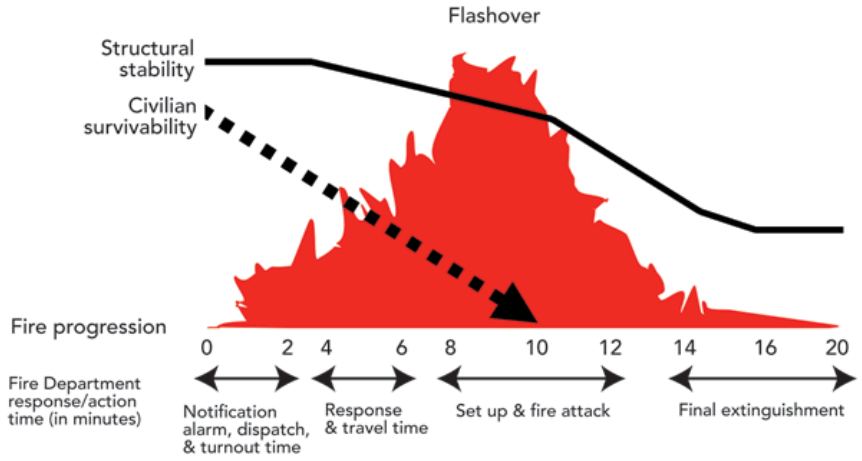
BACKGROUND:

Inputs influence outcomes. Within the effective delivery of fire and rescue services, response time elements are directly proportional to expected outcomes. In recent years, significant scientific research has substantiated the correlation of response times and number of trained firefighters necessary on the scene of structure fires to produce positive outcomes. Each local jurisdiction is encouraged to identify what specific hazards and risks exist in their individual communities. Also, local jurisdictions can evaluate their fire and rescue level of service or standard of cover for each type of service that they provide. From this collective information, progressive jurisdictions can effectively set a positive course for continuous improvement.

To strengthen fire protection service delivery systems and to empower local jurisdictions to determine more clearly what the appropriate level of response may be for their individual community's level of risk and clearly stated desired outcomes, the following illustrative models are offered to establish some basic, **minimal** framework for response to typical residential structure fires within a North Carolina rated fire insurance district.

Using dynamic indicators, these illustrative models are presented with the optimum desired outcome of confining and containing a typical (<2,000 square feet), occupied, residential structure fire to the room or area of origin when fire hydrants are available. Aligning North Carolina's growth patterns with national consensus standards and fire service industry best practices provided the foundation for these models. Also, it is important to note that times identified recognize total response time, beginning when the citizen first dials 9-1-1. These models for typical residential structures are **only** guidelines for evaluation and solely designed as a tool for use by local jurisdictions. Models for fire response to properties with higher risks demand more thorough analysis, more robust resources, and stronger performance measures.

Graphic Source: Fire Engineering



TYPICAL CASCADE OF EVENTS FOR A STRUCTURE FIRE:

Pre-Response:

Recognition of fire
Notification call made to 9-1-1

Total Response Time (measurable):

Receipt of call and dispatch of fire department(s) = approx. 60-90 seconds (NFPA)
Firefighter acknowledgement and fire equipment rolling adds 80+ seconds (NFPA)
Travel time – adds approximately 141 seconds per road mile (ISO)
Arrival at the fire scene

Post-Response:

Accessing, locating the fire, and taking necessary mitigating actions

TYPICAL RESIDENTIAL MODEL - FIRST ARRIVING FIRE APPARATUS:

For 90% of all typical residential structure fire incidents, at least one initial arriving fire apparatus and assembling at least four (4) adequately trained firefighters should arrive within ___ ***(determined locally)*** ___ minutes total response time and be prepared to take immediate action in accordance with department protocols.

Approximate Range of Credible Response Time Within State Rated Fire Insurance Districts

Area	Density per Sq. Mile	Fire Station	Prevalent ISO Rating	Total Response Time
URBAN	>2,000 people	within 2 miles	1-3	5-8 minutes
NON-URBAN	500-1999 people	within 4 miles	4-6	7-12 minutes
RURAL	<500 people	within 6 miles	6-9	12-17 minutes

TYPICAL RESIDENTIAL MODEL - ARRIVAL OF EFFECTIVE RESPONSE FORCE:

For 90% of all typical residential structure fire incidents, an effective force of at least seventeen (17) adequately trained firefighters *(including automatic aid responses)* should arrive within ___ ***(determined locally)*** ___ minutes total response time. The effective response force should be capable of establishing command, appointing a site safety officer, providing an uninterrupted water supply, advancing an attack line and back up line for fire control, complying with the OSHA requirements of two-in and two-out, completing forcible entry, searching, and rescuing at-risk victims, ventilating the structure, controlling utilities, and performing salvage and overhaul. These operations are done in accordance with department standard operating protocols while providing for the safety of responders and the public.

Approximate Range of Credible Response Time Within State Rated Fire Insurance Districts

Area	Density per Sq. Mile	Fire Station Prevalent	ISO Rating	Total Response Time
URBAN	>2,000 people.	within 2 miles	1-3	5-10 minutes
NON-URBAN	500-1999 people	within 4 miles	4-6	9-19 minutes
RURAL	<500 people	within 6 miles	6-9	19-29 minutes

Appendix C - Fire Station Construction Estimate Information:

Fire station construction costs in North Carolina have escalated in recent years. The chart below reflects cost changes in regional fire station bids between 2007 and 2023*. The current and most recent cost of fire station construction in the region is between $550 and $650 per square foot. The typical fire station (non-headquarters) in North Carolina is approximately 10,000-13,000 square feet is size.

2007	**5%**	**+/- increase**	**2015**	**3%**	**+/- increase**
2008	**12%**	**+/- increase**	**2015**	**18%**	**+/- increase**
2009	**16%**	**+/- increase**	**2016**	**22%**	**+/- increase**
2010	**9%**	**+/- increase**	**2017**	**20%**	**+/- increase**
2011	**5%**	**+/- increase**	**2018**	**8%**	**+/- increase**
2012	**11%**	**+/- increase**	**2019**	**14%**	**+/- increase**
2013	**7%**	**+/- increase**	**2020**	**21%**	**+/- increase**
2014	**21%**	**+/- increase**	**2022**	**20%**	**+/- increase**
			2023	**14%**	**+/- increase**

Below is an illustrative example of the cost estimation for fire station construction based upon a needs analysis (which was not part of the scope of work for Graham). However, this will provide Graham with a good indication of how the planning for size, space and cost would roll out. First, each area of the station would be programmed. Second, allowances are given for "grossing" for the building and bay area to accommodate electrical rooms, hallways, service areas, HVAC rooms, maintenance areas, etc. Third, ranges of cost are given based on the current market. Fourth, an 80/20 adjustment is made with 80 percent representing "hard" costs of construction and 20 percent representing the "soft" costs such as furniture, furnishings, equipment, fees, architectural, etc. Cumulatively, this helps to project a total building cost for a fire station. In planning, it is important to factor in all projected costs.

**Source: Stewart, Cooper, Newell Architects*

Two types of construction are typically considered – traditional and design/build. As noted above construction costs for traditional construction is approximately $550-$650 per square foot across North Carolina for fire stations. The design build model may reduce that cost into the $450-$550 per square foot cost range. The graphic below is an illustrative example of a recent design/build approach in nearby Wake County.

OWNER: Town of Fuquay-Varina

DELIVERY METHOD: Design-build

PROJECT DESCRIPTION: The new 12,000 sqft facility will include separate space for both Fire and EMS comprised of drive-thru apparatus bays, administrative space, living accommodations, cubicle space, locker rooms and an antique truck and history room.

FINAL COMPLETION DATE: September 2023 *(Estimated completion)*

GENERAL COST INFORMATION: Costs for a new fire station can vary depending on many factors. In today's market, construction costs for a fire station similar to Fuquay-Varina Fire Station No.17 are ranging from $400 - $600/sf, which includes all the plans, permits and construction costs. The site work is the biggest variable and can have a significant impact on the cost of the station.

CONTACT REFERENCE:
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Appendix F - Future Staffing Considerations:

An adequate number of firefighters to work structure fires is critical to the safety of the public and of the firefighters. Also, the largest portion of the ISO rating is staffing (15%).

NFPA 1710 SUMMARY/HIGHLIGHTS

NFPA 1710
Fireground Staffing Levels for Career Fire Departments

NFPA 1710 provides the minimum requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by career fire departments.

For the 2016 edition of the standard, subsection 5.2.4 on fire department service deployment was revised to include three new occupancies, along with the appropriate response staffing levels for each. The minimum staffing level for each occupancy is listed below. *(For the full breakdown of staffing requirements by position, refer to the subsections specific to each occupancy in 5.2.4.)*

Single-Family Dwelling — minimum of 16 members (17 if aerial device is used)
The initial full alarm assignment to a structure fire in a typical 2000 ft^2 (186 m^2), two-story, single-family dwelling without a basement and with no exposures must provide for a minimum of 16 members (17 if an aerial device is used).

Open-Air Strip Mall — minimum of 27 members (28 if aerial device is used)
The initial full alarm assignment to a structure fire in a typical open-air strip shopping center ranging from 13,000 ft^2 to 196,000 ft^2 (1203 m2 to 18,209 m2) in size must provide for a minimum of 27 members (28 if an aerial device is used).

Garden-Style Apartment — minimum of 27 members (28 if aerial device is used)
The initial full alarm assignment to a structure fire in a typical 1200 ft2 (111 m2) apartment within a three-story, garden-style apartment building must provide for a minimum of 27 members (28 if an aerial device is used).

High-Rise — minimum of 42 members (43 if building equipped with fire pump)
The initial full alarm assignment to a fire in a building with the highest floor greater than 75 ft (23 m) above the lowest level of fire department vehicle access must provide for a minimum of 42 members (43 if the building is equipped with a fire pump).

Other: Fire departments that respond to fires in occupancies that present hazards greater than those found in 5.2.4 shall deploy additional resources as described in 5.2.4.5 on the initial alarm.

NOTE: Even though fire ground staffing levels have changed, NFPA 1710 continues to require that engine companies be staffed with a minimum of 4 on-duty members, as stated in subsection 5.2.3. In addition, paragraph 5.2.2.2.1 requires that the fire department identify minimum company staffing levels as necessary to meet the deployment criteria required in 5.2.4 to ensure that enough members are assigned, on duty, and available to respond with each company safely and effectively.

Material used in this summary is taken from the 2016 edition of 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*. This reprinted material is not the complete and official position of the NFPA or its Technical Committees on the referenced subject, which is represented solely by the standard in its entirety. That standard can be accessed online at www.nfpa.org.

Comparative Analysis for National Standards on Deployment and Staffing

NFPA 1710 – Staffing Standard for Primarily Career Fire Departments:

First due travel times – 4 minutes or less 90% of the time.
Full assignment assembly times – 8 minutes or less 90% of the time.

Staffing - each company with at least four firefighters.

Turn-out times = 80 seconds for fire calls, 60 seconds for medical calls.

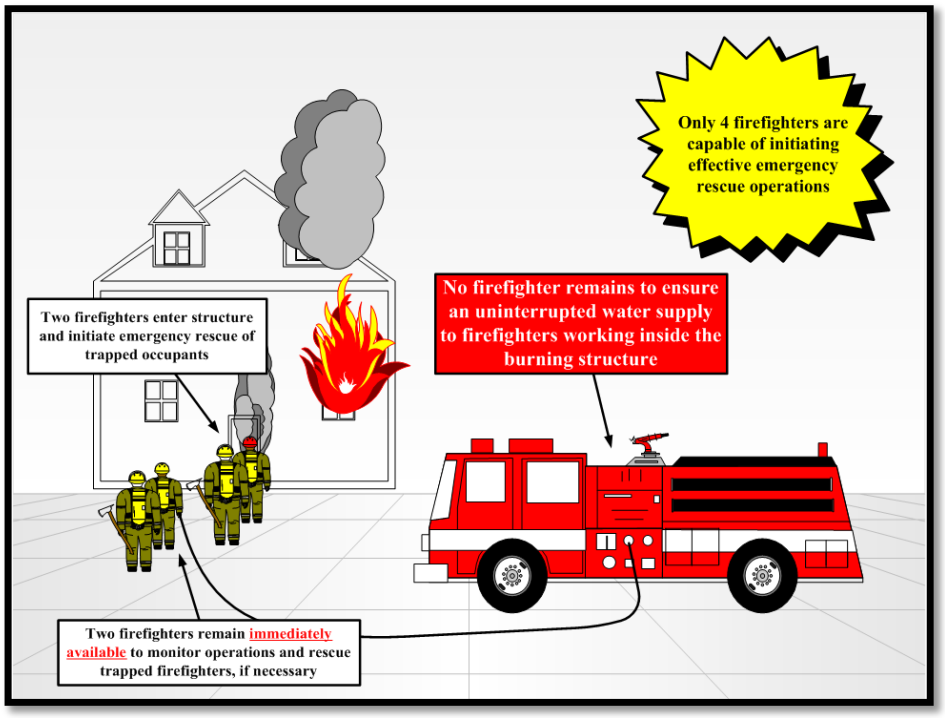
Travel time = 4 minutes or less for fire calls or medical calls.

Effective response force

- 17 firefighters on a typical residential structure fire
- Arrival within 8 minutes or less

Appendix G – Two In – Two Out Firefighter Staffing Depiction:

Regarding the number of firefighters, federal law mandates that before firefighters can make an interior attack on a structure fire, there must be a rescue crew established in case something goes wrong with the entry crew. The entry crew is going into an environment that is immediately dangerous to life and health (known as IDLH). Only when there is a known rescue are firefighters permitted by law to enter a structure fire without a rescue crew. This law is typically known as "Two In – Two Out" and applies to all fire service operations.



Appendix H – Project Staff:

Gregory H. Grayson, Fire Chief (ret), City of Greensboro, NC
Greg Grayson has more than 41 years of progressive experience in the North Carolina fire and rescue service. His experience includes beginning public service as a volunteer firefighter and ascending the career ranks to become the Fire Marshal/Fire Rescue Director for Wake County, North Carolina. In the following seventeen years, he served as the fire chief for three North Carolina urban cities – Burlington, Asheville, and Greensboro. In these executive leadership capacities, he was responsible for comprehensive fire and rescue operations, prevention programs, training and career development, emergency management functions and specialized regional response teams. In Burlington, he effectively led positive organizational change and implemented an innovative reserve firefighter program. In Asheville, he commanded significant re-engineering throughout the fire department and led Asheville to become an accredited agency. In Greensboro, he led the department to maintaining both accreditation and ISO "Class1" status and navigated the department through difficult fiscal years and challenging large-scale emergencies. In 2015, his long-term, dedicated public service to the people of North Carolina was recognized by the Governor through the prestigious "Order of the Long Leaf Pine", the state's highest honor that can be awarded to a citizen.

Upon retiring from local government service, Chief Grayson was appointed by the State Fire Marshal in 2015 to proactively serve as the state's first and only public fire service management consultant, providing high level technical assistance to county and municipal managers - enabling them to better strengthen their jurisdiction's fire protection service delivery systems. He also managed statewide fire service advancement initiatives and led the Office of State Fire Marshal's Technical Services program.

Beyond extensive experience, Chief Grayson holds a Master of Public Administration, bachelor, and associate in fire protection. He holds numerous professional credentials including Chief Fire Officer (CFO), MIFireE from the Institution of Fire Protection Engineers and multiple other fire service certifications, including being North Carolina's first Advanced Firefighter. He is one of very few, if not the only, Fire Chief in the United States to also hold the Senior Professional in Human Resources (SPHR) and SHRM-SCP credentials. He is active in the North Carolina Association of Fire Chiefs and the IAFC Metropolitan Fire Chiefs organizations and continues to serve as a volunteer firefighter in his home community.

Todd Tuttle, Assistant Chief (ret), Greensboro NC
Chief Tuttle is a 33-year fire service veteran who also served as a paramedic. For the last half of his career, he managed the intricate records management systems for the City of Greensboro Fire Department, which is an accredited, ISO Class 1 city. These duties included CAD, mobile data, AVL, Fire House, GIS technologies, Accreditation, performance management and many other related areas. Chief Tuttle is recognized throughout the state and nation as a technical expert on Firehouse records management systems as well as data analysis.

Robert McNally, Beacon GIS Partner, Monroe, NC
A GIS Analyst/Planner with niche specialty and ground experience for Fire, Rescue, EMS, Public Safety, Emergency Management, and Homeland Security projects, Robert owns Beacon GIS, a first responder planning services firm. Robert brings 20 years of public safety experience as a responder, manager, and trainer. He has been awarded twice for his service to the community. He graduated magna cum laude with bachelor's degree in public administration, securing an honor scholarship while during his education. Robert also has a graduate degree in Urban and Regional Planning from the University of North Carolina at Charlotte. Robert McNally has spoken at several conferences about public safety and homeland security and Beacon GIS has been involved in over 180 projects for emergency services of various sizes across the United States & Canada.

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