CITY OF WILMINGTON
FIRE DEPARTMENT
Serving and Protecting Wilmington since 1897

Wilmington, NC Fire Department

Standards of Cover

Effective September 18, 2023

The fire service has been challenged to develop methods to evaluate and define levels of service that it provides to its stakeholders. While the governing bodies have traditionally been charged with determining the levels of service their communities expect and can afford, the appointed managers, chiefs and their staff have been responsible for delivery of the service. With the diversity of different communities, the complexity of their fire problems and the potential for major emergencies, there is no "one size fits all" for addressing these issues and determining the needed resources to handle these emergencies.

Historically, when an emergency safety issue arises, there were no set policies for handling the situation; the fire service was just assigned the task of mitigation. This led to fire departments becoming more involved with emergencies other than fires.

During the 1980's the idea for a method to evaluate fire service agencies through self-assessment and accreditation led to the creation of the Commission on Fire Accreditation International (CFAI), which evolved into the Center for Public Safety Excellence (CPSE). This commission developed the Standard of Cover (SOC) guidelines manual that the Wilmington Fire Department (department) has used in the development of its SOC document.

The following report serves as the department's "Integrated Risk Management Plan: SOC" document. The CFAI defines the process, known as "deployment analysis", as a written procedure which determines the distribution and concentration of fixed and mobile resources of an organization. The purpose for completing such a document is to assist the agency in ensuring a safe and effective response force (ERF) for fire suppression, emergency medical services, and specialty response emergencies.

Creating an Integrated Response Management Plan: SOC requires that several subjects be researched, studied, and evaluated. The following report will begin with an overview of both the community and the agency. Following this overview, the agency will discuss:

- All-Hazard Risk Assessment of the Community
- Community Feedback
- Program Goals and Objectives
- Current Deployment and Performance
- Evaluation of Current Deployment and Performance
- Plan for Maintaining and Improving Response Capabilities

The agency will provide documentation of reliability studies and historical performance through charts and graphs. This document conforms to the 10th Edition of the CFAI SOC guidelines.

IV. Table of Contents

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V. Executive Summary

This document identifies the department's SOC for the city of Wilmington North Carolina. Response resources, deployment strategies, operational elements and overall community risks have been evaluated in this document. Using data provided from the department's record management system (RMS) the department completed an analysis to determine current levels of response performance. This analysis is completed twice a year and used in report-out sessions to the department. In addition to these report-outs, analysis is completed on performance data after the first of the year on the previous year for completion of the annual compliance report that is submitted to the Commission on Fire Accreditation International (CFAI). The department also completes annual divisional assessments, where each division and program is assessed by the manager of that program or division. From these analyses, the department identifies gaps in response performance and identifies opportunities for improvement. The gaps and opportunities are vetted at the report-out sessions and when corrective actions are needed, they will be assigned to the appropriate staff. This continued analysis of performance contributes to establishing performance benchmarks for all response programs and the different risk levels within each program. This document will identify those benchmarks and show performance baselines for each benchmark. This document establishes response time goals and standards for measuring the effectiveness of resources within the department and the deployed resources. This document is segregated into components generally based on the format recommended by the Center for Public Safety Excellence, 10th Edition.

The department is a direct operating department of the city and provides a fire service organization to respond to the needs of the community through emergency services and proactive risk reduction efforts. The department's service area encompasses all the corporate boundaries of Wilmington and the surrounding New Hanover County Fire District (by automatic aid agreement). This document will only address the area within the city limits of Wilmington.

The city has a resident population of 115,451[1] as of 2020 census. The area and the city continue to see sustained growth in population, the census as of 2010 in the city was 106,476[1]. The department serves an area of approximately 53 square miles within the city and an additional 328 square miles for the New Hanover County Fire District. The department operates nine city-owned fire stations and fifteen front line response vehicles. By an automatic aid agreement, the department, and New Hanover County Fire Rescue (NHCFR) operate together to provide for the community. The 911 Center provides emergency call receipt and dispatch services.

The Insurance Services Office (ISO) reviews the fire protection resources within communities and provides a Community Fire Protection Rating system from which insurance rates are often based. The rating system evaluates 3 primary areas: the emergency communication and dispatch system, the fire department, and the pressurized hydrant or tanker-based water supply. The overall rating is then expressed as a number between one and ten, with one being the highest level of protection and ten being unprotected or nearly so. As of the latest rating, ISO gave the service area a rating of Class One. This rating was given in 2022.

An analysis of the city's population density reveals that its service area classification is urban. Some areas of the city may be denser in population than others, but it is mostly uniform throughout and none of the city qualifies as rural. Therefore, the department has determined that it should provide the same level of services across the entire city.

Goals and objectives for the services provided by the department have been developed. These further define the quality and quantity of service expected by the community and consistently pursued by the department.

[1] According to the United States Census, Cencus.gov Pop 2020

Over-all Mission Statement

As a result of the analysis in this report and consideration of community input, the following mission statement (performance statement) and vision statements were previously adopted by the Wilmington Fire Department are affirmed.

Vision Statement

Excellence through Service

Mission Statement

To provide the most talented and effective fire service organization to respond to the needs of our community through emergency services and proactive risk reduction.

Values

Accountable Honorable Disciplined Unified

Acknowledgments

The department recognizes that without the commitment, determination, and patience of the Chief and his staff to pursue accreditation, thereby causing the in-depth analysis and evaluation of programs and service delivery, the Integrated Risk Management Plan: SOC would not have been undertaken and published. The following personnel are acknowledged here for the effort in creating and adopting the SOC:

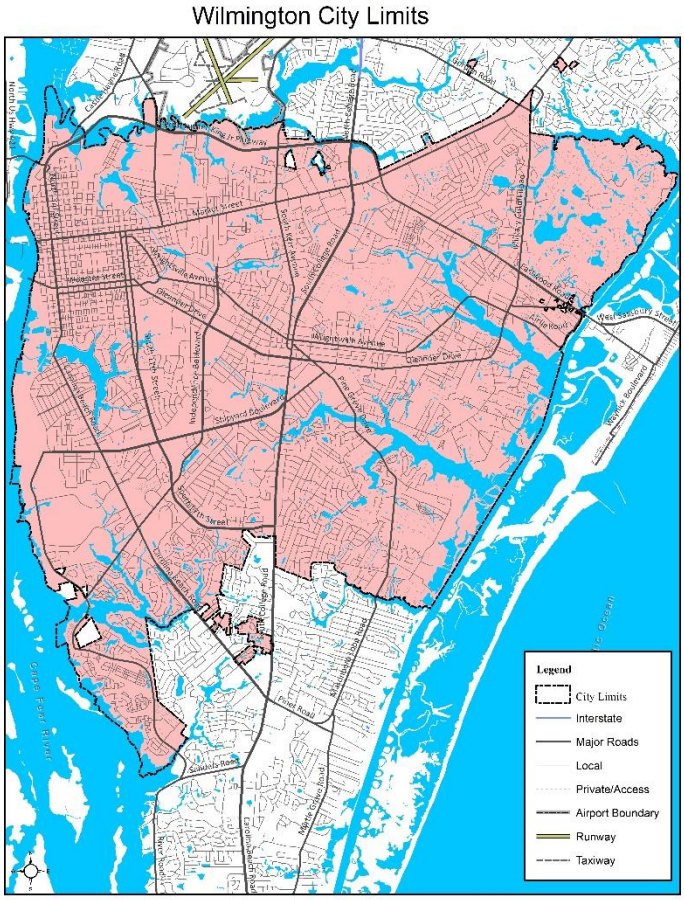
Standard of Cover Team

Andrew Holter – Administrative Services Manager/SOC Team
Wendy Gianni-King – Community Risk Reduction Coordinator/SOC Team
Chuck Styes - Battalion Chief (Retired)/SOC Team
David Hines – Battalion Chief (Retired)/Accreditation Manager
Jeff Clift – Public Safety GIS Analyst/SOC Team
Hunter Long – Administrative Specialist/SOC Team

Administration

Jon (Steve) Mason – Fire Chief
Thomas Robinson – Assistant Fire Chief of Support Services
Derek Mickler – Assistant Fire Chief of Operations
Chris Walker – Assistant Fire Chief of Fire Marshal's Office
Donald Burns – Assistant Fire Chief of Training & Safety
Scott Rivenbark – Project and Budget Analyst

VI. Documentation of Area Characteristics



The City of Wilmington is situated between the Cape Fear River and the Atlantic Ocean in southeastern North Carolina and is the county seat of New Hanover County. Wilmington is a city steeped in history dating back to the Revolutionary War era and yet is rapidly becoming a modern urban center. Wilmington is the principal city of the Wilmington Metropolitan Statistical Area (MSA), a metropolitan area that covers New Hanover, Pender, and Brunswick counties, in southeastern North Carolina. Brunswick County was recently added back into the MSA as of July of 2023 which provides the MSA, an estimated population of 444,873, based on the 2022 census estimate.

According to census.gov from the 2020 census Wilmington has a population of 115,451. The city is the eighth most populous city in North Carolina. The city has a wide range of occupancies which include commercial, manufacturing, high rise, warehousing, institutional, single family residential, and multifamily residential. The 2023 real property values are 20.3 billion dollars.

Originally known as New Liverpool, New Town, and Newton, Wilmington was incorporated in 1739. Wilmington was named in honor of Spencer Compton, Earl of Wilmington, who was a patron of Gabriel Johnston, North Carolina's royal governor at the time. In 1765, Wilmington was the scene of the American colony's first armed resistance to the Stamp Act. During the Revolution, local patriots, called Sons of Liberty, rivaled local Loyalists, many of whom were Highland Scots. [1]

From the Revolutionary War through the first few decades of the nineteenth century, Wilmington was a backwater town. Antebellum growth was hampered by a paucity of good roads via which to bring produce to the little port. Thanks to a series of navigational improvements to the Cape Fear River, expansion of the port during the mid-nineteenth century, and the invention of steam-powered vessels and railroads, Wilmington enjoyed steady growth, with exports far exceeding imports. During this time, Wilmington also became the terminus of the Wilmington & Weldon, Wilmington & Manchester, and Wilmington, Charlotte, and Rutherford Railroads.

At the onset of the Civil War, the port suffered from losing its export trade, but within a short time it more than made up for it by becoming a home port to the new lucrative blockade-running business. Functioning as "the lifeline of the Confederacy", the blockade runners brought the military armaments and supplies needed to fuel the confederate army into Wilmington. The town's official status changed from town to city in 1866. Wilmington's river and railroad related businesses continued to grow throughout the nineteenth century.

In 1898, following sustained growth and a booming recovery in the post-civil-war era, Wilmington suffered a racially motivated coup d'état and massacre. On November 10, 1898, following a contested election, a mob of armed white men marched to the office of The Daily Record, a local

African American owned newspaper, and set it on fire. The mob then took to the streets attacking African Americans. An unknown number of African Americans died in the attacks, and others were banished and forced out from the city. On the same day, local officials were forced out of office and replaced by white supremist leaders. Prior to these events, the fire department was made up of both white and black firefighters, however it would be decades until the city was served by more than one race again.

The 1940's and World War II brought an influx of newcomers and renewed energy to Wilmington. The North Carolina Shipbuilding Company employed thousands of workers who delivered 243 new ships for the war effort. In 1945, North Carolina legislature approved the State Ports Authority, which provided support to transform the World War II shipyard into a first-class port facility.

In 1947, access to higher education became a reality when Wilmington College, now the University of North Carolina Wilmington, opened its doors. The enrolled population in 1947 was approximately 237 students. Today there are 17,500 undergraduate, graduate, and doctoral students enrolled. During this same time, the shipyard in Wilmington closed after World War II and in 1955 Wilmington's largest employer, Atlantic Coastline Railroad, relocated to Florida leaving the economy an empty shell of what it had been. In 1958, the Wilmington Industrial Education Center (WIEC) was founded to provide vocational type training to residents. In 1958, the WIEC became the Cape Fear Technical Institute (CFTI) and continued to provide technical training in areas such as heating and air conditioning, carpentry, and oceanography. In 1989, CFTI

was renamed Cape Fear Community College (CFCC) and began offering a two-year college transfer program for students wishing to pursue a bachelor's degree. Today over 22,500 students receive training through CFCC.

As Wilmington continued to grow, Interstate 40 was completed in 1990, giving Wilmington a vital connection to other interstates and large metropolitan areas which was a major benefit for businesses and the state ports. [1]

Today, Wilmington is an urban center, affording opportunities to businesses and residents alike. The downtown area maintains its historical district with many old homes and commercial buildings still in use. The central business district (CBD) consists of approximately fifty blocks and is situated between the Cape Fear Memorial Bridge to the south, the Isabelle Holmes Bridge to the north, the Cape Fear River to the west, and 4th and 5th streets to the east.

In order to encourage the revitalization of the downtown area, the city built a boardwalk along the river, built a new convention center, installed new infrastructure, and gave authority to the Community Services Department to manage festivals. The Parks and Recreation Division helps to coordinate events such as the Azalea Festival, Riverfest, the Farmers Market, and many other activities.

[1] North Carolina Encyclopedia sec. Wilmington by Beverly Tetterton

The Wilmington Metro area offers many programs to assist small businesses and entrepreneurs with information and assistance regarding developing business plans, taxes, advertising,

marketing, and other needs. Many of the commercial buildings in the CBD now contain residences on the upper floors.

The largest employers in the Wilmington area are:

Company (Product/Service) - Employee Count

- Novant Health (Health Care) - 8,424 (main campus in the city)
- New Hanover County Schools (Education) - 3,762 (city and county)
- General Electric (Aircraft Engines) & Global Nuclear Fuel/GE Hitachi Nuclear Energy (Nuclear) - 3,100 (county)
- University of NC Wilmington (Higher Education) - 2,540
- New Hanover County (County Government) - 1,892 (city and county)
- Thermo Fisher Scientific (Discovery & Development Services to Pharmaceutical & Biotech) - 1,800
- City of Wilmington (Government) - 1,106
- Cape Fear Community College (Education) - 1,037 (main campus in the city)
- Corning, Inc. (Optical Fiber Manufacturing) – 1,000
- nCino (Fintech) - 1,000

Governance

The City of Wilmington is incorporated and exists by the authority granted in Article VII of the North Carolina Constitution, allowing the General Assembly to provide for the organization and government of counties, cities, and towns.

The City of Wilmington is governed under the council/manager form of government. The Council consists of a mayor, mayor pro-tem, and five council members. The Council is elected via general non-partisan election every two years. The mayor serves for two years, and the remainder of the Council serves staggered four-year terms, so 3 seats are up for election every two years. The council members, by vote, determine the mayor pro-tem. The city manager, deputy city managers, chief of police, fire chief, city attorney, and city clerk are hired by city council.

The city council establishes and adopts legislation in the form of ordinances and determines the levels of service and types of services to be provided to the citizens. The council has the authority to determine the local property tax rates for all properties inside of the corporate city limits. Property values are determined by assessment that is conducted by New Hanover County. The property tax rates are determined based upon the recommended budget presented each year by the city manager and staff. The budget must be adopted by city council prior to June 30th of each year. The fiscal year for the City of Wilmington runs from July 1st through June 30th.

North Carolina General Statute § 160A-291 authorizes a city to appoint a fire chief; to employ other firemen; to establish, organize, equip, and maintain a fire department; and to prescribe the duties of the fire department.[1]

The City of Wilmington is the largest city in the Wilmington Urban Metropolitan Planning Area and is the lead organization in the Wilmington Urban Area Metropolitan Planning Organization (WMPO). This organization provides a framework for future planning needs and growth within the area while allowing for input from all entities effected.

The Federal Aid Highway Act of 1962 required that transportation projects in urbanized areas of 50,000 or greater in population be based on a continuing, comprehensive, urban transportation planning process undertaken cooperatively by the states and local governments. To complete this transportation planning process in an effective manner, the WMPO was created in 1973.

The WMPO is composed of officials from each of the Wilmington urban area counties and municipalities, as well as the Cape Fear Public Transportation Authority (operating as WAVE Transit) and the North Carolina Board of Transportation. The WMPO is tasked with providing a regional, cooperative planning process that serves as the basis for the expenditure of all federal transportation funds in the area. Under section 134 of the Federal Highway Act of 1973, the WMPO is required to prepare long range transportation plans for the planning area with a minimum of a twenty-year horizon. Additionally, the WMPO prepares an annual planning work program and assists with the prioritization of projects for inclusion in the State Transportation Improvement Program.

[1] http://www.ncleg.net/EnactedLegislation/Statutes/PDF/ByArticle/Chapter_160A/Article_14.pdf

Wilmington Metropolitan Planning Organization (WMPO) Planning Area

The WMPO includes the following jurisdictions in addition to the City of Wilmington: New Hanover County, Pender County, Town of Leland, portions of Brunswick County, Town of Carolina Beach, Town of Wrightsville Beach, Town of Kure Beach, Town of Belville, and Town of Navassa. The current WMPO planning area boundary encompasses 408.1 square miles. While the WMPO is responsible for planning for these specific regions, impacts from surrounding areas are being felt here as well.

The larger area known as the Wilmington MSA was ranked as the 38th fastest growing among all U.S. metro areas as of 2022[1]. This will change with the addition of Brunswick County being added back to the MSA, Brunswick County is the fastest growing county in North Carolina and 7th fastest growing county in the entire United States as of 2023[2] . Growth in the region accelerated during the pandemic with the census now estimating the city with a population of 120,324 and New Hanover County which encompasses the city, with a population of 234,921, the County had a population of 203,295 in 2010 a 14.4% increase in ten years. Projections vary greatly but show the population of the city growing by at least another 10,000 by 2030. The addition of Brunswick County back into the MSA has not impacted the WMPO's service area.

Funding

The fire department is funded within the General Fund, which is supported primarily through property and sales tax revenue. The total budget for the City of Wilmington for FY24 was $351 million dollars, less transfers the budget is a total of 316 million and represents a 40% increase or 90 million dollars over FY23. A total of 18.9% is budgeted for public safety constituting 66.5 million dollars. The fire department was allocated approximately 25 million or 7% of the budget. Budgetary controls and expenditures for the department are in accordance with North Carolina "Local Government Budget & Fiscal Control Act", which serves as the principal guiding document for preparing the budget and applicable North Carolina General Statutes.

[1] https://www.wilmingtonchamber.org/blog/choose-cape-fear-5264/post/here-s-how-much-the-population-grew-in-wilmington-nc-during-the-pandemic-33436#:~:text=In%20the%20Wilmington%20metro%20area,among%20all%20U.S.%20metro%20areas.
[2] https://www.starnewsonline.com/story/news/local/2023/04/20/brunswick-county-among-top-10-counties-in-u-s-for-population-growth/70086230007/

Purchasing Guidelines

Requires council approval

- All construction contracts over $500K
- All purchases for equipment or materials over $90K
- Consulting Services in excess of $90K
- All unit price term contracts with an estimated expenditure over $90K

Requires council approval via memo

- All construction contracts over $5K but less than $500K
- All consultant contracts or service contracts over $10K but less than $90K
- All purchase orders in the amount of $10K up to $90K, regardless of funding source or prior council approval
- Any unit price term contract with an estimated expenditure (during the term of the contract) over $10K or a term of more than one year

Specific items listed on a contract which has been previously awarded by Council; do not have to be placed on the memo Purchase Order regardless of the amount. For the fire department, this may include uniforms, bunker gear, uniform rental, janitorial or mowing services. While the fire department is funded through the general fund, the department does generate some revenues through various scheduled fees such as (FY2023):

Description		FY 2023 Actuals
PERMITS / FIRE SPECIAL CHARGES		$ 83,682.00
FIRE SPECIAL CHARGES / ANNUAL FIRE PERMITS		$ 81,605.00
FIRE SPECIAL CHARGES / CONSTRUCTION PERMITS		$ 106,918.00
FIRE PROTECTION / STATE PROP (FIRE)		$ 177,754.00
FIRE PROTECTION / STATE/HAZMAT ADMIN		$ 20,000.00
FIRE PROTECTION / HAZMAT RESPONSE OT		$ 4,315.00
FIRE PROTECTION / REIMB OVERTIME		$ 37,260.00
FIRE PROTECTION / NHC - MAINT ON VEHICLES		$ 12,744.00
FIRE PROTECTION / FIRE INSPECTION FEES		$ 114,296.00
FIRE PROTECTION / ESCORTS		$ 46,000.00
		$ 684,574.00

In the fiscal year 2023, the department generate $684,574.00 from these fees. The money collected was then moved to the city's general fund balance.

The City of Wilmington has a Capital Improvement Program which is updated annually *(FY 2023-24 Adopted Budget, Section: Capital Improvement Program).* The Capital Improvement Program includes only the FY24 projects as a delay on a multi-year plan is occurring. Project costs, descriptions and funding plans are presented in six programmatic categories which include Streets and Sidewalks, Parks and Recreation, Golf, Public Facilities, Parking and Storm Water. Therefore, the program will consider such things as land acquisition, station construction, remodeling, and other major improvements for fire stations.

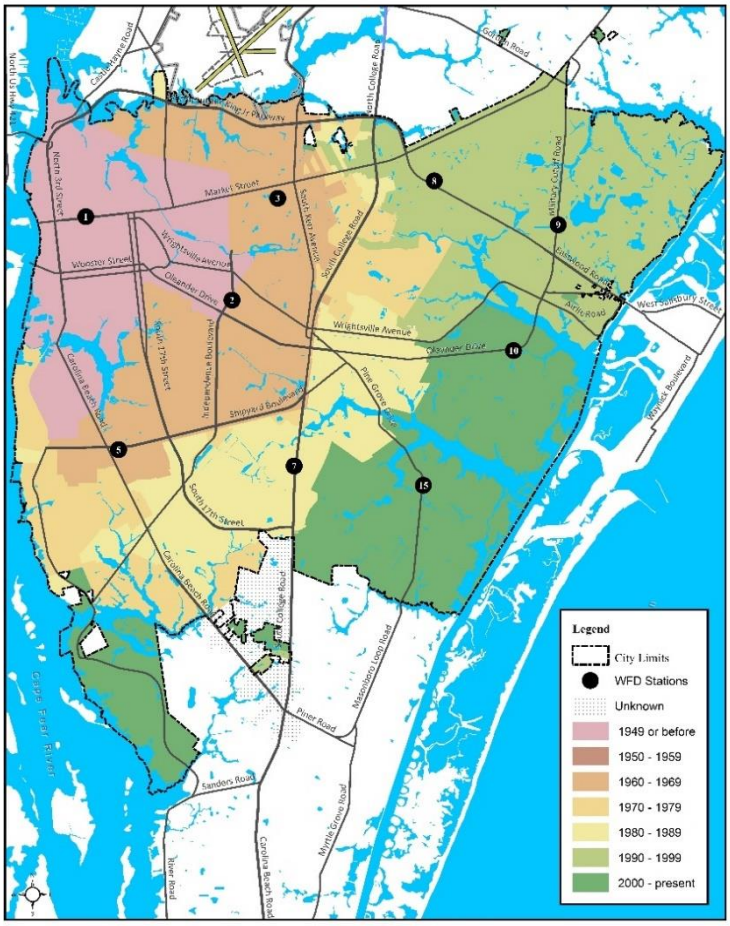
The city also has a Fleet Maintenance and Replacement program for determining when fire apparatus and other department vehicles will be replaced or refurbished *(FY 2023-24 Adopted Budget, Section: Fleet Maintenance and Replacement Fund).* This process provides for a timely

scheduling of these replacements so there is time to set aside funding and develop other opportunities such as "piggy backing" with other departments for these purchases to reduce the cost.

Growth

Prior to 2011, North Carolina General Statute Chapter 160A Article 4A allowed cities to manage growth through annexation processes. The annexed areas had to meet specific urban criteria and the city would be required to provide urban services. The City of Wilmington used this statute on several occasions to increase their corporate limits, and even though they were met with legal challenges, they prevailed. As a result, the city has grown considerably over the last fifty years.

Wilmington Growth



For the purposes of this study, growth was examined from 1980 to 2020. In 1980, the City of Wilmington had a population of 44,000 and an area of 20.73 square miles. In 1981, the city council chose to annex 6.71 square miles on the southern edge of the city with a population of approximately 5,400 residents. The newly annexed area became effective in 1984. The fire department built one new station and added fifteen personnel.

In 1983, another annexation was endorsed which included 1.63 square miles and an additional population of approximately 2,700 residents. The annexation became effective in 1985 and included one new fire station with the addition of 3 personnel. Some personnel assigned to fire headquarters were relocated to the new fire station.

In 1995, city Council voted to annex an area of 10.61 square miles and approximately 11,163 residents. This newest area would be on the eastern side of the city and would absorb the unincorporated areas extending to the intra-coastal waterway. Court challenges prevented this area from becoming part of the city until 1999. Due to the size of the area and the additional population, two new fire stations were built (#8 and #9). The addition of these fire stations included an additional 33 personnel and a shift battalion chief position to manage the eastern half of the city.

The next annexation occurred in 1997 and had an effective date of 2000. This area was 9.24 square miles and included approximately 11,140 residents. Again, the fire department added two new stations (#10 and #15) and 24 additional personnel.

In 2009, a voluntary annexation was requested by a developer of approximately 2.1 square miles. The land, Riverlights, is currently being developed as a mixed-use property. Property uses within the development consist of single family residential, multi-family residential, neighborhood retail

business, and community business. The property is located on the south-western border of the current city limits. Due to response time delays and distance from other resources the city is constructing a new fire station in the Riverlights neighborhood. The city has awarded bids and groundbreaking took place in the summer of 2023. The station is scheduled to open in late 2024 and an additional engine company is being added, with the vehicle's delivery scheduled for the fall of 2024. Currently, Riverlights is home to about 2,500 residents, but approved plans include 3,350 units by 2030 which could house nearly 10,000 people.

The city has grown by 31.9 square miles over the last forty years and now encompasses 53 square miles with a population of 115,451 given by the U S Census in April of 2020. This indicates that the city has increased in square miles 2.5 times and has seen the population more than double in size. Although much of the growth was due to annexations which resulted in approximately 30,400 more city residents.

In 2011, the North Carolina General Assembly repealed laws which allowed municipalities to pursue growth through forced annexation. Annexations now require the approval of 60 percent of the landowners in the area under consideration. This will have a major impact on the future growth of municipalities throughout the state. Voluntary annexations are still allowed, and since 2011 the City of Wilmington has had a few small areas annexed through this process. However, these types of annexations create sporadic growth, that is difficult to plan for and may leave detached areas difficult to serve by the city fire department. Several of these areas exist just south of city in the areas along or near Carolina Beach Road, several others on the north side of the city include small high density residential developments along Gordon Road and Market Street.

Despite the city's physical growth now being limited by legislative action, rapid infilling has occurred. In just the last five years the city reduced buildable vacant land by more than 50%. Existing structures and greenspace are being replaced largely with multi-family residential developments, and mixed-use occupancies to accommodate the influx of people.

Land Use

Central Business District & High Density/Mixed Use

The Central Business District (CBD) is in the oldest portion of Wilmington and encompasses approximately fifty blocks. Until the late 1950's, the CBD was the center of commerce for Wilmington and business in the area revealed wealth and prosperity for the region. Over time with the loss of the railroad and manufacturing industries, the use of buildings and land in the CBD changed. Previous uses included rail yards, industrial and manufacturing uses, and warehousing and distribution centers. Today commercial business, retail, assembly, office, and medium to high density residential uses dominate the landscape. As the city continues to grow, focus groups strive to brand and attract businesses to the historical CBD area. It remains essential to the identity and economy of the city. The city has recently taken ownership of the largest structure in the CBD, on the northern end of the city. With this purchase and continued efforts, the city is aggressively marketing and pushing for further redevelopment of the CBD in particular the last remaining undeveloped area in the northern part of downtown. This area is home to several tourist attractions including Live Oak Pavilion, a large openair concert venue, and the Riverwalk, a two-mile-long boardwalk that runs along downtown and the Cape Fear River, which has become the city's number one tourist attraction providing views of Cape Fear Memorial Bridge, the Cape Fear River and the U.S.S. North Carolina Battleship.

Industrial

With the arrival of the steam powered railroad and marine vessels of the 19th century, Wilmington began to see steady growth along the natural corridors of the river. The river was improved to become more navigable, and the import and export business of commodities increased. The area along the river; currently known as Water Street, Burnett Boulevard, and River Road began to grow into an industrial area. Today, the North Carolina State Ports and many oil and chemical terminals are located along this corridor. The corridor allows for these products to be transported by rail, marine, and roadway. During the early 20th century, the city saw industrial growth along the 23rd street corridor. This came as a result of the development of the airport and increased air travel. The river front south of the CBD remains heavily industrial today, while the northern parts of the river front have been redeveloped. In addition to these areas the largest single manufacturer in the city is on a 66-acre campus on the north central side of the city in between at the intersection of College Road and Market Street.

Business/Commercial Centers

As development occurred in the rural areas and with the development of the automobile, the infrastructure of the road system urbanized. Some of the first roads have now developed into key corridors of commerce. These corridors occurred with the development of the trolley to neighboring Wrightsville Beach and the textile industry such as Spofford Mills. By the mid-20th century, Market Street, College Road, Oleander Drive, Wrightsville Avenue, Military Cutoff, Carolina Beach Road, Shipyard Boulevard, and 17th Street had an influx of retail business, office uses, hospitals/ medical centers, and commercial centers. The first major commercial area to develop away from the CBD was Hanover Center and Independence Mall. As the city continued to grow eastward, smaller strip malls of retail and commercial business use began to infill along Market Street, Oleander Drive, College Road, and Shipyard Boulevard. In the last twenty years, the development of the eastern half of the city began to occur. Major mixed used developments, such as Landfall and Mayfaire Town Center developed. The area just before Wrightsville Beach has seen significant development with retail, office, and residential properties. The southern area of the city is currently undergoing major development with retail, office, movie theatres, and multifamily occupancies.

Large Recreational Areas

The city and county have done an excellent job designating recreational areas for the citizens and visitors of the community to enjoy. There are close to 50 parks and 38 miles of trails and bikeways in the city. The city has several large parks such as Greenfield Park (250 acres) which surrounds Greenfield Lake and has four and one-half miles of paved walkway and an outdoor amphitheater. Halyburton Park (58 acres) has a one and one-half mile nature trial and a facility that can be rented for receptions, meetings, and parties. In addition to these city parks, the county maintains parks within the city limits, including Long Leaf Park, a large park nearly right in the middle of the city which includes playgrounds, baseball fields, a dog park, several picnic pavilions, and even a splash pad. There are other smaller parks which contribute to a total of 778 acres of open space or recreational facilities for the public. There is the Gary Shell Cross City Trail, a multi-use trail that runs fifteen miles in length. It is designed for bicycle and pedestrian access to numerous recreation areas, shopping centers, educational and cultural points of interest. There are several venues for athletic events such as the Legion Sports Complex, Althea Gibson Tennis Center, Olsen Park Softball Complex, Wilmington Boxing Center, and the Fit for Fun Center. There are also several city pools, a municipal 18-hole golf course and a 9-hole par 3 course.

Building Stock

The buildings in Wilmington range in age and type of construction. The city has some of the oldest structures and homes in North Carolina. Within the Downtown Historic District, the Mitchell-

Anderson House (also known as the Smith-Anderson House) dates to 1740, the year the town was chartered. Built in the Georgian style in Flemish bond brick, the house underwent several alterations and expansions; however, its original lines can still be discerned. A planter, Edward Mitchell, acquired the lot in 1738 for 24 pounds, and sold it to John Smith in 1744 for 250 pounds, suggesting that the house was added in the interim. In the 1800's, the house belonged to a local physician, Edwin A. Anderson, who kept his office in the L-shaped building next door. Today, the building has been converted to office space. The DuBois-Boatwright House dates to 1769. It is one of Wilmington's five oldest buildings. A merchant and alderman, John DuBois, built the house. In June 2013, the local Historic Preservation Foundation placed the home on the "Most Threatened Historic Places". Since then, the house has been thoroughly renovated. The nearby Burgwin-Wright House dates to around 1770, but it apparently contained parts of the old county jail, dating back to the 1740's. It is now maintained as a house museum by the Colonial Dames.

The older homes and structures in the Historic District are wood frame construction. Some of the older and larger structures in the Commercial Business District were constructed with heavy timber. Although redevelopment has occurred throughout the city, the Historic District is largely protected from this happening, and the downtown area around fire headquarters remains predominately older construction.

As the city grew during the turn of the 20th century, commercial structures were built around the textile mills and the shipyards. During the early half of the century, residential neighborhoods were constructed to support housing needs of the working population which consisted of small wood frame homes. As the city continued to expand the brick ranch home became predominant in the 1960's and 1970's. Since then, the city has seen a move towards the higher-end developments with gated communities and larger homes. The gated community of Landfall contains some of Wilmington's most expensive homes and is the highest concentration of single-family home property values, it includes the highest valued single-family home currently within the city limits which last sold for 4.8 million dollars and sits along the Intercoastal Waterway (ICW).

As the city continues to grow in population but not geographical size, the density is rapidly increasing. As such, the building stock now includes a multitude of 3- and four-story multi-family residential housing structures that have made their way into nearly every area of the city. These structures are also on occasion being built as mixed-use occupancies. Greenspace is being converted rapidly to residential housing, and in some areas, redevelopment is still occurring. Recently, Cardinal Lanes, a bowling alley along Shipyard Blvd. was demolished to make way for a large multifamily residential housing complex on the site incorporating existing wooded lots surrounding the former bowling alley. Although building codes and enforcement make areas within these structures safer, their proximity to each other in new developments presents increased risk.

Today, the commercial structures range from the historic downtown shops to smaller and moderate strip mall complexes, to larger malls and mixed-use developments. Some of the older structures have been renovated and all the newer ones have been built to meet modern building codes, thereby reducing the level of risk for these commercial buildings.

Topography

The city is a coastal community located in southeastern North Carolina between the Cape Fear River and the Atlantic Ocean. The intersection of highways NC 132 and US 74/76 is the approximate center of the city and is located at 34º12'35.78" N and 77º53'12.86" W. The city limits encompass a total area of 52.8 square miles. About 7 percent of the total area is water or marsh. The City of Wilmington has approximately ten miles of waterfront along the Cape Fear River and approximately 7 miles of waterfront along the ICW.

The city has gradual changes in elevations which range from sea level to approximately 65 feet above sea level. Most of the city is twenty to forty feet above sea level. There are some low-lying areas in the city that are prone to flooding during rain events and this can delay the response of fire department apparatus and/ or damage the apparatus from water in-take. The department has purchased a high-water vehicle through grant funding to help alleviate this issue. The fire department often responds and rescues citizens from flooded vehicles during these types of emergencies. The city has a very proactive storm water management program and is currently working to resolve any flooding issues identified in the Hurricane Florence after action reviews.

Less than 8 percent of the land in the city is buildable and vacant, but vacant land is rapidly disappearing. Most vacant buildable tracks of land have plans in development or in place and approved to convert them. Development has reduced the probability of woodland fires to a minimum within the city. The NC Forest Service is an additional responder to forest fires and helps control the fires if they grow to more than a couple of acres and/or are in wetland areas. The department has off-road vehicles for controlling minor brush fires and has purchased a high-water vehicle that can also be used for wildland firefighting in rough terrain. A new skid unit was also purchased through a grant to ensure the department maintains this capability.

The trees in the city are a mix of coastal hardwoods and varying pine species. The pine trees can reach an average height of sixty to eighty feet. The coastal hardwoods can reach an average of forty to sixty feet with a crown spread between 30 and fifty feet. Trees impact the fire department during major weather events, such as hurricanes, as they may fall due to high winds and ground saturation. Streets may be blocked for a few days to a week depending on the intensity of the weather event. In 2022, the department worked closely with the city's tree crews and trained them on cutting trees and equipped vehicles with chain saws and personal protective equipment (PPE) for chain saw work on trees. For their service to the city and community, the department was presented an award by the city leadership. The department's squad program placed 3 heavy duty pick-up truck vehicles in service throughout the city, these vehicles are equipped with winches and can be used to help open roadways during emergencies.

Climate

Wilmington has a humid subtropical climate. Winters are generally mild with daytime average temperatures in the 50's and 60's. Nighttime temperatures are generally in the 30's and 40's. There are usually brief periods when the temperature ranges are 20's to 30's. Occasionally, there is snowfall with accumulations from one half inch to as much as 15 inches on rare occasions. Spring has temperatures in the 70's and 80's. The presence of dense vegetation in the area causes significant pollen production. Summer brings humidity with temperatures in the 80's and 90's. Heat indexes can easily exceed the 100-degree Fahrenheit mark. Due to the proximity of warm Atlantic Ocean waters, the area may be hit by a tropical cyclone during the summer, at an average of once every 7 years. Fall is also generally humid at the beginning, with the same tropical threats as the summer. Temperatures hover mostly in the 70's and 80's.

Climate Data for Wilmington, North Carolina 2023

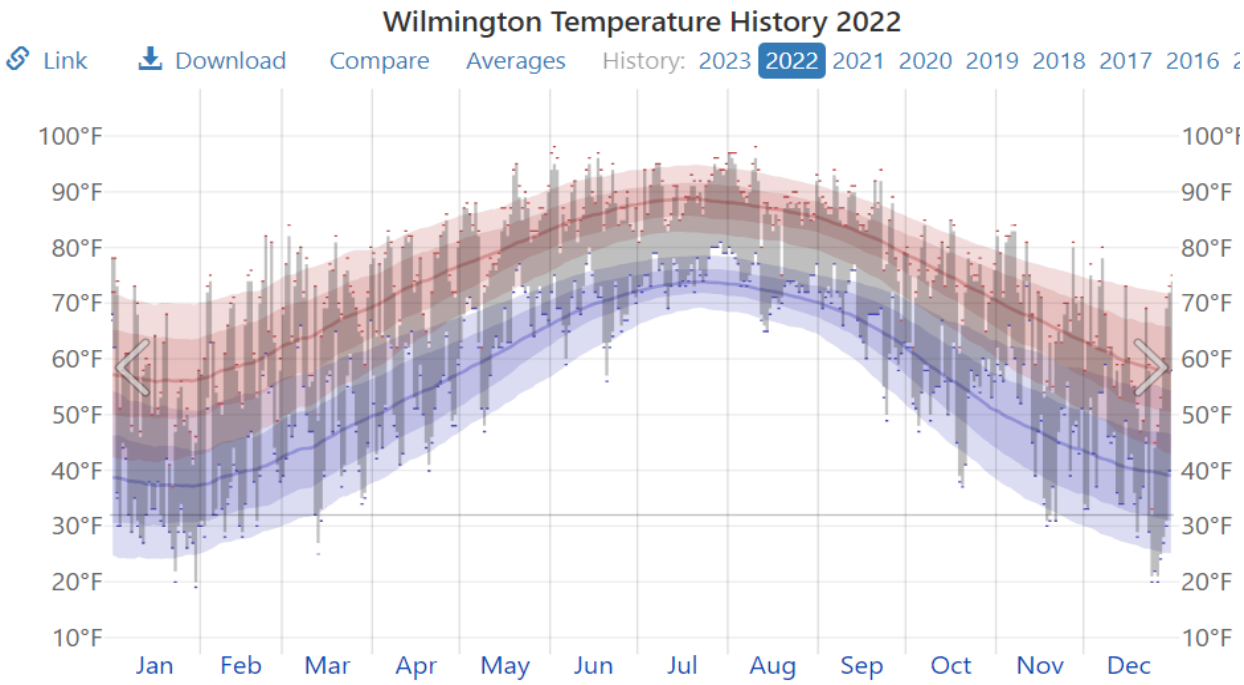
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °F (°C)	82 (28)	86 (30)	94 (32)	95 (35)	101 (38.3)	104 (40)	103 (39)	103 (39)	100 (37)	98 (37)	87 (31)	82 (28)	104 (40)
Average high °F (°C)	56 (13.3)	60 (15.6)	66 (18.9)	74 (23.3)	81 (27.2)	87 (30)	90 (32.2)	88 (31.1)	84 (28.9)	76 (24.4)	68 (20)	59 (15)	74 (23.3)

Average low °F (°C)	36 (2.2)	38 (3.3)	44 (6.7)	52 (11.1)	60 (15.6)	69 (20.5)	73 (22.7)	71 (21.7)	66 (18.9)	55 (12.7)	45 (7.2)	38 (3.3)	54 (12.2)
Record low °F (°C)	5 (-15)	5 (-15)	9 (-13)	28 (-2.2)	35 (2)	48 (9)	54 (12.2)	55 (13)	42 (5.6)	27 (-3)	16 (-9)	0 (-18)	0 (-18)
Precipitation inches (mm)	3.76 (95.5)	3.62 (91.9)	4.21 (106.9)	2.82 (71.6)	4.49 (114)	5.18 (131.6)	7.48 (190)	7.41 (188.2)	7.84 (199.1)	3.89 (98.8)	3.29 (83.6)	3.62 (91.9)	57.61 (1,463.3)
Snowfall inches (mm)	0.4 (10.2)	0.4 (10.2)	0.4 (10.2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.6 (15.2)	1.8 (45.7)

Source: https://weatherspark.com/y/20822/Average-Weather-in-Wilmington-North-Carolina-United-States-Year-Round#google_vignette August 2023

Source #2: https://www.extremeweatherwatch.com/cities/wilmington-nc August 2023

2022 Wilmington NC temperature Compared to Average (shadow).



The daily range of reported temperatures (gray bars) and 24-hour highs (red ticks) and lows (blue ticks), placed over the daily average high (faint red line) and low (faint blue line) temperature, with 25th to 75th and 10th to 90th percentile bands.

History of Significant Weather

The city often finds itself located in the path of many storms and other weather-related events. The United States Department of Commerce, an organization of the National Oceanic and Atmospheric Administration provides a storm events database with weather events recorded in New Hanover County since 1950. Since January 1, 1980, through January 1, of 2023 there have been 460 significant weather events in New Hanover County resulting in 17 deaths, 26 injuries, and 1.04 billion dollars in property damage. Most of the property damage occurred in September of 2018 during Hurricane Florence, which resulted in an estimated billion dollars in damage.

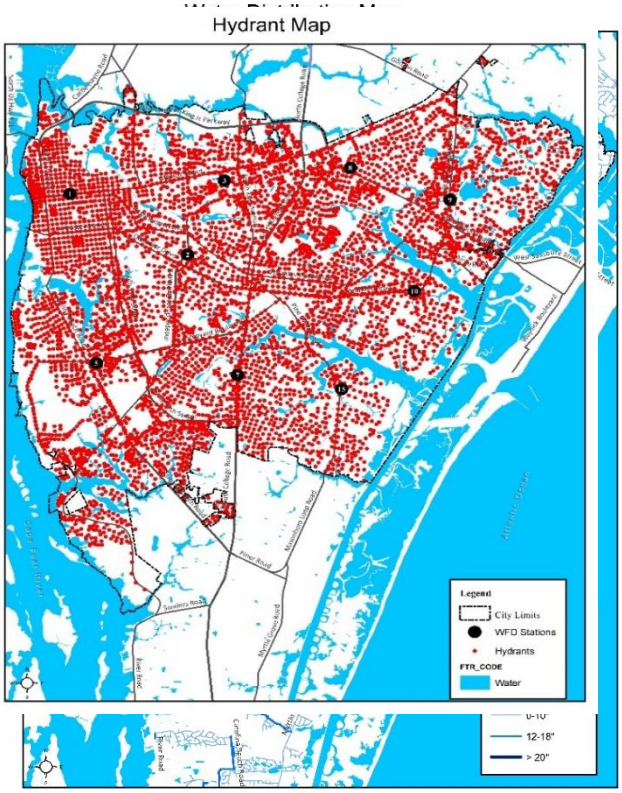
Because of the possibility of weather-related emergencies, New Hanover County Emergency Management, and all the municipalities within the county, have developed extensive emergency operations plans. Emergency operations centers have been created to provide for joint oversight and effectiveness. The county now has a newly constructed emergency operations center that is

attached to the 911 center and located at the county government building. The center was constructed to withstand historic storms and remain functional throughout.

Water Supply and Distribution

The city's water distribution system dates to 1900. The city takes raw water from the Cape Fear River at Kings Bluff and transports it 25 miles by pipe to the Sweeny Water Treatment Plant. Additional water is purchased as needed from the Lower Cape Fear Water and Sewer Authority. The city's raw water treatment plant was upgraded in 1943 to a capacity of 7 million gallons per day (mgd) and again in 1958 to fifteen mgd. Today the operational capacity is 35 mgd day with a high demand capacity of 44 mgd.In 2008, the Cape Fear Public Utility Authority (CFPUA) was created to consolidate city and county water and sewer operations. The potable water supply is comprised of a looped system of feeders and mains ranging in size from 6" to 24" in diameter.
For fire protection, the city fire code requires hydrants in residential neighborhoods to be no more than 500 feet apart and in commercial areas the regulation is 300 feet. The code requires new mains in residential areas to be 8" in diameter. Main size for commercial and other property uses depends on the needed fire flow. Many commercially developed properties have additional hydrants located throughout the site in order to meet and/or exceed the requirements of the fire code.

Static pressures on the system range from approximately fifty to 7ty psi and fire flow tests have historically shown that ample water is available to meet needed fire flows. Additionally, the system achieved a score of 38 out of a possible 40 in the 2020 ISO rating. The average gallon per minute flow for the city is 3,500 gallons per minute. This is based on data collected from fire flow testing. A map showing available fire flow 2-hour, 20psi was generated by CFPUAs' computer modelling program is included in the appendices. The CFPUA has developed the "Integrated Water Resources Master Plan", which makes future projections on demand and provides the planning to handle this increase. The total potable water supply and wastewater treatment capacities will more than double between the years 2012 and 2060.



Population and Demographics

The city is the eight largest in North Carolina and contains an area of 53 square miles. The population from the 2020 census is 115,451. The population density is approximately 2,245.9 people per square mile. There are more than 58,694 housing units in the city with more than 52,656 households. Almost 50 percent of the households in the city are family households with just 19% of those families having children. The estimated persons per household in city is just 2.1 significantly below the national average of 2.6. This coincides with an aging in place population and growing retirement destination community.

Service Area Characteristics (2023)

Station	Population	Population (%)	Square Miles	Road Miles
1	17457	14.94%	5.8	125.1

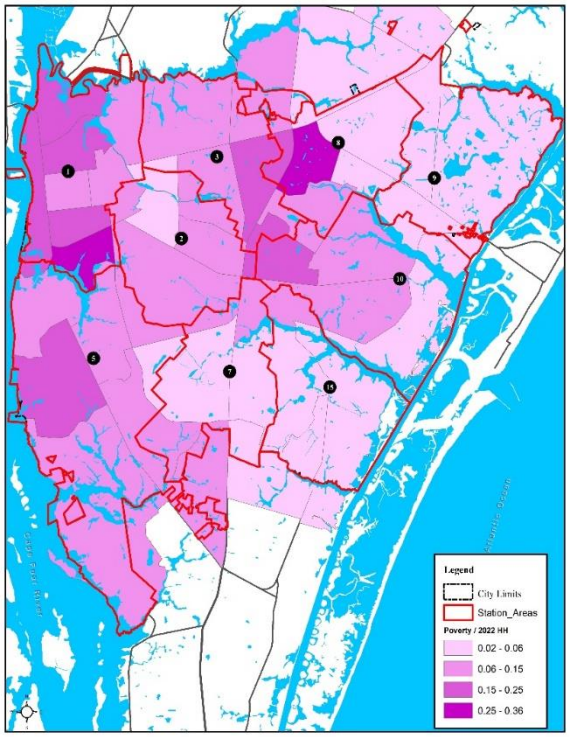
2	11471	9.82%	4.6	73.6
3	13414	11.48%	4.6	62.8
5	19951	17.08%	10.8	161.9
7	12326	10.55%	4.8	76.8
8	10923	9.35%	4.5	63.7
9	8670	7.42%	6	73.3
10	12836	10.99%	6.9	84.5
15	9787	8.38%	5	53.7
Total	**116835**	**100.0%**	**53.1**	**775.4**

Based on the Center for Public Safety Excellence, the city has an "urban" service area because it has a population of over 30,000 people and/or a population density of over 2,000 people per square mile. The population density map, which is based on 2020 census data, shows the distribution of population per square mile by census block areas.

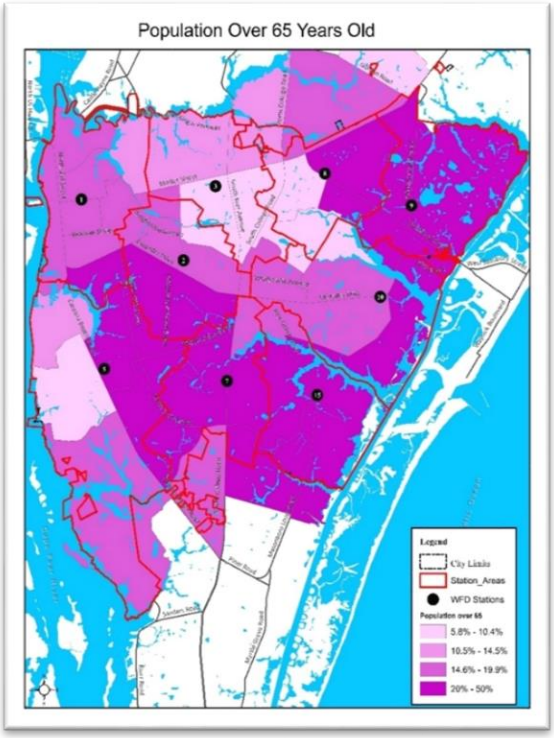
The western border of the city along the Cape Fear River includes the central business district, state port, and tank farms. The rest of the city consists of commercial corridors, residential areas, educational facilities, and medical complexes.

The socioeconomic character of the city ranges from an unhoused population of approximately 1,200 individuals to affluent gated communities. According to the Census Bureau as of 2021, the median income for a household in the city was $54,066, a dramatic increase of 30% in just 11 years since 2010. The per capita income for the city was $38,890, and about 18.8% of the population is below the poverty line, a decline of about 4% since 2010.
The areas where the percentage of population living below the poverty level is the greatest directly correlates to a higher call volume in first due areas. The chart below shows how population in general effects call volume within in stations area.

Population Below Poverty Level

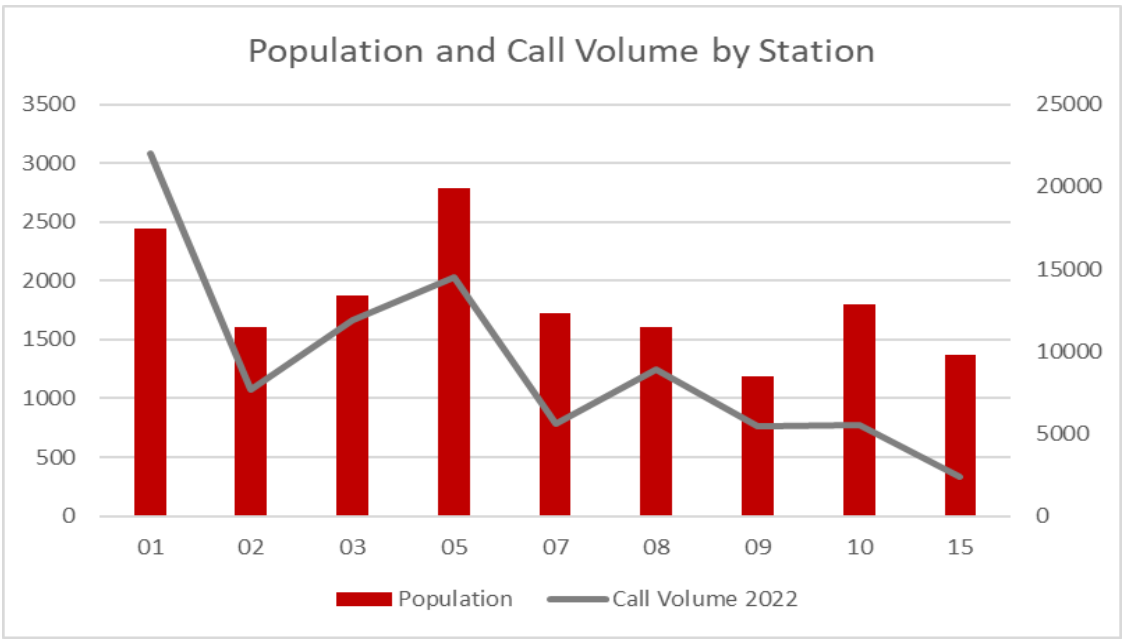


The "Population and Call Volume by Station" graph illustrates the distribution of population in first due response areas and call volume in the first due response areas. It was found that the total number of people in a station area is not always a direct indicator of call volume. As an example, station one ranks second overall for population served but has the most call volume by a significant margin. Therefore, it was determined other factors contribute to demand for service, inclusive of socioeconomic factors and at-risk populations.



Two other unique populations to be considered as "at risk" are the elderly and the very young. According to the 2020 Census, the population below five years old was 4.2 percent and the population over 65 years old was 17.5 percent. These populations place a demand on services that is higher than the general population and pose other risks directly associated with age.

The distribution of the population less than five years old is illustrated on the "Population Under 5 Years Old" map. The map shows that the areas with higher concentrations of children under five years old directly correlates to some of our first



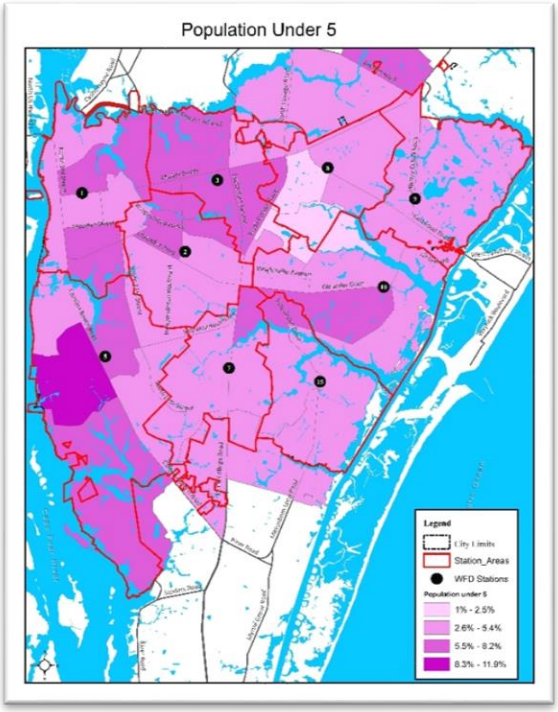
due

areas which experience the highest call volumes; station 1, station 3, and station 5.

The distribution of the population in Wilmington over 65 years old is illustrated on the "Population Over 65 Years Old" map. In analyzing this data, one may expect to see the same result as the population under five years old, in that, there would be a direct correlation to the density of this population and call volume. However, in this case, it was found that the older population predominately resides in areas of higher income and newer homes. There are still some pockets of the "at risk" older adult population which could be directly correlated to higher call volumes. These pockets can be found in first due areas for station 8, station 5, and station 2.

The "Specific Risk Populations by Station" table displays the percentage of the very young (less than five years old) and elderly (over 65 years old) in the first due station areas.

Specific Risk Populations by Station



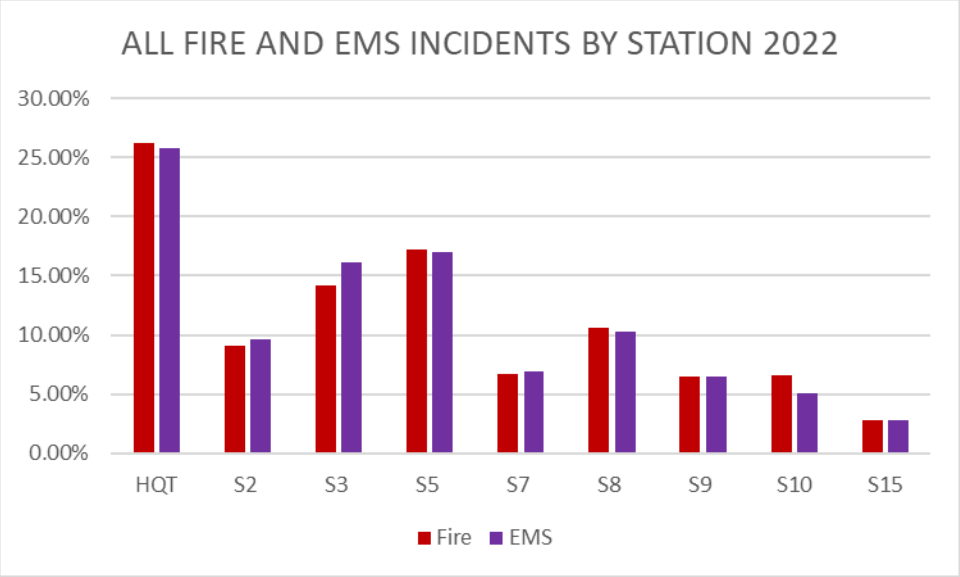
STATION	TOTAL POPULATION	PERCENT POPULATION	SENIOR POPULATION	PERCENT OF SENIORS	UNDER 5 POPULATION	PERCENT UNDER 5
S1	17457	14.94%	2905	16.64%	1008	5.77%
S2	11471	9.82%	2316	20.19%	616	5.37%
S3	13414	11.48%	1342	10.00%	877	6.54%
S5	19951	17.08%	4054	20.32%	1066	5.34%
S7	12326	10.55%	2883	23.39%	542	4.40%
S8	10923	9.35%	1813	16.60%	373	3.41%
S9	8670	7.42%	2766	31.90%	306	3.53%
S10	12836	10.99%	2238	17.44%	529	4.12%
S15	9787	8.38%	2117	21.63%	448	4.58%

As stated before, by only observing population distribution, one would expect the number of people to solely determine the service demands placed on the agency. The distribution of the department's core services is depicted in the table "Fire and EMS Services by Station" and then related to the population in the "Core Services and Population" graph. These illustrations further support those other factors, in addition to population, influence the workload of the first due station. This is discussed further in the risk analysis section of this document.

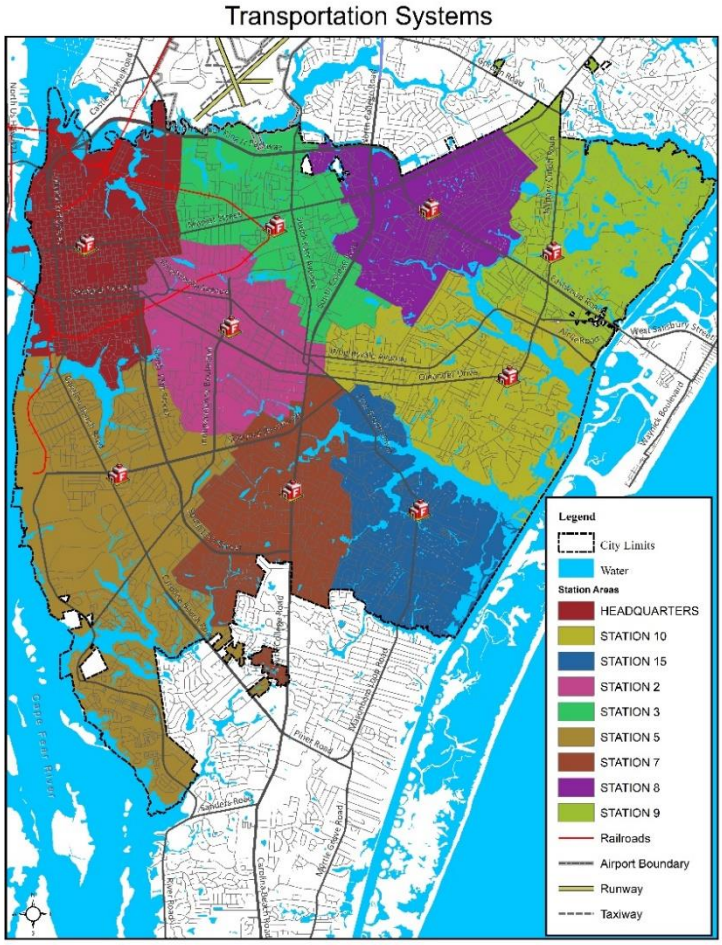
Core Services and Population

Station	Fire	EMS	Population
1	26.24%	25.82%	14.94%
2	9.12%	9.59%	9.82%
3	14.14%	16.09%	11.48%
5	17.27%	16.96%	17.08%
7	6.70%	6.94%	10.55%
8	10.61%	10.24%	9.35%
9	6.48%	6.51%	7.42%
10	6.62%	5.04%	10.99%
15	2.82%	2.81%	8.38%
Total	**100.0%**	**100.0%**	**100.0%**

Fire and EMS Services by Station 2022



Transportation



The city is a medium sized municipality that is home to the University of North Carolina Wilmington, Cape Fear Community College, and Miller Motte College. There are two high schools and numerous elementary and middle schools within the corporate limits. There are also many daycare centers and several private schools. Novant Hospital (the largest employer in the County) and many physicians' offices are located here. These facilities create a substantial amount of traffic congestion on the city's roadways as well as an influx of non-resident population. While an accurate count of visitors is unknown, the tourism authority reports that the tourism industry in New Hanover County employs more than 6,143 people and generates 246.5 million dollars in payroll as of 2022.

Wilmington is at the eastern terminus for Interstate 40 and US Highway 74/76, the southern terminus for US 421, NC 132, NC 117, and NC 133. US Highway 17 crosses through the northern portion of the city. All these major roadways contribute to additional non-resident traffic whether passing through, business related travel, or vacationing.

Wilmington International Airport is on the northern perimeter of the city which not only brings visitors, but also the potential for a mass casualty type of event. During the 2022 calendar year, the airport saw a record number of passengers with 545,899 enplanements and 540,346 deplanements, totaling 1,086,245 passengers. The airport had 78,237 total operations, an average of 214 per day, 14% air carrier, 14% air taxi, 55% general aviation, and 17% military. The site is frequently used by military aircraft for training and refueling.

The Cape Fear River, in conjunction with the NC State Ports, provides for ship traffic, increased trucking traffic, military vessel traffic, as well as other commercial and pleasure vessel traffic. The North Carolina State Ports Authority announced in July of 2023 that the port of Wilmington saw a record year in FY22 with revenues and container growth. The port was named the most productive port in North America in 2022. The port has received hundreds of millions of dollars in investments in the past six years, adding container cranes, cold storage facilities, and extra truck lanes. In addition to the inland railyard enhancements, growth at the port is expected to continue.

The ICW has several marinas alongside it that are within the city. This provides for many commercial and pleasure vessel traffic and the potential for maritime emergencies.

The state ports and the bulk storage terminals along the riverfront generate a great deal of truck traffic moving through the city and most of the rail traffic moving through the western and northern parts of the city. The rail traffic is moved by the Wilmington Terminal Railroad and CSX Railroad.

VII. Description of Agency Programs and Services

History of Department

Like most towns in America, Wilmington's first firefighters were groups of volunteers who organized for their own protection. The first group called the "Wilmington Hook and Ladder Company", organized in 1846 but was not chartered until 1867.

CHIEF CHARLES SCHNIBBEN

On February 19, 1875, the fire steamer "Little Giant" arrived here from New York on the steamship "Regulator". It was to replace the "Rankin", worn out after five years in service at the Wilmington Steam Fire Engine Company #1.

In 1883, the fire department was comprised of five companies. Their names were: The Cape Fear Steam Fire Engine Company #3 located at 110 Ann Street, the Little Columbia Fire Company at 413 Nun Street, the Hook and Ladder Company #1 at 313 Dock Street, the Little Giant Steam Fire Company at 322 Princess Street (the location of the original Fire Headquarters), and the Howard Relief Steam Fire Company #1 at 14 South Front Street.

Sometime between 1883 and 1886, Headquarters moved from 322 Princess Street to 4th and Dock Streets. With this move, the old Headquarters building was turned into a Blacksmith Shop by J.O. Brown. A huge bronze bell cast in 1886 hung in a wooden tower behind the new Headquarters building at 4th and Dock Streets. The new headquarters building was constructed of wood and is said to have originally been a Church. The front of the station faced 4th Street. The pumper company facing Dock Street was the Hook and Ladder Company.

On December 1st, 1897, the department transitioned from a volunteer department to a paid department. In April of 1897, Charles Schnibben became Chief of the department. He had joined the volunteer department in 1886 and was made assistant chief in 1895. In 1897, the fire department had twenty men. At least six and sometimes up to ten men remained on duty at all times in case of alarm. In 1897, there were two steam driven pumpers. The 19th century firemen had one hose company, one chemical company, and one hook and ladder.

Sometime around the early 1900's, the old wooden tower and headquarters building were torn down and replaced with a brick training tower and a brick headquarters building. The huge bell that had sounded the alarm and served volunteer and professional firemen alike was moved to 5th & Castle Streets in the year 1915. It continued to sound the alarm of fire until 1918, when the last of the horse drawn fire wagons were replaced. In 1912, the department had its first hose wagon. The first motorized pumper to replace horses was a 1917 model LaFrance. By 1921, there was one motorized pumper, two old steam drive pumpers, two hose wagons, and a fireboat.

Much of the department's training took place at the original training tower behind the old brick headquarters building at 4th and Dock Streets. This tower was established in 1929.

In August 1954, the firemen from headquarters at 4th and Dock Streets moved to temporary quarters at 2nd and Market Streets while the old building was torn down and a modern one was constructed. The old training tower was also torn down and replaced by a more modern tower built in the area of Greenfield Lake. This one was completed in the 1960's.

In 1960, there were 7 pumpers, an aerial truck, a foam truck to combat gasoline fires, and an auxiliary truck to fight grass fires in addition to the fireboat. A new pumper was bought in 1960 to replace the one that was wrecked in 1959.

In 1999, a new fire headquarters station was built at 801 Market Street and the station at 4th and Dock Streets was sold to the neighboring church. In 2006, a partnership was developed between the City of Wilmington, Cape Fear Community College, and New Hanover County which allowed for the funding of a new and modern training facility to be built. On September 11, 2008, the new facility was dedicated.

Today, the department has over 220 professional firefighters and staff personnel whose purpose is to protect, serve, and educate for the safest community. Currently, there are nine stations located strategically throughout the city to ensure rapid response to fire and emergency medical calls for service. Assigned to these stations are 3 shifts of personnel for fifteen companies. Equipment includes 8 engine/pumpers, 4 trucks, 3 squads, 1 heavy rescue vehicle, 2 hazmat trucks, 1 technical rescue truck, 1 water rescue/dive equipment truck, and various support vehicles. In addition, there are 2 battalion chiefs assigned to each shift 1 for each of the 2 districts, and 1 safety officer assigned to each shift.

Stations

The City of Wilmington has grown and changed throughout the years and the fire department has changed and grown accordingly. The following is a brief outline reflecting these changes to some degree:

- Fire headquarters was located at 4th and Dock Streets until 1999 when a new station was built at 801 Market Street.

- Station 5 at 17th and Dock Streets was opened in 1931 and housed one company of men. This station closed in 1968 and men were sent to a new station 2 located at 3403 Park Avenue. In 2011, station 2 was torn down and rebuilt at the same location.

Old Headquarters at 4th & Dock

- Station 6 at 3rd & Willard Streets opened in 1942. This station was relocated to 3939 Carolina Beach Road with the 1985 annexation.

- Station 4 located at 310 S. Wallace Avenue was opened in accordance with the 1985 annexation.

- Station 2 at 5th and Castle Streets was closed with the opening of the new Headquarters in 1956.

- In 1960, station 5 was located at 17th & Dock Streets, station 6 was at 3rd & Willard Streets, station 4 was at 4th & Campbell Streets, and Headquarters was at 4th & Dock Streets, and the fireboat station at the foot of Grace Street.

- In 1966, when the new station #2 was opened, it housed the company from 17th & Dock Streets plus ten additional firefighters. This gave the station more manpower and more equipment than the entire department had when it first became a professional organization in 1897.

- Station 3 located at 3933 Princess Place Drive opened December 21st, 1973 and station 4 at 4th & Campbell Streets closed December 21st, 1973.

- Station 5 located at 1502 Wellington Avenue opened in June of 1974.

- Station 7 located at 3230 South College Road was opened in 1999.

- Two stations, station 8 located at 601 Eastwood Road and station 9 located at 1201 Military Cutoff Road, were opened in conjunction with the 1995 annexation in 2000.

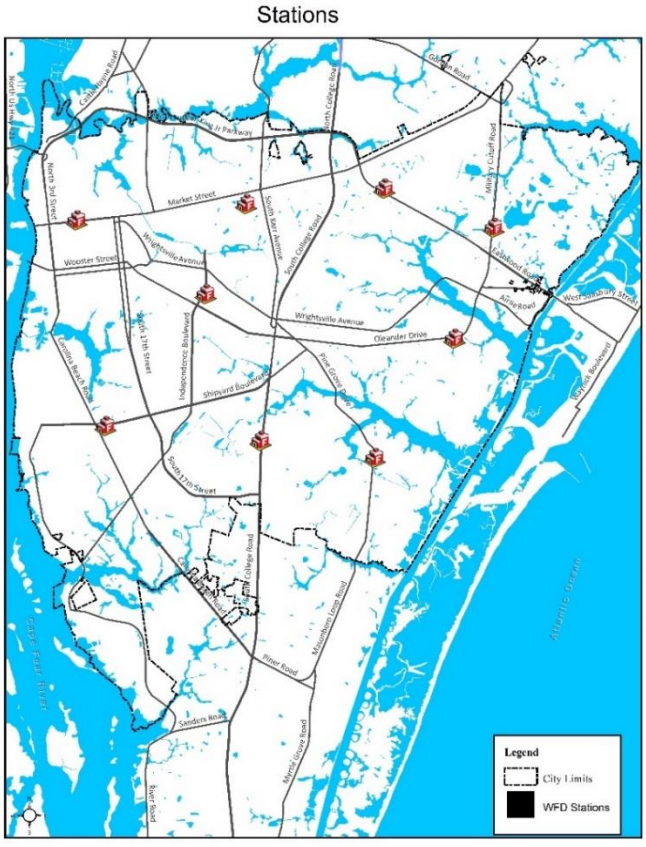
- Station 10 located at 6102 Oleander Drive was a former volunteer station when the city annexed again in 1998. This station was occupied until 2008 when it was torn down and replaced with a new station.

- Station 15 was built and opened in 2006 also in conjunction with the 1998 annexation.

- In 2015, station 3 on Princess Place Drive was relocated to a new facility on Cinema Drive and station 4 on Wallace Avenue was closed and the personnel were utilized to add an additional Truck company at station 8.

- In 2018, a new station 5 was opened near the intersection of Shipyard Boulevard and Carolina Beach Road. This station replaced the stations on Wellington Avenue (station 5) and the station on Carolina Beach Road (station 6).

- In 2023, the city broke ground on a new station 6, in the Riverlights community. The station is expected to be completed and staffed by the end of 2024.



Fireboats

For more than fifty years, Wilmington was the only city on the east coast between Jacksonville, Florida and Norfolk, Virginia to use a fireboat.

The first fireboat was put into use by the department in 1907. This was “Atlantic I”, which was used for 7 years. In 1914, “Atlantic II” was put into use until 1948, when it was replaced by an Army “T” boat which became “Atlantic III”.

“Atlantic III” was red and white, and like “Atlantic I and II” had a wooden hull. In 1961, “Atlantic III” pumped 135,000 gallons of water into the USS North Carolina’s ballast tanks to settle it to the bottom of her current berth and to keep it in the correct position. “Atlantic III” was used for fifteen years and replaced with “Atlantic IV”, which was a larger and better boat. It had a sixty-foot-long steel hull. At one time, this was a US Navy Patrol vessel that was constructed in 1932. After being adapted with a variety of firefighting equipment and a bright coat of white paint, it became fireboat “Atlantic IV” and took over the duties of “Atlantic III”. Its first assignment was to wash down the decks of the USS North Carolina before the dedication ceremony.

After the closing of the fireboat station at the foot of Grace Street, the company assigned to the fireboat was stationed at Headquarters. “Atlantic IV” never had a permanent home as it moved from dock to dock on the waterfront until the men gave it the name “Orphan of the Waterfront”. “Atlantic IV” was placed out of service in 1989. The fireboat “Atlantic V” was a navy surplus vessel and served the WFD from 1986 until it sank in 1999.

The fifty-foot fireboat “Atlantic VI” was built and delivered in 2007 and is stationed on the riverfront downtown. In addition, the fire department has two small marine craft for use in the creeks, ponds, lakes, and the waterways on the Eastern city limits.

Agency Introduction

The department is a multi-hazard response organization. Currently, the department responds to more than 12,000 calls for service in a calendar year. The incidents range in nature from fires, emergency medical events, hazardous materials incidents, marine/water incidents, technical/rescue incidents, and motor vehicle accidents. The fire department is organized into four divisions, each supervised by an assistant chief, the divisions include, operations, safety and training, support services, and the fire marshal’s office (FMO).

The operations division includes operational staff from the rank of probationary firefighter to battalion chief and is supervised by the assistance chief of operations. Operations are carried out from nine stations, with a tenth station under construction. Out of those stations, eight engine companies, four truck companies, 3 squads, and one heavy rescue are staffed daily to respond and provide services to the city.

The fire department also provides services for fire inspections, investigations, code enforcement, public education as part of its strategic community risk reduction efforts. The CRR division was created in 2012 to work in conjunction with the FMO and the operations division to identify and reduce potential threats from fires and other incidents within the city and promote the safer community restoration initiative identified in the city’s Strategic Plan. Since that time, CRR has been moved organizationally within the FMO, but continues to work closely with operations to achieve community risk reduction efforts. The FMO is led by an assistant chief who serves as the city’s fire marshal. The division also contains inspectors and investigators at the rank of master firefighter and captain. In FY24 the city approved that the part-time fire and life safety educator become a full-time position as the position has been vacant for nearly a year. The city also approved a BC in the FMO to serve as the deputy fire marshal and help support the assistant chief.

The training division is led by an assistant chief of safety and training and houses the day shift training staff and a safety and wellness BC along with 3 safety captains who are each assigned to a shift. The training division is responsible for conducting the recruit firefighter training academy, conducting promotional processes, professional development and continuing education related to things such as Blue Card Certification and EMS recertification.

The support services division is led by the assistant chief of support services and contains a logistics officer, the BC of special teams, the fleet maintenance group, and the administrative services group.

Existing Fire Stations

	Station 1: Headquarters 801 Market St
	Station 2 3403 Park Avenue
	Station 3 114 Cinema Drive
	Station 5 680 Shipyard Blvd
	Station 7 3230 South College Road

	Station 8 601 Eastwood Road
	Station 9 1201 Military Cutoff Road
	Station 10 6102 Oleander Drive
	Station 15 3335 Masonboro Loop Road

Companies

The department currently operates with two battalions, each defined by the district assigned. The composition is two battalion chiefs, one shift safety officer, eight engine companies, four truck companies, 3 squads, and one rescue company.

The companies are dispatched to calls for service by the type of resource required, an automatic vehicle locator (ALV) system, and a predetermined unit run order. For the purposes of resource management, the two districts are divided as follows:

- District 1 consists of station 1, station 3, station 5, and district 2 consists of station 2, station 7, station 8, station 9, station 10, and station 15.

- The assigned battalion chiefs respond to calls for service in the first due area for each of the stations in their district. When a significate fire occurs the second battalion chief will also respond for assistance but must be able to respond to their district if needed.
- The shift safety officer responds into the county to assist NHCFR on incidents requiring a designated safety officer, or at the request of the incident commander.

Organizational Structure

Department

The fire chief is the department head and director in the city's organizational structure. The chief has the overall responsibility for the operation of the fire department in accordance with the goals and directives set by city leaders. He serves as part of the executive management team for the city and as part of the Emergency Operations Center (EOC) executive staff. During major events, he provides oversight for all fire department activities. The chief is assisted by a senior staff consisting of four assistant chiefs, each with responsibility for the operation of one of the four divisions within the department. The chief's executive staff also includes the administrative services manager, public information officer, and executive staff assistant.

The department has four divisions, operations, safety and training, support services, and FMO. The operations division is responsible for all emergency operation services provided by the fire department. These services include fire suppression, emergency medical response and supporting the department with community risk reduction. The support division includes special operations, the administrative division, fleet maintenance, and logistics. The training and safety division provides on shift safety support via 3 safety captains supervised by a BC of safety and wellness. The division also has uniform staff responsible for training and development related to the fire department operations division. The fire marshal's office division (FMO) includes, community risk reduction, public education, fire inspections, plan reviews, and fire investigations.

Divisions

<u>Operations Division</u>

The operations division operates under the direction of an assistant chief. The primary function of the operations division is responding to emergency events with the goal of preventing the loss of life, reducing injuries, and minimizing property losses through fire suppression activities and emergency medical care. The assistant chief of operations is directly responsible for and provides oversight to the following:

- 6 Battalion Chiefs, one per district per shift
- 42 Company Captains
- 9 Lieutenants
- 55 Master Firefighters
- 90 Firefighters

Special team operations such as hazardous materials, technical rescue, and marine incidents are performed by the operations division, but the programs are managed by the special teams BC in the support division. This was changed in the past few years to maintain a balanced span of control for the assistant chief of operations. The special team members are all fire suppression personnel that have been cross trained in one or more special response discipline. All department operations personnel have awareness or operations level training in the special operations

programs. Team members have all volunteered to serve on their respective special teams and are certified or trained and qualified to technician level depending on which team they are on.

Most operations division personnel are also trained and certified as car seat technicians, and many firefighters are certified as public life safety educators. The operations division is heavily involved in community risk reduction efforts. The fire department inspects over a hundred car seats every year and this service is provided at every fire station in the city. The CRR coordinator works closely with liaisons in the operations division to bring reduction to the front lines of the department and the city.

Support Division

The support division is managed by an assistant chief. The primary functions of the support section are resource management, including the garage (fleet maintenance), special teams, performance analysis, budget and project management, human resource support, research, and data processing. The assistant chief of support is directly responsible for the oversight of the following:

Support Division Staff

- 1 Logistics Officer
- 1 Battalion Chief of Special Teams
- 1 GIS/Data Analyst
- 1 Fiscal Support Specialist
- 1 Administrative Services Manager
- 1 Human Resource Technician
- 1 Budget and Project Analyst
- .5 Administrative Support Specialist (part-time)
- .5 Accreditation Manager (part-time)
- .5 QA Specialist (part-time)
- 1 Garage Supervisor
- 2 Emergency Vehicle Technicians

Fire Marshal's Office Division

The fire marshal's office (FMO) is managed by an assistant chief. The primary functions of the FMO division are fire inspections, fire investigations, public education, plan review, and overall community risk reduction. The assistant chief of the FMO is directly responsible for the oversight of the following:

- 1 Administrative Support Technician
- 2 Captains/Inspectors
- 4 Master Firefighters/Inspectors
- .5 Administrative Support Assistant (part-time)
- 1 CRR Coordinator
- 1 Public Fire and Life Safety Educator
- .5 Fire Inspector (part-time)

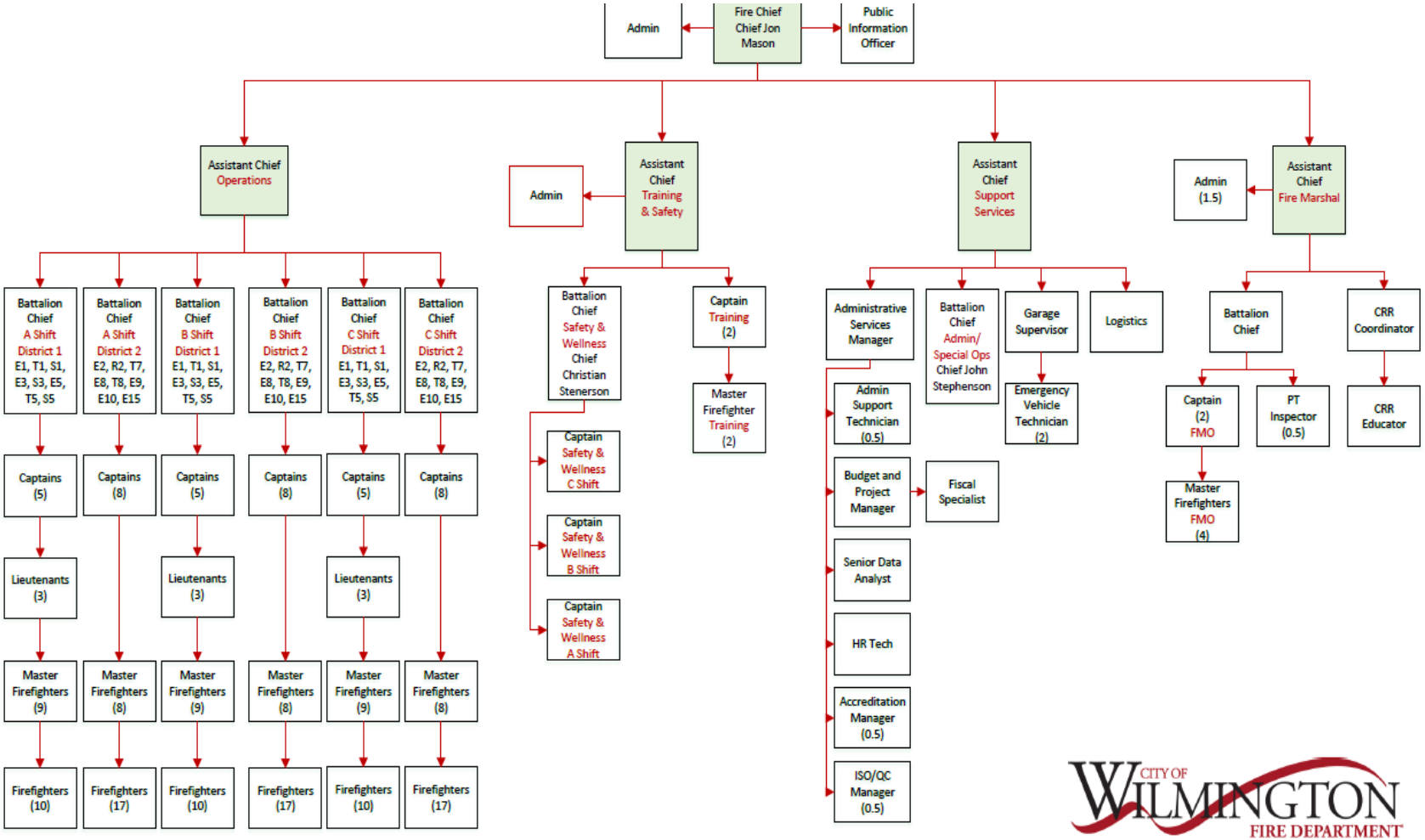
Safety & Training Division

The safety and training division is managed by an assistant chief of safety and training. The primary functions of the division include on-shift incident safety captains and overall responder safety programming, training which includes recertification and continuing education, recruit firefighter academy, as well as promotional and new recruit hiring processes. The assistant chief of safety and training is directly responsible for the oversight of the following:

Training

- 1 Battalion Chief of Safety and Wellness
- 3 Safety Captains
- 1 Training Captain
- 2 Training Master Firefighters
- 1 Travel and Fiscal Support Technician

2023 Wilmington Fire Department Organizational Structure Chart



CITY OF WILMINGTON
FIRE DEPARTMENT
Serving and Protecting Wilmington since 1897

Edited
January 11, 2023

Services Provided by Division

Operations Division

The department is an all-hazard response organization. The department has identified multiple risks and developed a response strategy based upon these risks. The services provided are not only for the protection of the residents of the city but also for the visitors and people that work in or attend facilities within the city. Many of the services provided to the citizens of Wilmington are also extended to the surrounding areas through automatic and mutual aid agreements and contracts.

All emergency service organizations in New Hanover County, which includes the City of Wilmington, are dispatched to calls for service through the New Hanover County 911 Center. The department, in union with other fire departments in New Hanover County, has developed response plans for the delivery of service based on the level of risk as well as the availability of resources. Once a call for service comes into the 911 center, the location and nature of emergency are determined. The incident is assigned to the appropriate agency dispatch console for processing and the dispatch of proper resources. As soon as the nature of the event is determined, a nature code populates into a Computer Aided Dispatch System (CAD), a predetermined response plan is identified which allows the dispatcher to select the recommended unit(s) necessary to meet the first alarm assignment for the agency. Dispatch then occurs by an automated system which requests units based on the predetermined response plan.

The fire department response plans for both fire and non-fire incidents are developed around the nature of the event and risk level. The response plans built into the CAD system are identified by category and assigned a value from F1 through F26. These response plans are utilized to determine the correct unit types and number for the initial response to the incident.

All front-line engines, trucks, and rescue units are staffed daily with a minimum of 3 personnel except truck 1, which is tractor-drawn aerial and has a minimum staffing of four and rescue 2 which has a minimum of four as well. The department in 2022 also began a squad program and currently runs 3 squads which are staffed with one officer and one master firefighter. These units are added in parts of the city with high EMS related call volumes to provide a more efficient and measured response to EMS incidents in lieu of an engine or truck company. The other apparatus are staff with an officer, master firefighter/driver (two master firefighters or firefighters on truck 1), and a firefighter. Qualified personnel are allowed to work in these capacities when the regularly assigned person is off or unavailable. The department also utilizes, a battalion chief for each of the two districts and a shift safety officer who responds to incidents throughout the city and county.

On rare occasions, when multiple incidents occur simultaneously, or a large event occurs that taxes the department’s resources, the department has automatic mutual aid agreements which allow for back-filling of stations on request. The department also utilizes technology to text, leave voicemail, or otherwise notify personnel of events requiring a return to duty.

To provide an overall level of service that is both effective and efficient, the department utilizes personnel that have been specially trained in areas such as hazardous materials, technical rescue, marine rescue, and marine vessel operation. In addition to these special response units, all uniformed personnel are certified EMT-basic, NFPA 472 hazardous materials operational level, and trained in basic rescue including vehicle extrication.

By far, the majority of calls for service originate at the 911 center. When a call comes in, the call taker answers the phone to begin the process of obtaining information from the caller to determine the nature of emergency, caller information, location of the event, and structure or vehicles involved. The call taker forwards the incident to the proper dispatcher console for dispatching the resources. The dispatcher determines the nature of the event, the priority level, verifies the location, and then enters sufficient data into the CAD system to enable the system to determine the nature code which determines the correct unit type, correct number of units, and any additional resources necessary for the event. These unit recommendations are the result of predetermining what resources are necessary for each category of risk and incident type. All walk in and discovered incidents are processed through the 911 center as well typically via radio communication from personnel.

The department currently has one response plan. The response plan contains approximately 77 nature codes. Each nature code, in turn, has from 5 to 17 determinants ranging from A-1 through E-1, with the "A" determinants indicating a lesser priority and "E" representing a critical need for a response. Each of the determinants has a predetermined unit recommendation which informs the dispatcher of the correct units to be dispatched on the call for service.

For all moderate structure fires within the city, there are a minimum of sixteen personnel deployed on the initial dispatch. The resources include 3 engine companies, one truck company, one rescue company, one squad, one battalion chief, and one shift safety officer. Except for the battalion chief, safety officer, and squads, all units are manned with a minimum of 3 personnel.

The ERF deployment provides resources that allow for a combined minimum of 7,500 gallons per minute pumping capacity. Most fires are residential and require only one engine to pump, a minimum of 70 feet of elevating platform with water flow, and one rescue unit with sufficient rescue equipment and lighting capability.

Emergency Medical Services

The level of EMS service has changed throughout the history of the department. Earlier history indicates that personnel were all trained in first aid and CPR. In the early 1970's, the first EMT's were certified in the department and began to provide EMS transport service. In the latter 1970's, some of the EMT's were trained and certified as EMT Intermediates. As the need for more advanced levels of service and service for the entire community became necessary, New Hanover County became responsible for providing a countywide EMS system. As the level of service evolved into paramedic/advanced life support, the county contracted with New Hanover Regional Medical Center to provide countywide paramedic level EMS service. New Hanover Regional Medical Center was sold and now Novant operates the EMS pre-hospital care system.

Currently all uniformed personnel of the department are trained and certified as EMT Basics by the State of North Carolina. All front-line apparatuses are equipped with materials and supplies necessary to provide basic life support (BLS) until an advanced life support (ALS) unit arrives to the patient. The department responds to high acuity calls as a first responder type of medical provider. The department operates under the North Carolina EMT Basic protocols which are amended and approved by the Medical Director of Novant EMS.

The department currently has one Emergency Medical Dispatch (EMD) response plan. The response plan contains 34 nature codes. Each nature code, in turn, has from 1 to 50 determinants ranging from O-1 through E-1, with the "O" determinants indicating a lesser priority and "E" representing a critical need for a response. The department responds along with Novant EMS to

medical calls that are categorized by dispatchers at NHC911 using Pro-QA or by request of EMS due to long responses or the need for additional personnel. The EMD is reviewed bi-annually.

The department also has several members who are cross trained in tactical EMS response and are members of the city's SWAT team and can deploy in support of the police department as SWAT medics. These individuals must maintain additional credentials and attend training and experiences with the police department to maintain their position on the team.

Vehicle Extrication

Accidents involving an entrapment or confinement situations are often complex and require more than a single engine company response. With these incidents, specialized equipment is utilized to stabilize the vehicle(s) and remove the vehicle from around the patient. There are often fluid spills associated with these accidents which must be contained and controlled. Additionally, any potential sources of ignition must be recognized and eliminated. Traffic control is a function of the police and there is always at least one advanced life support EMS unit on the scene. The department has established a response plan for these types of accidents that requires an engine company, a truck company, a rescue company, a battalion chief, and a shift safety officer. Additional resources are deployed as requested by the incident commander.

Special Teams

The department, as stated earlier, is an all-hazard organization, and not only provides response service to fires and emergency medical incidents but also responds to incidents involving trench collapse, hazardous materials releases, marine incidents (rescue, recovery, and fire), and tactical rescue emergencies such as high angle rescue, confined space incidents, and collapse situations. For these types of events, the department has created and maintains special teams of cross-trained firefighters to respond to and mitigate these incidents. The teams include the hazardous materials team, the technical rescue team, and the marine response team. Some of the firefighters are trained in multiple disciplines of special response. These responders are within the operations division, but the programs are managed by a BC of special teams who is in the support division.

Technical Rescue

In most cases, the first response to a technical rescue type of incident involves the first due engine for the location of the incident. All line firefighters have been trained to be aware of the inherent risks involved with collapse, confined spaces, and entrapment situations. All firefighting personnel are familiar with ropes, knots, mechanical advantage, and operations involving these types of events as required in NFPA 1001 for the firefighter II certification level.

The technical rescue team provides rescue capabilities for the city in several disciplines. The disciplines covered are high angle, confined space, trench, and structural collapse. The team has between 12 and 15 members assigned to each shift with 7 of them predominately assigned to station 2. Station 2 houses rescue 2, the city's heavy rescue company and an additional truck and trailer equipped with specialized rescue equipment. All tactical rescue team members are also a part of the North Carolina Task Force 11 (NCTF-11) which responds in an initial area of eight surrounding counties but can be requested and deployed state-wide. The NCTF-11 is a joint operation supported by the department and NHCFR. Depending on the nature of the event, a local response for the tactical rescue team would consist of engine 2, rescue 2, and additional technical resources from station 2 or the county as needed. Once these units arrive on scene, their assessment of the situation would determine the need for the rest of the on-duty team members. The standard for the department is to notify NHCFR that an incident has occurred and request

that they stand-by until the incident is terminated. Emergency management also deploys personnel for logistics and finance functions during an extended event.

When a response for NCTF-11 is received, the initial response includes on-duty personnel from the department and NHCFR. The required initial response is twelve personnel in the first twelve hours and an additional twenty personnel during the first twelve hours that are not part of the initial response. The total number of personnel is 37. This team is expected to be enroute to the incident within one hour of the request for assistance. The expected duration of the team response is 72 hours. The team must have the ability to be self-sufficient for this period of time. In the event of a NCTF-USAR response, off-duty team members will be utilized to back-fill station 2 as well as provide resources for a second wave of response as needed.

Hazardous Materials

North Carolina general statutes and the City of Wilmington municipal codes provide authority to the fire chief in having jurisdiction to respond to and mitigate a release or potential release of a hazardous material. The department provides this service to citizens by requiring all line firefighters to be trained to the operations level as defined by OSHA, as well as the N.C. Department of Insurance State Fire Marshal's Office. In addition, the department has created and maintains a hazardous materials response team equipped and trained to deliver technician level of response to these types of events. The team consists of 30-six technicians and specialists distributed between 3 shifts with eight technicians on each shift, predominately assigned to station 5.

The hazardous materials team provides technical assistance and response/mitigation within the city as well as Southeastern North Carolina. The team is one of several regional response teams strategically located throughout the state. When a request for assistance is received by the state, the state contracted team within the assigned area responds as predetermined by the contract. The hazmat team, identified as Regional Response Team 2 (RRT-2), covers an area including 7 counties in Southeastern NC. RRT-2 is based out of station 5 which is closest to the highest risk areas of the city for hazardous materials at the state port. Station 5 houses RRT-2, as well as two support trucks and trailers with equipment.

Local Response

A local or city response may be initiated by information obtained from a call into the 911 center or by an incident commander on the scene. This requires engine 5 and truck 5 to be placed out of service and those personnel respond with the RRT-2 truck and support vehicles. Typically, these units respond with a minimum of six personnel. If the scale of the event demands, on-duty haz-mat personnel from other stations will respond to the scene. If the event is of such magnitude and duration as to impact the services to the rest of the city, additional manpower is called back to duty. The city can also request a regional response, if necessary, from the state which could send RRT resources from other teams across the state to the city.

Regional Response

Regional responses require that RRT-2 and the support vehicles, as necessary, respond with a minimum of twelve team members. In the event of a regional response, a callback of personnel can be accomplished if necessary to backfill and place engine 5 and truck 5 in service and maintain the level of service indicated. If necessary, personnel from one of the other regional teams may be requested to respond. Technical assistance is available locally and regionally in the form of telephone conferencing and/or two to four-person responses as advisory/monitoring teams.

Water Rescue/Marine

The marine team responds to water-based emergencies and requests for service within and around the city. This team trains and responds to emergencies on the Cape Fear River, the Northeast Cape Fear River, the ICW and the Atlantic Ocean. These large bodies of water are the primary reason for the existence of this division, although there are multiple smaller creeks, ponds, and lakes within the jurisdiction. This team consists of fireboat 1, marine 1, marine 9, and a dive support truck based at headquarters. This division consists of a team of personnel who are qualified divers and boat operators.

Fireboat 1 primarily serves the district 1 response area of Wilmington and is docked along the Cape Fear River. The crew responsible for manning this boat is housed at fire headquarters. Fireboat 1 is a 50-foot fire/rescue boat capable of flowing over 6,000 gallons of water or foam solution per minute. It initially responds for fire suppression and rescue emergencies but can also be used to supplement water supply for large scale land-based incidents. Initial response within its jurisdiction is with 3 to four personnel trained in marine firefighting and water rescue. The boat is frequently used in the Cape Fear River as a platform for dive operations as well.

Marine 1 is housed at fire headquarters. It is a 16-foot hard bottom inflatable boat that is used for water rescue and recovery. It constantly remains on a boat trailer, so it can be mobilized to any location as needed quickly. Marine 2 is currently being replaced with a new 24-foot aluminum landing craft style boat that is scheduled for completion in the winter of 2024/2025.

Marine 9 is housed at station 9. It is a 16-foot aluminum boat that is used for water rescue and recovery.

The dive support unit is housed at fire headquarters. It is a large box truck loaded with the departments SCUBA equipment. Personnel on the team are trained and certified SCUBA divers. Most of the team members are stationed at fire headquarters to facilitate responses using the dive truck and the fireboat or marine 1. The team responses range from water rescue to body/property recovery. The team responds to all areas of the city and is requested to support the county at times and frequently interacts with federal resources such as the U.S. Coast Guard.

Fire Marshal's Office

The FMO of the department is established by the North Carolina General Statute 58 Article 79 and the North Carolina Fire Protection Code, Sections 103, 104, and 105. In addition, regulations are set forth in the City of Wilmington Code of Ordinances, Sections 3-16 and 3-17. The division consists of one assistant chief, one battalion chief, two captains, four master firefighters, one CRR coordinator, one public and life safety educator, one part-time inspector, and two administrative support personnel. All duties and responsibilities are considered non-emergency. These duties are separated into four categories, which include: code enforcement/inspections, plan review, fire investigations, and CRR.

Code enforcement and inspections, as required under North Carolina General Statutes GS 58-79-1 and GS 58-79-20, are performed for all businesses and commercial occupancies, public schools, and multifamily residential buildings within city corporate limits. Inspections consist of building familiarization and noting any fire or life safety hazard present in the building. If a hazard exists, it shall be corrected in a timely manner. This is determined by the fire code official performing the inspection. These inspections rotate on various schedules as mandated by the North Carolina State Building Code: Fire Prevention Code Section 106. These inspections are performed at intervals established by code.

Construction plan reviews are completed for any new commercial or multifamily development. Plans for commercial renovation are also reviewed by the division. During the plan review process, the fire code official is focused on making the building safer for emergency responders and the public. After the plans are approved by the fire code official, the construction project may begin. All public safety concerns must be addressed during the plan review process. Other plans that are reviewed by the department are fire alarm systems and fire sprinkler systems.

Fire investigations are performed by certified investigators within the FMO. Investigations are categorized as incendiary, accidental, or undetermined. Investigators are mandated to determine the cause and origin of all fires, regardless of the category. During an investigation, circumstances may reasonably deem a fire suspicious or incendiary. If deemed an incendiary fire, the FMO works closely with area law enforcement to complete the investigation. The desired outcome for any incendiary fire is an arrest and conviction of the responsible party.

In conclusion, the FMO of the department performs many functions. Those described in the above are a brief description of the responsibilities that department employees are tasked with completing. They are the main non-emergency duties and responsibilities of these personnel.

Community Risk Reduction (CRR) and Public Education

The CRR component of the FMO is comprised of a civilian coordinator and public and life safety educator along with the support of 3 firefighters from the line. Each of the 3 firefighters is reassigned to the CRR division one day a month plus one overtime day per month as needed. This division exists to develop, manage, and maintain department wide and company level risk reduction strategies. These strategies help ingrain the department as well as partner agencies and organizations throughout the city as measures of prevention, mitigation, and preparedness.

The department engages in CRR, which is a process to identify and prioritize local risks, followed by the planning of relevant programs and outreach events, and then strategically integrating resources (emergency response and prevention) to reduce the occurrence and impact of those identified risks. The department recognizes that each individual station's specific risks require individual risk reduction strategies, therefore station personnel work with the CRR coordinator to develop strategies, activities, and outreach opportunities focused on mitigating pre-determined risks within their territories. Recognizing that diverse groups live and work in the city, programs and activities are created to address individual risks with the needs of each audience in mind. The department's CRR focuses on establishing community relationships, maintaining interdepartmental relationships, and preserving positive and relevant community involvement within each station's territory.

As one of CRR's 5 E's of prevention, public education outreach is coordinated by the CRR coordinator and delivered to the public via the public and life safety educator and 3 reassigned line firefighters and all fire companies across the 3 shifts. All employees of the department are considered educators and are responsible for providing fire safety education to the public when called upon. Education is presented to the public and businesses in a variety of ways as to meet the needs of each learner. Some of the different types of public education consist of, but are not limited to fire extinguisher training, fire safety presentations, gear demos, home fire escape planning, fire drills, safe kitchen/cooking demonstrations, fall prevention, and hands only CPR training. Recently, one of the biggest successes has been to create resource fairs in areas where high call volume combines with socioeconomic demographic factors to present a high risk to the department. These resource fairs bring social resources right to the neighborhoods and locations where people need them.

VIII. All-hazard Risk Assessment of the Community

Introduction

Within this section, the intent is to assist the reader in understanding the community risk analysis processes utilized as well as the scope, complexity, and the evaluation methodology to measure the risks. As related to the tenth edition of the CFAI SOC, this analysis required that we analyze not only the physical aspect of risk but also the economic, sociologic, and demographic aspects of risk.

We also needed to not only look at the structural fire problem but also the non-structural and non-fire related risks, inclusive of emergency medical, marine, inclement weather events, technical rescue, and hazardous materials incident potential and historical data. These risks include fixed facility events as well as transportation risks such as marine vessels, rail carriers, cargo trucks, aircraft, and pipelines.

Factors affecting these risks could also be street connectivity, traffic volumes, structure size, on site processes, seasonal factors concerning summer visitors and weather issues during certain times of the year, as well as special events which draw large crowds into the city. Building and population densities were evaluated in order to adjust response plans according to anticipated exposures and life safety risk.

The department developed a building matrix composed of the critical components in construction and associated hazards. A risk level score based on building class and property use was assigned to prioritize the different occupancies. We have identified this process as an Occupancy Vulnerability Assessment Profile (OVAP). Other known hazards in these occupancies were also considered at the time of the risk level assignments.

The department was able to perform an assessment on approximately 3,493 single occupancy buildings as well as approximately 823 multi-occupancy structures. The department has determined that it will utilize the risk factor rating to prioritize the completion of Pre-Incident Surveys of these occupancies.

There are approximately 10,150 occupancies listed in our record system. This includes current occupancies, temporary permits, vacant occupancies, and 155 demolished facilities. There is currently no mechanism in place to remove occupancies no longer in existence or occupancies which were of a temporary nature such as special events and tents.

Along with the structure fire risk, it was necessary to look at the non-structure fire related risks such as other fires, emergency medical incidents, hazardous materials, technical rescue, marine related, potential terrorist events, as well as weather related risks. As addressed in the other sections of this document, the department provides a service response to all these types of events at some level.

When the decision to evaluate the structure fire risk was made, we decided to look at the city overall and then break the risk down to a station first-due response area level. These area levels were identified as zones and sub-zones for response planning as well as risk analysis. We then determined that we needed to look at facilities identified as special risk in a different manner than the other occupancies. These occupancies were evaluated as an entire site complex rather than individual structures due to the amount of risk and resources that may be required to mitigate an event.

Physical Risk Factors

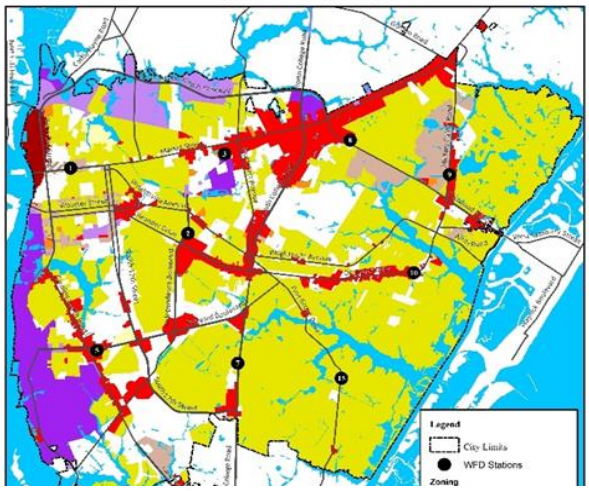
The review of physical risk factors requires understanding and documentation of those features which may increase demand, adversely affect the capability of the agency to respond, increase the probability of an emergency, or increase the consequences of life safety and economic impact upon the community served.

Geospatial Characteristics of the Service Area

The department's risk analysis is based on several relevant factors. For instance, the cost benefit ratio also had to be considered. Is the likelihood of an event occurring significant, and if an event occurs, what is the level of loss to be incurred by the community?

One of the key elements that was considered for the overall risk was land use. As illustrated in the "Wilmington Zoning Map", approximately 75 percent of the land in the city is single family residential use; the remaining land use is commercial, business, industrial, mixed use, and multifamily.

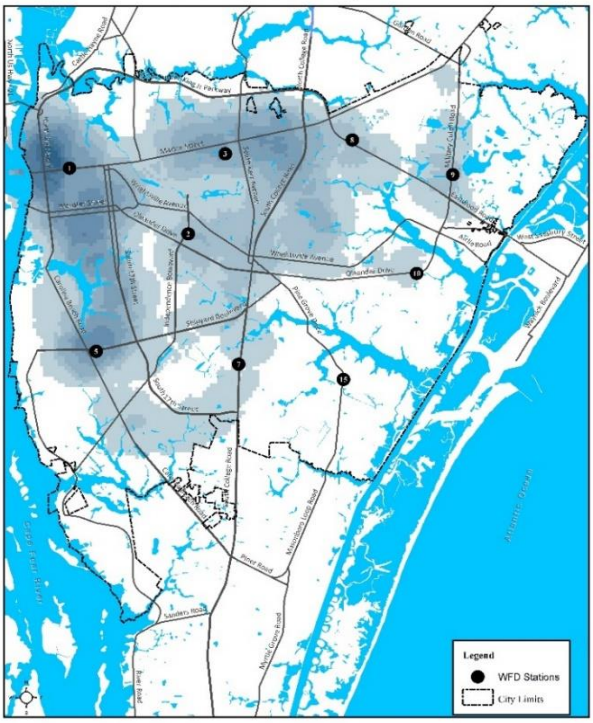
Wilmiington Zoning Map



Traditionally, the higher population density and the higher building-to-land ratio has been in the downtown business area, central, and southwest parts of the city, which include station areas 1, 2, 3, and 5.

Other pockets of high-density trend towards current land development patterns. As the land becomes scarcer in the city, developments look to maximize density on vacant lands. These are clusters of multi-family developments causing higher population counts, including the University of North Carolina at Wilmington student housing. These clusters of high-density development are located throughout the city now, but are increasingly appearing in station areas 2, 3, 8, 10, and the Riverlights area, home to future station 6.

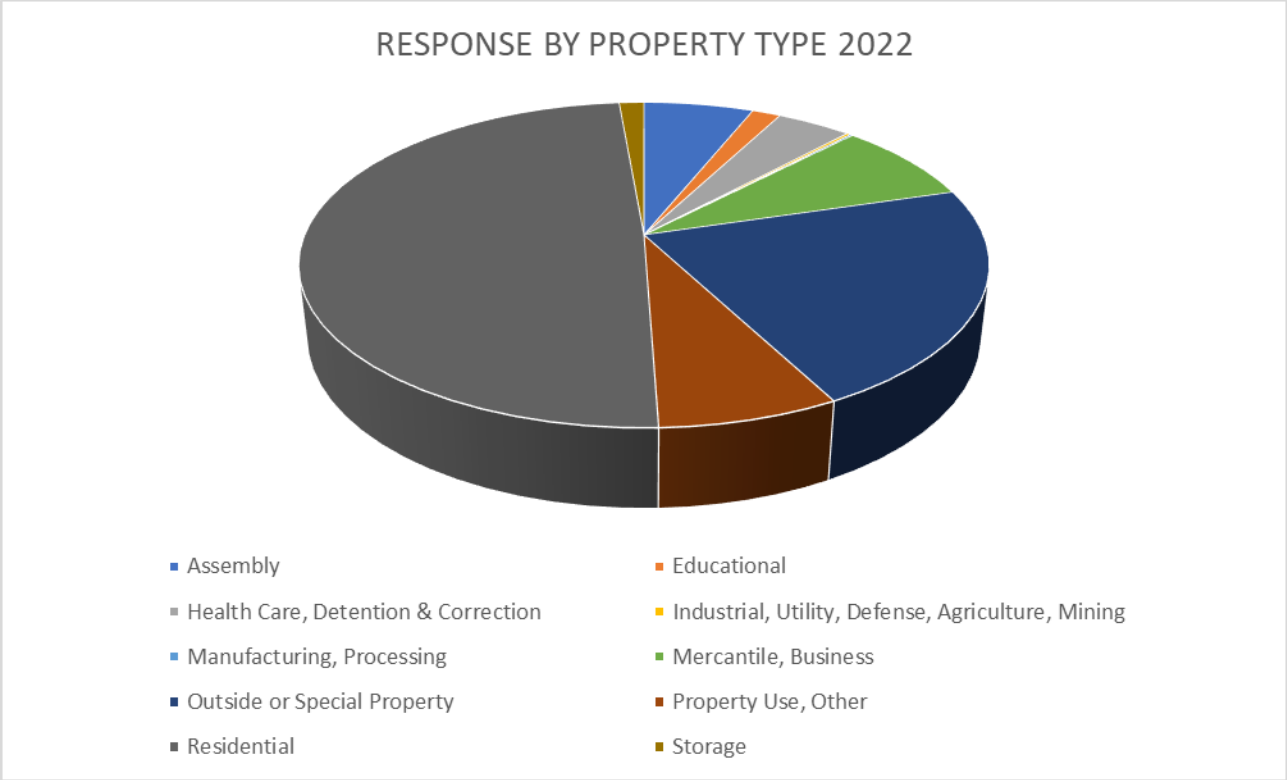
All Calls 1 Year Hotspot



When evaluating the risk potential, it was also necessary to look at trends or patterns in the location of where most of the events occur. The "All Calls 1 Year Hotspot" depicts service demand for all incident types. As represented in the distribution graphs earlier, higher demand for service areas do not change significantly from year to year, and therefore allows for some expectation that the future workload will be somewhat similar to the current workload. The maps validate the positioning of resources based on demand and concentrations of events. Future

deployment modeling will be able to evaluate the need for additional resources based on this analysis.

Another consideration in the risk analysis was the type of properties where the incidents occurred. Nearly half of all incidents occur in residential use properties, either single-family or multi-family. The second highest percentage of incidents occurs in outside properties which include transportation incidents, as well as on open land such as parks, woods, and other undeveloped properties.



As the department moves forward with risk analysis and programs involving CRR, consideration is given to these types of property uses and on ways to reduce the number of incidents within them.

Political Boundaries

The City of Wilmington exists by the authority granted in Article VII of the North Carolina Constitution, allowing the General Assembly to provide for the organization and government of counties, cities, and towns. The city is governed under the council/manager form of government. Council consists of a mayor, mayor pro-tem, and five council members.

North Carolina General Statute § 160A-291 authorizes a city to establish, organize, equip, and maintain a fire department, and to prescribe the duties of the fire department. The city is adjoined on the eastern side by the incorporated town of Wrightsville Beach. The other 3 sides of the city adjoin the unincorporated areas of New Hanover County.

Growth Boundaries

The City of Wilmington is considered a mature city in that its available land has been approximately 92% developed. Current and future land use plans emphasize redevelopment and infill development. Previously, the city relied on annexation for growth and the need for increased service delivery. In 2011, the state legislature removed the existing annexation statutes and passed legislation which had a tremendous impact on the city's ability to grow. The city currently has only one annexed area that required additional service delivery resources. This is the area known

as Riverlights. An additional fire station is being constructed here now with plans to finish in late 2024. The development of that tract has been delayed due to the downturn in the economy resulting from Covid-19, however it has rapidly restarted in the aftermath of the pandemic. Since 2011, there have been a few smaller areas annexed into the city by developer request, but they have not resulted in a reallocation or increase in resources. These island or remote annexations are provided first due emergency services by New Hanover County Fire Rescue.

Construction Limitations

There are construction limitations within the city. To delve into them in detail in this section would be time prohibitive other than to state that the regulations do exist and can be found in the City of Wilmington's "Full Land Development Codes" specifically Article 5, Zoning District Regulations and Article 14, Public Infrastructure. These sections cover such topics as water/sewer, storm water, set-back and buffer requirements, building height, development density, land uses, etc. These regulations are often based on the land use zoning such as residential, central business, office and institution with additional subzones and special use permits and exceptions. However, it should be noted that variances or ordinance amendments are common occurrences resulting in many permitted exceptions.

Infrastructure Limitations

Every few years, the city has traditionally reviewed and updated a strategic plan which establishes the goals and priorities of council. The city management team, in turn, develops annual strategic business plans which present the methods by which each individual department operates as well as actions undertaken by the departments to accomplish the goals set by the council in its multi-year strategic plan.

The development services department has the main responsibility for infrastructure. They perform services involving streets, sidewalks, bikeways, lighting, traffic signals, etc. The water and sewer services were transferred to the newly established Cape Fear Water and Sewer Authority in 2007-08. This authority consists of an 11-member board which includes two representatives from both the Wilmington City Council and the New Hanover County Commission. The remaining members are appointed by these governing bodies.

Response Barriers

The city is a coastal community and is bordered on the east by the ICW and to the west by the Cape Fear River. These waterways do not create a natural barrier to the responding units as these are the city limits on these sides. The true barrier to the department's responding units would be man-made, such as poor connectivity to neighborhoods and large tracts of land for parks or schools.

The city does recognize the need for improved transportation networks and has allocated significant funding for sidewalk improvements, trailways, and roadway repairs.

In the 2004 transportation study, the major traffic corridors were graded primarily as D, E, and F according to the national Research Council Highway Capacity Manual rating system. This rating indicates that these roadways are deficient in their ability to move traffic at an acceptable level. The WMPO and the city have worked closely with the NCDOT and several major infrastructure projects are planned in the city between now and 2030. These include extensions of Independence Blvd to the Martin Luther King Jr. Highway and a major intersection revision to Eastwood Rd and Military Cutoff Rd. The NCDOT has also worked with the city to install traffic preemption devices. The first phase of the project is complete, but forward progress is slow.

Elevation Changes

Most of the city has an elevation between twenty and forty feet above sea level. This degree of change does not pose any increased risk for responding units and the ability to control an event. Some of the properties along the banks of the inland waterway and the river could be, and are occasionally, impacted by storm surges. The potential for more significant rises in the water levels is real and could have a potential impact on service delivery at some point in the future as sea level rises.

Open Space/Interface

The city has a long history, and as such, has seen development through the years. Approximately 92 percent of the land capable of being developed has been therefore, there is only minor interface between open areas and developed ones. The only real issue with interface would involve the fact that many areas, although developed, have a substantial number of trees remaining or replaced by the developer.

Transportation Risk Factors

The road system is one of the most important factors that affect the ability to deliver needed resources to the scene of an emergency. The traffic flow pattern, number of vehicles, connectivity, traffic calming devices, and the ability of vehicles to yield to emergency vehicles all affect the service delivery of the fire department. The following pages describe in more detail the transportation network within the city. This information was gathered directly from the city's Future Land Use Plan adopted in 2004.

History & Overview

The city has experienced a steady increase in population and employment growth within the last twenty years. The city has grown from a generally isolated and small city to a medium-sized city with regional attractions. The city is expected to continue to be an attraction for potential residents and employees due to its climate and amenities as well as a tourist destination. Since the city is nearly built out, there are limited opportunities to build new roads. In addition, the city's land use patterns are auto dependent, the street network of arterials, collectors, and local roads was poorly planned, and there is a limited use of the other modes of transportation, such as walking, bicycling, and public transit. Although the city and WMPO have made it a focus to increase the city's walkability, by providing new sidewalks in many parts of the city. The city has also funded several trail projects that will eventually connect city parks and downtown to the Wrightsville Beach area.

Traffic congestion was one of the most important issues identified at the citizen input meetings during development of this original plan and during the strategic planning sessions in 2022 it remained a common concern, and it should be noted that traffic congestion has been one of the biggest concerns of Wilmington residents for years. Other transportation-related issues identified at these meetings were poor traffic circulation or connectivity, lack of vision from public officials concerning the relationship between development and traffic flow, unsafe and insufficient bicycle and pedestrian facilities along the major corridors, and the provision of an accessible and efficient transit system.

The city streets form a hierarchical network much like the vascular system of the human body composed of arteries, veins, and capillaries, which work together to supply oxygen. Similarly, our street network must function to provide mobility to the entire city and region. The components of this street network are commonly referred to by their functional classifications. Functional

classifications encompass both the design characteristics of streets and the type of service the streets are intended to provide. Traditionally, functional classification forms a hierarchy of streets. The functional classification ranges from major routes designed to move large numbers of vehicles quickly through the region (major thoroughfares or arterials), to streets intended to provide a greater balance between mobility and access to residential, commercial, and industrial areas (minor thoroughfares or collectors), and to those that are primarily for access to homes (local streets). The functional classification system acknowledges that individual streets do not act independently of each other but form a network of streets that work together to serve travel needs on a local, city-wide, and regional level.

Unfortunately, the city's streets do not function like a traditional system. The arterial and collector streets that provide connections to our activity centers and other major destinations need improvements to improve traffic flow. The primary role of our arterials and thoroughfares is being compromised. Simply stated, land use and development patterns have created too many driveways and access points along these roads causing traffic congestion and unsafe conditions. In addition, we have very few collector roads. As a result, many of our local streets must act as a collector, creating excess traffic in residential neighborhoods and unsafe conditions in many instances. This lack of neighborhood collectors has contributed to the creation of many locations that must now be considered for traffic-calming solutions. Because of the lack of vacant land and the expense of acquiring the right-of-way, it is unlikely that we will be able to expand the capacity of our road system by building new roads. Therefore, we must better manage the capacity of our existing road system.

In lieu of a reliance on building new roads, we must improve our roads to serve multiple functions. Strategies to alleviate some of the problems that exist along our arterial and collector streets system may include various access management techniques. Access management is much more than driveway regulation. It involves the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections. It also encompasses roadway design treatments such as medians and auxiliary lanes and the appropriate spacing of traffic signals.

Traffic volumes have grown faster than our infrastructure and our expectations, and consequently our roadway Level of Service (LOS) is declining. LOS is a measure of how well a roadway is performing its function to move people and goods. LOS is expressed by a letter code ranging from "A" for excellent conditions to "F" for failing conditions. The conditions defining the LOS for roadways are summarized in the Appendix and are also discussed in the Level of Service section of this plan. The construction of additional roads or widening of roads is most often not a long-term solution in and of itself. Widening roadways without considering the system-wide and regional impacts often creates what is known as induced demand.

Induced demand is created when additional capacity on a roadway corridor becomes available and is quickly used up by deviation of traffic from other routes and by attraction of additional vehicles when a given location is accessible to a larger geographic area in the same travel time.

The city and the WMPO are placing a high priority on examining the transportation-land use relationship and exploring ways to improve coordination in the decision-making process. The WMPO is currently conducting a long-range transportation planning process and gathering stakeholder input. Tools to implement many of the strategies in this plan, such as retrofitting existing private development access, do not currently exist or are untested in the city. The city also recognizes that it has taken time to grow into what we are today and that any changes to our current

transportation system will take time to implement and will not occur overnight. The strategies contained in this section focus on providing a more effective road network; improving the existing roads; reducing congestion; providing better access to schools, parks, transit stops and activity centers; and reducing reliance on the automobile. *(Future Land Use Plan, Chapter 111-F, Transportation, Introduction, Page 1-3).*

A traffic signal preemption system is currently installed at several intersections throughout the city in locations determined to be necessary through a joint effort with Wilmington PD and NCDOT. Funding for the system was provided by a Surface Transportation Block Grant through the WMPO but more work remains.

Road Preemption

The goal of a roadway network is to effectively and efficiently transport people and goods from one point to another. Land use patterns and development influence this movement. The impacts of other transportation modes (such as air, rail, mass transit, etc.) should not be minimized. The capacity of roads is directly linked to number of lanes, signalization, presence of left and right turn lanes and/or acceleration/deceleration lanes, lane width and shoulders. These design features culminate into the roadway's capacity, or ability to accommodate certain amounts of traffic. The actual amount of traffic on the roadway represents the road's volume. The degree to which the roadway accommodates traffic demand is a measure of the roadway's Level of Services (LOS), which is reflected through a comparison of the volume and capacity referred to as the volume/capacity (v/c) ratio. It is also measured by the amount of delay at intersections along the roadway. In addition to these quantitative measures, roadway LOS is also typically described in qualitative terms that describe the characteristics of traffic flow. Table I provides qualitative and quantitative descriptions of traffic flow LOS standards. These measures are acceptable national engineering standards established by the Highway Capacity Manual *(Future Land Use Plan, Chapter III-G, Level of Service, Roads, Page 2).*

Table 1: Descriptions of Roadway Service Levels

LOS	Traffic Flow	Effect on System Users	Delays at Intersections	V/C Ratio
A	Free	Individual users are virtually unaffected by the presence of others in the traffic stream.	- seconds/vehicle	< to .33
B	Stable	Presence of other users in the traffic stream begins to be noticeable to other users.	5 - 15 seconds/vehicle	.33 to .50
C	In the range of stable	Operation of individual users becomes significantly affected by interaction with others in the traffic stream.	5 -25 seconds/vehicle	.50 to .65
D	High density, but stable level of traffic flow	Speed and freedom to maneuver are severely restricted, and the user experiences a poor level of comfort and service.	25 - 40 seconds/vehicle	.65 to .80

E	Operation at capacity level	All speeds are reduced to a low, but relatively uniform value; comfort and convenience levels are extremely poor and driver frustration is generally high.	40 - 60 seconds/vehicle	0.80 to I
F	Represents forced or breakdown of traffic flow; this condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse that point	Operations within the queues are characterized by stop and go waves, which are extremely unstable.	> 60 seconds/vehicle	>1

Source: Transportation Research Board, National Research Council Highway Capacity Manual.

LOS "D" is generally considered "acceptable" in an urban environment by national standards. LOS of "E" or "F" conditions exist along Market Street, College Road, Randall Parkway, Kerr Avenue, Military Cutoff Road, and Carolina Beach Road. Table 2 shows the LOS for major roads based on 2004 traffic volume counts *(Future Land Use Plan, Chapter III-G, Level of Service, Page 3).*

Table 2: Major Roadway LOS (2004)

Street	Current LOS	Adopted LOS	Status
College Road	**F**	**D**	**Deficient**
Oleander Drive	D	D	Acceptable
Kerr Avenue	**E**	**D**	**Deficient**
Randall Parkway	**E**	**D**	**Deficient**
Market Street	**F**	**D**	**Deficient**
Shipyard Boulevard	B	D	Acceptable
17th Street	D	D	Acceptable
Military Cutoff Road	**F**	**D**	**Deficient**
Eastwood Road	D	D	Acceptable
Carolina Beach Road	**E**	**D**	**Deficient**
Wrightsville Avenue	D	D	Acceptable

LOS is calculated for entire corridors using distance weighted average volume to capacity ratios. The LOS measures shown here are indicative of general conditions throughout the day. Congestion is particularly critical during the morning and afternoon peak periods, or rush hours. Because of their intense commercial development and function as regional routes, some corridors such as Market Street and College Road are congested more hours per day than others. In contrast, corridors such as 17th Street and Shipyard Boulevard, with less intense commercial development

but access to major employment centers, exhibit a much more significant level of congestion during the peak hours and less at other times. *(Future Land Use Plan, Chapter III-G, Level of Service, Page 4)* [1]

Rail Lines

The rail lines run from the city's western limits at the state port and tank farms through the center of the city. The rail line exits the city on a bridge over the Northeast Cape Fear River or along the northern city limit across 23rd Street. Although the map depicts the rail line going out along Market Street, this is a rail right-of-way only and there are no actual tracks in this area.

The Wilmington Terminal Railroad (WTRY) is a 7teen mile short line railroad serving the Port of Wilmington (North Carolina). It began operations in 1986 over lines owned by the North Carolina Ports Railway Commission, whose other lines (at Morehead City) were simultaneously leased to the Carolina Rail Services Company. The company is owned by Rail Link, Inc., a subsidiary of Genesee & Wyoming Inc.,[1] which acquired it from the Rail Management Corporation in 2005.

The North Carolina State Ports Authority commissioned a report that projected the number of trains passing through the city. In 2017 there were 6 trains each way per week averaging 3000 feet in length. Average car length of 65 feet yields 277 cars each way per week, total 14,400 rail cars each way per year. It is approximated that there are now 7 trains each way per week, averaging 6000 feet in length. An average car length of 65 feet yields 646 cars each way per week, total 33,592 each way per year. Commodities transported include chemicals, forest products, pulp and paper products, petroleum products and steel. Roughly 50 percent are loaded with some type of hazardous material (i.e. gasoline, asphalt) and the remaining half are generally comprised of lumber and other commodities. These shipments travel throughout the department's response areas 1, 2, 3, 5, and 8. This includes all of district 1 and a sizable area of district 2. These rail cars arrive and depart throughout the day.

More than 250,000 vehicles cross railroad tracks every day within the city. This in of itself creates a risk, but also an opportunity. A study is currently underway for a massive rail realignment project to move rail traffic out of the city. According to the U.S. Department of Transportation the realignment project is currently undergoing an environmental assessment, however the project itself is yet to be funded.

Airports

The city's corporate boundary is adjacent to the property owned by Wilmington International Airport (ILM) where flights by American, Avelo, Delta, and United Airways operate. In addition, it is home to a couple of fixed based operators (FBO), Aero Center and Modern Aviation Wilmington, which are companies that provide aeronautical services such as fueling, tie-down and parking, aircraft rental, aircraft maintenance, and more. Although this airport is not within the corporate city limits, the department responds through an automatic aid agreement to incidents at this location. Also, some runway paths for the airport send aircraft directly over the city on take-off and approaches. This increases the risk for an aircraft incident to occur within the city as most often incidents happen during take-off or landing.

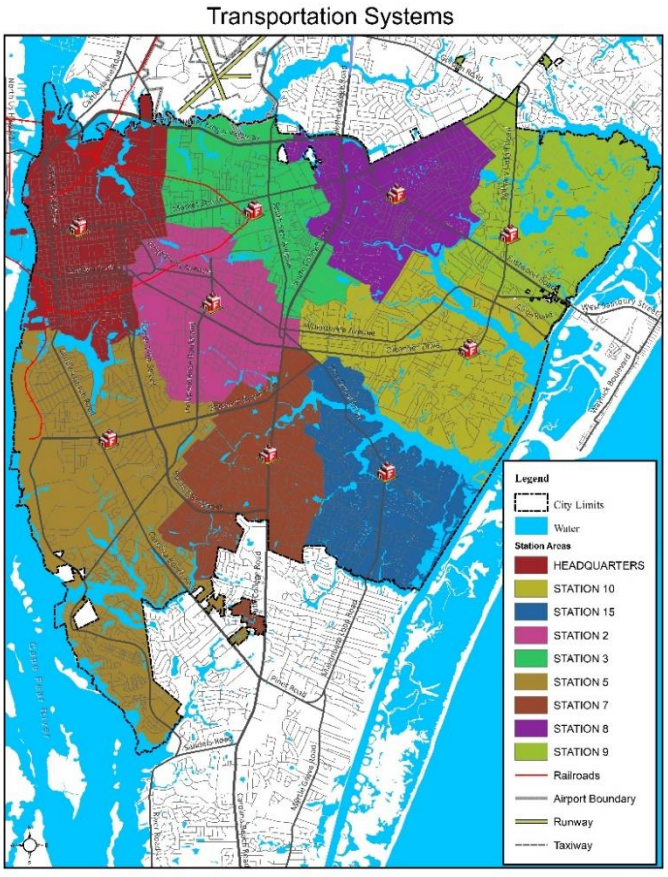
Wilmington International Airport (ILM) has a wide range of aircraft. These aircraft can range from a single engine plane, 10 feet in length, that is privately owned to a scheduled Index B aircraft that is 90 to 126 feet. Generally, the largest of these types of aircraft that arrive and depart is the Boeing 737- 400 which holds 144 passengers and a crew of five. However, there have been many occasions that flights were diverted along the east coast corridor and a larger plane such as the

Airbus 340 (passenger capacity over 300) landed unscheduled due to a medical emergency or some other reason. ILM is also a secondary airport for many military aircraft and the aircraft continually perform touch and go landings here and refueling. Modern Aviation holds a "hot refueling" contract with the U.S. Department of Defense. A variety of military aircraft frequent the airport including, F-18s, Boeing 757 (C-32A) more commonly known as Air Force 2, C-130's, KC-10, KC 135's, F-35B's, CH-53K helicopters, E-2's, V-22 Ospreys, and many others.

The Wilmington International Airport has seen record growth in the months following the pandemic. In 2022, ILM had a record number of passengers pass through the airport, just over 1,000,000 people in one year. A dramatic increase from 2017. The increased traffic has continued, in July of 2023 the airport reported a record month, seeing 72,877 passengers, a 33% increase from July of 2022.

There are no recorded crashes at the airport property. However, in and around the areas there have been a few crashes resulting in death. One was a FedEx plane that crashed into Smith Creek, a local waterway. Another was a two-seat amphibious plane that crashed off Wrightsville Beach resulting in two fatalities. Lastly, was a helicopter tragedy that claimed the life of an off-duty fire captain. By and large, the incidents that occur are mostly medical related and require a diversion to an unscheduled stop.

Wilmington International Airport has designated airspace up to 10,000 feet and assumes communications when aircraft are within a ten-mile perimeter up to this 10,000-foot mark. The airport is governed by the Federal Aviation Regulation Part 139 that classifies ILM has an Index B airport. This simply means that we have more than five departures of aircraft with a length between 90 to 126 feet. Part 139 specifies that the airport should be able to maintain a 1500 gallon per minute water flow rate with foam concentrate that will produce 3000 gallons of finished foam solution. Wilmington International Airport exceeds this ability with the use of two fire apparatus that are each capable of delivering this quantity. They have one 1500 gpm Oshkosh and one 1500 gpm Rosenbauer Fire Apparatus. Wilmington International Airport has mutual aid agreements with New Hanover County Fire and Rescue for assistance with fire suppression.



The "Transportation Systems" map displays the location of the rail lines within the city and shows the location of the airport just north of the city limits. Because some flight paths take aircraft over the city, the department participates in training activities along with the airport response personnel and county fire services.

Waterways

The city is bordered on the west by approximately nine miles of the Cape Fear River and approximately eight miles of the Intracoastal Waterway to the east. The Port of Wilmington receives and ships over 320,000 TEUs (Twenty-foot equivalents) as

of 2022, this is roughly 160,000 40-foot cargo containers. The deep-water port moves more than 2,000,000 tons of general cargo annually. This facility receives product from 32 shipping lines in which 461 ships and one barge annually visit the port with the average turnaround time of twelve hours. Product is imported and exported primarily from China, Great Britain, Belgium, South Korea, and Turkey. The imports are generally chemicals, grains, urea, ore, retail merchandise and the exported materials are generally phosphate, wood chips, agricultural goods, metal products, and military related. Along the eastern border, the ICW is utilized primarily by pleasure craft and vessels of a smaller nature; however, barge shipments, dredge boats, and sizable watercraft also traverse the waterway.

The department has responded to 27 watercraft fires since 2001. These 27 calls generated a response from a total of 132 pieces of apparatus. Five of the calls were located along the Cape Fear River, five were at marinas, six calls within the city (i.e., located on home property), and six calls were located on the ICW. A total of two of the river-based incidents occurred at the state port. Based on the property and content values and losses, since the first documented incident, there has been an estimated loss of $303,000 in property that had an estimated value of $1,433,600 resulting in estimated 21 percent loss.

Of the 27 documented calls, several were significant events. On Saturday, July 14, 2001, a fire erupted on an ammunition ship berthed at the Military Ocean Terminal Sunny Point. The fire erupted in the engine room of the "Edward Carter" at 4:10 p.m. The vessel was operated by the US Navy Military Sealift Command. Firefighting units from Sunny Point and nearby communities in Brunswick, New Hanover, Pender, and Horry counties responded. Heavy smoke poured from the vessel and made efforts to extinguish the blaze difficult. As a precaution at the height of the fire, the US Coast Guard closed the Cape Fear River for four miles in either direction to maritime traffic. The fire was reported extinguished at approximately 10:00 p.m. One body was recovered on the vessel. A second crewman, reported to have jumped from the ship into the Cape Fear River, was reported missing and was later confirmed as deceased. The “Edward Carter” arrived at Sunny Point on June 14th for the loading of prepositioned explosives. The vessel was scheduled to depart for Diego Garcia in the Indian Ocean on July 27th. The vessel was not being loaded at the time of the fire. The vessel carried approximately 1,232 ammunition containers, the equivalent of five million net explosive weights of assorted munitions and missiles. The department provided support using the fireboat by cooling the hull and providing 102 buckets of 3 to 6 percent AFFF foam from the inventory of the city and the state truck.

On March 25, 2007, a fire occurred on the “Y/M Hamburg” docked at Berth 8 of the North Carolina State Ports at Wilmington. Crews arrived on scene to find one shipping container on fire due to the use of a cutting torch. Crews applied water to the container in order to allow the port workers to remove containers and place the container that was on fire onto the ground. The crews then extinguished and performed overhaul on the burning container.

In addition to these events, the department has incurred several smaller events along the intracoastal waterway. A fire that occurred at Bradley Creek Marina on October 31, 2003, resulted in 3 exposures. On July 21, 2012, the department responded to assist New Hanover County Fire & Rescue with a shrimp boat on fire. The department provided personnel and assistance with its fire boat.

On January 19, 2014, the department responded to a 56-foot Sportfisher pleasure boat with both smoke and flames showing on arrival. The boat was docked at the marina at Fish House Grill. Department personnel made a quick knockdown from the exterior, then made entry to perform a

search and check for interior fire extension. Most recently, department personnel responded to a fire on a tugboat that was docked at a marina on Smith's Creek, off the Northeast Cape Fear River. This fire occurred on January 12, 2018. It is important to mention that within the city; the Sector Command for North Carolina United States Coast Guard is located here.

Climatic Impact

Wilmington has a sub-tropical climate. The temperatures generally range from summertime 80's and 90's to winter months of 20's and 30's. The humidity in the summer combined with the high temperatures can have a significant impact on emergency operations. The department has committed to a fitness and wellness program which includes taking measures to reduce the likelihood of a heat related injury to personnel. The cold weather can produce some chance of hypothermia, water line freezing, and hydrant inoperability. There is very little snowfall in Wilmington; however, when snowfall occurs, response times can increase with the occurrence of icy road conditions. Snow accumulation may obscure hydrants from view. Another impact of snow is a decrease in personnel arriving to work when the road conditions are poor, thus reducing the number of personnel on duty or fatiguing others already on duty.

Disaster Exposure

The city has the potential risk of a disaster exposure in both man-made and natural disasters. In terms of man-made disasters there are many potential target hazards in our community.

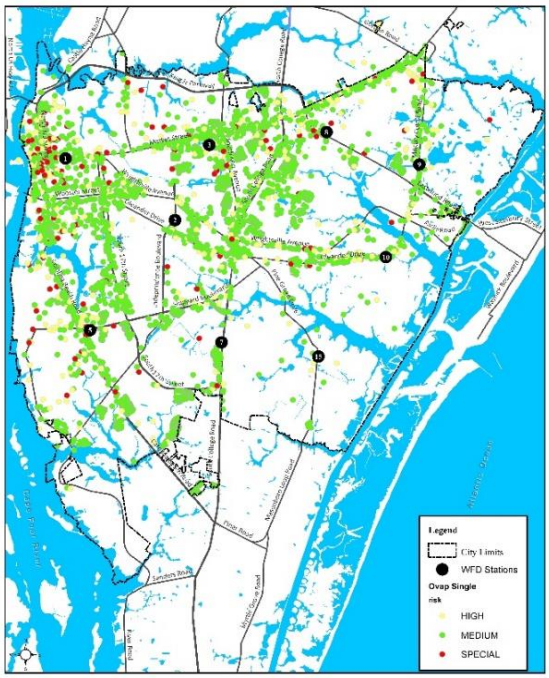
Wilmington is in New Hanover County, which is in the southeastern portion of North Carolina. Within a hundred-mile radius, there are several facilities, terminals, and bases which could be a target for terrorism. The state port and many oil, and chemical terminals are within the city limits. Infrastructure target sites within the city include electrical substations and water treatment facilities. Communication target sites include cell towers, the 911 center, the trucking system, and any of the numerous broadcast facilities. To the North of Wilmington are Camp Lejeune Marine Corps Base and Cherry Point Air Station. To the West of Wilmington are Fort Liberty Army Base and Pope Air Force Base. Located just South of Wilmington are the Military Ocean Terminal Sunny Point and the Brunswick Nuclear Power Plant.

Regarding natural disasters in and around Wilmington, there are atmospheric conditions that create potential disasters. We are subject to tropical storms, hurricanes, and nor'easter storms on a regular basis. We also have severe thunderstorms, lightning, hail, drought and extreme heat conditions as well as the possibility of winter storms and freezing temperatures. Wilmington also lies within a geologic area that has encountered earthquakes in years past. With these geologic disasters, the potential for tsunamis, and sinkholes exists. During any major storm, floods, storm surge, and erosion are a threat.

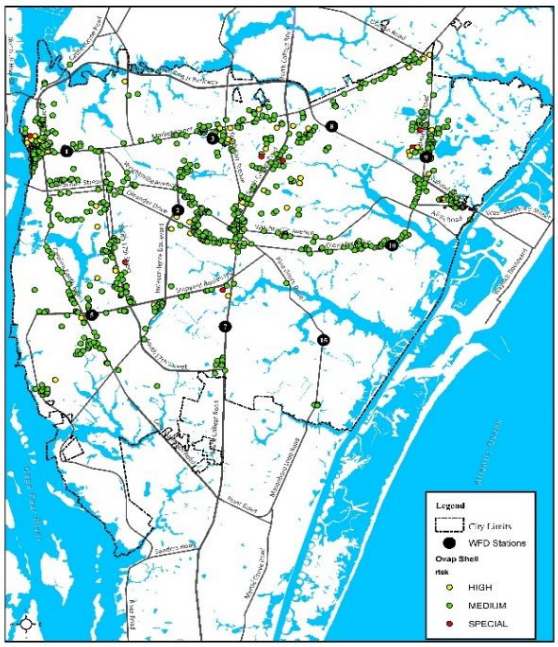
Physical Assets

An essential piece of the building risk assessment was the creation of an Occupancy Vulnerability Assessment Profile (OVAP). The department received a generic format through the North Carolina Accreditation Managers' Group and modified it to assist with the evaluation of commercial structures within the city. The data needed for the OVAP was not available in the department's record management system (RMS), nor could it be obtained from ISO in an accurate format. The decision was made to update the RMS with the necessary information, which took many months to get enough information to provide an adequate reflection on the property status. The collection of this data is an ongoing process. Approximately 3,493 single occupancy and 823 multi-occupancy structures were analyzed to accomplish an overall evaluation of the service area. The results of the scores are illustrated on the OVAP maps and in the risk scores table. The data will continue to be captured and updated for the remaining occupancies.

Occupancy Vulnerability Assessment Profile Scores (Singles)

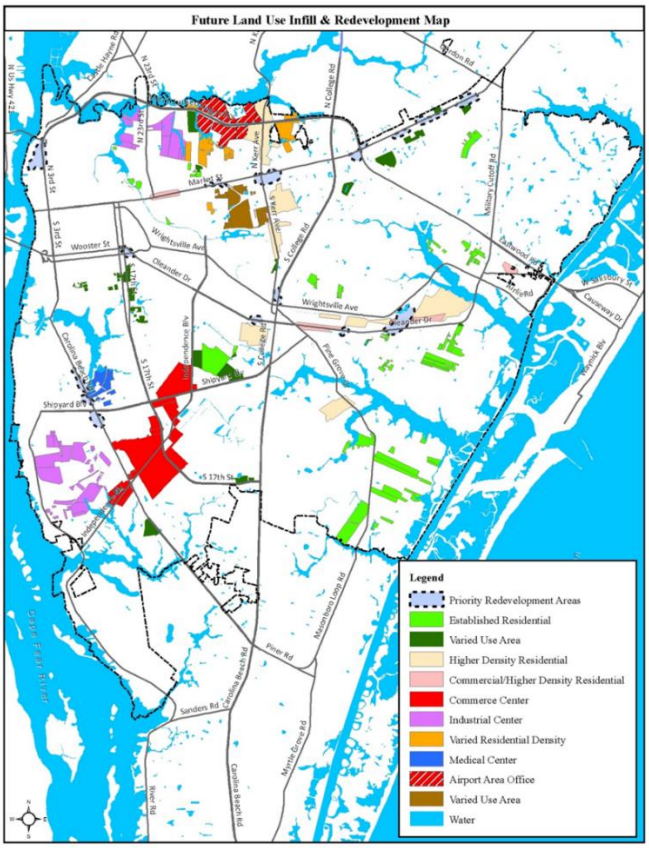


Occupancy Vulnerability Assessment Profile Scores (Multiple)



Upon completion, the OVAP scores were reviewed by the battalion chiefs and the final scores were discussed. The consensus drawn was that very few structures were scored higher or lower than necessary. The agreement of this decision was based on the knowledge the battalion chiefs have of the area, the occupancies, and the history of incidents. In the end, some OVAP scores were either raised or lowered based on the B/C's evaluation. The final scores were critical to determining resource deployment to a structure fire at any one of the buildings. The maps illustrate the distribution of OVAP risk categories for single occupancy structures and multi-occupancy structures. The department utilized the OVAP tool to evaluate the risk on a structure rather than individual occupancies. Therefore, each building has a single score.

Risk Scores	Single Occupancies		Multi Occupancies	
	Number	Percent	Number	Percent
Moderate	3423	98%	745	90.50%
High	47	1.30%	69	8.35
Special	23	<1%	9	1.20%
Total	3493		823	



Future Land Use

The city has a future land use plan that was started in 2013 and adopted by the council in 2016. The comprehensive plan illustrates the goals of the council to establish reasonable growth using both "infill" and "redevelopment". The process of infill is developing the small remaining and very few large tracts of land. Redevelopment is the process of renovating existing structures or demolishing structures and building new ones. The plan projects that by 2040 the population of Wilmington will be around 166,000 people, given the present development and proposed plans the city is on pace to hit that growth.

Risk Assessment Output

The department risk analysis is intended to be comprehensive and analytical. The result of the process is the ability to quantify risks to allow for prevention, mitigation, and response. For a response, the allocated resources must match the level of risk that is present and ensure that the most effective assignment on the scene is provided.

Based on the risk assessment, the department intends to utilize the practice of "differential response", thus providing the correct amount and types of resources to provide for firefighter safety and system efficiency and effectiveness. A small structure such as a detached garage will not require the same deployment as a large multi-family residential structure. The department has operated under this practice to be effective; however, since this analysis is complete, the department will have a better tool to observe the outcomes and any inefficiency.

The department's overall risk analysis included the major risk categories present to the city. The first category is natural events. They include severe weather such as hurricanes, storm surge, flooding, severe thunderstorms, winter weather conditions such as snow, icy conditions, and summer conditions such as drought, excessive heat and humidity, and high winds. For some of these events, the department has established written standard operating guides (SOGs). The department is part of the joint emergency operations center and operates under the plans established for these types of events. The next category of risk would involve man-made or caused events. These would include incidents such as fires, emergency medical incidents such as sickness or injury, hazardous material spills or releases, collapses, cave-ins, vehicle accidents, marine events, aircraft and rail transportation incidents. For these types of risks, the department operates under tactical guidelines as well as other SOGs.

A **distribution** of resources must be available to be able to reach a very large number of events, regardless of how significant they are, over most of the jurisdiction being protected. This is done through the location of stations. **Concentration** is based on an agency's ability to place adequate

resources on any specific risk to keep the event from escalating into a major incident. Therefore, as the risk level increases, the concentration of resources should also be increased. If most of the fires occur in each area, the placement of fire apparatus should be assigned or stationed in this area.

The Occupancy Vulnerability Assessment Profile (OVAP) determined a numeric score which helped to determine the potential risk of a structure. The OVAP score was developed from building characteristics such as exposure distance, construction type, height, square footage, accessibility, occupant load, occupant mobility, alarm systems, exiting, oversight, human activity, experiences, capacity to control, hazard indexes, fire loading, required fire flow, and property loss value to community. Also, consideration was given for the occupancy classification.

The final part of the building risk assessment was to determine the special/high risk occupancies, complete a separate overview of these and determine the unique characteristics which would require a different amount (if any) of resources to be committed during the initial dispatching process. These occupancies included such facilities as the North Carolina State Ports, the tank farms with bulk storage, the hospitals, the university complex, and any high-rise structure. It was critical to closely examine the built-in systems for fire protection and alarm monitoring when assessing these occupancy types.

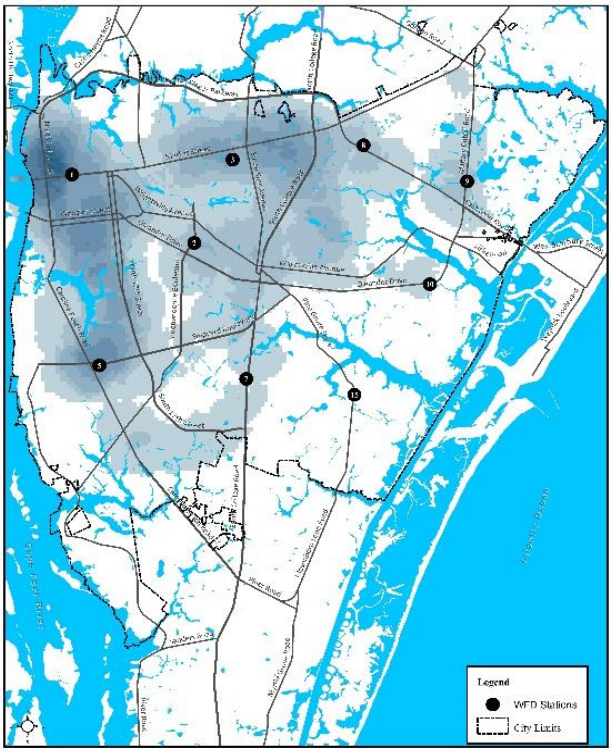
Risk Classification

Within the city, there are areas of higher fire risk and significantly greater demand for services. With this higher level of risk comes the need for concentrations of staffing and resources.

Although most communities develop response plans and performance benchmarks based solely on demand zones with specific population density and call volume, the department developed the SOC based on an overall risk classification identified as "urban". Urban areas are considered those with a population over 30,000 and/or a population density greater than 2,000 people per square mile.

Although the OVAP process identified potential high risks throughout the city, the probability, and the consequence of major incidents in the high-risk areas is so low, that the department deploys resources primarily around the historical demand for service and the population density as reflected in the map "All Calls 1 Year Hotspot". These factors largely influence the decisions on locating future resources.

All Calls 1 Year Hotspot



In addition to the building classification risk assessment with the OVAP the department assessed additional risks and resources needed based on other factors.

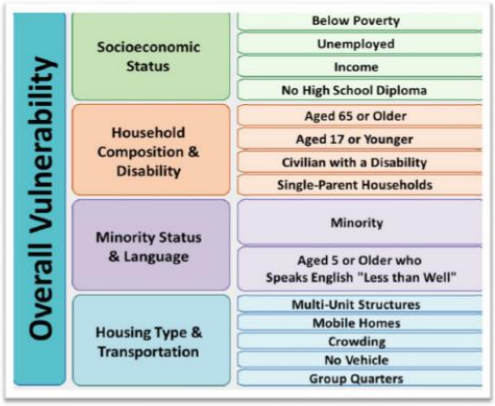
Planning Zones

In 2020, the department set out to identify and create geographic planning zones based on demographic risk factors from Census data and land-use data. The department wanted to identify geographic areas to help focus its community risk reduction strategies and tactics, identifying specific risk areas and grouping them together in planning zones. The department could use these planning zones for focused strategic community risk reduction.

Land Use + Vulnerability = CRR Planning Zones

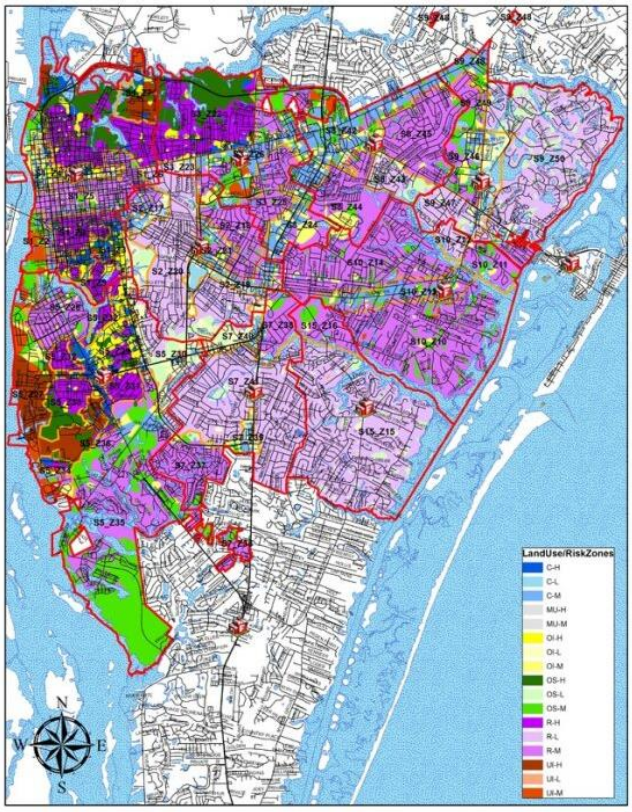
Land Use
Residential
Open Space
Office/Institutional
Mixed Use
Utility/Industrial
Commercial

+



Community Risk Reduction Zones

In 2021, pulling data from the Census risk profile database, call volume histories, and land use data the department created the "Community Risk Reduction Zones" map displayed on the next page. The map depicts 50 individual zones throughout the city that are grouped together based on their assessed risk. The department has identified the top 5 station unique zones in the city which account for nearly 30% of all calls for service in the city. The department tracks calls in these zones for determining the efficacy of community risk reduction strategies. The top 5 zones include station 5 zone 29, station1 zone 4, station 8 zone 42, station 3 zone 26, and station 10 zone 14.



IX. Risk Assessment Analysis on Incident Types

The department conducted a risk analysis on call types to ensure that the proper number of resources were being dispatched to high-risk incidents. The analysis tool that was used is known as 3 axes where each incident type was analyzed on 3 criteria. X, Y, Z axis where X axis

is “consequences to the community”, Y axis is “probability of occurrence”, and Z axis is “impact on the department”.

X axis “consequences to the community” was scored with a numerical value between 2 and 10. All EMS calls were scored a 2 except assaults that were scored a 4. All traffic related incidents were scored a 4 except multiple vehicles, vehicle vs. pedestrian or biker were scored a 5. Structure fires were scored between 5 and 8 depending on the occupancy type. Explosions in a high-rise structure or government building scored 9. All other incidents were looked at separately and scored comparatively to the incidents above and their scoring.

Y axis “probability of occurrence” was scored with a numerical value between 2 and 10. We looked at all incidents that we had been to for the past 5 years and determined a yearly average. If the yearly average was less than 4 incidents in a year, we scored it a 2, 4 to 11 times a year scored a 4, 12-51 times a year scored a 6, 52-364 scored an 8, over 364 scored a 10.

Z axis “impact on the department” was scored with a numerical value between 2 and 10. All single unit responses was scored with a 2, a 1-engine response with supplemental units scored a 4, 1-engine response with a truck and rescue and 2-engine response with supplemental units scored a 6, 3-engine response with supplemental units scored an 8, and a 4-engine response with supplemental units scored a 10.

$$\sqrt{\frac{(pc)^2}{2} + \frac{(ci)^2}{2} + \frac{(ip)^2}{2}}$$

The numbers from each axis were then inserted into the 3-axis formula below to determine the final risk score for each incident.

Top 25 Fire Incident Types W/ Highest Risk Scores

Structure Fire HIGH LIFE HAZARD
Explosion HIGH LIFE HAZARD
Explosion HIGH RISE
Structure Fire Residential (single occupancy)
Structure Fire COMMERCIAL/INDUSTRIAL building
Structure Fire Residential (multiple occupancy)
Explosion Government building
Structure Fire HIGH RISE
Gas Leak / Gas Odor (Natural and LP Gases) HIGH LIFE HAZARD
Gas Leak / Gas Odor (Natural and LP Gases) COMMERCIAL/INDUSTRIAL building
Gas Leak / Gas Odor (Natural and LP Gases) Residential (multiple occupancy)
Explosion COMMERCIAL/INDUSTRIAL building
Structure Fire COMMERCIAL/INDUSTRIAL building with hazardous materials
Outside Tank Fire Refinery/Tank farm fire
Explosion Override-Delta
Vehicle Fire Vehicle fire with THREATENED building/structure
Outside Tank Fire LARGE NATURAL/LP GAS storage tank
Outside Tank Fire LARGE CHEMICAL storage tank
Outside Tank Fire LARGE FUEL storage tank
Aircraft Emergency Aircraft crash on land (ALERT III)
Aircraft Emergency Aircraft fire/incident on ground (ALERT III)

Explosion Residential (single occupancy)
Train and Rail Fire Train fire involving buildings/structures
Gas Leak / Gas Odor (Natural and LP Gases) Outside commercial line
Outside Fire LARGE OUTSIDE fire

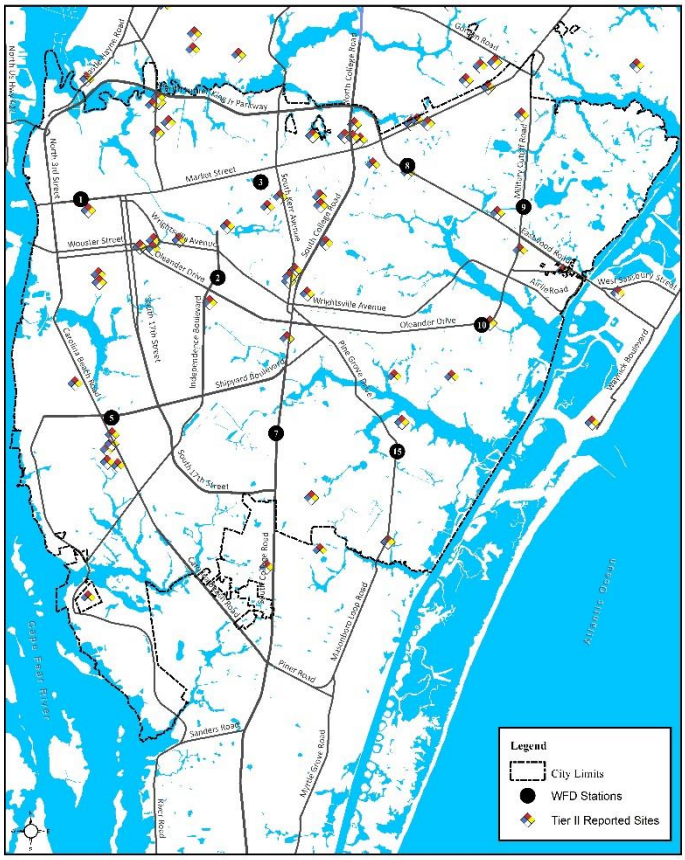
Top 25 Medical Incident Types W/ Highest Risk Scores

TRAFFIC/TRANS ACC HAZMAT
TRAFFIC/TRANS ACC PINNED
TRAFFIC/TRANS ACC MAJOR
STAB/GUN/TRAU MULTIPLE WOUNDS
TRAFFIC/TRANS ACC HIGH MECH
UNCON CHANGING COLOR
TRACHEOSTOMY
DIFF SPEAKING BTW BREATH
CARDIAC INEFFECTIVE BREATHING
CARDIAC NOT BREATHING AT ALL
ABNORMAL BREATHING PART OBSTR
FALLS NOT DANGEROUS BODY AREA
PUBLIC ASSIST (NO INJURIES)
FALLS UNKNOWN STATUS /OTHER CODES NOT APPLICABLE
OVERDOSE/POISONING CHANGE COLOR
OVERDOSE/POISONING (INGESTION) NARCOTIC/OPIOID ARREST (OBVIOUS)
STROKE NOT ALERT
STROKE ABNORMAL BREATHING
STROKE SUDDEN SPEECH PROBLEMS
STROKE SUDDEN WEAK OR NUMBNESS
TRAFFIC/TRANS ACC INJURIES
UNCON AGONAL/INEFF BREATHING
UNCON EFFECTIVE BREATHING
UNCON NOT ALERT
UNK PROBLEM LIFE STAT QUESTION

Hazardous Materials

When the department undertook the analysis of hazardous materials in the community, it was determined we could not identify every potential hazardous materials risk, but we could evaluate ones that would pose the highest consequence if intervention failed. The city has several manufacturing facilities within its jurisdiction which use numerous hazardous chemicals. The city also provides services to the North Carolina State Port facility on the Cape Fear River. In addition, there are several tank farms located along the river which store and ship millions of gallons of chemicals annually.

Tier II Chemical Inventory (Reported Sites)



While some businesses fail to report, the department utilized the E-Plan Tier 2 report system to identify the facilities within the city reported inventory for 2022. The facilities were mapped to provide a geographic reference in relation to department resources and other occupancies, such as schools, assemblies, and medical treatment facilities. In addition to Tier 2 reporting, the department evaluated all occupancies which have storage tanks for chemicals, as well as occupancies with a chemical inventory, regardless of reporting requirements.

Assessing the known locations of hazardous materials or transport of hazardous materials allows for preplanning and provides an overview of the level of risk from a hazardous material event. Each station response area was evaluated for the risk of hazardous material incidents; some first due areas have a higher risk potential because of proximity to storage facilities (i.e., tank farms), transport facilities (i.e., State Ports), or transportation corridors (i.e., major arterials and railway) while others only have a slight possibility for an event. The low probability sites are predominately in residential neighborhoods where the expectation for an event is from home fuel storage or delivery of products to small gas stations/convenience stores.

SPECIAL RISK

The decision was made to determine a set of criteria other than an OVAP score to identify certain occupancies that would pose unusual risk/tactical issues for firefighters and other responders during an emergency. The criteria is as follows:

- Any occupancy that stores or offers for transport one or more hazardous materials in such an amount as to pose an unusually significant risk to responders or the immediate surrounding area.
- High life hazard possibility (over 400 people or 2+ stories)
- Multiple buildings on a “campus” with the same address

- May require either specialized equipment or response

These occupancies will be considered “Special Risks”.

The following facilities in the city were identified as special risks due to their size, complexity, processes, high life risks, or extreme or unique hazards. Each of these facilities received a site visit as well as provided information that the department did not have or that needed to be updated. An analysis of each unique hazard site is found in the appendix.

- University of North Carolina Wilmington 601 South College Road
- Novant Medical Center 2131 South 17th Street
- North Carolina State Ports Wilmington 1 Shipyard Boulevard
- Corning Fiber Optics 310 North College Road
- Kinder Morgan Terminals 1710 Woodbine Street
- Apex Oil Company 3314 River Road
- Nu-Star Asphalt 3345 River Road
- Chemserve Terminal 3325 River Road
- Tribute Companies (Developer) 2005 North 6th Street
- Novant Orthopedic Hospital 5301 Wrightsville Avenue
- Colonial Terminals 1002 South Front Street
- Buckeye Partners Terminal 1312 South Front Street

The following structures were also classified as special risks since they are 7 or more stories in height. Overcoming the height barrier requires additional manpower and resources. Another consideration was that, because fires in these structures occur rarely, a lack of experience for the fire ground command staff is created.

- The Trust Building 2 North Front Street
- Solomon Towers 15 Castle Street
- 106 North Water Street Shell 106 North Water Street
- Cape Fear Hotel Apartments 121 Chestnut Street
- 201 North Front Street Shell 201 North Front Street
- Ballast Hotel 301 North Water Street
- City Headquarters (Formerly PPD) 929 North Front Street

Multifamily Risk Assessment

The city has 1,493 structures that are classified as multi-family dwellings. From January 2018 thru December 2022, the department responded to 7,716 emergency calls. There were 343 reported fires within these structures during the same five-year period with an estimated total loss of $4,643,621. During the same time period, there were 4,022 EMS related calls, 940 alarm activations, 1217 good intent calls, 937 service calls, and 201 hazardous condition calls.

The life risk factor for these dwellings is significant based on the number of occupants within a dwelling. Although the SOC has identified other special and high hazards that are of significant

concern, most of those hazards have extremely good fire monitoring, detection, and suppression systems (i.e. Novant Medical Center).

These multi-family dwellings pose significant life hazards for several reasons. Most dwellings are wood frame construction and many use light weight truss construction. In addition, many dwellings are 3 stories in height. This is significant in both rescue and ventilation efforts. The deployment of ground ladders and attack lines from the ground floor could be delayed. Accessibility issues in the placement of the apparatus may cause the apparatus to be more than 75 feet from the main access point. The apparatus generally carries 200 feet of pre-connected hoses that are 1 ¾ inches in diameter. These lines can be extended to 300 feet in effort to reach the seat of the fire. However, in some cases this may not be enough and larger lines will need to be deployed and the smaller line reconnected to reach the fire. This may hinder fire suppression activities and hamper efforts to safely and effectively mitigate the emergency. The determination was made to classify multifamily units as follows:

- Special Risk: Multi-family structures that are 7 or more stories in height, protected or unprotected.
- High Risk: Multi-family structures that are less than 7 stories but are 3 stories or more, protected or unprotected.
- Moderate Risk: Multi-family structures that are less than 3 stories, protected or unprotected.

There are numerous multi-family dwellings which are aging and in higher risk areas. For example, Cape Fear Apartments, Cape Fear Hotel, Carolina Apartments, Solomon Towers, and the Pines to name a few. Additionally, dwellings are located throughout the city and are in all response areas. The area surrounding the University has a very high number of multi-family dwellings. The age of the occupants in the dwelling varies, but with over 17,500 students enrolled annually, age can play a factor in the number and types of calls received.

The department continues efforts towards community risk reduction by proactively seeking to reach out to residents, management, and ownership of these dwellings and various organizations (i.e. Wilmington Apartment Association). These efforts are delivered through programs offered and safety messages in community newsletters.

Schools

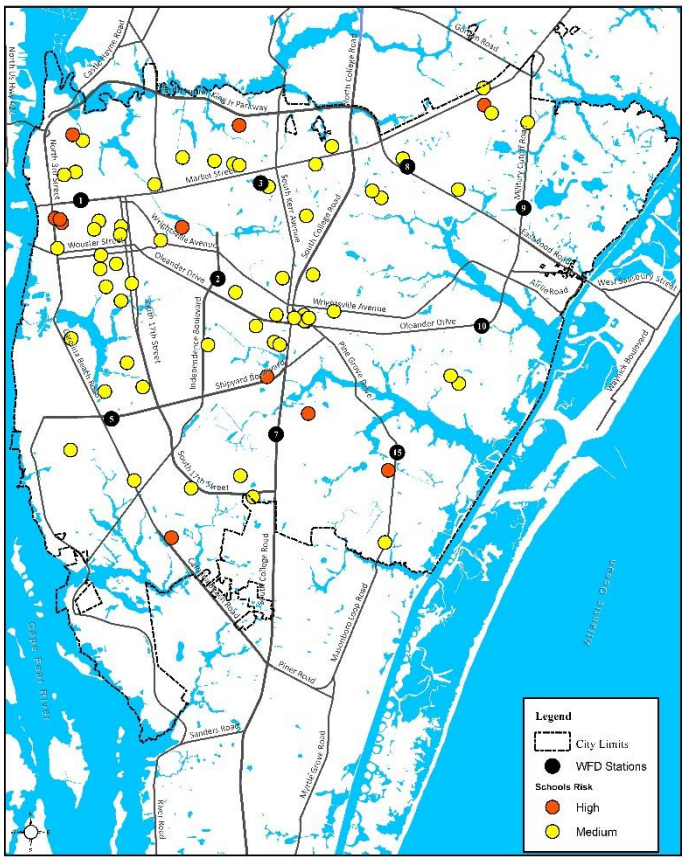
The risk assessment for the schools within the city were based on the size of the student population, the number of stories, the size of the structure, built in protection, and exposures. The incident history was examined to look at the likelihood of an event occurring which is not an absolute determinant but rather a guide. The following criteria were determined to assess the risk category:

- High Risk: Any school consisting of two or more stories
- High Risk: Any school with a student population greater than 400
- Moderate Risk: Any school less than 400 students and only one story
- No Schools were rated as Low Risk

Based on the two criteria above and the history of incidents at elementary schools, 11 schools were deemed to be high risk and the other thirteen were moderate risk. Over a 5-year period, there were 157 incidents at elementary schools.

Even though the middle and high schools have a much larger population, the call volume is slightly more modest. Over a 5-year period, there were 143 incidents. These schools, while having few incidents, were categorized as high risk due to the size of the student population, construction type, lack of automatic extinguishing systems (AES), and size of facilities. The risk analysis for the middle and high schools resulted in 7 high risk and 3 moderate risk facilities. The "School Risk Assessment" table illustrates the schools located within the station first due areas, the assigned risk, and the number of stories, AES present, and the student population for each school.

Risk Scores for School Sites



School Risk Assessment

Station	Name	Grade(s)	AES	Stories	Population	Risk
1						
	New Hanover	High	N	3	1546	High
	Lakeside High	High	N	2	107	High
	Virgo	Middle	N	2	285	High
	Williston	Middle	N	3	600	High
	Gregory	Elementary	N	1	396	Moderate
	Saint Mary	K-8	N	2	274	High
Station	**Name**	**Grade(s)**	**AES**	**Stories**	**Population**	**Risk**
	Dorothy B. Johnson	Pre-K	N	1	54	Moderate
	Mary Washington Howe	Pre-K	N	1	150	Moderate
2						
	Alderman Elementary	Elementary	N	1	279	Moderate

	Amy Bradley	K-8	N	1	38	Moderate
	Forest Hills Elementary	Elementary	Y	2	462	High
3						
	Calvary Learning Center	Elementary	N	1	39	Moderate
	Mosley Performance Center	High	N	1	70	Moderate
	Rachel Freeman Elementary	Elementary	N	1	348	Moderate
	Snipes Academy	Elementary	Y	2	491	High
4						
	Winter Park	Elementary	N	1	336	Moderate
	The Children's Schoolhouse	Elementary	N	1	45	Moderate
5						
	Sunset Park	Elementary	N	1	306	Moderate
	Cape Fear Center for Inquiry	K-8	Y	1	372	Moderate
6						
	Codington	Elementary	N	1	526	High
7						
	Holly Tree	Elementary	N	1	489	High
	John T. Hoggard	High	N	2	1632	High
	New Horizons	Elementary	N	1	93	Moderate
	Pine Valley	Elementary	N	1	553	High
	Roland Grise	Middle	N	2	763	High
8						
	Blair	Elementary	N	1	610	High
	College Park	Elementary	N	1	380	Moderate
	Milestones Childcare	Pre-K	Y	2	166	High
	Noble	Middle	N	1	887	High
	Saint Marks	K-8	N	2	431	High
	Isaac Bear Early College	College Prep	N	1	240	Moderate
Station	**Name**	**Grade(s)**	**AES**	**Stories**	**Population**	**Risk**
9						
	No Schools					
10						

	Bradley Creek	Elementary	N	1	339	Moderate
	Friends School of Wilmington	K-8	N	1	98	Moderate
15						
	Parsley Elementary	Elementary		1	602	High

**The "Risk Score for School Sites" map and "School Risk Assessment" table do not include all the small daycares or specialty schools which are moderate risk structures similar to single family residences.*

CRITICAL TASKING

With every type of emergency event there are certain tasks that must be accomplished in order to mitigate the incident. These tasks must be accomplished in a prompt, efficient, and safe manner. The fire department has the responsibility of assuring that an adequate number of resources is deployed in order to carry out the described tasks.

For the purposes of this document, the department relies on historical events and practices as each structure fire incident is followed by a formal critique to identify any weakness or shortfall in operations. Factors such as personnel, response time, cause and origin, strategy, and tactics are also covered during the critique process. The department relies on studies and standards developed by agencies such as the National Fire Protection Agency (NFPA), International Association of Fire Chiefs, in determining the number of resources to be deployed as part of the ERF. Structural firefighting drills and calls are also used and considered to help the department establish critical tasking numbers.

Fires – Critical tasking for fire ground operations is the number of personnel needed to perform the required tasks to effectively control a fire in the determined risk category. Major deployment incidents go beyond the first alarm assignment and require additional resources.

EMS – Critical tasking for emergency medical incidents is the number of personnel required to support the identified strategy based on the department's adopted medical protocol. For the department, this protocol has been established as basic life support. The department also considers and acknowledges that Novant EMS will respond to all EMS calls for service in the city providing a minimum of 2 personnel as well, typically trained to the advanced life support level.

Resources for Risk Type

The following tables represent the minimum number of resources determined to be necessary for the type of risk identified and tasks to be completed.

Low Risk Fire	
TASK	Number of Personnel
Command/Attack Line/Safety	2
Pump Operator	1
Total	**3**
Moderate Risk Fire	
TASK	Number of Personnel
Command/Safety	1

Pump Operator	1
Attack Line	2
Search and Rescue	3
Ventilation	3
RIT	3
Support	3
Total	**16**
High Risk Fire	
TASK	Number of Personnel
Command /Accountability	1
Safety	1
Pump Operator	1
Attack Line	2
Second Attack Line	2
Search and Rescue	3
Ventilation	3
RIT	3
Support	3
Total	**19**
Special Risk Fire	
TASK	Number of Personnel
Command	2
Safety	1
Accountability	1
Pump Operator	1
Attack Line	2
Second Attack Line	2
Search and Rescue	3
Ventilation	3
RIT	3
Support	3
Total	**21**

Low Risk Hazardous Materials	
TASK	Number of Personnel
Command//Safety/Mitigation	1
Mitigation	2
Total	**3**
Moderate Risk Hazardous Materials	
TASK	Number of Personnel
Command/Safety	1
Mitigation	2
Back up Mitigation	2
Research	1
Total	**6**
High Risk Hazardous Materials	
TASK	Number of Personnel
Command/Accountability	1
Safety	1
Protection/ Attack Line	2
Mitigation	2

Back up Mitigation	2
Research	1
Total	**9**

Low Risk Technical Rescue	
TASK	Number of Personnel
Command//Safety/Mitigation	1
Mitigation	2
Total	**3**
Moderate Risk Technical Rescue	
TASK	Number of Personnel
Command/Accountability/Safety	1
Mitigation	2
Patient Care /Rescue Tasks	3
Total	**6**
High Risk Technical Rescue	
Command/Accountability	1
Safety	1
Mitigation	2
Patient Care /Rescue Tasks	5
Total	**9**

Low Risk Marine	
TASK	Number of Personnel
Command//Safety/Mitigation	1
Mitigation	2
Total	**3**
Moderate Risk Marine	
TASK	Number of Personnel
Command/Accountability/Safety	1
Mitigation	2
Patient Care /Rescue Tasks	3
Total	**6**
High Risk Marine	
Command/Accountability	1
Safety	1
Mitigation	2
Patient Care /Rescue Tasks	5
Total	**9**

Moderate Risk EMS	
TASK	Number of Personnel
Patient Care	1
Support	1
Total	**2**
High Risk EMS	
Command/Accountability/Safety	1
Patient Care/Rescue Tasks	4
Support	2
Mitigation	2

Total	**9**

SERVICE LEVEL OBJECTIVES

Setting specific service level objectives after risks have been identified is part art, part science, and part politics. Once a thorough evaluation and categorization of risks have been completed, it is expected that the fire department will review emergency outcomes, which occur in any given risk category. The science part is "understanding historical events, the ability to analyze the outcomes, and the capacity to plan for the future based upon the extent of historical problems" for each risk type in the community. The question then needs to be asked "were the outcomes acceptable to the department, elected officials, and the community?"

While the performance of the department has been praised and ranked highest in community surveys of all city departments, the fire department itself realizes, and with the internal evaluations created as part of the accreditation process, that there are areas of needed improvement.

To assist with identifying and correcting any deficiencies, the department has established the following community wide service delivery objectives as a part of the risk analysis.

Fire

Objective: For all fire incidents, the department shall arrive in a timely manner with sufficient resources to stop the escalation of the fire and keep the fire confined to the area of involvement upon arrival. Initial response resources shall contain the fire, rescuing at-risk victims, and performing salvage operations, while providing for the safety of the responders and general public.

Distribution Performance Measure for Fire-All:

The first due engine (or truck with engine capabilities) staffed with a minimum of 3 personnel shall arrive within 7 minutes and 30 seconds total response time, for 90 percent of all calls for emergency service.

Concentration Performance Measure for Fire – Low

The response for low fire risk events shall be comprised of a single unit with pumping capabilities staffed with a minimum of 3 personnel. The total response time for the arrival of this unit shall be 7 minutes and 30 seconds for 90 percent of the calls for service.

Concentration Performance Measure for Fire – Moderate

The ERF for moderate risk fire events shall be comprised of a minimum of 3 engines, one truck, and one rescue staffed with a minimum of 3 personnel on each unit, a squad unit with two personnel, a safety officer, and a battalion chief for a combined ERF of sixteen personnel. The ERF shall arrive within 11 minutes total response time for 90 percent of all requests for emergency service.

Concentration Performance Measure for Fire – High

The fire department response for high-risk fires shall consist of 3 engines, two trucks, and one rescue unit, each staffed with a minimum of 3 personnel, a squad unit with two personnel, a safety officer, and a battalion chief for a combined force of nineteen personnel. The ERF for high-risk

fire events shall have a total response time of twelve minutes for 90 percent of the calls for emergency service.

Concentration Performance Measure for Fire – Special

The fire department response for high-risk fires shall consist of four engines, two trucks, and one rescue unit, each staffed with a minimum of 3 personnel, a squad unit with two personnel, a safety officer, and a battalion chief for a combined force of twenty-one personnel. The ERF for special risk fire events shall have a total response time of thirteen minutes for 90 percent of the calls for emergency service.

Emergency Medical Services

Objective: For all emergency medical incidents requiring first response from the department, the department shall arrive in a timely manner with sufficiently trained and equipped personnel to provide medical services that will stabilize the situation, provide for care and support to the victim and reduce, reverse, or eliminate the conditions that have caused the emergency while providing for the safety of the responders. All front-line fire department units can provide basic life support for EMS events. All uniformed fire department personnel are trained to a minimum of EMT-B.

Distribution Performance Measure for EMS – All

The first due unit staffed with a minimum of two personnel shall arrive within 7 minutes and 30 seconds total response time, for 90 percent of all calls for emergency service.

Concentration Performance Measure for EMS – Moderate

For all moderate risk EMS events, the department shall deploy an ERF consisting of a squad unit staffed with a minimum of two personnel for a combined manpower of two personnel. The ERF shall arrive within 7 minutes and 30 seconds total response time for 90 percent of the calls for service.

Concentration Performance Measure for EMS – High

For all high-risk EMS events, the department shall deploy an ERF consisting of an engine and a truck or rescue capable of performing extrication staffed with a minimum of 3 personnel, and a squad unit staffed with two personnel for a combined manpower of ninepersonnel. The ERF shall arrive within 11 minutes total response time for 90 percent of the calls for service.

Technical Rescue

Objective: For all technical rescue incidents, the department shall arrive in a timely manner with sufficient resources to stop the escalation of the incident and determine if additional resources are needed. Initial response resources shall establish command, sizing up the situation to determine if a rescue is required, rescuing at-risk victims, and providing basic life support to any at risk victim without endangering response personnel.

Distribution Performance Measure for Technical Rescue – All

The first due unit staffed with a minimum of 3 personnel shall arrive within 7 minutes and 30 seconds total response time, for 90 percent of all calls for emergency service.

Concentration Performance Measure for Technical Rescue – Low

The response for low-risk technical rescue events shall be comprised of a single unit with sufficient resources staffed with a minimum of 3 personnel. The total response time for the arrival of this unit shall be 7 minutes and 30 seconds for 90 percent of the calls for service.

Concentration Performance Measure for Technical Rescue – Moderate

The ERF for moderate-risk technical rescue events shall be comprised of a minimum of 6 firefighters and officers. The ERF shall arrive within 10 minutes total response time for 90 percent of all requests for emergency service.

Concentration Performance Measure for Technical Rescue – High

The ERF for high-risk technical rescue events shall be comprised of a minimum of 9 firefighters and officers. The ERF shall arrive within 11 minutes total response time for 90 percent of all requests for emergency service.

Hazardous Materials Response

Objective: For all hazardous materials incidents, the department shall arrive in a timely manner with sufficient resources to stop the escalation of the incident and determine if additional resources are needed. Initial response resources shall establish command, sizing up the situation to determine if a rescue is required, rescuing at-risk victims without endangering response personnel, perform operational level measures to minimize impact and establishing hot, warm, and cold zones.

Distribution Performance Measure for Hazardous Materials Response – All

The first due unit staffed with a minimum of 3 personnel shall arrive within 7 minutes and 30 seconds total response time, for 90 percent of all calls for emergency service.
Concentration Performance Measure for Hazardous Materials Response – Low

The response for a low-risk hazardous materials response shall be comprised of a single unit with sufficient resources staffed with a minimum of 3 personnel. The total response time for the arrival of this unit shall be 7 minutes and 30 seconds for 90 percent of the calls for service.

Concentration Performance Measure for Hazardous Materials Response – Moderate

The ERF for a moderate-risk hazardous materials response shall be comprised of a minimum of 6 firefighters and officers. The ERF shall arrive within 10 minutes total response time for 90 percent of all requests for emergency service.

Concentration Performance Measure for Hazardous Materials Response – High

The ERF for a high-risk hazardous materials response shall be comprised of a minimum of 9 firefighters and officers. The ERF shall arrive within 11 minutes total response time for 90 percent of all requests for emergency service.

Marine Services Response

Objective: For all marine services responses, the department shall arrive in a timely manner with sufficient resources to stop the escalation of the incident and determine if additional resources are needed. Initial response resources shall establish command, sizing up the situation to determine if a rescue is required, rescuing at-risk victims without endangering response personnel, preparing and boarding the marine craft for response when needed.

Concentration Performance Measure for Marine Services Response – Low

The response for a low-risk marine services response shall be comprised of a single unit with sufficient resources staffed with a minimum of 3 personnel. The total response time for the arrival of this unit shall be 7 minutes and 30 seconds for 90 percent of the calls for service.

Concentration Performance Measure for Marine Services Response – Moderate

The ERF for a moderate-risk marine services response shall be comprised of a minimum of 6 firefighters and officers. The ERF shall arrive within 10 minutes total response time for 90 percent of all requests for emergency service.

Concentration Performance Measure for Marine Services Response – High

The ERF for a high-risk marine services response shall be comprised of a minimum of 9 firefighters and officers. The ERF shall arrive within 11 minutes total response time for 90 percent of all requests for emergency service.

X. Program Goals and Objectives

Performance Statement and Objective

The following section describes the emergency response performance levels that are determined to be both reasonable and achievable by the city fire department. Both the desired performance levels and the actual performance levels are described in this section.

Each community must decide the desired level of service it expects from the fire department. Communities have their unique risks. Although they may be like other communities in nature, the frequency of events and the impact on the community are often very different; therefore, they must have a response tailored to their specific expectations.

The city council is elected and charged with determining the levels of service, as well as, making resource allocation decisions regarding funding and revenue streams. As they adopt the budget each year, direction is given by council to the city manager and staff as to where revenues may be spent. This direction directly impacts the level of services that can be delivered to the citizens and community.

Overall Performance Goal

The department is committed to prevent or reduce risks to the citizens of Wilmington and visitors to our community. The department is an all-risk response agency meaning that it responds to a

multitude of events ranging from small trash and brush type fires to vehicle fires, structure fires, hazardous materials releases and spills, accidents and entrapments, medical emergencies, water rescues, technical rescues, assists other agencies, and any other type of emergency. The department also provides non-emergency types of service which help to reduce or prevent incidents from occurring. These services include but are not limited to inspections, public education, enforcement, plan review, child car seat installation, smoke detector installation, blood pressure checks, and investigations.

The WFD is committed to providing a level of service that can be measured against industry standards and generally meets or exceeds them. Performance goals as well as the published industry standards have been established in the SOC document to define benchmarks. The department has evaluated the risks, as well as critical tasks, to establish specific performance objectives.

Performance Objective All Risks

For all calls for emergency service, the fire department shall respond a first due apparatus staffed with a minimum of 3 personnel. The total response time for the first due unit will be within 7 minutes and 30 seconds for 90 percent of all calls for emergency service. Total response time includes call handling/processing, turnout, and travel times.

Performance Objective – Fire Risk

The fire department shall respond to all emergency incidents involving fire with a first due engine apparatus staffed with a minimum of 3 personnel within 7 minutes 30 seconds total response time for 90 percent of the requests for service. The first due unit can deploy a single hose-line for containing the fire, initiating rescue of persons in immediate life-threatening danger, establishing a water supply, and providing for the safety of responders and the public.

Performance Objective – EMS Risk

The fire department shall respond to all requests for emergency medical assistance assigned to the fire service as first responders, a first due apparatus equipped for basic EMS delivery, staffed with a minimum of two personnel within 7 minutes 30 seconds total response time for 90 percent of the requests for service. The first due unit can provide care and support for the victim(s), securing the scene to provide for them safety of the victim(s), the responders and the public, and initiating rescue as necessary.

Performance Objective – Rescue Risk

For all incidents that require a rescue of victims, which include but are not limited to motor vehicle accidents (MVA's) with entrapment, industrial accidents with entrapments, confined space emergencies, explosions, or construction site type of emergencies with trenches, collapses, or equipment rollovers the fire department shall respond a first due apparatus with a minimum of 3 personnel trained and equipped for extrication. The first due unit will arrive within 7 minutes 30 seconds total response time for 90 percent of the requests for service.

Performance Objective – Non- Fire and Non-EMS Risk

For all requests for emergency response other than fire or emergency medical incidents the fire department shall respond a first due apparatus with a minimum staff of 3 personnel and equipment necessary to stabilize the situation, secure the scene, establish an initial action plan, initiate rescue,

and provide for the safety of responders as well as the public. The first due unit will arrive within 7 minutes 30 seconds for 90 percent of the requests for service.

Performance Objective – Hazardous Materials Risk

For all incidents involving the release or potential release of hazardous materials the department will respond a first due unit with a minimum of 3 personnel trained to a minimum of operational with limited resources necessary to stabilize the situation, establish command, size up the situation to determine the presence of a hazardous materials, determine the need for additional resources, and establish a hot, warm, and cold zones.

Performance Objective – Marine Services Risk

For all marine services responses, the department will respond a first due unit with a minimum of 3 personnel trained in marine services with minimal resources necessary to stabilize the situation, establish command, size up the situation to determine if a rescue is required, rescuing at-risk victims without endangering response personnel, preparing and boarding the marine craft for response when needed.

Distribution Performance Measures

Fire Response

For the purposes of distribution, a truck apparatus can respond to all fire incidents requiring a single engine response, since the fire department's truck units are also in fact, quint type apparatus capable of pumping and supplying fire streams. Total response times are only utilized in the percentiles when the first due unit responds emergency traffic and does not downgrade.

Electronic Fire Alarm Response: Single Family

An electronic fire alarm response to a single-family dwelling will constitute one engine company staffed with a minimum of 3 personnel and a truck company staffed with a minimum of 3 personnel. The first due company will respond emergency traffic, while the second due company will respond non-emergency traffic. The first due company will determine the cause of the alarm activation, judging whether additional resources are needed, and assuring that the proper notifications are made when possible. For electronic alarms in multi-family structures, an additional engine company will be added to the above response.

Electronic Fire Alarm Response: Commercial Structure

For electronic alarms in commercial structures, the fire department shall respond a first due engine company and a truck company non-emergency staffed with a minimum of 3 personnel. The company officer or battalion chief may change or upgrade the response to a structure fire whenever the situation warrants. The first due company will determine the cause of the alarm activation, judging whether additional resources are needed, and assuring that the proper notifications are made when possible. For electronic alarms in high life structures, the first due unit will respond emergency. For electronic alarms in high rise structures, there will be an additional engine company added to the above response and the first due unit will respond emergency.

Structure Fire Response: Residential

For residential structure fire incidents, the fire department shall respond a first due engine company staffed with a minimum of 3 personnel. The first due engine will arrive within 7 minutes and 30 seconds total response time for 90 percent of the requests for service. The first due company shall advance the first attack line with a minimum flow of 150 gpm.

Structure Fire Response: Commercial

For commercial structure fire incidents, the fire department shall respond a first due engine company staffed with a minimum of 3 personnel. The first due engine will arrive within 7 minutes and 30 seconds total response time for 90 percent of the requests for service. The first due company shall advance the first attack line with a minimum flow of 150 gpm.

Non-Structure Fire Response: Other

For all fire incidents not involving a structure, such as but not limited to vehicle fires, grass fires, trash fires, etc., the fire department shall respond a first due engine company with a minimum of 3 personnel within 7 minutes and 30 seconds total response time for 90 percent of the requests for service. The first due company shall advance the first attack line with a minimum flow of 150 gpm.

Tactical Rescue Response

For all incidents requiring a tactical rescue response, the fire department shall respond a first due engine company with a minimum staff of 3 personnel. The first due unit will arrive within 7 minutes and 30 seconds total response time for 90 percent of the requests for service. The first due unit will establish command, secure the scene and start rescue operations.

Hazmat Response

For all incidents involving a hazardous materials release or potential release, the fire department shall respond a first due engine company staffed with a minimum of 3 personnel. The first due unit will arrive within 7 minutes and 30 seconds total response time for 90 percent of the requests for service. The first due unit shall be capable of starting hazmat operations at the operational level.

Marine Response

For all marine/ water rescue incidents the fire department shall respond a first due apparatus staffed with a minimum of 3 personnel. The first due unit shall arrive within 7 minutes and 30 seconds total response time for 90 percent of the requests for service. The first due unit will start the rescue operation and/ or mitigation of the incident. Considering the unique nature of marine incidents, the fact that fire department marine craft are manned with cross-trained personnel and the location of

the watercraft, the measurement of the response for this purpose may be from the station to the marine vessel to respond. If the incident is along the shore or on a dock, another apparatus is dispatched to the incident location.

Emergency Medical Service

The department responds to EMS incidents that are high acuity incidents. These incidents are identified in CAD as Delta, Echo, and some Charlie calls. The fire department is often requested for assistance in other situations such as when Novant EMS system is taxed, and their units will be delayed.

For this SOC, we are stating a performance measure for the critical types of incidents. The department shall respond a first due unit staffed with a minimum of two personnel trained to provide basic life support. The first due unit shall arrive within 7 minutes and 30 seconds total response time for 90 percent of the requests for service to the critical incidents.

WFD Benchmark Times for Distribution

Distribution	Response (minimum)	Total Time	Percent	Personnel (minimum)
Fire Alarm Single Family	Engine, or Truck	7:30	90%	3
Structure Fire Residential	Engine, or Truck, or Rescue	7:30	90%	3
Structure Fire Commercial	Engine, or Truck, or Rescue	7:30	90%	3
Non-Structure Fire	Engine	7:30	90%	3
EMS	Engine, or Truck, or Rescue, or Squad	7:30	90%	2
Tactical Rescue	Engine, or Truck, or Rescue	7:30	90%	3
Hazmat	Engine, or Truck, or Rescue	7:30	90%	3

Concentration Performance Measures

Fire

All emergency agencies are dispatched through the 911 center. For fire services, the center utilizes a priority dispatch system. This system uses assigned nature codes with agency established response plans to determine the correct resources to be dispatched. The nature codes and response plans are shown in the following table. The ERF designation in this section should be considered a minimum, but the established response times shall be met no matter the difference in the priority system. Although the risk analysis will identify the different risk for each first due area, this section will be utilized for measurement purposes. In addition to the distribution goals listed previously, the following concentration performance goals are proposed for the department.

Fire: Low Risk

For fires in the low-risk category, which include sheds, brush fires, trash containers/ dumpsters, vehicles, transformers, downed power lines, or investigation of unknown situations, the fire department shall respond an ERF consisting of one engine company staffed with a minimum of 3

trained personnel. The ERF shall arrive within a total response time of 7 minutes and 30 seconds total response time for 90 percent of the requests for service.

Fire: Moderate Risk

For fires in the moderate-risk category, which includes single and duplex residential structures, detached garages, and commercial structures of not more than two stories in height or 30,000 square feet in area, the fire department shall respond with an ERF with a minimum of sixteen personnel and sufficient apparatus with the capacity to deliver 3,000 gpm. The ERF shall include a minimum of 3 engine companies, one truck company, one rescue company, one squad unit, one battalion chief, and one safety officer. The ERF shall arrive within 11 minutes total response time for 90 percent of the requests for service.

Fire: High Risk

High-risk fires shall include but not be limited to structures greater than 30,000 square feet, 3 or more stories in height, store large volumes of hazardous materials subject to reporting requirements, multi-family units, and assemblies of greater than 100 occupancies. For high-risk fires the fire department shall respond with an ERF with a minimum of nineteen personnel within a total response time of twelve minutes for 90 percent of the requests for service. The ERF shall consist of 3 engines, two truck companies, one rescue company, one squad unit, one battalion chief, and one safety officer. The ERF shall have the capability to deliver a minimum of 4500 gpm, initiate search and rescue, establish RIT, advance two fire attack lines, begin ventilation, control utilities, and provide for accountability, safety, and resource management.

Fire: Special Risk

For special-risk fires such as hospitals, skilled care nursing facilities, high rise structures of 7 or more stories, and structures greater than 400,000 square feet, the fire department shall respond an ERF of twenty-one personnel within a total response time of thirteen minutes for 90 percent of the requests for service. The ERF will generally include four engine companies, two truck companies, one rescue company, one squad unit, two battalion chiefs, and one safety officer. The ERF will establish a water supply, delivering a minimum of 5,000 gpm, advancing two fire attack lines, establishing RIT, ICS, accountability, initiating rescue, starting salvage operations, ventilating, and providing for the safety of responders.

EMS

Emergency medical service response is primarily a function of Novant's New Hanover Regional Medical Center. The department provides for first responder service to the citizens to reduce the number of fatalities and provide basic life support care until an Advanced Life Support unit can arrive. The fire department has no control over the number of resources or response protocols established by the hospital for their units. The Advanced Life Support units are pre-alerted, and the department's units must wait for the call to be completed to determine if a response is programmed. This enables Advance Life Support units to arrive before or shortly after fire units except during high peak demand times.

EMS: Moderate Risk

A moderate-risk EMS incident would be defined as, but not limited to, a single patient with a cardiac, respiratory, injury, seizure, minor MVA without entrapment, etc. The first due unit shall be capable of starting patient care. For a moderate risk EMS incident, the fire department shall

provide a single unit staffed with a minimum of two personnel with a total response time of 7 minutes and 30 seconds for 90 percent of the calls for service.

EMS: High Risk

A high-risk EMS incident would be defined as, but not limited to, a multiple patient incident and/ or MVA with entrapment. For a high-risk EMS incident, the fire department shall provide an engine company, a truck company, a rescue company with 3 personnel, a battalion chief, and a safety officer capable of performing extrication of entrapped patients for an ERF of six personnel with a total response time of 11 minutes for 90 percent of the calls for service.

Hazardous Materials

Hazardous Materials: Low Risk

For low-risk hazardous material incidents, the fire department shall respond with an ERF of a minimum of 3 trained personnel within a total response time of 7 minutes and 30 seconds for 90 percent of the requests for service. The ERF shall establish command, contain or control the spill/ leak, securing the scene, providing safety for the responders and public, and requesting additional resources as necessary to include advanced level hazardous materials personnel.

Hazardous Materials: Moderate Risk

For moderate-risk hazardous materials incidents, the fire department shall respond with an ERF of a minimum of six personnel within a total response time of 10 minutes for 90 percent of the requests for service. The ERF shall be capable of providing the equipment, technical expertise, knowledge, skills, and abilities to mitigate a hazardous materials incident in accordance with department standard operating guidelines and requesting additional resources as necessary to include advanced level hazardous materials personnel.

Hazardous Materials: High Risk

For high-risk hazardous materials incidents, the fire department shall respond with an ERF of a minimum of 9 personnel within a total response time of 11 minutes for 90 percent of the requests for service. The ERF shall be capable of establishing command; establishing a safety officer; identifying the release of materials; establishing a decontamination team; and providing the equipment, technical expertise, knowledge, skills, and abilities to mitigate a hazardous materials incident in accordance with department standard operating guidelines and requesting additional resources as necessary to include advanced level hazardous materials personnel.

Technical Rescue

Tactical rescue incidents are those that require specialized equipment and training. Examples include high angle rescue, trench cave in rescue, confined space rescue, or structural collapse. For tactical rescue incidents, the fire department sends a first due engine from the closest station to confirm the event and secure the scene. The tactical rescue team and equipment are primarily assigned to station 2 and members are cross-trained personnel.

Tactical Rescue: Low Risk

For low-risk rescue incidents, the fire department shall respond an ERF consisting of a single unit staffed with a minimum of 3 firefighters within a total response time of 7 minutes and 30 seconds for 90 percent of the requests for service. The ERF shall establish command, securing the scene,

beginning the rescue process and requesting additional resources as necessary to include advanced level rescue personnel.

Tactical Rescue: Moderate Risk

For moderate-risk rescue incidents, the fire department shall respond an ERF of six personnel within a total response time of 10 minutes for 90 percent of the request for service. The ERF shall be capable of establishing command; establishing patient contact; extricating the patient from a vehicle without the use of heavy extrication tools, providing advanced life support if needed; conducting the rescue in accordance with department standard operating procedures, and requesting additional resources as needed.

Tactical Rescue: High Risk

For high-risk rescue incidents, the fire department shall respond an ERF of 9 personnel within a total response time of 11 minutes for 90 percent of the request for service. The ERF shall be capable of: appointing a site safety officer; establishing patient contact; extricating the patient from a vehicle with the use of heavy extrication tools, providing advanced life support if needed; and conducting the rescue in accordance with department standard operating procedures and requesting additional resources as needed.

Marine

Marine incidents can vary greatly in scope and complexity. The fire department shall respond a unit with a minimum of 3 personnel to marine type incidents to establish command, assess the situation, secure the scene and request additional resources if necessary. The battalion chief can request more resources as the situation dictates. Marine incidents are so few that reporting them by hazard class will have very few responses and the response data would be unreliable.

Performance Objectives

Distribution	Risk Level	Minimum Required	Minimum Personnel	Time Frame	Percentile
All Risks except EMS	Low	1 Engine, or Truck, or Rescue	3	7.5 minutes (450 sec)	90th
EMS	Moderate	1 Squad, or Engine, or Truck, or Rescue	2	7.5 minutes (450 sec)	90th
Concentration	**Risk Level**	**Minimum Required**	**Minimum Personnel**	**Time Frame**	**Percentile**
Fire					
	Special	4 Engines, 2 Trucks, 1 Rescue, 2 Squads, 2 Battalion Chiefs, 1 Safety Officer	21	13 minutes (720 sec)	90th
	High	3Engines, 2Trucks, 1 Rescue, 2 Squads, 1 Battalion Chief, 1 Safety Officer	18	12 minutes (720 sec)	90th
	Moderate	3 Engines, 1 Truck, 1 Rescue, 1 Squad, 1 Battalion Chief, 1 Safety Officer	15	11 minutes (660 sec)	90th
EMS					

	High	1 Engine,1 Rescue, 1 Truck, 1 Battalion Chief, 1 Safety Officer	9	11 minutes (660 sec)	90th
Tech Rescue					
	Moderate	1 Engine, 1 Truck, 1 Battalion Chief, 1 Safety Officer	6	10 minutes (600 sec)	90th
	High	1 Engine, 1 Truck, 1 Rescue, 1 Battalion Chief, 1 Safety Officer	9	11 minutes (660 sec)	90th
Hazmat					
	Moderate	1 Engine, 1 Truck, 1 Battalion Chief, 1 Safety Officer	3	10 minutes (600 sec)	90th
	High	1 Engine, 1 Truck, 1 Rescue, 1 Battalion Chief, 1 Safety Officer	9	11 minutes (660 sec)	90th
Marine (Fire)					
	All	1 Engine, 1 Truck or 1 Fireboat	9	11 minutes (660 sec) (fireboat at dockside)	90th

The deployment of the correct number of resources to a given risk is predetermined by the fire department and programed into the CAD system at the 911 center. There is a predetermined response for every nature code so that once the tele-communicator selects the nature of the call the system will identify the proper response to dispatch. The response plans for the department are located in a separate document due to the frequency of review and revision that occurs to them. The response plan tables illustrate the many different response plans and nature codes with the appropriate response included. This addresses both distribution and concentration.

Regional Response

The State of North Carolina has divided the state into 7 regional areas for technician level response. This provides coverage and protection to the citizens of the state for significant events without each county and response agency having to suffer the great expense associated with the manpower and equipment necessary for a response to a major incident that may never occur in their jurisdiction. The department's hazardous materials team is identified as Regional Response Team 2 (RRT2) and has an initial response area covering 7 counties in Southeastern North Carolina which includes the 2 state port facilities. The state contract requires a minimum of twelve hazmat team members to respond with the necessary equipment. The department has set an initial enroute time of 30 minutes to a requested RRT2 response.

The State of North Carolina has assembled 11 fire service teams capable of specialized tactical rescue operations and entered into agreements for equipment and training in return for these teams to cover regional areas and provide tactical rescue services upon request from the areas having jurisdiction. This service delivery relieves each local agency from having to cover the expense of this type of response, which may be required on a very infrequent basis. The Technical Rescue

Team, in conjunction with the team from New Hanover County Fire Services (NHCFS) makes up the North Carolina Task Force 11 (NCTF 11). This team also serves as a Search and Rescue (SAR) team and is qualified through the National Incident Management System as a NIMS TYPE 2 team and registered as such. The initial response area for NCTF 11 encompasses 8 surrounding counties, but the team can be sent anywhere in the state. When a regional request for NCTF 11 is received, the initial response includes on-duty department personnel as well as additional personnel from NHCFS. The required response is 12 personnel in the initial response to be enroute within 1 hour from the time of the request and a follow-up of 20 personnel during the first 12 hours, providing 32 personnel and equipment.

XI. Current Deployment and Performance

Station Location and Resource Deployment

Station Location Factors

It is worth noting here that a great deal of the explanation for longer travel times for first due companies is the result of previous planning and land use tied to political determinations resulting in connectivity challenges between neighborhoods and thoroughfares.

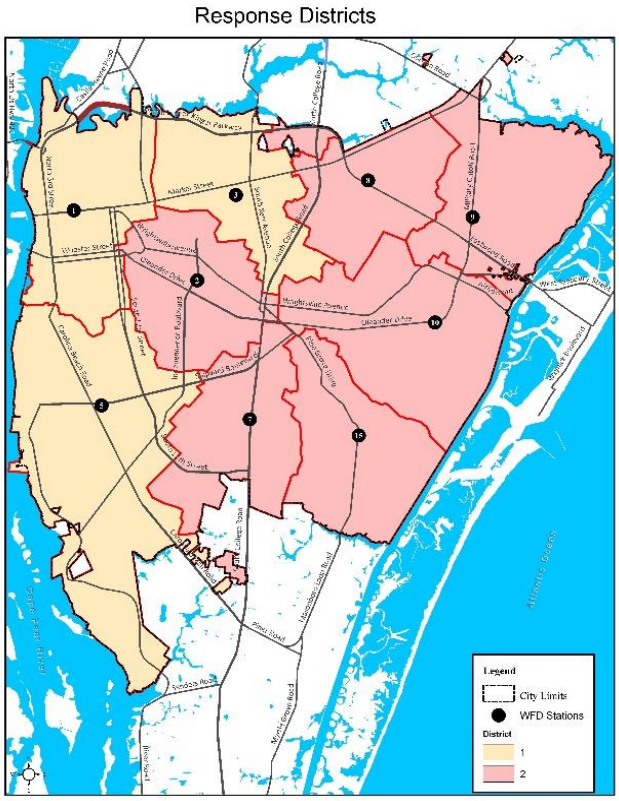
When making the determination for the location of a new fire station, many factors are taken into consideration. The department considers whether to rebuild on current sites or if new locations are necessary. Additionally, the city considers population density, as well as demographics of the service area.

The current demand for services and the anticipated increase for services based on growth, either in population or other occupancy development, are also factored into the decision-making process. Data currently indicates that socioeconomically challenged areas result in increased demand and allocation of resources. The availability and cost of land of sufficient size with access to main thoroughfares is also an important consideration. Historically speaking, the city has refrained from using eminent domain to acquire land for the purposes of constructing a fire station. The city strives to meet the ISO and NFPA guidelines for station first due response areas. The ISO's last evaluation determined that the department's deployment was a score of 8.95 out of a possible 10.0 points. The department has an established and published goal of having a first due unit arrive on the scene of an emergency in 4.5 minutes of travel time at the 90^{th} percentile as compared to NFPA 4 minutes travel time. The department has divided the city into two response districts or battalions for resource management. The two battalions are divided further into station first due areas defined as zones. The zones are further divided into sub-zones for deploying the nearest resources for establishing an ERF as well as the nearest units for responding if the first due unit is unavailable.

The city previously located stations based on the ISO rating schedule of having an engine company within one and a half miles travel distance from every structure.

Response district one consists of headquarters station, station 3, station 5, and their assigned zones. Response district two consists of station 2, station 7, station 8, station 9, station 10, and station 15 and their assigned zones.

Department Apparatus Types



* **Squad**: First response, pick-up truck type vehicle, currently located at headquarters, station 3, and station 5. Units are equipped to handle EMS incidents and provide support on other incidents from service calls such as a tree down, to hand tools for rescue and structural firefighting.

* **Engine**: Primary response unit from each station assigned to handle most types of incidents. Each engine has a minimum 1500 gpm pump, hose, and water tank with a 500-gallon capacity.

* **Truck**: A specialized apparatus with a compliment of ladders, an elevating platform or ladder at least 70 feet in length, a pump like the engines, a small water tank, extrication tools, and salvage and overhaul equipment.

* **Rescue**: An apparatus designed to carry personnel, extrication equipment, telescoping lights, thermal imaging, and gas monitoring equipment.

* **Safety**: A pickup truck type of unit designed to carry the shift safety officer and his equipment to the scene of an emergency.

* **Mobile Air**: A specialized apparatus designed with a compressor and cascade system utilized on the fire ground to refill empty SCBA bottles.

* **Hazmat**: A specialized response apparatus designed to carry hazmat technician level personnel and the equipment necessary for the containment and control of hazardous materials releases.

* **Technical Rescue**: Special unit for delivering technical rescue personnel and equipment to the scene of an emergency involving unique entrapment/collapse type situation.

* **Marine**: Watercraft ranging in size from sixteen to fifty feet utilized for water related incidents such as fires or marine/dive rescue or recovery.

* **Battalion**: A vehicle, such as an SUV, designed to deliver a battalion chief officer and resources necessary for strategic plan development to the scene of an emergency.

The “Resource Allocation” table displays the resources that are assigned to each station along with the number of personnel assigned to each unit. Note that some special response units are manned by cross trained personnel assigned to other front-line apparatus.

Resource Allocation 2023

Station	Unit Type	Personnel Assigned	Minimum Personnel	District
1 (HQ)	Engine 1 Squad 1 Truck 1 Battalion 1 Marine 1* Marine 2*	4 2 4 1 * *	4 2 4 1 * *	1
2	Engine 2 Rescue 2 Tech Rescue*	4 5 * *	3 4 * *	2
3	Engine 3 Squad 3 Fire Safety 2	4 2 1	3 2 1	1
5	Engine 5 Squad 5 Truck 5 Haz-Mat 1*	4 2 4 *	3 2 3 *	1
7	Truck 7 Mobile Air 1*	4 *	4 *	2
8	Engine 8 Truck 8	4 4	3 3	2
9	Engine 9 Marine 3	4 *	3 *	2
10	Engine 10 Battalion 2	4 1	3 1	2
15	Engine 15	4 *	3 *	2

*** Denotes units that are manned by cross-trained personnel assigned to other front-line apparatus**

Community Baselines

The current performance of the department is an essential part of the Standard of Cover process. The establishment of community baselines is crucial when attempting to understand how well the services that we provide are being delivered. This understanding allows a basis for determining if changes need to be made to the system.

It is the responsibility of the senior staff to decide the location of resources and personnel. The correct match of resources to the needs of the community provides for efficient and timely response to emergency situations within the jurisdiction. To assist the staff with their responsibility, the establishment of a valid process needed to be developed. The personnel assigned with this task

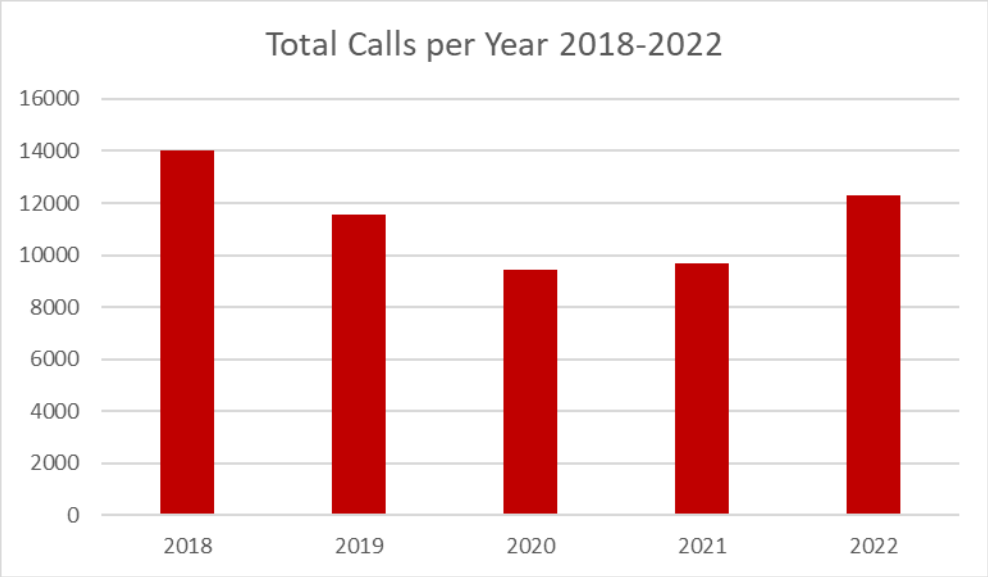
have spent countless hours developing reports, maps, queries, and processes for assuring that accurate data is available.

In establishing the community baselines, the decision was made to analyze five years of data from January of 2018 to December of 2022. The data was collected using the department's record management system ("Firehouse") as well as ArcGIS software and validated using CAD software data. In order to obtain a more accurate picture of how well the department performs, the analysis looks over the five-year period. It is important to note as a continuous improvement department that the response plans have changed significantly during the reporting period. Call volumes reflect changes made to the EMS response plan which reduced calls in 2019, 2020, 2021, and 2022 along with the Covid-19 pandemic impacts.

The analysis looked at two levels of performance in the process. These were at the overall jurisdictional level and at the station first due response area.

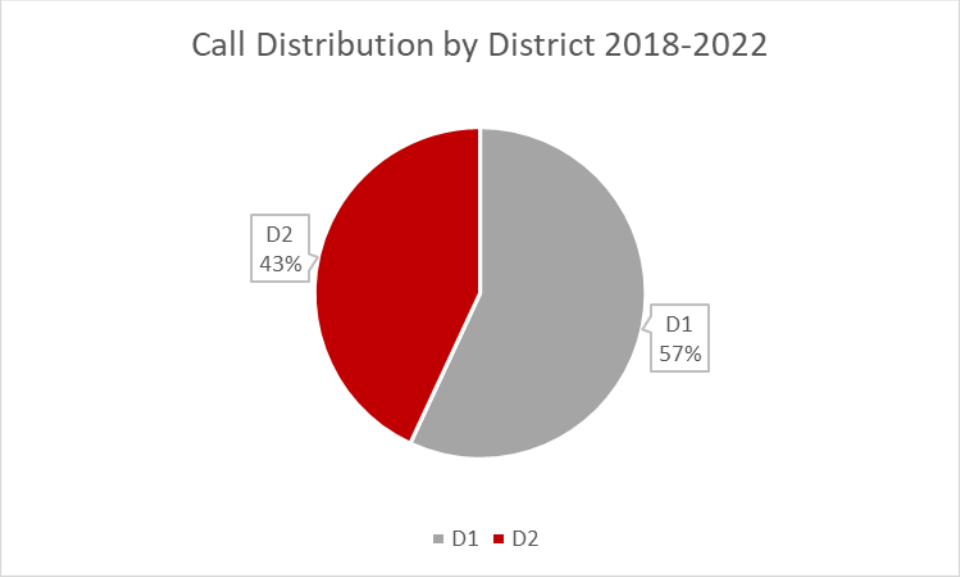
The overall demand for services has decreased between 2018 and 2022 by 13%, however the trend of 2022 is continuing into 2023, and calls for service are projected to increase over 2022 levels in 2023. See chart as illustrated.

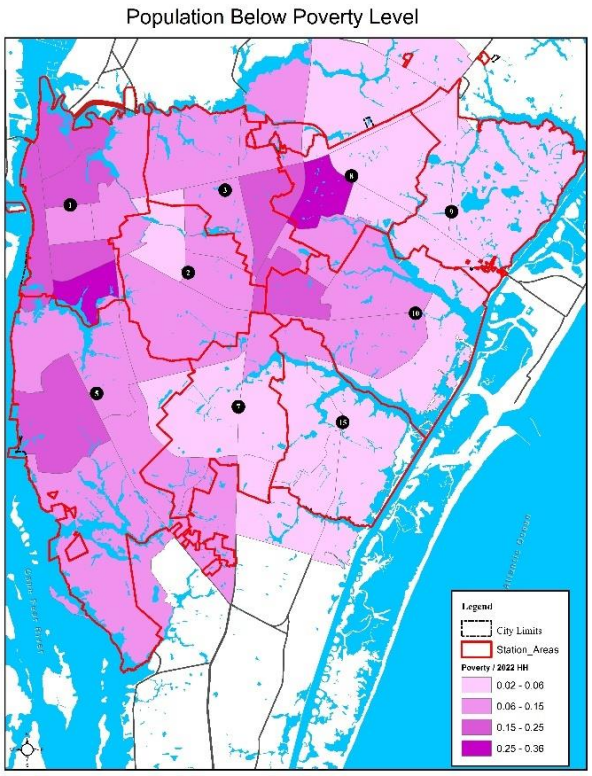
Demand for Service by Year



The "Workload Distribution by District" chart illustrates the workload for the two response districts. District 1 handles a higher number of calls for service than district 2. The reason for the difference in service demand includes factors such as population density, socio-economic factors, concentrations of specific risk groups, and the age of buildings.

Workload Distribution by District

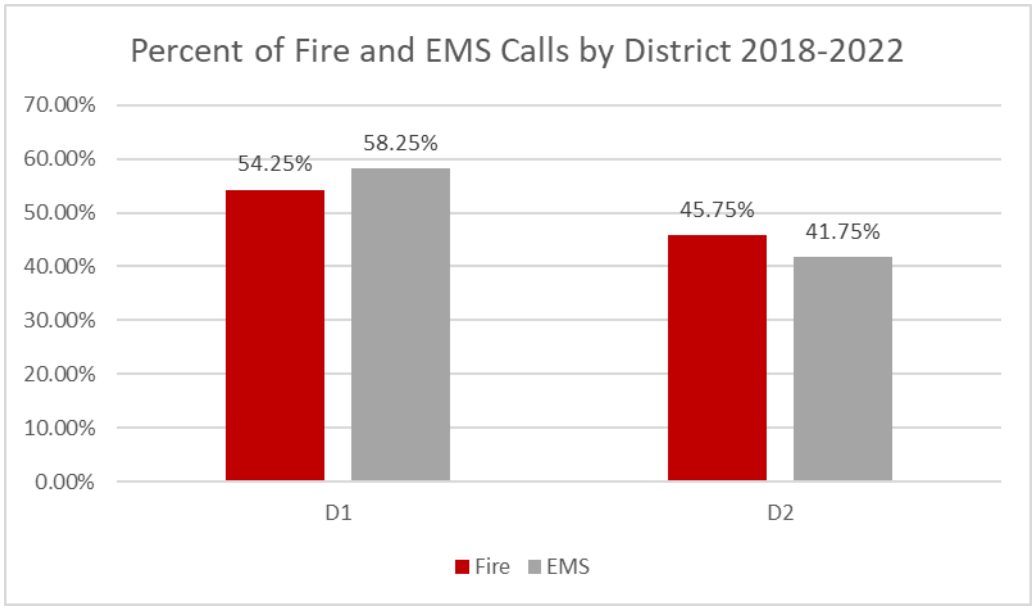




The population living below the poverty level tends to have a higher demand for service and predominantly resides in district 1. In addition, district 1 primarily incorporates the oldest parts of the city. Additionally, some older homes may not be maintained properly. Changes in wiring, heating, plumbing, and construction may be performed without proper permits and oversight. Many more homes are in need of repair, but the population may not be able to afford the expense of those critical repairs to comply with current building standards. District 2 also contains newer homes and some of the most affluent parts of the region including the Landfall development.

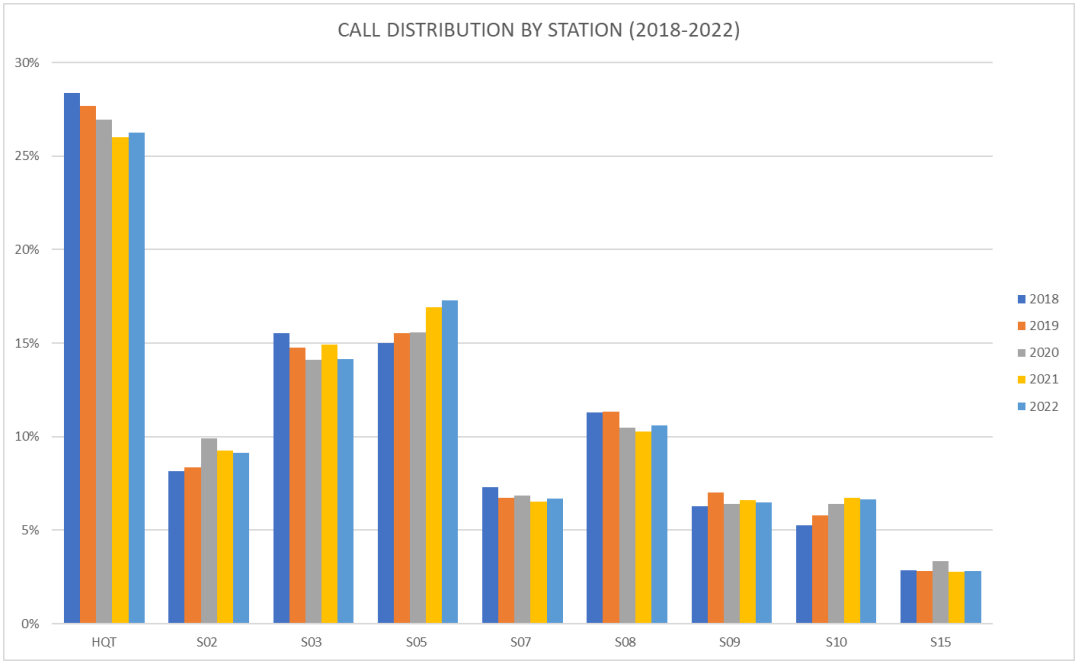
When the demand for core service categories, fire and EMS, are assessed, they follow the same trend as the overall workload distribution by district. Despite having a higher population of older adults in district 2, the calls for service are less. The "Percent of Fire and EMS Calls by District 2018-2022" graph below shows the breakdown.

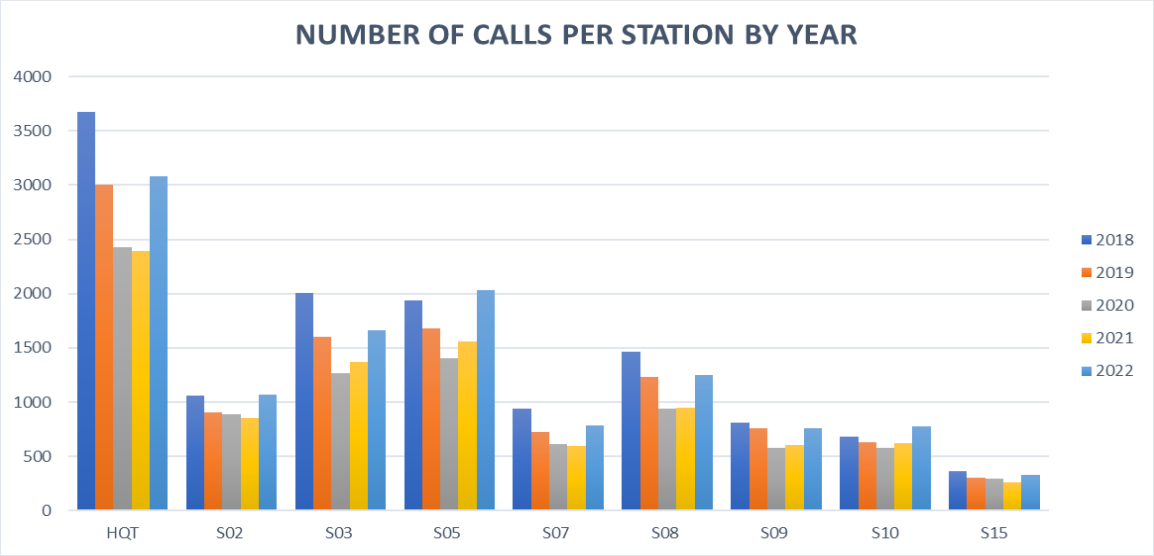
Core Service Workload by District (2018-2022)

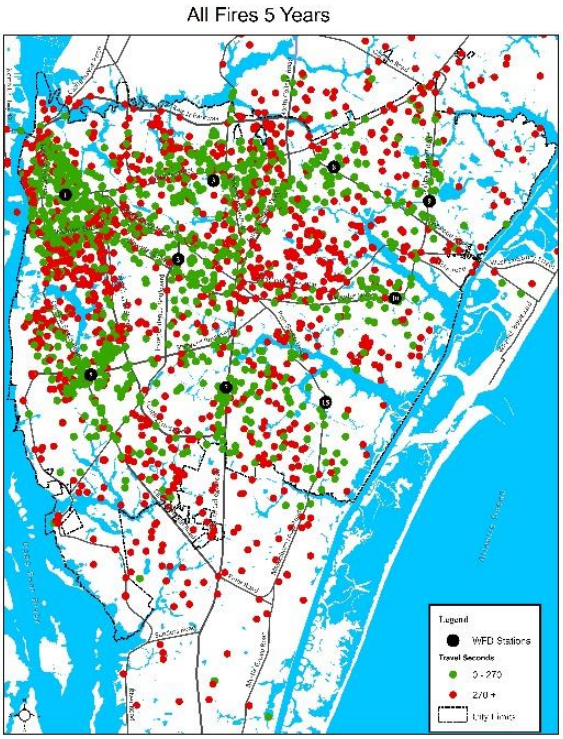


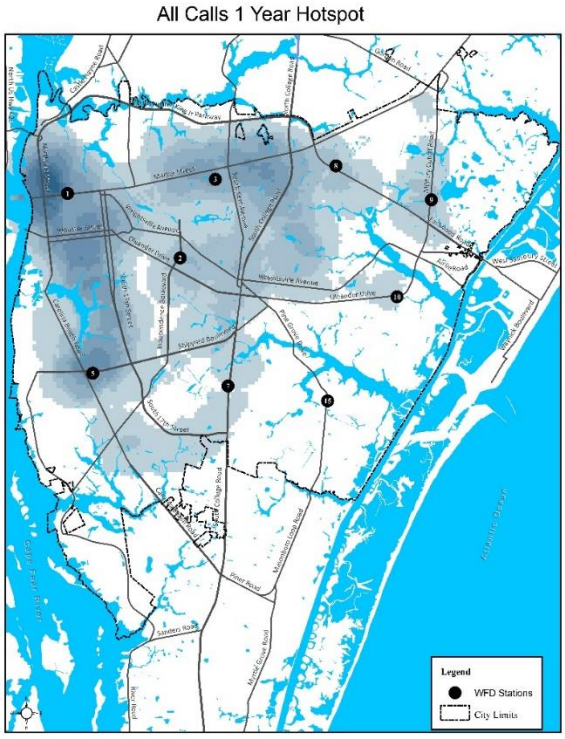
The "Workload by Station for 2018, 2019, 2020, 2021, 2022" graph compares call volume in each year for each station. The percentage of call volume for each station does not change significantly in any given year and the comparison of each station to the others remains consistent. Headquarters consistently runs a significant majority of calls compared to the rest of the department, however as the Riverlights area has expanded and other developments have occurred in station 5's area they have become busier. The department re-aligned the squads recently and moved squad 8 to station 5 to become squad 5 to help with this increase.

Workload by Station for 2018, 2019, 2020, 2021, 2022









GIS (Geographic Information Systems) was used to map incidents and show where those incidents are concentrated. The “All Calls 1 Year Hotspot” map shows the incident density for all calls for service in 2022, which further illustrates the distribution of calls for service. The “All Fires 5 Years” map illustrates the demand for service specific to fires. The map illustrates that for fires specifically, the demand for service is concentrated in downtown and stretches to station 5 on Shipyard Blvd, and out just east of station 3 by New Center Drive, Market Street, and near the high-density housing in midtown near UNCW. Through these maps it is clear that socioeconomic and demographic factors, along with aged housing stock play a role in the fire risk as areas such as Masonboro near station 15 and Landfall near station 9 are relatively low in fire calls. These areas are more affluent, with higher property values, and newer housing stock.

Response Performance

The key areas analyzed for response performance were call processing time, turnout time, travel time, and total response time. The times shown in the "Station First Due Area" table is performance at the 90th percentile.

Station First Due Area

Station	Turnout Time					Travel Time					WFD Response Time				
	18	***19***	***20***	***21***	***22***	***18***	***19***	***20***	***21***	***22***	***18***	***19***	***20***	***21***	***22***
HQT/1	96	101	101	98	96	314	306	287	293	294	364	339	334	348	342
2	81	88	87	82	77	272	286	284	276	289	328	339	343	334	335
3	89	92	92	96	92	303	311	297	291	290	364	368	353	349	349
5	88	85	82	80	82	330	309	310	316	306	390	363	362	365	351
7	96	97	86	88	79	273	286	306	332	338	337	351	357	385	389
8	81	79	74	74	83	290	289	281	285	305	343	335	337	333	361
9	89	92	90	82	83	348	328	324	362	362	404	391	441	415	420
10	83	94	91	82	86	352	363	342	361	352	412	409	394	425	399
15	95	100	92	88	87	300	334	310	333	318	375	395	368	391	364

Introduction & Historical Perspective on Department Performance

The department evaluated data from January 2018 through December 2022 and determined this was the data set to be used for considering current performance and baselines. Next, the department considered data for a time period between January 1, 2013, and December 31, 2017, in order to evaluate the department's historical performance.

During a request for service, the department captures 3 key elements of time. The times are used to assess current performance and set goals for future improvement.

The first consideration is the amount of time it takes for the dispatch center to receive and process a call. This includes determining what resources are needed and from which agency and then the actual dispatch of these resources. This is referred to as **Call Processing Time**.

The next segment of time measured is from the time the dispatcher notifies the department of an event until the resource is moving toward the incident or "wheels turning". This time period is referred to as **Turnout or Reaction Time.**

The final piece of the time equation to be measured is from the turnout time until the resource arrives at the location of the incident. This is referred to as the **Travel Time.** The sum of the 3-time segments is the **Total Response Time** for an emergency event.

The policies and practices of the 911 center dictate how quickly the calls are received and processed to dispatch the correct resources. The center has no real control over the other segments of the total response time. Likewise, it is the policies and practices of the fire department which affect turnout time and travel times.

Every emergency begins with an event occurring whether it is an accident, a medical emergency, a chemical release, etc. The first action that triggers the response is that someone must realize or discover the event. Someone must make the notification to the 911 center or other emergency operations facility.

This notification sets into motion the call processing. The caller is asked a series of questions such as location, if injuries are involved, and if flames and smoke are visible, in order to determine the correct number and type of resources to be deployed to the situation. Once resources have been determined, the dispatcher will send the emergency notification to the ideal agency via radio or computer. The National Fire Protection Agency (NFPA) has set a maximum time for receiving, processing, and dispatching of emergency calls at 60 seconds for 90 percent of events.

The notification to the agency starts the process of receiving the alert, moving of personnel to the apparatus, and starting towards the scene of the emergency. This process is known as the turnout time. The NFPA has set the maximum time for turnout at 60 seconds for EMS calls and 80 seconds for fire calls.

Once the apparatus is moving toward the incident, the time it takes to arrive is known as the travel time. There are several different methods used to determine the allowable amount of travel time. NFPA has stated the maximum time to get to the scene as 4 minutes (240 seconds). The Insurance Services Office (ISO) has held that instead of time, distance is measured. Per ISO, the maximum distance from the nearest fire engine should not exceed 1.5 miles. NFPA 1710 has set travel time standards for first arriving at 240 seconds, second arriving at 360 seconds and 8 minutes (480 seconds) for the remainder of the full ERF, which is defined as the necessary resources needed to confine and control the incident.

Performance Objectives

While the goals and objectives section further define time allocations for various types of incidents as well as ERF for special incidents, an overview has been provided.

The following tables reflect the call processing times, turnout/reaction times, first due travel times, and the ERF travel times. The ERF times are for moderate risk structure fires and high-risk EMS incidents. The tables also reflect the 90th percentiles for 2018, 2019, 2020, 2021, and 2022 combined for a historical snapshot, followed by a table showing only 2022 which we used to indicate our current performance levels.

Collective Performance Data from 2018, 2019, 2020, 2021, 2022

Call Type	Call Processing	Turnout	Travel	Travel ERF
Fires	2:08 (128)	1:33 (93)	5:11 (311)	
Moderate Risk Fires	1:50 (110)	1:39 (99)	4:48 (288)	9:57 (567)
EMS	3:27 (207)	1:27 (87)	5:01 (301)	9:01 (541)

Performance in 2022

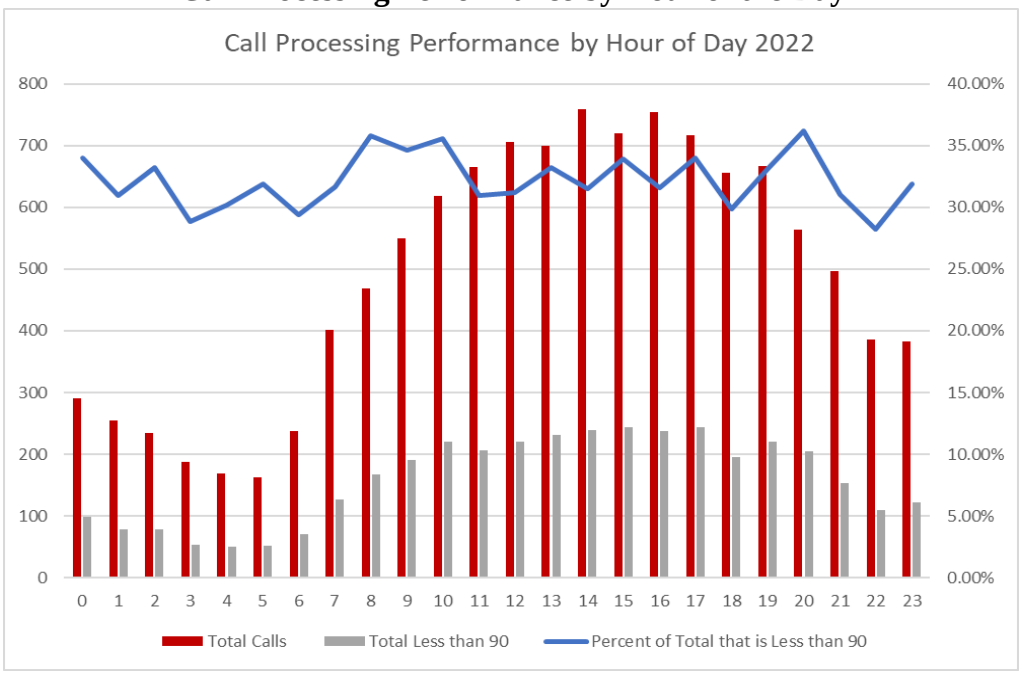
Call Type	Call Processing	Turnout	Travel	Travel ERF
Fires	2:02 (122)	1:27 (87)	5:05 (305)	
Moderate Risk Fires	1:55 (115)	1:32 (92)	4:46 (286)	9:26 (566)
EMS	3:33 (213)	1:26 (86)	5:01 (301)	8:59 (539)

The assessment *of call processing time revealed it is not adequate* to achieve the level of service desired. While the department has no direct control over the 911 center, a committee from the city and county fire services and emergency medical service has been formed to work with the staff at this facility to determine what the issues may be and to assist them in finding solutions to any identifiable issues. While some progress has been made, the department, the 911 center, and any other emergency response agencies being dispatched through the center need to continue to monitor and evaluate the call center progress and efficiency.

The department's firefighting personnel work 24-hour shifts. Therefore, calls will be received during sleep hours, mealtimes, and physical training hours. The department needed to determine if these types of activities impacted performance; therefore, performance was analyzed by hour of the day.

The "Call Processing Performance by Hour of the Day" chart reflects performance for call processing at specific hours of the day. The axis on the left reflects the number of calls and the number of calls meeting the established goals. The axis on the bottom shows the hour of the day, and the line shows the performance percentile. The performance percentile is the percent of time the call processing was completed in 90 seconds, which is the objective. It is apparent from the graph below that the hour of the day, nor the call volume, influences the performance of call processing time.

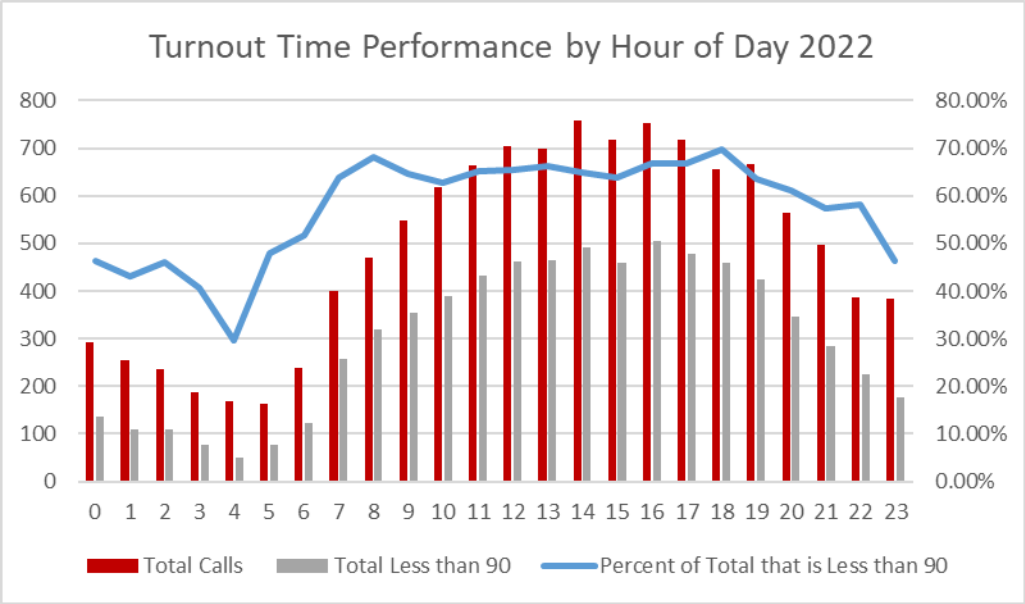
Call Processing Performance by Hour of the Day



The "Turnout Time Performance by Hour of Day" chart represents the same type of information but regarding turnout time. The data clearly shows that time of day directly effects turnout time

performance. It shows that at night, while the companies are asleep, the turnout time performance is worse than it is during early morning, day, and early evening hours. This difference in performance was expected.

Turnout Time Performance by Hour of Day



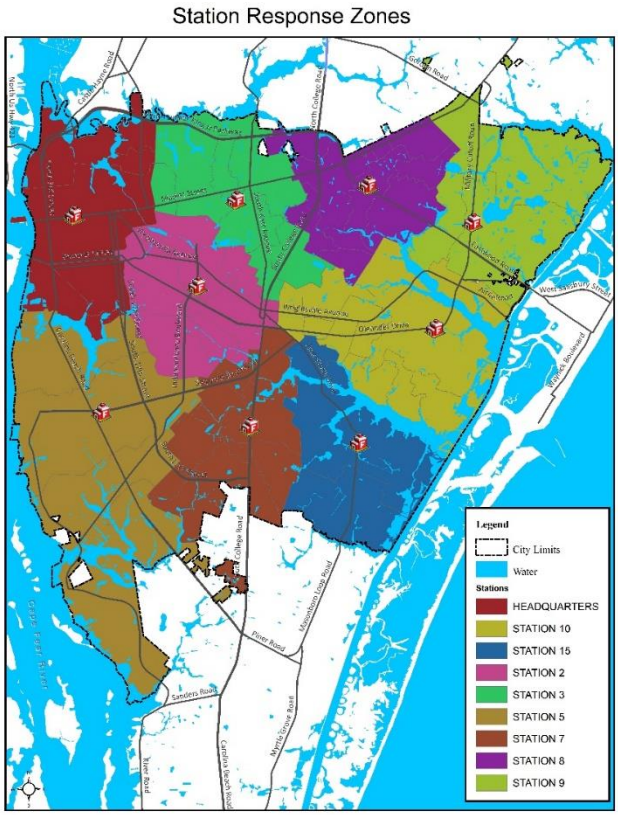
Distribution and Demand for Service

Distribution

The Commission on Fire Accreditation International (CFAI) has defined distribution as geographically distributed first due resources for all risk initial intervention. Most cities are faced with the issue of providing the same quality and level of service to all areas of the city or informing the citizens that they will not have the same response times even though the risk is the same in their neighborhood. The usual decision is made to provide services and resources spread out rather than from a central location. These station locations are needed to ensure rapid deployment to minimize and terminate average or routine emergencies.

The city department has historically strived to provide equitable levels of service to all its stakeholders. The socio-economically disadvantaged areas of the city should have the same level of protection as the more affluent areas. In many instances, the demand for service is higher in the poorer and distressed areas of the city. Station and resource locations were historically driven by an attempt to comply with the Insurance Service Office (ISO) standards which stated that all occupancies were within a one-and-a-half-mile travel distance from a fire station. This travel distance measured at an average speed of 35 miles per hour meant that the first due fire engine would normally have an average travel time of 3.2 minutes. Although station locations were not always within the desired one and a half miles, due to land availability, political ramifications, and costs, the attempt to meet ISO standards has resulted in a marginally higher than average station distribution throughout the city. This also provides for excellent travel times that exceed those of many jurisdictions.

The "Station Response Zones" map shows facility locations and size of first due response areas in comparison to the other stations.



Distribution can be evaluated by the percentage of the jurisdiction covered by the first-due units within the adopted public policy service level objectives. The demand for service has a direct impact on the distribution of resources. Where there is a high volume of demand or increased risk, additional resources may need to be allocated to achieve the objective of having a first due arrival within the established time frame. This is directly connected to the agency's concentration needs.

To be more efficiently and effectively respond to incidents, the department is using an automatic vehicle location (AVL) system. The CAD system searches for a defined unit type for a category of incident within a one-mile radius of the incident. If the correct unit type cannot be found within the one-mile radius, CAD uses the traditional unit run order to dispatch the appropriate resource.

Service Area

As each new station is built, a measured and defined service area is established. This provides for a first due unit, usually an engine company, that can be dispatched and arrive within the set time frame to initially contain or stabilize any event or provide medical treatment when necessary. In service areas where a larger workload is anticipated, multiple resources may be assigned to the station.

During the development of the SOC, each service area is analyzed to review the workload and the reliability of the units to provide the services that are stated. Issues such as the amount of time that the first due unit was unavailable to respond are reviewed. This may be due to any number of reasons such as training, apparatus service, prior assignment, administrative work, or other issues. Simultaneous events in each area are documented to see if the workload is so great that additional resources should be relocated or created. The response times for other units to cover the additional calls for service in place of the first due unit have also been evaluated. These types of analyses should become part of the department's planning process and performed routinely to monitor changes in each station's service area demand.

Included in this section are maps and charts that demonstrate the distribution of the department's resources and travel time coverage. The section on reliability indicates workloads and simultaneous events history for each service area of the department.

The population distribution among the first due station response areas is representative of the residential, commercial, and industrial properties located within the city. Although most of the population data is obtained from census numbers, it must be realized that the populations in different zones may change throughout the day, as well as months or seasons, with people relocating to work, shop, or go to school.

Station 1's (Headquarters) first due area includes the CBD along the riverfront with the highest population density and many historical and high value infrastructure facilities. Station 2's area is the smallest and has the second highest ratio of commercial to residential properties. Station 3 is an area with a commercial corridor running along Market Street and connecting with other high commercial streets such as Kerr Avenue and New Centre Drive. This area also has a high concentration of multi-family structures. Station 4 was closed when the new station 3 was built around 2015 and the first due areas were incorporated into the surrounding stations first due areas. Station 5's area has a mix of residential, commercial, and manufacturing properties as well as the Novant Hospital Center which has caused the growth of the medical complexes in the immediate area. This first due area also includes the North Carolina State Port facility which contains many large structures, docks, processes, and vessels being loaded and off loaded. Station 6 closed with the opening of new station 5 in 2019 and its first due area was absorbed into other first due areas. A new station 6 is being built in the Riverlights community and is expected to open in late 2024. The department will create a first due area for station 6 which will require changes to bordering areas and changes to the run orders to include station 6. Station 7's first due area has a large commercial corridor along South College Road and Shipyard Boulevard. It also has multi-family structures in the area. Station 8's area has the highest concentration of commercial properties. This area also contains many multi-family dwellings. Also, in this first due area is the Corning Fiber Optical manufacturing complex and the northern most portion of UNCW. Station 9's area has a large and growing commercial corridor along Military Cutoff and Eastwood Roads. This station's area also contains the Landfall Community which is a high value residential gated community. Station 9's area extends to the far eastern limit of the city and borders with Wrightsville Beach town limits. Station 10's area is largely residential area with a commercial corridor extending mainly along Oleander Drive. Station 15's first due response area has a very small concentration of commercial properties along Masonboro Loop Road. Most of this zone is single- family residential with a few multi-family units. Using GIS data, the entire city response was re-evaluated based on modeling to determine the most effective first due response areas for each station.

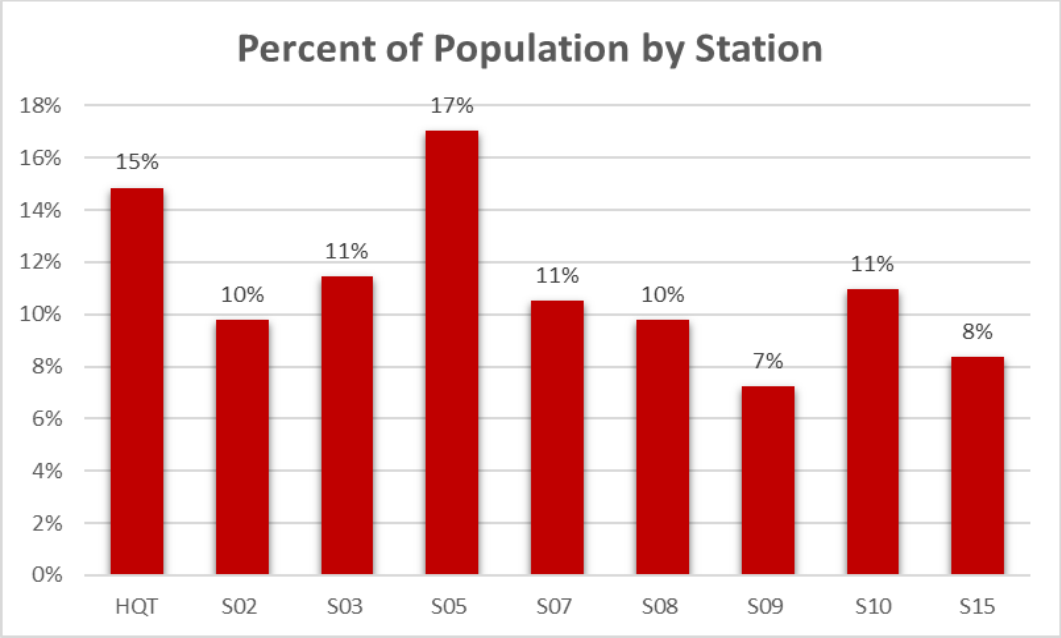
The "Demand for Service" table compares the call volume 2018-2022.

Demand for Service

Incident Type	2018	2019	2020	2021	2022
Fire	519	499	504	546	733
Structure Fire	118	106	130	116	129
EMS	7261	6106	4623	4634	5911
Other	6229	4936	4298	4491	5633
Total	14009	11541	**9425**	**9671**	**12277**
Percent Change	n/a	17.6% DECREASE	18.3% DECREASE	2.6% INCREASE	26.9% INCREASE

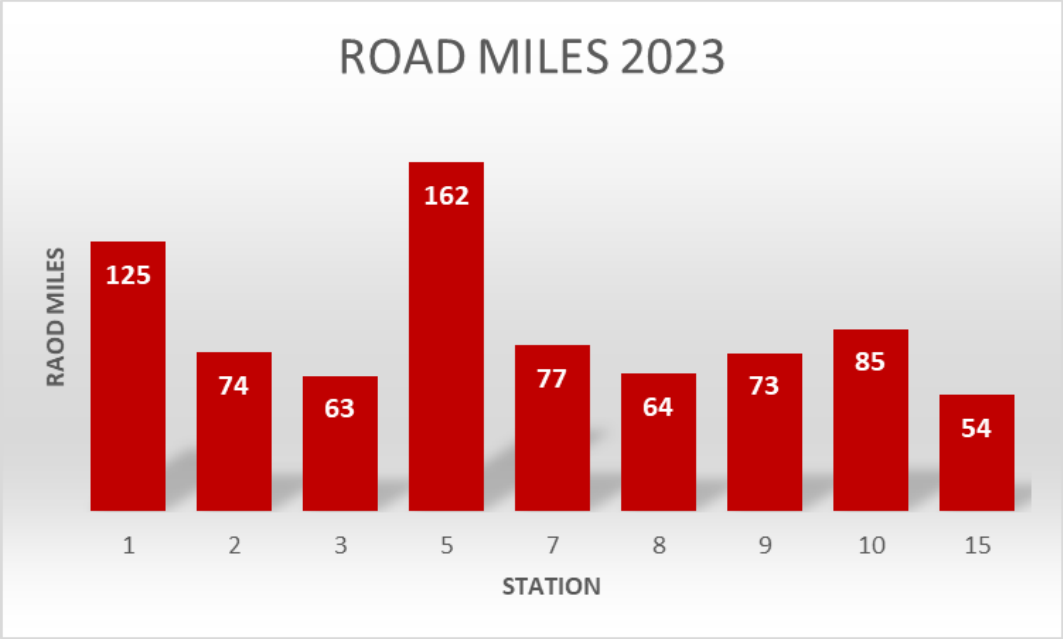
Population breakdown by station first due areas is depicted in the "Distribution of Population in First Due Area" chart.

Distribution of Population in First Due Area



The “Road Miles in First Due Areas” chart displays road miles for each station’s first due area.

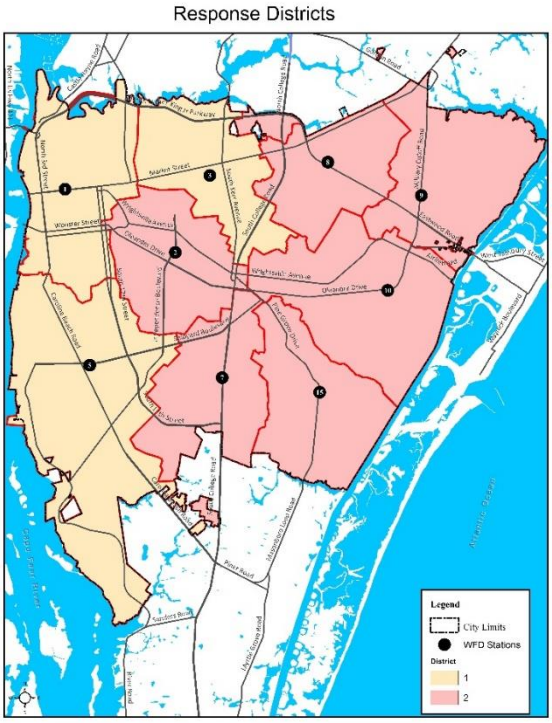
Road Miles in First Due Areas



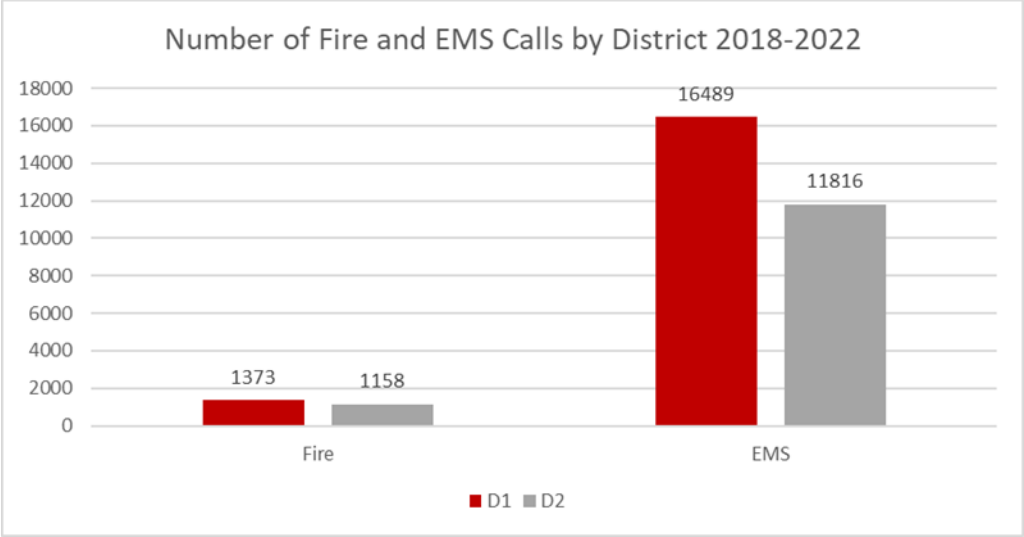
The department created two response districts, each with an assigned battalion chief, to allow for span of control for all the resources and to establish incident command on the scene in an efficient amount of time. Response district 1 includes stations 1, 3, and 5 and the respective first due response areas. Response district 2 includes stations 2, 7, 8, 9, 10, and 15 with their first due areas. The “Response Districts” map shows the two districts. Battalion 1 is assigned to station 1 (Headquarters) and battalion 2 is assigned to station 10.

It is relatively easy to see that the workload in response district 1 is more than the workload in response district 2, however they are more evenly distributed today than in the past. In 2022 a change was made to shift station 2 to district 2 to more evenly distribute workload and maintain the span of control. This has helped to shift the distribution of work. Previously district 1 was nearly double the call volume of district 2. That has also shifted as the population continues to grow in district 2.

Percentages of calls by response district are depicted in the "Fire & EMS Distribution by Response District in 2018-2022" graph. It is evident that response district 1 has considerably more workload than district 2 in these the EMS category. This analysis helped influence the decision to place squads solely in district 1.

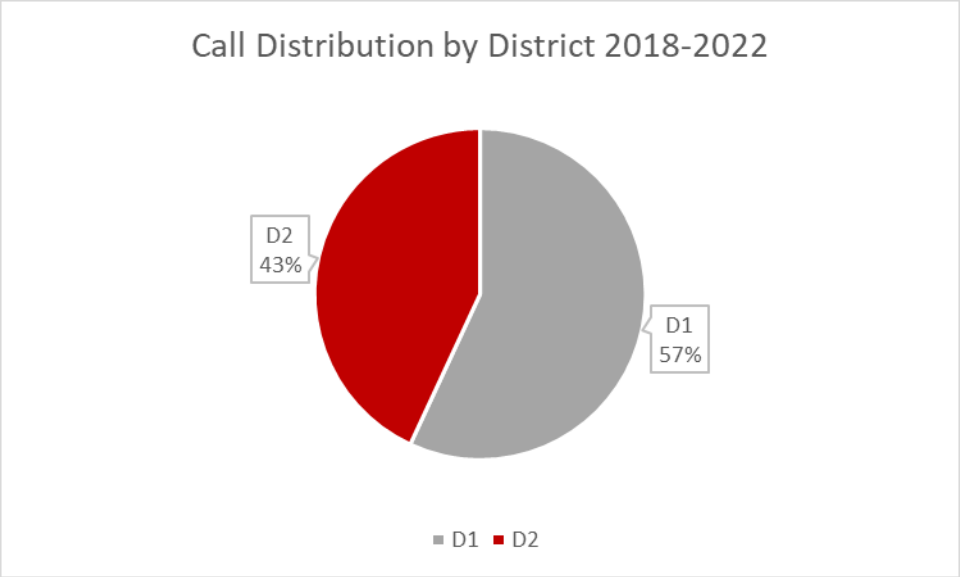


Fire & EMS Distribution by Response District in 2018-2022



A comparison by percentage of workload for all incident categories between response district 1 and response district 2 is depicted in "Call Distribution by District" pie chart. Again, by far district 1 is busier than district 2.

Call Distribution by District



Travel Time and Distribution

Distribution strives for an equitable level of outcome: everyone in the community is within the defined distance from a fire station. Distribution is based on probabilities that all areas experience equal service demands, not totally of the same risk or consequence as those of the demands for service in other areas.

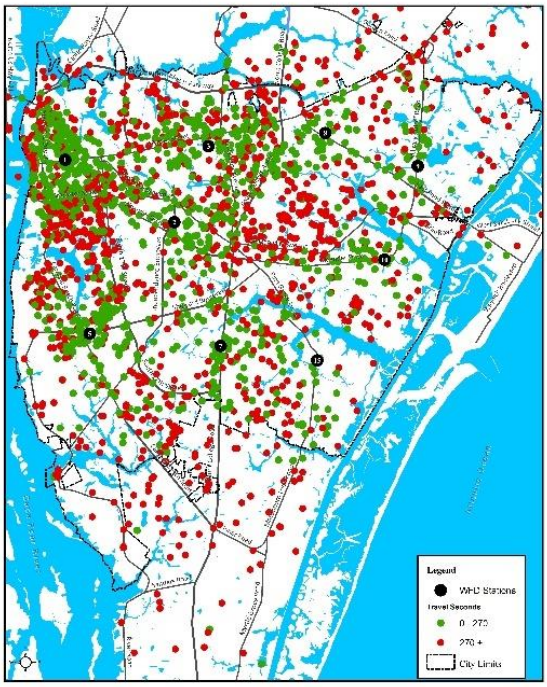
For example, an area of low risk could have fire company travel times far greater than those of a high-risk, high-consequence area, but would the citizens in the low-risk area accept a different level of service? Additionally, aggressive EMS response times, based on successful intervention in cardiac arrest cases, drive distribution to be the same communitywide, which negates different distribution based on risk. The table "First Arriving Travel Time (90th Percentile) by Incident Category" displays the first arriving travel time for the different incident categories. First evaluating performance with data from a five-year period (2018, 2019, 2020, 2021, and 2022) and then calculating performance for the last calendar year (2022).

First Arriving Travel Time (90th Percentile) by Incident Category

Incident Category	5-Year Travel Time Performance 2018-2022	2022 Travel Time Performance
Fire	5:20 (320 seconds)	5:23 (323 seconds)
Structure Fire	4:47 (287 seconds)	5:24 (324 seconds)
EMS	5:03 (303 seconds)	5:04 (304 seconds)
Marine	5:37 (337 seconds)	5:19 (319 seconds)
Hazmat	5:34 (334 seconds)	5:44 (344 seconds)
Technical Rescue	5:44 (344 seconds)	6:27 (387 seconds)

A significant piece of the SOC process is to determine where the department meets established goals and where it falls short, as well as understanding why there are times when standards are not achieved. The "All Fires 5 Years" map illustrates when the department met its four-and-a-half-minute travel time for first arriving unit and when it did not meet it for *all* fire type incidents during a five-year period. Many of the incidents with greater travel times are at further points in station areas or beyond our first due responsibility. This is further discussed when reliability is examined in this section.

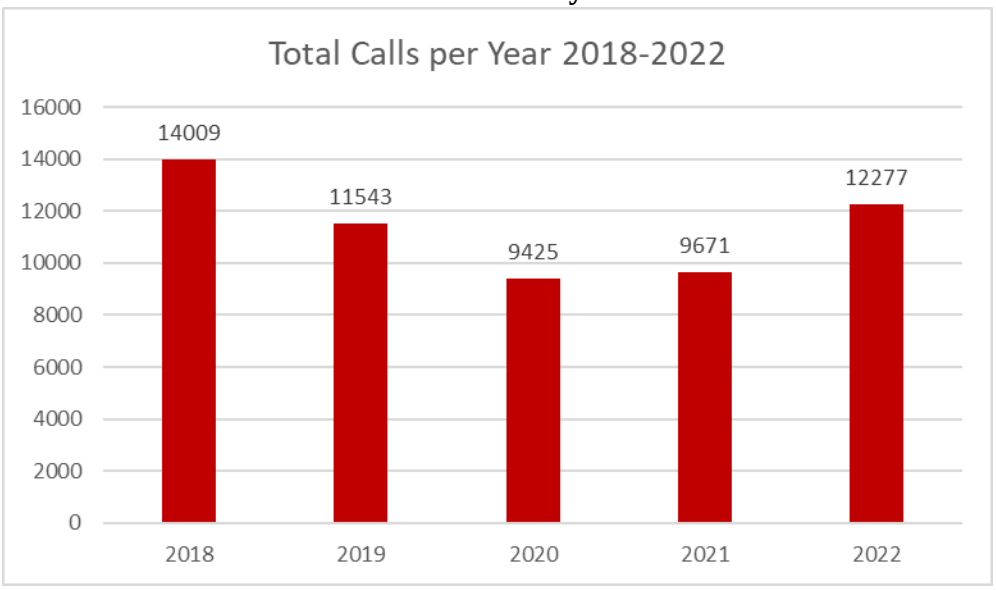
All Fires 5 Years



Historic Workload of System

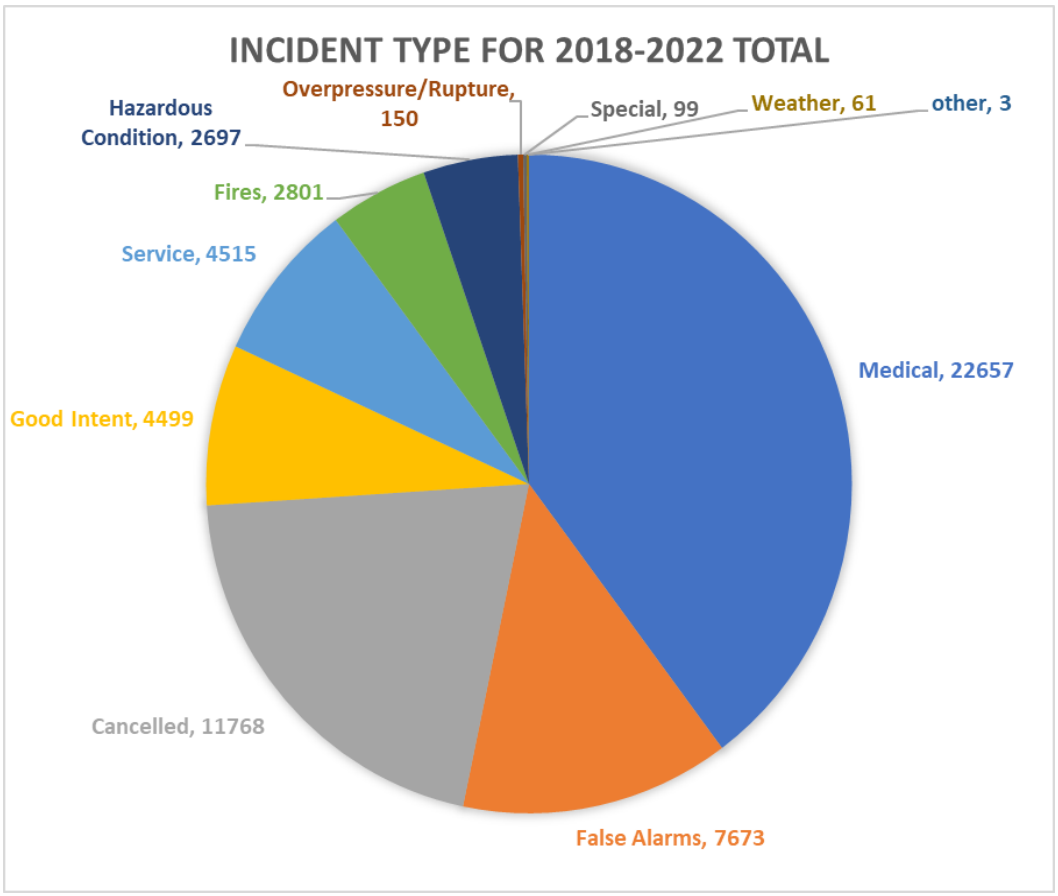
The "Total Incidents by Year" graph reflects the response workload for the five previous years. The fluctuations are mostly from emergency medical incidents. The emergency medical incidents that we choose to respond to has changed continually from a bi-annual review of the response plans. These decisions are vetted with Novant EMS supervisors who may request that we should respond to a type of call that we have not been responding to or vice versus.

Total Incidents by Year

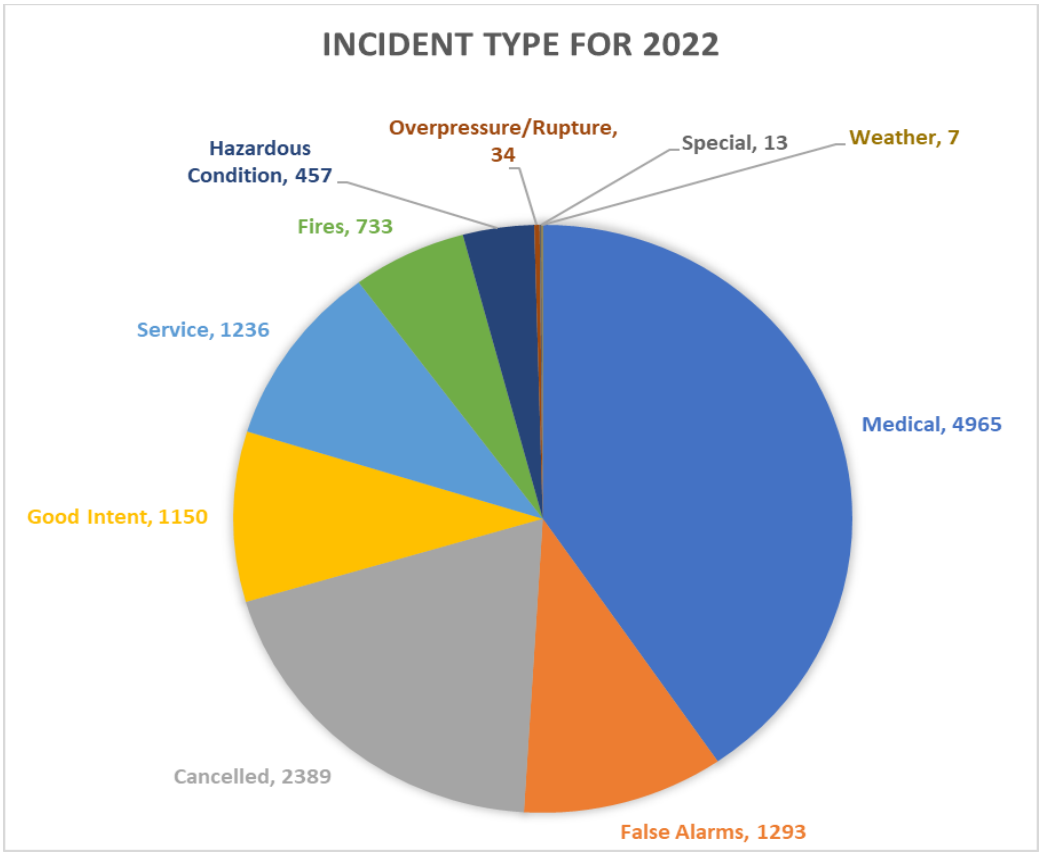


The "Workload by Incident Type for 2018-2022" and the "Workload by Incident Type for 2022" pie charts show responses by incident type for different periods of time. By far, the largest demand for a single type of service is EMS. Fires continue to account for only 5% to 6% of all the incidents.

Workload by Incident Type in 2018 - 2022



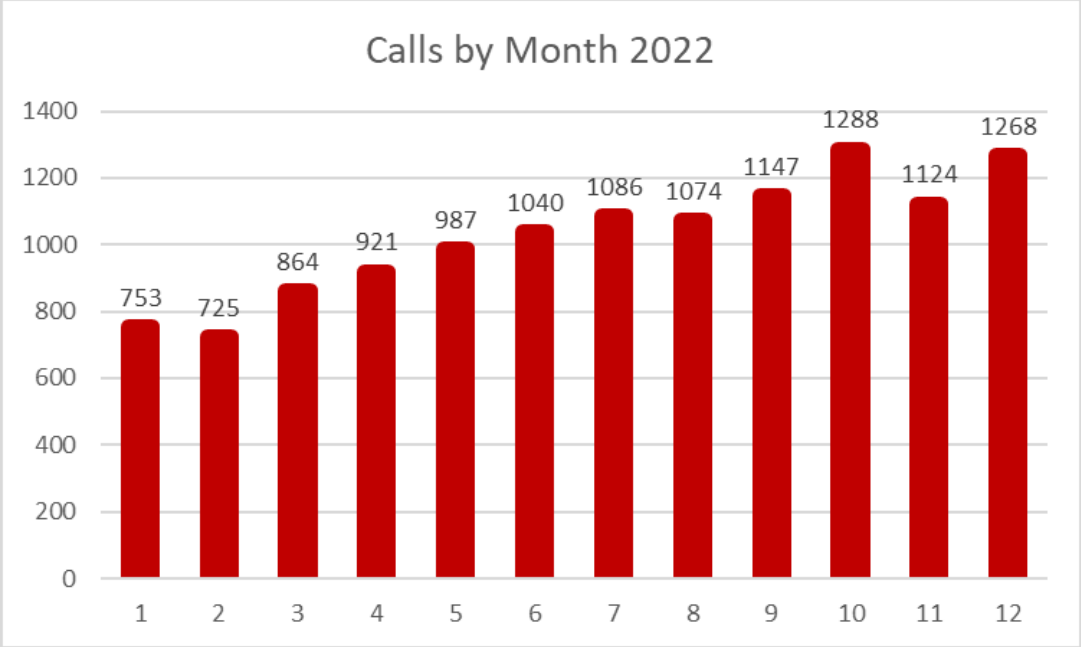
Workload by Incident Type in 2022



Temporal Activity

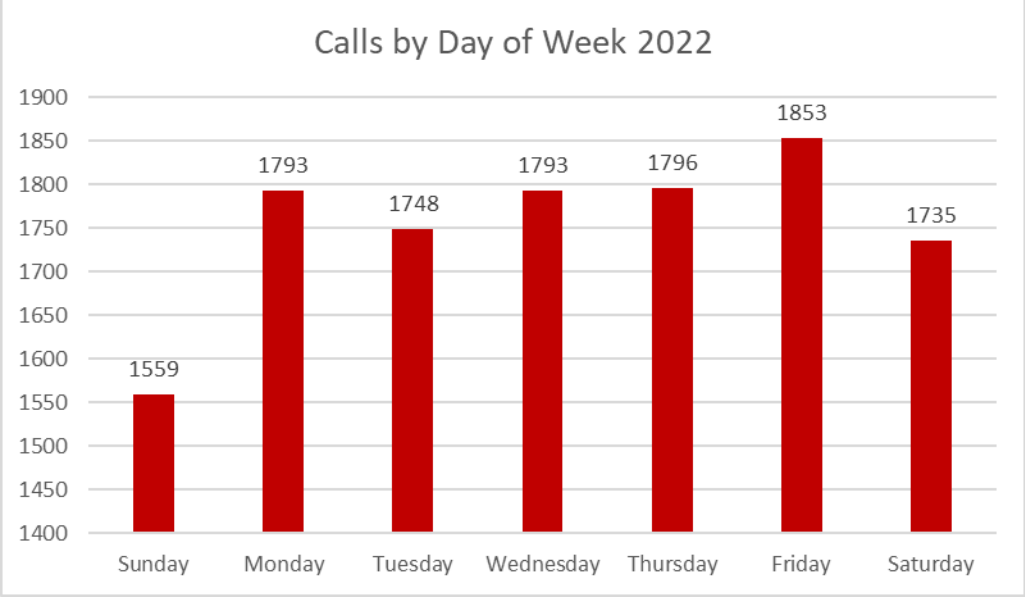
In order to determine when the greatest demand for service occurs, it is necessary to look at the call volume in each month, by each day of the week, and also time of day. This allows the department to establish peak work periods that could have an impact on concentrations and deployment of resources. However, this could have been effected by bi-annual reviews of the response plans where decisions were made to start responding to calls that were not previosly being responded to. The "Calls by Month in 2022" depicts the call volume in each month for 2022.

Calls by Month in 2022



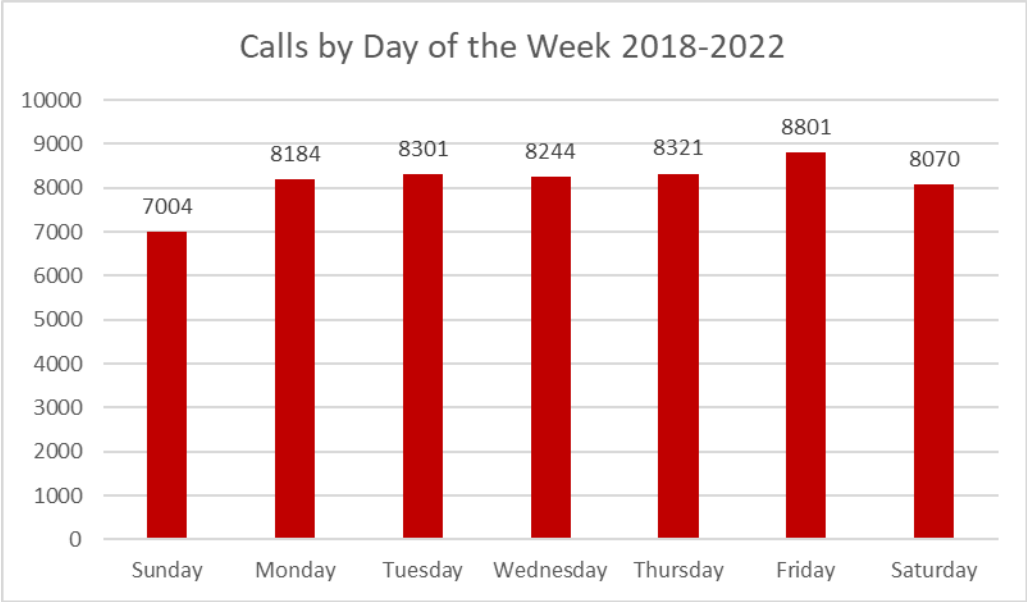
The "Incident Responses by Day of Week" graph illustrates calls by the days of the week for 2022.

Incident Responses by Day of Week 2022



The "Incident Responses by Day of Week (2018, 2019, 2020, 2021, 2022)" graph illustrates calls by the days of the week for a five-year period.

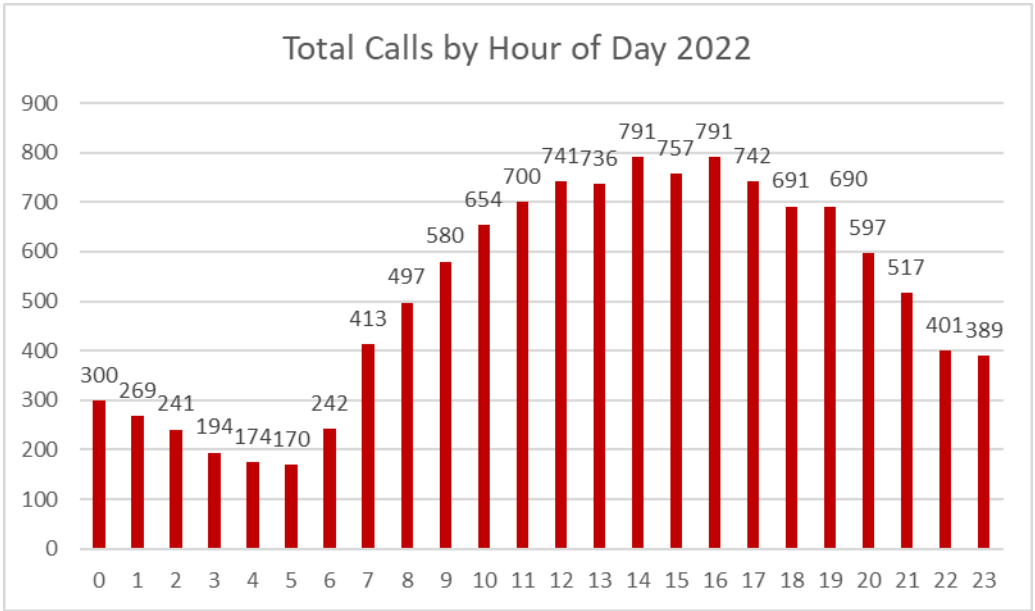
Incident Response by Day of Week (2018 - 2022)



In reviewing the incidents by day of the week for one year and for five years, there is a definite trend for an increase in calls during specific days of the week. The call volume consistently rises on Thursday and continues to peak into Saturday.

The “Call Volume by Hour of Day” graph shows we have 4 times the amount of calls around the lunch hours compared to the call volume at 5:00 am. Call volume spikes around noon and does not begin to fall until after 8:00 pm.

Call Volume by Hour of Day

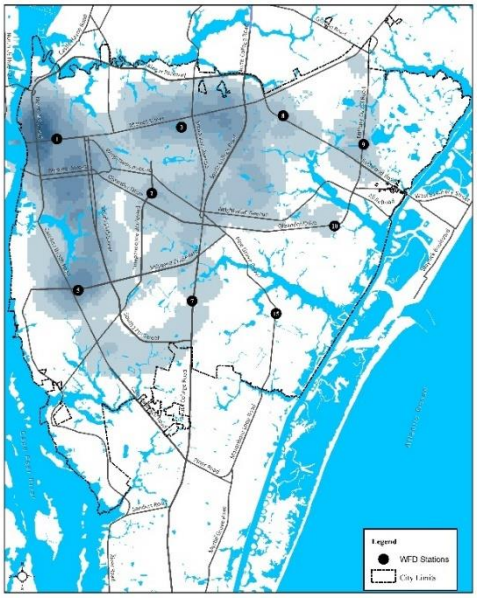


Station and Unit Workload Analysis

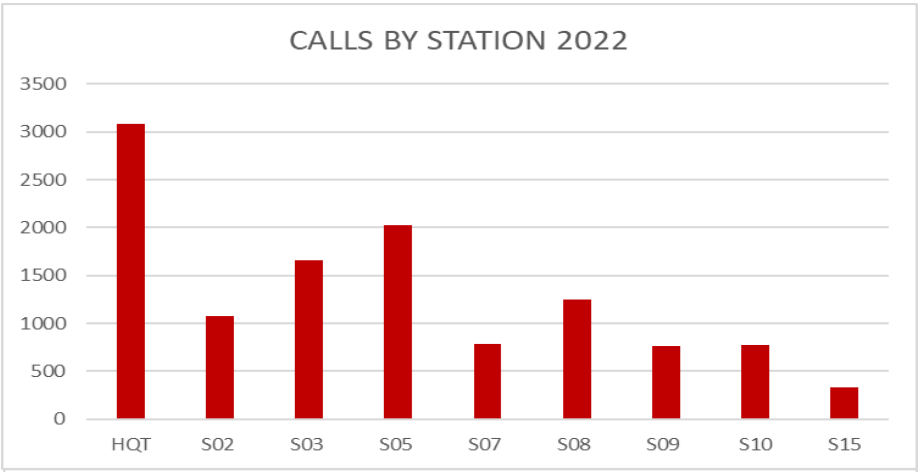
The next part of the analysis of distribution examined the workload of each first due station. A critical part of the analysis used to develop the standard of cover involved the station and workload, as well as their respective response performance. This process was lengthy and involved response time analysis, which provided the first overview of the department's distribution and established the framework for a further look at concentration. Station reliability and unit availability were also key components of this analysis.

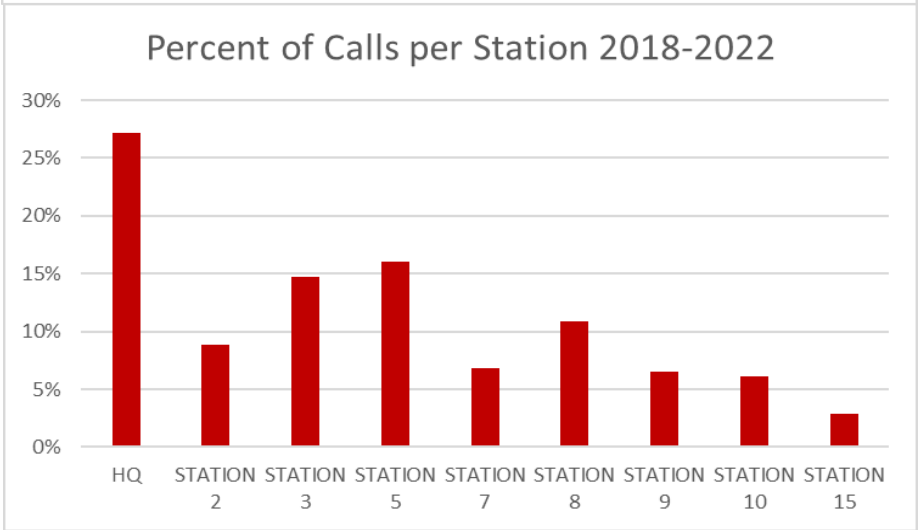
The "Calls by Station in 2022" graph illustrates the call volume distribution for each station in the 2022 calendar year. The following graph illustrates the same data by percentage. The "All Calls 1 Year" map shows the density of the calls in the city for 2022.

All Calls 1 Year Hotspot



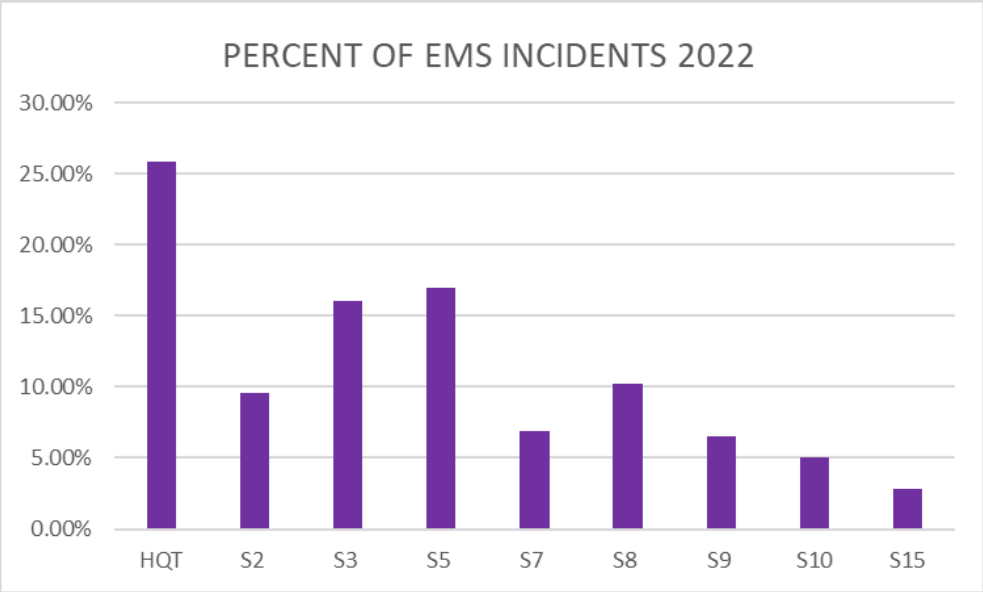
Call Distribution by Station in 2022



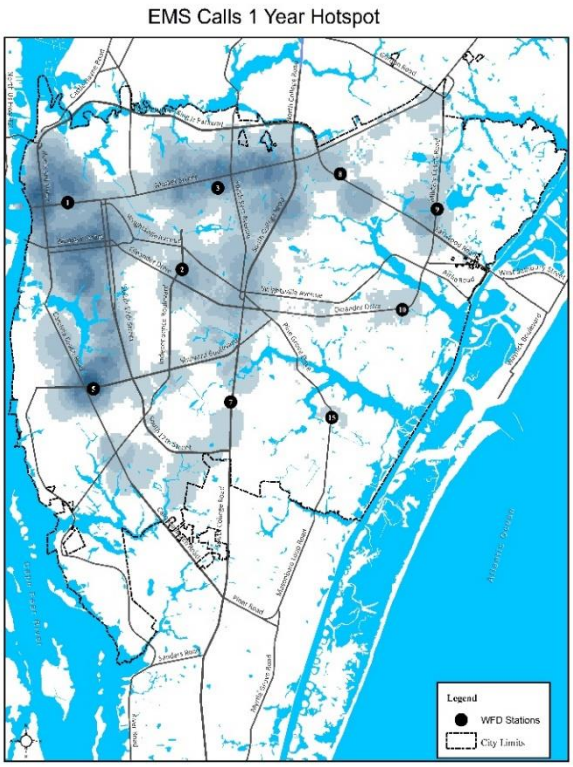


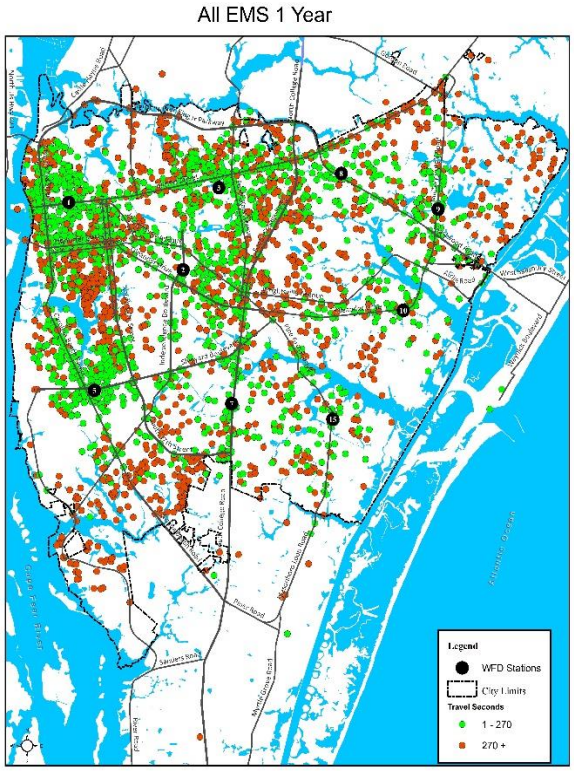
The “EMS Incidents by Station in 2022” graph displays the EMS demand for each station and the “EMS Incidents” map illustrates the location of the EMS incidents and the density of these incidents in specific locations.

EMS Incidents by Station in 2022



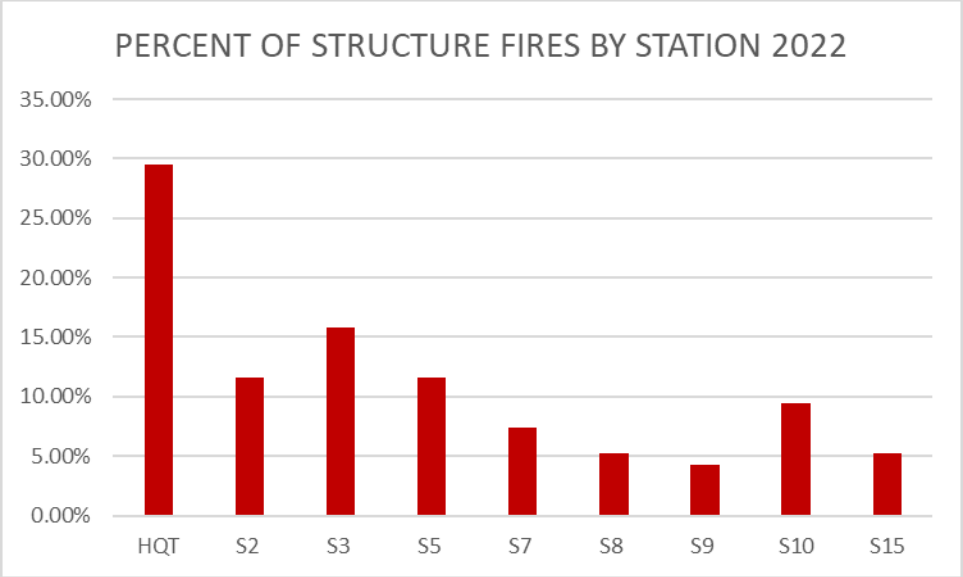
All EMS Incidents For 2022



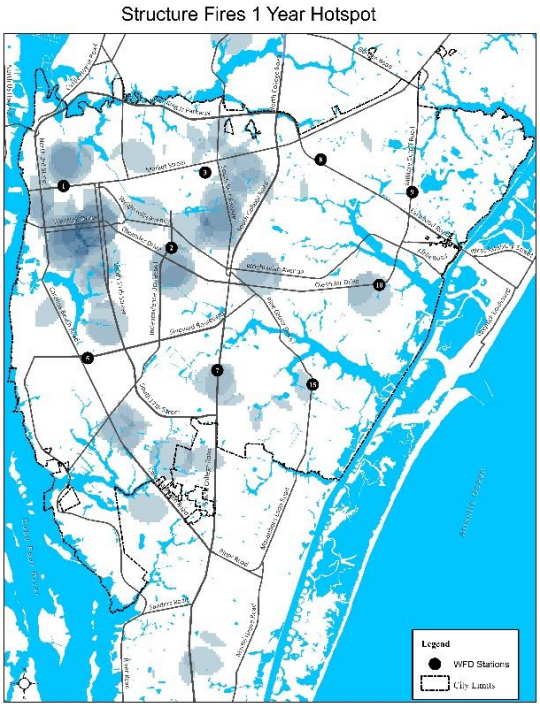


The “Structure Fires by Station in 2022” graph demonstrates structure fire distribution in each first due station areas in 2022 and the “Structure Fire Density Map” map illustrates the location of the structure fires and density in certain locations throughout the city.

Structure Fires by Station in 2022

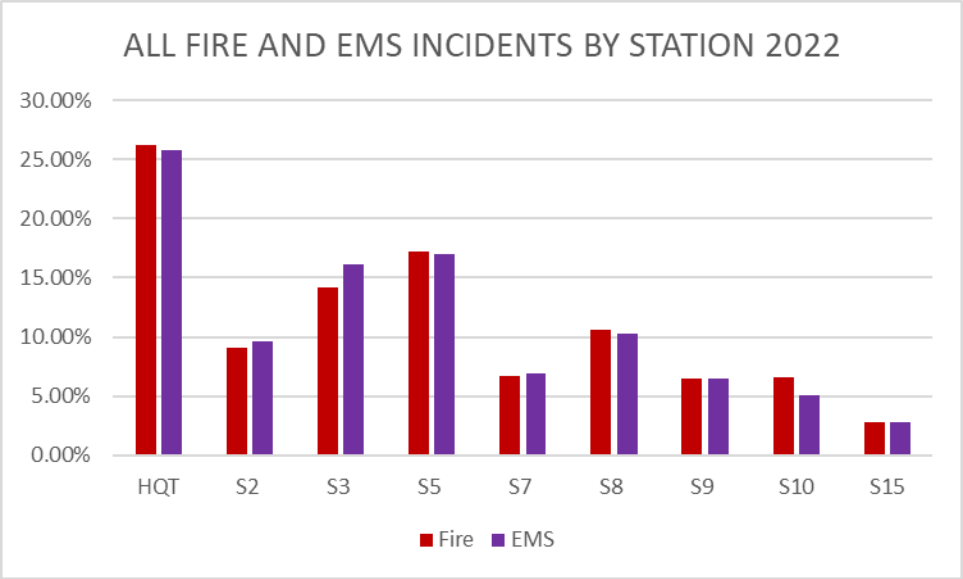


Structure Fire Density Map for 2022

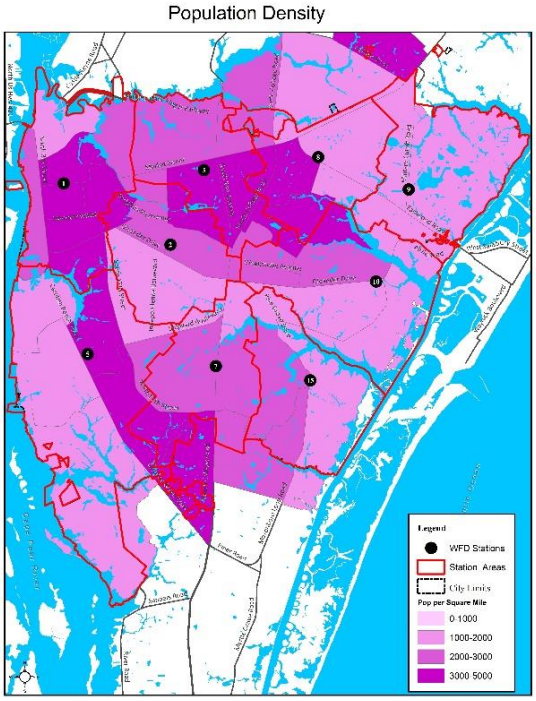


The "All Fire & EMS Incidents by Station in 2022" graph places the demand for EMS and Fire Service for each station area in a format to easily compare the incident categories as well as identifying any unusual trends such as a station being far more heavily impacted by either fire type calls or EMS calls.

All Fire & EMS Incidents by Response Stations 2022



It became clear that the areas with the greatest demand for service were stations 1 (Headquarters), 3, and 5. When other factors were examined, it was observed that the population density, percentage of population, and the percentage of people below the poverty level has a significant impact on demand.

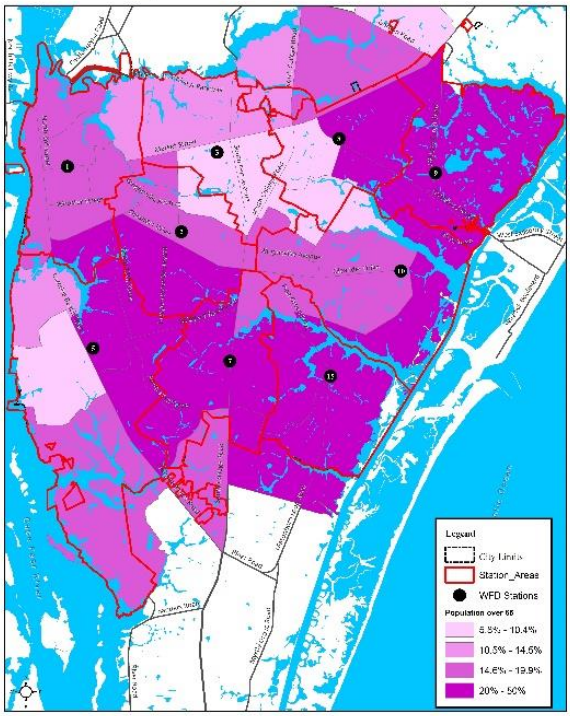


Population Density Map

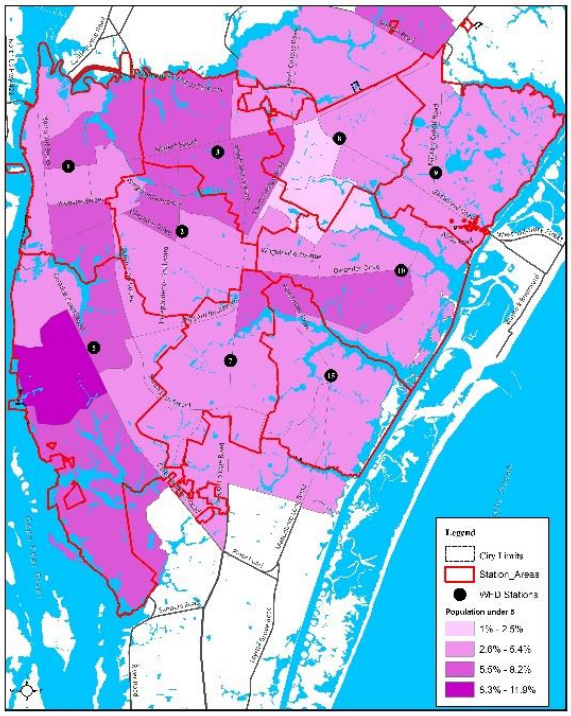
Some of the more frequent requests for EMS service involve two unique populations which include the very young and the elderly. The "Population Under Five Years Old" and "Population Over 65 Years Old" maps are used to identify the highest concentrations of these two populations and relate these populations to the highest demand for serivces. The population under 5 years old has a direct correlation to the areas that have the highest demand for services, station 1, station 3, and station 5.

While the highest percentage of the elderly is predominately in a low demand area, station 9's response area, there are also concentrations of the elderly population in station 5's and station 8's first due area, which may have a direct impact on the demand for EMS services.

Population Over 65 Years Old



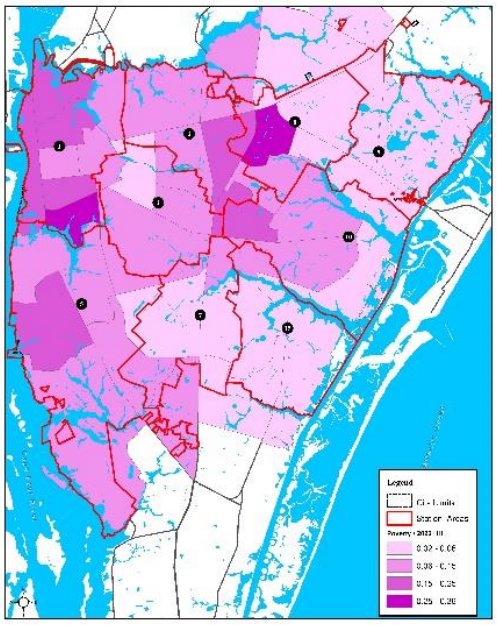
Population Under 5

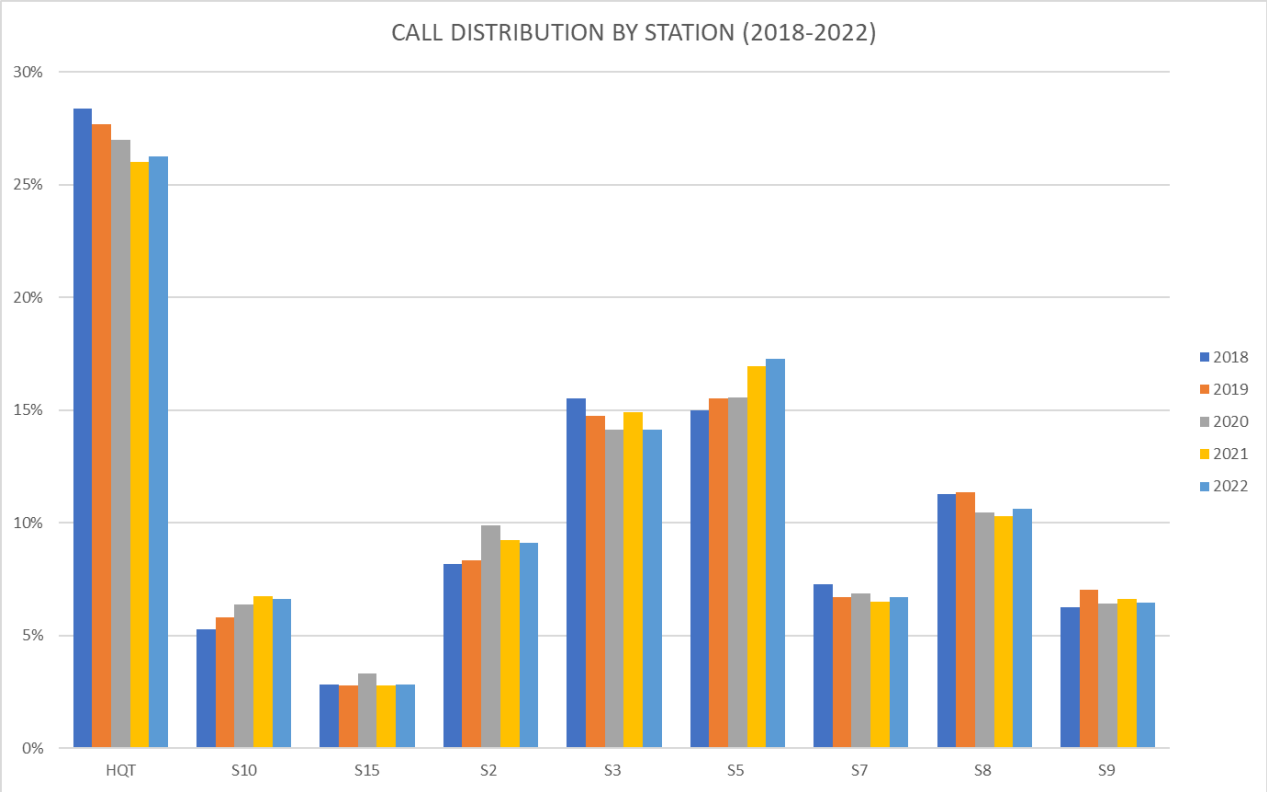


The "Population Below Poverty Level" map depicts where the population living below the poverty level are found. Again, it can be seen that these individuals are located in the first due response area for station 1 (headquarters), station 3, and station 5.

If the call distribution history is examined over a five year period, it is observed that there is very little change in the workload for each station's first due area. Headquarters, station 3, and station 5 have the largest share of the workload, accounting for over 56 percent of all the calls.

Population Below Poverty Level





As stated earlier, the first level of analysis should be of system-wide performance. The "Collective Performance Data from the 2018, 2019, 2020, 2021, 2022 table provides system-wide performance for reaction/turnout time, travel time, and total response time over a five-year period at various percentiles.

Collective Performance Data for 2018-2022

Time 2018-2022	90%	85%	80%	75%
First Unit Turnout	1:32	1:23	1:17	1:12
First Unit Travel	5:28	4:54	4:30	4:13
First Unit Total Response	10:12	9:05	8:26	7:56

The department has stated a goal of 4 minutes and 30 seconds for travel time at the 90th percentile. From the table we can see that the department is achieving this time at the 80th percentile.

Availability

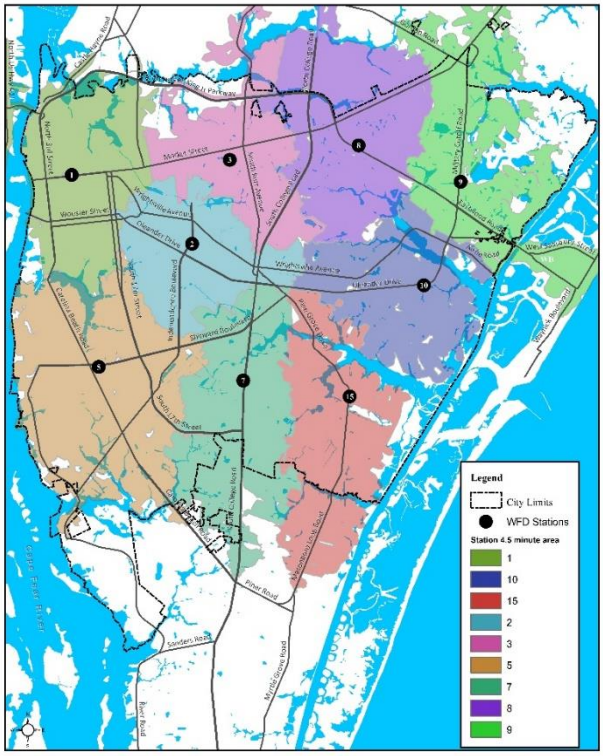
The "Unit Availability" table displays the availability of each unit by evaluating how much timeis spent on calls and also provides insight into company reliability. This table provides information on how available companies are considering call volume and the actual amount of time spent on those calls. While companies are involved in other activites such as training, this helps indicate just how much of their time is spent on calls and how available they are outside of those calls for other duties including addiitional calls for service.

Unit Availability 2022

Unit	Minutes on a Call	Hours on a Call	Apparatus Availability %
ENG5	30924	515.40	94.12%
ENG1	27453	457.55	94.78%
ENG3	25682	428.03	95.11%
ENG2	20684	344.73	96.06%
TRK8	19456	324.27	96.30%
TRK5	16310	271.83	96.90%
ENG9	16118	268.63	96.93%
ENG7	15859	264.32	96.98%
TRK1	15811	263.52	96.99%
FSAF2	15771	262.85	97.00%
ENG10	13296	221.60	97.47%
RES2	12398	206.63	97.64%
TRK7	11748	195.80	97.76%
BATT1	11214	186.90	97.87%
ENG4	10568	176.13	97.99%
SQD1	9934	165.57	96.22%
ENG8	9481	158.02	98.20%
BATT2	8734	145.57	98.34%
ENG15	8274	137.90	98.43%
SQD3	6401	106.68	97.56%
SQD8	6280	104.67	97.61%

One of the tools utilized in setting goals was travel time modeling through data presented and then displayed in a GIS format. This illustrated the distances and coverage that should be provided in the adopted travel time goals. This system utilized projections based on a pre-determined travel speed while taking into consideration turns and connectivity. The "Travel Time Model (4 min 30 sec)" map displays the modeled coverage which the first due units should achieve based on a 4 minute and 30 second travel time from the first due stations. As illustrated, the coverage is almost complete and matches the tables indicating a high percentage of compliance in meeting our stated performance goals.

Travel Model

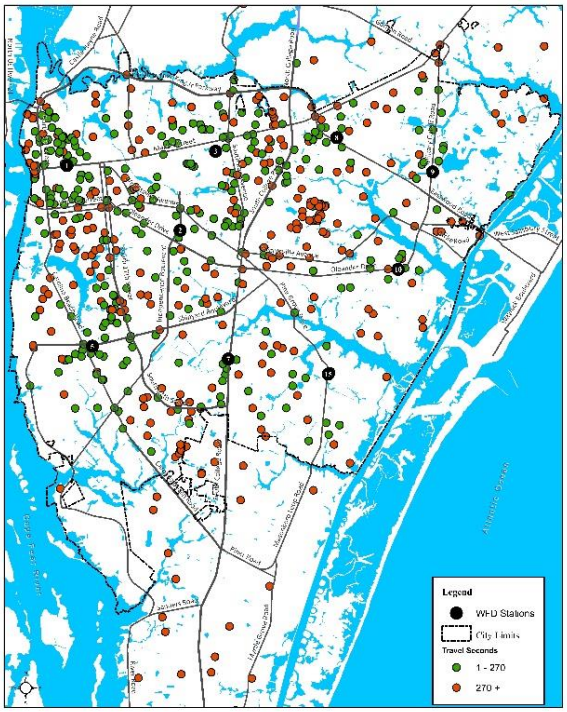


The history of meeting and not meeting the four and a half minute travel time for two primary incident types are depicted in the maps below for first arriving units. Fire and EMS calls are illustrated for 2022 as well as for a five-year period (2018-2022).

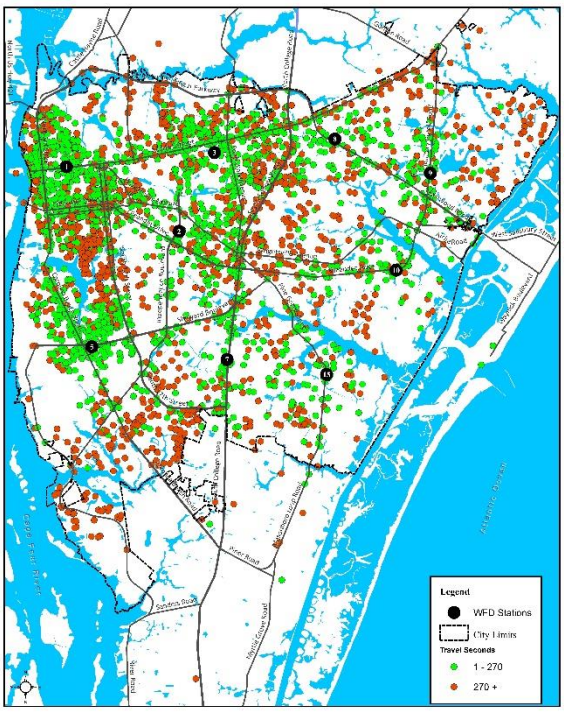
The maps show the location of the incidents where the department does and does not meet the threshold of four and one half minutes travel time. The concentrations of meeting and not meeting are clearly apparent in both types of maps.Being able to assess the data in this context, patterns were visualized for where we could meet and could not meet our desired performance. In some

instances, street connectivity is the known issue. Some neighborhood areas are hard to reach due to a single access, narrow streets, or no direct connectivity to a major road.

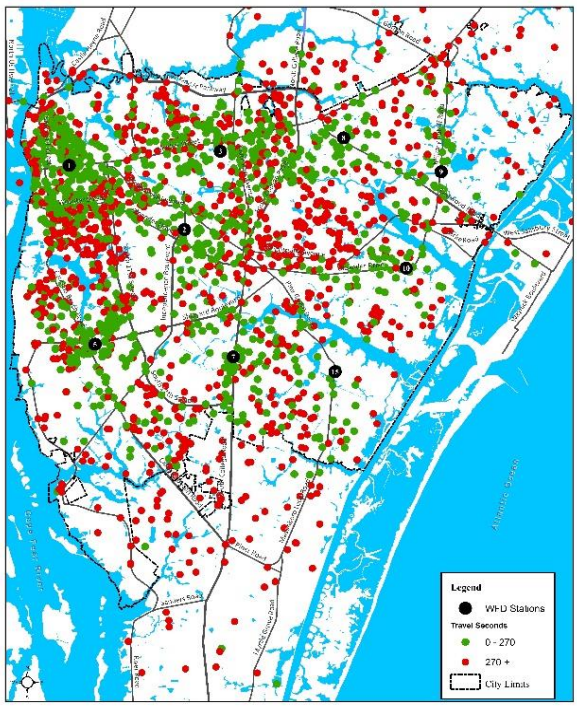
All Fires 1 Year



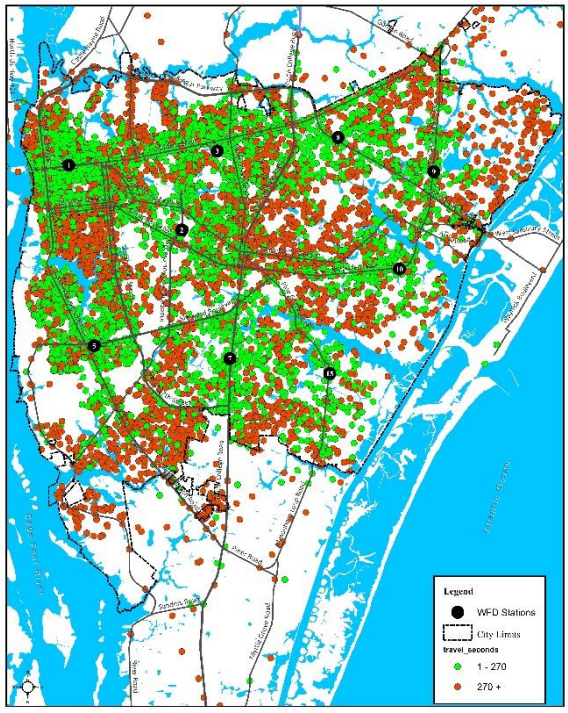
All EMS 1 Year



All Fires 5 Years



All EMS 5 Year

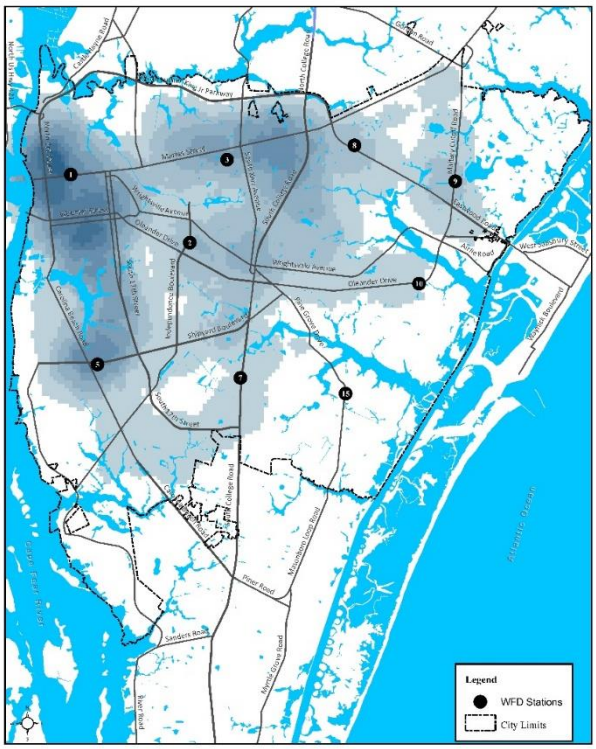


Concentration

A concentration study requires an analysis of the arrangement of multiple resource spacing (close enough together) so that the ERF may be assembled at the scene within the adopted public policy time frames. The ERF, resulting from critical task analysis, should be able to stop the escalation or forward progress of the emergency.

While distribution was about first unit arrival, concentration is about having enough of the right equipment and staff arriving in a time frame that allows them to be effective while servicing the demand/situation. Distribution is about time and distance while concentration is about calls for service and risk level being protected.

All Calls 5 Year Hotspot



Increased Risk = Increased Concentration

The analysis of concentration begins with a systemwide overview of the demand for service by station first due areas. The "Overall Demand for Service" table below illustrates the demand for service for each first due engine company. The "All Calls 5 Year Hotspot" map illustrates the hot spots of activity over a five-year period.

Overall Demand for Service

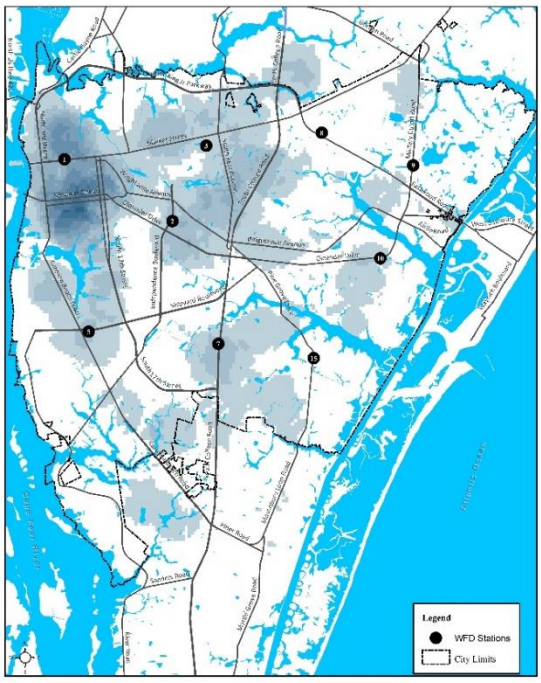
UNIT	CALLS FOR SERVICE 2022	PERCENT OF TOTAL CALLS 2022
ENG1	2047	9.72%
ENG10	965	4.58%
ENG15	510	2.42%
ENG2	1581	7.51%
ENG3	1670	7.93%
ENG4	19	0.09%
ENG5	2256	10.72%
ENG7	1256	5.97%
ENG8	29	0.14%
ENG9	1218	5.79%
SQD1	2053	9.75%
SQD3	1216	5.78%
SQD8	926	4.40%
TRK1	1418	6.74%
TRK5	1292	6.14%
TRK7	948	4.50%
TRK8	1650	7.84%

The “Structure Fire Service Calls” table shows the demand for structure fire service calls over a 3 year period and the “Structure Fires 5 Year Hotspot” map illustrates the hotspot activity over the five-year period.

Structure Fire Service Calls

Station	Number of Structure Fires	Percent of Structure Fires
1	128	29.29%
2	45	10.30%
3	64	14.65%
5	51	11.67%
7	35	8.01%
8	23	5.26%
9	27	6.18%
10	39	8.92%
15	25	5.72%

Structure Fires 5 Year Hotspot



Effective Response Force

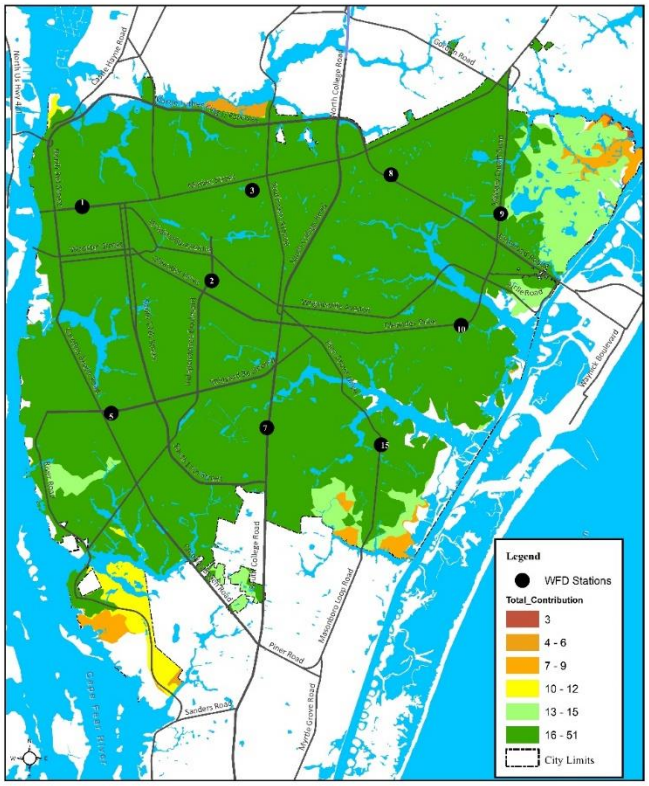
Critical tasking conducted by the department determined that the ERF for a moderate risk structure fire would be sixteen personnel. In order to achieve the amount of personnel on scene as identified in critical tasking, the department has established response plans that allow for a certain amount of units and personnel to be deployed on the first alarm assignment as illustrated in the “First Alarm Assignment” table.

First Alarm Assignment

Unit Type	Personnel
1 Battalion Chief	1
1 Safety Officer	1
3 Engines	9
1 Truck	3
1 Rescue	4
1 Squad	2
Total Personnel	20

The table shows the first alarm assignment for a moderate risk fire incident. The total personnel shown is twenty personnel responding, however the rescue, squad, safety officer, and the battalion chief could be traveling a considerable distance from a station that was not part of the run order for the call. Sending more than the ERF/ critical tasking calls for allows for the arrival of the ERF to be more timely. The department has historically located stations as close to ISO recommendations as possible. There is very little area within the city that cannot be reached in eight minutes by units from the station considered to be part of the ERF for each station's first due area. This also allows for the probability that the stations included in the eight minutes for the primary station would be the stations from which the ERF would be deployed.

Concentration Model
(8-Minute Travel Time)



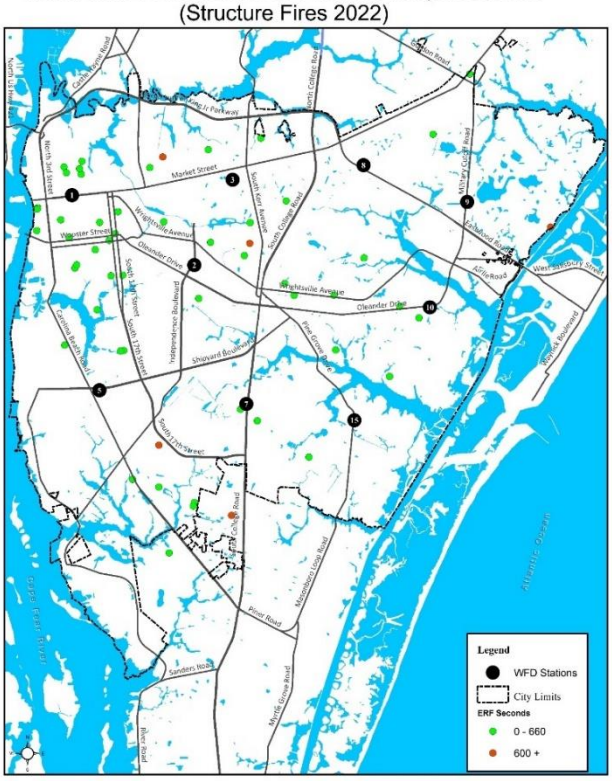
While the station 1 (headquarters) first due area has the greatest risk by call volume, population density, and risk vs. outcome potential, most of the area can be covered by an ERF in eight minutes as represented on the "Concentration Model (8 minute Travel Time)" map. Very few areas of concern are presented by the concentration model which models personnel from stations responding to calls throughout the city in order to achieve an ERF within 8 minutes considering travel time and minimum staffing of all companies throughout the department. This model does not take into consideration automatic aid.

There are 3 main areas which indicate the potential for delays. The first being the Riverlights area in the southwestern most area of the city. The department has previously identified this need and the Riverlights area will have a new fire station (station 6) constructed and in service by the end of 2024. The other large area is the Landfall area, a private and gated development located in the northeast corner of the city. The layout and roads inside of this community make it extremely timely to travel through lengthing the response of emergency vehicles. This area often receives automatic aid from the county and on occuasion can also be provided aid from Wrightsville Beach to complete the ERF. Lastly, the area in the southeastern portion of the city that is highlighted as promblematic is provided ERF coverage with automatic aid from station 18 in the county which is the second due engine and truck for that response zone.

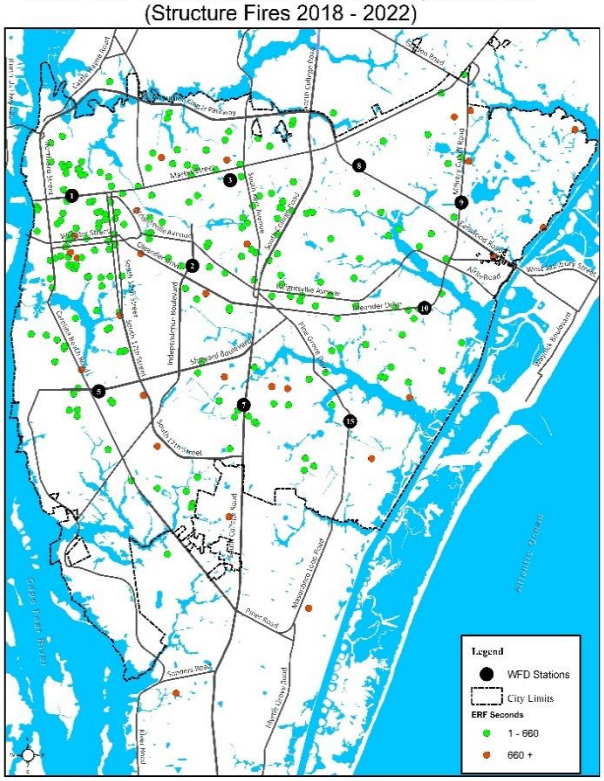
The "Travel Time Performance for ERF" maps represent the compliance for an eight minute travel time to a moderate risk fire incident for the arrival of the ERF for structure fires in 2022 and for structure fires over a five year period.

When analyzing the ERF response times it needs to be stated that the call processing times are the same for all units and the turnout time goal is only for the first unit enroute; therefore, this analysis and assesssment of the ERF performance only concerned the total travel time it took to receive the ERF on the scene for moderate structure fires. Other ERF's for other fire risk and other programs at different risk levels are know and analyzed, moderate structure fires is the highest call volume to achieve ERF's. The current compliance for the eight minute goal and the current performance at the 90th percentile (baseline) was examined. Over a five-year period the department had 167 moderate risk fire incidents where the full first alarm ERF arrived on the scene. The "ERF Travel Time Performance" table shows the established travel time goal of 8 minutes travel time was met 72.2 percent of the time. Our baseline performance at the 90th percentile is 10:02.

Travel Time Performance for Effective Response Force
(Structure Fires 2022)



Travel Time Performance for Effective Response Force
(Structure Fires 2018 - 2022)



ERF Travel Time Performance for 2018 - 2022

2018 -2022	90%	85%	Compliance
TRAVEL TIME	10:02	9:11	72.2%

The maps for ERF travel time allowed for the visualization of where compliance was met and not met. The "Travel Time Performance for ERF in 2022" map provides an analysis of incidents in 2022 where the ERF arrived on the scene of a moderate risk structure fire. The five-year map is a more realistic analysis due to a larger number of incidents to analyze. More data will allow for the assessment to reveal more consistent and realistic patterns. In the "Travel Time Performance for ERF (Moderate Structure Fire Incidents in 2018, 2019, 2020, 2021, 2022)" map, provides this analysis over 5 years. The travel times for the past 5 years to moderate risk structure fires is almost identical to the previous 5 years. The department sends the only heavy rescue to all structure fires, and it must travel from station 2 to the incident which could be a considerable distance. The safety officer must travel from station 3 to the incident which could be of considerable distance. The battalion chief must travel from one of two locations, stations 1 and 10 which could be of considerable distance. To help alleviate this issue the department upped the minimum manning from 3 to 4 on four

apparatuses across the city. In addition, the department added a squad unit to all structure fire calls. So now there are 20 plus personnel dispatched to a moderate risk structure fire to achieve an ERF of 16. This is also true for other risk ERF's. The department will continue to monitor the ERFs to see if this change helps or if further adjustments are needed.

Performance Objectives

In addition to the vision, mission, and value statements, the following response-specific performance objectives are recommended. These objectives were developed from analysis of current performance and the achievement of low or no cost service level improvements.

First Due Response Performance Objective

1. The first fire department response unit will arrive at a fire emergency in the city within 7 minutes 30 seconds from time of dispatch notification 90 percent of the time.
2. The first fire department response unit will arrive at a medical emergency in the city within 7 minutes 30 seconds from time of dispatch notification 90 percent of the time.
3. The first fire department response unit will arrive at a technical rescue emergency in the city within 7 minutes 30 seconds from time of dispatch notification 90 percent of the time.
4. The first fire department response unit will arrive at a hazardous materials emergency in the city within 7 minutes 30 seconds from time of dispatch notification 90 percent of the time.
5. The first fire department response unit will arrive at a marine emergency in the city within 7 minutes 30 seconds from time of dispatch notification 90 percent of the time.

Concentration Performance Objective

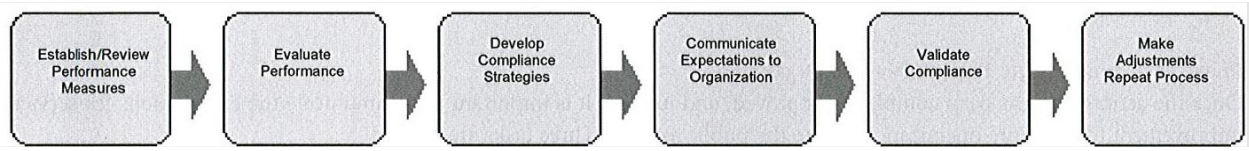
1. For moderate-risk fire incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within 11 minutes total response time 90 percent of the time.
2. For high-risk fire incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within twelve minutes total response time 90 percent of the time.
3. For special-risk fire incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within thirteen minutes total response time 90 percent of the time.
4. For high-risk EMS incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within 11 minutes total response time 90 percent of the time.
5. For moderate-risk technical rescue incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within ten minutes total response time 90 percent of the time.
6. For high-risk technical rescue incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within 11 minutes total response time 90 percent of the time.
7. For moderate-risk hazardous materials incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within ten minutes total response time 90 percent of the time.
8. For high-risk hazardous materials incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within 11 minutes total response time 90 percent of the time.

9. For all marine incidents within the city, the department shall assemble an ERF consisting of personnel sufficient to effectively mitigate the incident based on risk within 11 minutes total response time 90 percent of the time.

XII. Plan For Maintaining and Improving Response Capabilities

COMPLIANCE MODEL

The department intends to use the compliance model developed and published in the CFAI SOC 5th edition as a guide. The model is as follows:



Phase 1: Establish/Review Performance Measures

Upon completion and adoption of the SOC, the department will conduct a complete review of the performance measures and compliance to the SOC bi-annually. The analysis is risk-based and evaluates the following:

- Services provided are identified
- Levels of service are defined
- Levels of risk are categorized
- Performance objectives and measures developed

    - Distribution performance measures adopted
    - Concentration performance measures adopted

Phase 2: Evaluate Performance

Performance measures are applied to actual service provided at various levels:

- System level
- Regional level First due level
- Unit level
- ERF level

Phase 3: Develop Compliance Strategies

Upon completion of the evaluation, determine issues and solutions.

- If catchment areas exist, what can be done to close the gaps?
- Are there resources that can/should be reallocated?
- What alternative methods are there to provide the services?

- Provide budget estimates as necessary.
- Are we maximizing the existing resources?

Phase 4: Communicate Expectations to the Organization

With the completed action plan approval, it is necessary to communicate the expectations to the organization and the public.

- Explain the method of measuring compliance to personnel who are expected to perform the services.
- Provide feedback mechanisms.
- Define consequences of noncompliance

Training may need to be provided if there is a change in policy or procedure.

- Provide appropriate levels of training/direction for all affected personnel.
- Communicate consequences of noncompliance.
- Empower personnel within the organization to identify the need to modify (remediate) business processes, business application systems, and technical infrastructure as necessary to comply should there be a conflict with the new methods.

Phase 5: Validate Compliance

Develop and deploy verification tools and/or techniques that can be used by sub-sections of the organization on an ongoing basis to verify compliance requirements. These may include:

- Semi-annual evaluation
    - Performance by unit
    - Overall performance
    - Review of performance by division

The operations division conducts monthly meetings between the battalion chiefs and assistant chief of operations to review company and district performance. The department conducts a semi-annual report out process to evaluate all programs within the department and their performance against benchmarks and historical performance. The department also conducts annual evaluations such as the divisional assessment process.

- Semi-annual evaluation
    - Performance by unit
    - Performance by first due

- Overall performance
- Review of performance by executive management

Phase 6: Adjust and Repeat Process

Review changes to ensure service levels have been maintained or improved. Develop and implement a review program to ensure ongoing compliance.

- Bi-annual Review and Evaluation
  - Performance by unit, first due unit, and overall performance
  - Compliance to times established in SOC
  - Look for trends
  - Review performance by governing body
  - Adjustment of service level by governing body as necessary
- Overall review of performance and process.
- Adoption of performance measures by governing body.
- Establish a process to manage future changes within the department.

Overall Evaluation

The SOC development process involved an in-depth evaluation of the department's entire operations and many policies and procedures. The analysis involved an overview of the community including such criteria as legal basis, finance/budget, growth, demographics, and history of the fire department, climate, topography, and transportation. The next area reviewed was the current levels of service provided. This included looking at each service and the baselines for responding to different types of emergencies, station and resource location and number were included in this section, organizational structure was illustrated to allow for the alignment of position and responsibility. A brief description of the delivery system was reviewed and provided. Also covered were services provided other than emergency response services. A community risk assessment was included in the document. In this section an evaluation of the different types of risk (fire and non-fire) was performed. Weather, hazardous materials releases, marine incidents, and technical rescue risk potentials were analyzed. An Occupancy Vulnerability Assessment Profile (OVAP) process was developed and utilized for the buildings which there were complete data for. This is currently an ongoing process and OVAP scores will be developed as the data is available. A risk assessment was also performed on incident types, using the dispatch codes for incidents the department responds to as called to by the 911 center, this was done to ensure proper resource allocation to specific calls for service. Special risks were evaluated as well. Such occupancies as tank farms, hospitals, high life hazard occupancies, schools, and large assemblies and institutions were individually assessed. Critical infrastructure such as transportation, marine facilities such as the NC State Ports, railways, and major highway transportation routes were examined for traffic patterns and connectivity issues. The next section was the historical perspective and evaluation of the department. Response times, distribution, concentration, workloads, availability, and incident concentrations were evaluated in this section. Next the department's performance objectives and measures were established and adopted. These objectives created performance levels that the department determined to be obtainable and within established industry best practices. The levels set by the department will be examined at the 90th percentile which provides an overall accurate analysis. The next section was development of compliance methodology by the department used to maintain and evaluate service delivery in an ongoing and timely manner.

The following are some of the findings which were observed during the development of the SOC:

- The quality of data in the record management system (RMS) has greatly improved since the original SOC writing. Quality control of incident reports has been assigned to the shift battalion chiefs. A new RMS is being onboarded and that should make the QA process and data quality even better through more rules and controls.

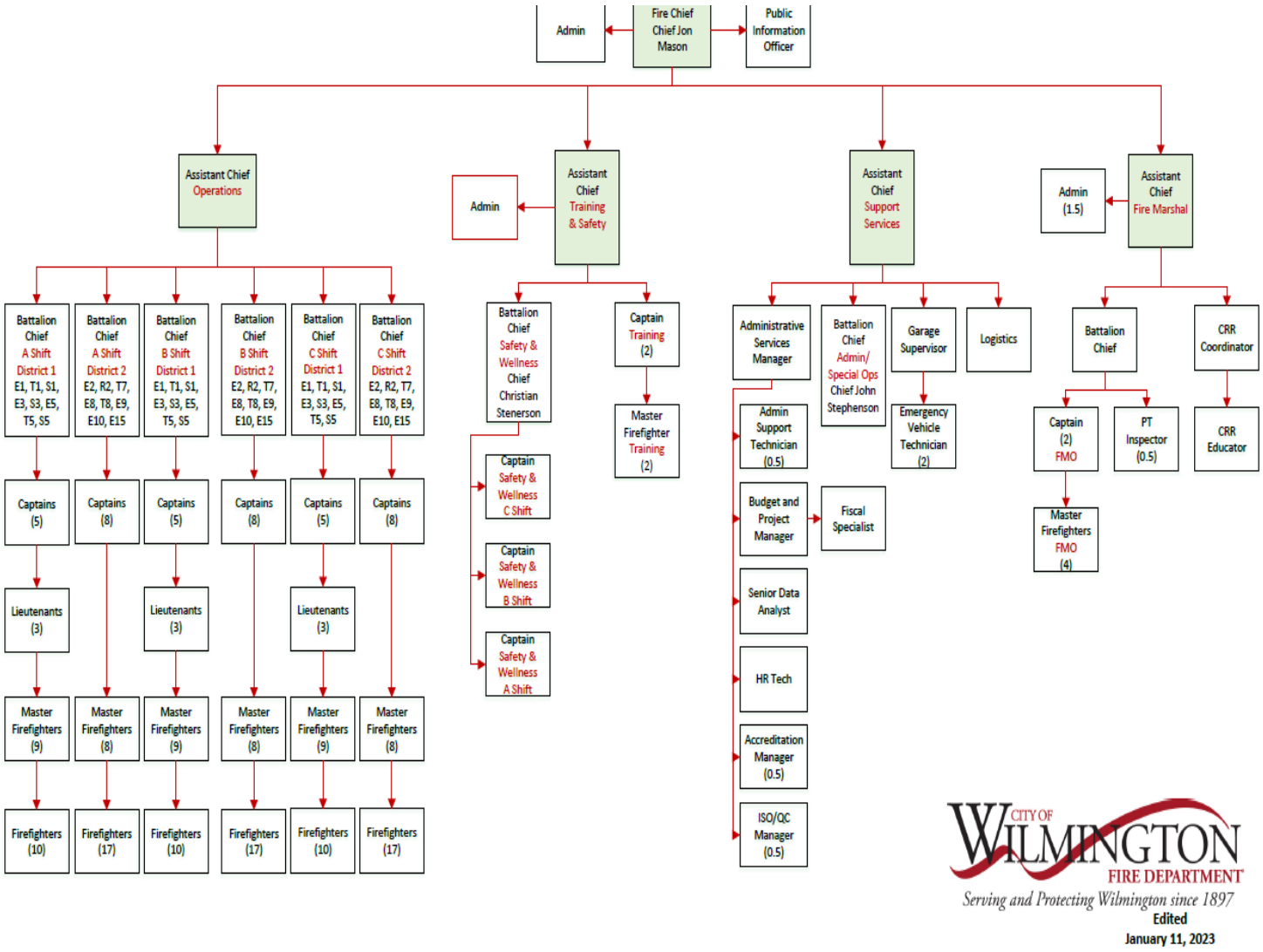
- The occupancy data, while perhaps good enough for inspections, did not provide any complete information on the structures. These records have been under review since the original SOC was developed and much of the missing data has been recorded and verified.

- Department response times remain stagnant, however that perhaps is indicative of our proactive measures to continue to improve. Since 2017, traffic and population growth have caused challenges in the city yet are response times remain fairly consistent. This is a sign that our processes are working as it would be expected to see longer response times.

- There is now a quality assurance program in place for the 911 center and a committee of fire and EMS agencies meet with the center on a bi-monthly basis to discuss issues and implement any changes that have been agreed upon. The center also implemented automated dispatch in the fall of 2021. The department is now quick-launching calls that originate in the EFD system.

Appendices/Exhibits

ORGANIZATIONAL CHART



CITY OF WILMINGTON FIRE DEPARTMENT
Serving and Protecting Wilmington since 1897

Edited
January 11, 2023

WFD INVENTORY

Vehicle #	Unit #	Year	Make	Model	Station/Location

91234	Hose Testing Truck	1991	CHEVY	C1500	Station 10/Oleander Dr
97251	Reserve Truck	1997	SUTPHEN	QUINT LDH	Station 3/Cinema Dr
99226	Brush 1	1999	FORD	F350	HQ/801 Market St
99221	Dive Support	1999	FREIGHTLINER	SALVAGE	HQ/801 Market St
99249	Training Engine	1999	SUTPHEN	PUMPER LDH	HQ/801 Market St
00235	Tech Rescue	2000	FORD	RESCUE LT	Station 2/3403 Park Ave
00236	Tech Rescue	2000	HAULMARK	TRAILER	Station 2/3403 Park Ave
01211	Old Garage Shop Truck	2001	DODGE	3500	HQ/801 Market St
01238	Brush 15	2001	DODGE	3500	Station 15/Masonboro Loop
01239	Brush 9	2001	DODGE	3500	Station 9/Military Cut Off
01255	Reserve Quint	2001	SUTPHEN	QUINT LDH	HQ/801 Market St
02275	Marine 9 Trailer	2002	MAGIC TILT	BOAT TRAILER	Station 9/Military Cut Off
02276	Citizens Academy Trailer	2002	PACE AMERICAN	TRAILER	Marstellar
04278	John Deere Gator Trailer	2004	COMBS	TRAILER	Station 15/Masonboro Loop
06223	Reserve Rescue	2006	FREIGHTLINER	RESCUE HVY	Station 10/Oleander Dr
06243	Reserve Engine	2006	SUTPHEN	PUMPER LDH	Station 7/S College Rd
06252	Truck 8	2006	SUTPHEN	AERIAL	Station 8/Eastwood Rd
06279	Public Education Trailer	2006	LARK	TRAILER	Station 10/Oleander Dr
07246	Reserve Engine	2007	SUTPHEN	PUMPER LDH	Station 10/Oleander Dr
07524	Foam Dump Truck	2007	INT'L	CHEM FOAM	Station 7/S College Rd
08264	B/C Special Teams	2008	FORD	EXPEDITION	HQ/801 Market St
08237	HazMat Pickup	2008	FORD	F550	Station 5/Shipyard Blvd
08212	Garage Supervisor	2008	FORD	F250	HQ/801 Market St
08263	Reserve BC White	2008	FORD	EXPEDITION	Station 10/Oleander Dr
08245	Reserve Engine	2008	SUTPHEN	PUMPER LDH	HQ/801 Market St
09256	Training Pool	2009	DODGE	CHARGER	HQ/801 Market St
10227	FMO Spare	2010	FORD	F150	115 N. 3rd St
10222	Training MstFF	2010	FORD	F150	Training Center/Hurst Dr
11208	Training Pool	2011	TOYOTA	CAMARY	Training Center/Hurst Dr
11215	Training Pool	2011	FORD	CROWN VIC	Training Center/Hurst Dr
11265	Training Pool	2011	FORD	VAN	Training Center/Hurst Dr
12254	Truck 7	2012	SUTPHEN	QUINT LDH	Station 7/S College Rd
12268	6" Hose Trailer	2012	CARL	TRAILER	Station 7/S College Rd
12293	Training Trailer (Enclosed)	2012	HAULMARK	TRAILER	Training Center/Hurst Dr
13257	A/C Training	2013	FORD	EXPLORER	HQ/801 Market St
13217	Rescue 2	2013	PIERCE	HDR	Station 2/3403 Park Ave
14230	B/C Safety/Training	2014	FORD	F150	Training Center/Hurst Dr
14203	Truck 1	2014	PIERCE	AERIAL	HQ/801 Market St
14280	Foam Trailer	2014	COMBAT SUPPORT	FOAM TRAILER	Station 7/S College Rd
14281	Foam Trailer	2014	COMBAT SUPPORT	FOAM TRAILER	Station 7/S College Rd
14282	Foam Pump Trailer	2014	COMBAT SUPPORT	TRAILER	Station 7/S College Rd
15209	A/C Fire Marshal	2015	FORD	FUSION	115 N. 3rd St

15204	Battalion 1	2015	FORD	EXPEDITION	HQ/801 Market St
15306	Foam Truck 2	2015	FORD	F550	Station 7/S College Rd
15307	Foam Truck 1	2015	FORD	F550	Station 7/S College Rd
15206	Training Pool	2015	FORD	FUSION	Training Center/Hurst Dr
15202	Risk Reduction Coordinator	2015	FORD	FUSION	HQ/801 Market St
16220	HazMat Pickup	2016	FORD	F550	Station 5/Shipyard Blvd
16308	Battalion 2	2016	FORD	EXPEDITION	Station 10/Oleander Dr
16309	Logistics	2016	FORD	FUSION	HQ/801 Market St
16244	Engine 8	2016	PIERCE	VELOCITY PUMPER	Station 8/Eastwood Rd
16247	Engine 9	2016	PIERCE	VELOCITY PUMPER	Station 9/Military Cut Off
17207	PT Inspector	2017	FORD	FUSION	115 N. 3rd St
17219	Fire Marshal's Office	2017	FORD	F150	115 N. 3rd St
17201	Safety 2	2017	FORD	F150	Station 3/Cinema Dr
17242	Engine 10	2017	PIERCE	VELOCITY PUMPER	Station 10/Oleander Dr
18205	Fire Marshal's Office	2018	FORD	F150	115 N. 3rd St
18258	Fire Marshal's Office	2018	FORD	F150	115 N. 3rd St
18259	Fire Marshal's Office	2018	FORD	F150	115 N. 3rd St
18225	Fire Marshal's Office	2018	FORD	F150	115 N. 3rd St
18253	Truck 5	2018	PIERCE	AERIAL	Station 5/Shipyard Blvd
18270	Marine 2 Trailer	2018	DUTTON LAINSON	BOAT TRAILER	HQ/801 Market St
19248	Engine 15	2019	PIERCE	VELOCITY PUMPER	Station 15/Masonboro Loop
19260	Engine 3	2019	PIERCE	VELOCITY PUMPER	Station 3/Cinema Dr
20213	PIO	2020	FORD	FUSION	HQ/801 Market St
20216	Fire Marshal's Office	2020	FORD	F150	115 N. 3rd St
20241	Engine 5	2020	PIERCE	IMPEL PUMPER	Station 5/Shipyard Blvd
20262	Engine 2	2020	PIERCE	IMPEL PUMPER	HQ/801 Market St
20292	Training Trailer (Flat)	2020	BRI-MAR	TRAILER	Training Center/Hurst Dr
21302	A/C Operations	2021	FORD	EXPLORER	HQ/801 Market St
21301	Chief	2021	FORD	EXPLORER	HQ/801 Market St
21205	CRR	2021	NISSAN	NV200SV	HQ/801 Market St
22211	Garage Shop Truck	2022	FORD	F350	HQ/801 Market St
22232	Training Captain	2022	FORD	F250	Training Center/Hurst Dr
22303	Squad 1	2022	FORD	F350	HQ/801 Market St
22304	Squad 3	2022	FORD	F350	Station 3/Cinema Dr
22305	Squad 5	2022	FORD	F350	Station 5/Shipyard Blvd
22233	Training MstFF	2022	FORD	F250	Training Center/Hurst Dr
22202	A/C Support	2022	FORD	F150	HQ/801 Market St
22293	Training Trailer (Enclosed New)	2022	CONTINENTAL CARGO	TRAILER	Training Center/Hurst Dr
23210	Engine 1	2023	PIERCE	IMPEL PUMPER	HQ/801 Market St
23261	Mobile Air 1	2023	PIERCE	AIR TRUCK	Station 7/S College Rd

OVAP SCORE DEVELOPMENT

Building Score

Exposure Separation - The distance, in feet, to the nearest adjacent building		**Type of Construction**	
		Type I Fire Resistive	1 point
101'+	1 point	Type II Non-Combustible	2 points
61'-100'	2 points	Type III Joisted Masonry	3 points
31'-60'	3 points	Type IV Heavy Timber	4 points
11'-30'	4 points	Type V Wood Frame	5 points

Stories – Total stories present		**Access** – Unimpeded access to the building. No insurmountable barriers such as masonry fencing, waterways, utilities, common walls with other structures, transportation corridors, etc.	
1 – 2 Stories	1 point		
3 – 4 Stories	2 points	All Sides	1 point
5 – 6 Stories	3 points	3 Sides	2 points
7 – 9 Stories	4 points	2 Sides	3 points
10+ Stories	5 points	1 Side	4 points
		Extra Ordinary Effort	5 points
Square Footage - Total square feet (ft^2) for occupancy, including all stories			
0 – 7500	1 point		
7501 – 15,000	2 points		
15,001 – 25,000	3 points		
25,001 – 40,000	4 points		
40,001+	5 points		

Building Factor Score – Add all points

Life Safety Score

Occupant Load - Denotes the occupant load of the building. For buildings with more than one occupancy, utilize the occupant load of the occupancy that has the highest occupant load 0 – 10 1 point 11 – 50 2 points 51 – 100 3 points 101 – 300 4 points 300+ 5 points	**Occupant Mobility** - Denotes the mobility characteristics of the occupants. Consider number of occupied stories and capability to exit the structure. For buildings not normally occupied, indicate that occupant mobility is not a factor. Awake Ambulatory 1 – 2 Stories 1 point Asleep Ambulatory 1 – 2 Stories 2 points Awake Ambulatory 3+ Stories 3 points Asleep Ambulatory 3+ Stories 4 points Non-Ambulatory or Restrained 5 points Not a Factor 0 points
Warning Alarm – Type of fire protection alarm system. If there is more than one occupancy in the structure, utilize No Alarm unless all of the occupancies in the group are protected by a warning alarm system. Automatic – Central 1 point Automatic – Local 2 points Manual – Central 3 points Manual – Local 4 points No alarm system 5 points Not a Factor 0 points	**Exiting System** – Exits that conform to the building code or those that do not. Most modern construction will have conforming exits. Conforming x 1 Non-conforming x 2

Life Safety Score - Add Occupant Load, Occupant Mobility and Warning System. Multiply the sum by Exiting System

Risk Score

Frequency/Likelihood Score

Regulatory Oversight – Indicates the level of code enforcement for the occupancy

Highly Regulated, Mandatory Compliance	1 point
Highly Regulated, Inspections Scheduled	2 points
Regulated, Inspection Schedule Random	3 points
Regulated, Voluntary Compliance	4 points
Unregulated, Uninspected	5 points
Not a Factor	0 points

Human Activity - Indicates the capability of someone to access the occupancy

No access to unauthorized persons	1 point
Controlled access to unauthorized persons	2 points
Business activity, Sales and Retail	3 points
Group activity, Transient population	4 points
Domestic activity, No occupant control	5 points
Not a Factor	0 points

Experience – Frequency of fires in this type of occupancy and not the occurrence of fires in the specific occupancy

Daily events	1 point
Weekly events	2 points
Monthly events	3 points
Annual events	4 points
Rare occurrence	5 points

Frequency/Likelihood Score – Average the 3 above scores.

Consequence Score

Capacity to Control – An estimation of the amount of difficulty that can be expected during firefighting efforts.

Control within building of origin	1 point
Exposure to complex of building	2 points
Major deployment	3 points
Extreme resistance to control	4 points
Hazardous to firefighting activities	5 points

Hazard Index – Indicates the types of hazards present in the occupancy.

Limited hazards	1 point
Common hazards (Residential type)	2 points
Mixed hazards (Business type)	3 points

Industrial hazards, F.L., F.G., Explosives	4 points
Multiple and complex hazards	5 points

Fire Load – Fire load characteristics.

Light	1 point
Ordinary Hazard Group I	2 points
Ordinary Hazard Group II	3 points
Extra Hazard Group I	4 points
Extra Hazard Group II	5 points

Consequence Score – Average the 3 above scores

Risk Score – Multiply Frequency/Likelihood score with Consequence Score

Water Demand Score

Required Fire Flow - Indicate the *available* fire flow for 100% fire involvement for the first floor only, in gallons per minute (GPM).

0 – 1750 GPM	1 point
1751 – 3250 GPM	2 points
3251 – 4750 GPM	3 points
4751 – 6250 GPM	4 points
6251 GPM+	5 points

Fire Flow Available

Yes	x 1
No	x 2

Water Demand Score – Required Fire Flow score multiplied by Fire Flow Factor.

Value Score

Property Value

Personal/Family loss	1.0 point
Business loss, minor casualty exposure	1.1 points
Moderate economic impact, severe casualty exposure	1.2 points
Severe economic impact, tax base or job loss	1.3 points
Irreplaceable loss to community	1.4 points

Occupancy Vulnerability Assessment Profile (OVAP) Final Score/Risk Category

For a total score and placement in a category add Building Score + Life Safety Score + Risk Score + Water Demand Score and multiply the sum by Value Score.

Risk Category

Special	60+
High	40 - 59
Moderate	15 - 39
Low	14 or less

OVAP Scoring Worksheet Sample: 323 Eastwood Road, Shell

Building Score					
Exposure	**Const.**	**Height**	**Access**	**Sq Ft**	**Building Factor Score**
3	3	1	1	3	11

Life Safety Score				
Occ. Load	**Occ. Mob.**	**Alarm**	**Exiting**	**Life Safety Score**
1	1	5	1	7

Risk Score								
Reg. Over.	**Activity**	**Experience**	**Frequency Score**	**Cap. To Control**	**Hazard Index**	**Fire Load**	**Conseq. Score**	**Risk Score**
2	3	4	3.00	3	3	3	3.00	9.00

Water Demand Score		
Fire Flow	**Available**	**Water Score**
1	1	1

OVERALL RISK SCORE		
VALUE SCORE	**OVAP SCORE**	**RISK**
1.2	33.60	**M**

ASSESSMENTS of SPECIAL RISK SITES

Name	Address	Contact	Note
University of North Carolina Wilmington	601 South College Road	910-962-3000 Contact@uncw.edu	
Novant Medical Center	2131 South 17th Street	910-667-7000	
North Carolina State Ports Wilmington	1 Shipyard Boulevard	Terry Sydnor operations manager 910-443-1443 Chris Harrington operations manager 910-443-1462	
Corning Fiber Optics	310 North College Road	910-784-7200	
Kinder Morgan Terminals	* 1710 Woodbine Street	• 910-763-0104	
Apex Oil Company	3314 River Road	Contact terminal Jamie Mealy 910-799-0030 jmealy@apexoil.com	Products: Gasoline, Liquid Asphalt, Distillate, Biodiesel, Aviation Gasoline Total storage capacity:1,485,000 bbls
Nu-Star Asphalt	3345 River Road	910-799-0483	
Chemserve Terminal	3325 River Road	910-799-0180	Commercial contact Matt Law 757-544-0784
Tribute Companies (Developer)	2005 North 6th Street See Kinder Morgan	910-762-8588 Contact Tribute Properties 332 Military Cutoff Rd | Wilmington, NC 28405 Main Phone: 910-251-5030	As of June 22 '23 this address was bought by tribute properties from Kinder Morgan for 5 mil clause to not be residential for perpetuity. Kinder bought in 2008 for 1.4 mil
Cape Fear Hospital *Novant New Hanover Orthopedic Hospital	5301 Wrightsville Avenue	910-452-8100	
Colonial Terminals	1002 South Front Street	910-251-1020 910-762-6615	
Buckeye Partners Terminal	1312 South Front Street	Emergency line: 1-800-331-4115 910-763-5122	

Apex Oil Company Terminal Facility

FH Occupancy ID:	PETR000001
Terminal Address:	3314 River Road, Wilmington, NC 28406
Terminal Phone:	910-799-0030
Terminal Fax:	910-799-0037
Contact:	John Joyner Terminal Manager
Contact Phone	910-279-2570
After hours contact:	Wynn Hair-910-675-3977 (Home) 910-279-2752 (Cell)
Terminal Size:	37acres (including site across the street)
Number of Buildings:	9
Size of Buildings:	350-2450 square feet
Number of Tanks:	20 +5 additive tanks
Range of Tanks:	420,000 – 6,300,000 gallons in (20) and 4000-6000 gallons in 5 additive tanks

Number of Vessel docks-1-705 feet long, 39 feet deep

Apex Terminal facility is located on 37acres of property and is geographically bordered on the western side by the river. The facility is comprised of 9 buildings and 20 storage tanks, with an additional 5 additive tanks. The nine buildings are all no taller than two stories. Eight of the nine structures are Type II- Non-Combustible and one is Type V- Wood Frame structure. The closest exposure distance is less than 11 feet. Accessibility is extremely poor on all accounts. Although there are 3 driveways there are height restrictions at the loading racks and gravel surrounding most of the tanks themselves. The largest structure on site is 2450 square feet. Generally, there are no more than 11-50 personnel on site at any given time; this includes contractors, employees, and vendors. The partial alarm system monitors operations building and is comprised of smoke and heat detectors. The loading rack must be activated manually, but once activated a signal is received by a central monitoring agency. The fire control panel is located within the main office. Apex is open 24 hours per day with the following exception: from midnight on Friday until 0800 on Saturday and from 1600 on Saturday until 0800 on Sunday and from 1600 on Sunday until Sunday midnight during the off times indicated, an employee from Apex will conduct random inspections of the site. All the exits that are located conformed to the building code at the time they were constructed. There is absolutely no access to unauthorized personnel and all visitors are required to check in, register, and be escorted by an employee during their visit. All contractors receive a job safety analysis for the task at hand and all employees have a daily 10 to15 minute safety briefing.

The facility's storage tanks are all either gasoline or diesel fuel except for one tank of ethanol. The facility on a daily average load and sends out into our community 100 tanker truck load of product ranging in capacity from 7000-8000 gallons of product. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the significant category. Apex terminal is one of only two sites that deliver gasoline from Charleston, South Carolina north to Chesapeake, Virginia and west to Selma, North Carolina. The facility has a history of eight calls located in Firehouse software. The facility is inspected by the North Carolina Department of Environmental and Natural Resources annually. The Internal Revenue Service inspects every periodically. The United States Coast Guard inspects the facility quarterly and randomly. The Environmental Protection Agency and OSHA inspect as needed.

Apex ensures that all its employees have 24 hours of HAZWOPER training along with an annual refresher. They also conduct 15-20 computer-based modules annually on a variety of safety

subjects to include but not limited to, ergonomics, ladder haz-mat. Every other year Apex trains their employees in either fire extinguisher training or CPR. Apex facility inspects their storage tanks in accordance with the American Petroleum Institute's recommendations. Apex inspects their foam concentrate and their hydrants annually.

Fire/Hazmat Risks:

This facility has 20 storage tanks and an additional five additive tanks containing various light hydrocarbons, asphalt, and some ethanol. The Apex facility comprises 80% of fuel storage while Nu-Star operates asphalt storage and loading operation at the facility's north property line. There are two systems located on the facility. One system is located in the heart of the west side facility. It can send alcohol resistant foam solution to most tanks on the west side site to include the truck load rack nearest River Road. It is also capable of discharge to fire department apparatus should the need arise. The storage tank(s) and load rack located at the Nu-Star side of the facility are not foam system protected. Apex Oil's storage tank farm on the east side of River Road is primarily gasoline storage. There are five storage tanks: The 3 newer are about 150 feet in diameter and two older tanks, nearest River Rd. are about 120 feet in diameter. All five tanks are foam system protected. The fire protection system is a capable, modern design, employing freeze protected, 3% AFFF (not alcohol resistant). East and west- side firefighting system water is supplied to electric fire pumps via a city water main, which is estimated to be capable of delivering 3500 gallons per minute (GPM). The fire department connection is located next to the fire pump building as well as the sprinkler riser. There are Knox boxes located at each of the facilities gates and the Knox box keys override the system's automatic feature. There is no provision for stand-by power to these or other fire pumps at any facility located on River Road. Foam concentrate can be accessed from system supply tanks with minor transfer plumbing alterations. All systems at Apex Oil have the ability to discharge foam solution more than 2000 (GPM) to fire department apparatus should the need arise. Alternate firefighting water sources for this and other nearby facilities on River Road may be via the use of fire boat, Atlantic VI's discharge into fire department supplied large diameter hose, or through an abandoned product transfer pipeline sourced at Apex Oil marine piers. This is a marpol line that is required by the federal government for vessels with oily waste. Regarding the incident history, there was a small fire on the transformer platform that was out on our arrival in 2011.

Tactical Rescue Risk:

This facility has 20 storage tanks that are inspected by Apex. Currently Apex has oversight of these mandatory inspections, and they occur every 10-20 years, depending on the product. These tanks are permit required confined spaces and the likelihood of an incident occurring is significant. Prior to entry into any permit required confined space all lock out procedures and proper air monitoring occurs. Personnel working above ground could also fall victim to a possible fall requiring the use of high angle or low angle rescues.

Marine Risk:

Marine water supply access to this location is adequate; the dock has a mean depth of 39 feet of water, which is more than adequate for access of our fireboat. The facility's normal schedule is to receive products via ship every 5-6 per month. The average stay for these marine vessels is 24 hours.

EMS Risk:

The facility generally has approximately 11-50 personnel on site. The likelihood of an EMS incident is moderate. There has been little to no history; however, medical emergencies of any nature could occur. Access within the facility is excellent.

Buckeye Terminal - Main

Occupancy Name:	Buckeye
FH Occupancy ID:	AMER000002
Terminal Address:	1312 South Front Street Wilmington, NC 28401
Terminal Phone:	910-763-5122
Terminal Fax:	910-762-2608
Emergency Line	1-800-331-4115
Contact:	Jesse Burdett- Terminal Superintendent-910-515-4268
Terminal Size:	17 acres
Number of Buildings:	5
Size of Buildings:	500-2150 square feet
Number of Tanks:	14
Range of Tanks:	6000-6344898 gallons
Number of Vessel Docks:	1

The facility is located on 17 acres of property and is geographically bordered on the western side by the river. It is comprised of 5 buildings and 14 storage tanks. The five buildings are all no taller than two stories. Four of the five structures are Type II- Non-Combustible and one is Type V-Wood Frame structures. The closest exposure distance 61-100 feet. Accessibility is excellent on all sides. Generally, there are no more than 10 personnel on the facility at any one time. However, on rare occasions there have been as many as 25 people at the facility. The one alarm system monitors the loading rack, and the fire control panel is located within the main office beside the front door. After normal business hours there is always a representative on the premises. All the exits that are located conform to the building code at the time they were constructed. There is absolutely no access to unauthorized personnel and all visitors are required to check in, register, watch a safety film and be dressed in the proper personnel protective equipment. Any contractors on site have a daily 10-to-15-minute safety briefing.

The facility's storage tanks are all either gasoline or diesel fuel except for one tank of ethanol (Tank# 8904). The facility on a daily average load and sends out into our community 100 tanker truck load of product ranging in capacity from 7000-8000 gallons of product. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the maximum category. The facility has a history of eight calls recorded in Firehouse software. The facility is inspected by the North Carolina Department of Environmental and Natural Resources every 2-3 years. The Internal Revenue Service inspects every other month. The United States Coast Guard inspects the facility quarterly and OSHA inspects as needed. Back in 1990's there were two storage tanks that overflowed.

The facility ensures that all its employees have 24 hours of HAZWOPER training along with an annual refresher. They also conduct 15-20 computer-based modules annually on a variety of safety. Subjects include but not limited to, ergonomics, ladder, and haz-mat as well as fire extinguisher training or CPR. The facility inspects their storage tanks in accordance with the American Petroleum Institute's recommendations. They also inspect their foam concentrate and their hydrants annually.

<u>Fire Risk/ Hazmat Risk:</u>

There are 14 unprotected storage tanks within this facility. There is an automated loading rack fire system that is supplied by adequate city water. The available fire flow is 4105 gallons per minute (gpm) with a 20-psi residual. The system is supported by a fire department connection (FDC) located at the foam storage building. The FDC connects to a dry pipe system that has heat activated sprinkler heads. The foam system storage tank holds approximately 600 gallons of National Gold 1x3% AR-AFFF. In addition, there are 200 gallons in drums, stored in an adjacent warehouse. Full surface fire for the largest single gasoline storage risk requires 3,217 gpm of solution, requiring 6,270 gallons of 3% concentrate, or 2100 gallons 1%, for one-hour duration. Large foam stream range is achievable in all areas. Marine access is good. Hand deployment of LDH for some 500-600 ft. is likely with the dock. Within the facility there is an electrical hazard posed by 3 phases-480 volts. Five of the eight calls within the history have been fire or hazardous materials related with nothing found by the department.

Tactical Rescue Risk:

This facility has 14 storage tanks that are routinely inspected. There is currently oversight of these mandatory inspections, and they occur every 10-15 years. These tanks are permit required confined spaces and the likelihood of an incident occurring is significant. Prior to entry into any permit required confined space all lock out procedures and proper air monitoring will occur. Personnel working above ground are at risk of a possible fall requiring the use of high angle or low angle rescues.

Marine Risk:

Marine water supply access to this location is adequate; the dock has a mean depth of 28 feet of water, which is more than adequate for access of our fireboat. The facility's normal schedule is to receive products via ship every 3 weeks. The average stay for these marine vessels is 18-24 hours.

EMS Risk:

The facility generally has approximately 10 personnel on site. The likelihood of an EMS incident is moderate. There has been little to no history; however, medical emergencies of any nature could occur. Access within the facility is excellent. 3 of the eight calls for this facility in Firehouse software, ranged from one patient that had fallen, another patient experiencing breathing problems and the third call was a cancelled call.

Colonial Terminals

FH Occupancy ID:	JMLT 000001
Terminal Address:	1002 South Front Street, Wilmington, NC 28401
Terminal Phone:	910-251-1020 or 910763-5122
Terminal Fax:	910-762-6154
Contact Information:	Robert (Bob) Welch (extension: 6103)
After Hours Number:	910-443-8395
Number of Buildings:	8 (includes old blend building and B.O.L. building)
Size of Buildings:	1000-3200 square feet
Number of Tanks:	29
Range of Tanks:	9,000-3,370,000 gallons
Number of Vessel docks-	1- (900 feet long and 350 feet from the bank)

Colonial Terminal facility is located on 19 acres of property and is geographically bordered on the western side by the river. The facility is comprised of 8 buildings and 29 storage tanks. The eight buildings are all no taller than two stories. Six of the eight structures are Type II- Non-Combustible and there are 2 Type V-Wood Frame structures. The closest exposure distance is 31-60 feet. Accessibility is adequate with the exception that some tanks may be in the same immediate vicinity as others. Unfortunately, the second east-west roadway on the south side of the facility (Meare's St.) terminates in a former storage tank containment space, now a storage area, which allows no vehicle access over the south-side dike bridge to the Wright St. path, which leads uphill to South Front St. and the main gate. Generally, there are no more than 10 general employees at the facility. There can be as many as six trucks transferring products and varying numbers of contractors. The facility has a central automatic alarm system. After normal business hours there is a security guard on the premises. All the exits that are located conform to the building code at the time they were constructed. There is absolutely no access to unauthorized personnel and all visitors are required to check in, register, and be dressed in the proper personnel protective equipment. The facility has a ring manifold system that can supply 4000 gallons of water per minute. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the moderate category. The facility has a history of nine calls since 2000.

The facility is inspected by the North Carolina Department of Environmental and Natural Resources and its different divisions of air quality, hazardous materials, and permits on a quarterly basis. Colonial Terminal is also a member of the Clean Land and Harbor Consortium. Regarding training of their personnel, they send new hires to Savannah, Georgia to receive all mandatory training. They return and pair the new employee with a more seasoned employee until they are ready. Colonial holds periodic safety meetings as needed for their employees.

<u>Fire Risk/ Hazmat Risk:</u>

There are twenty-nine significant size storage tanks containing polar solvents, ethanol, and methanol. The most significant product by volume is methanol with a daily average of 33 million gallons among 5 storage tanks. 11 tanks are outfitted with full surface foam systems with plans to be completely protected by a fire department supported foam chamber systems within the next six to eight years. All systems on this site require alcohol resistant foam supply at various flow rates and pressure. An unprotected, upper loading rack is situated near the South Front Street gate. Tank truck and rail loading racks are the most likely problem areas and are totally unprotected. They transport on average 191,500 gallons of methanol daily by roadway. Firefighting operations at the

loading racks will require manual foam stream application from an engine's foam inducting monitor; portable, oscillating ground monitor, foam trailer(s) and or purpose-built firefighting trailer with industrial size solution capabilities.

A city water main deluge system is in place at a mixing rack in mid-lower facility, which has FDC support dangerously close to the risk. Water flow more than 4000 gpm is available from the city water system. Static pressure on this system is 80 psi. Two tank truck and rail loading racks are unprotected and will require manual foam stream application. There are 7 265-gallon totes of 1x3% AR-AFFF located in an open-sided, covered area on the south side of the steep dike-wall bridge at the river end of Meares Street

Tactical Rescue Risk:

This facility obviously has 29 storage tanks that are periodically inspected. These tanks are permit required confined spaces and the likelihood of an incident occurring is significant. All these inspections are required by the American Petroleum Institute (API). Colonial has bids conducted on a third-party basis to inspect these tanks every 10 years. All safety measures are taken into consideration. Personnel working above ground are at risk of a possible fall requiring the use of high angle or low angle rescues.

Marine Risk:

This site can be supported by marine assets. There may be considerable effort on the part of fire department personnel to deploy by hand large diameter hose (LDH) to support riverside land-based firefighters. Due to the narrow, sloping nature of this property, in most cases, access to downgrade areas may be hampered by the need to pass a fire. Moreover, to gain access or receive support from Atlantic VI, passing a fire may be necessary. The USCG inspects this facility annually in most cases. Colonial reported a body floating in the water in September 2006 and we responded with our fireboat and utilized their floating dock for EMS and coroner.

EMS Risk:

The facility generally has 14 personnel employed with no more than 10 on site at any given time. The likelihood of an EMS incident is moderate. There has been little to no history; however, medical emergencies of any nature could occur. Access within the facility is adequate. The history for this facility is 3 calls, one occurred in December 2002. The department responded to assist EMS with patient packaging of two personnel that had fallen from the loading platform. The second incident occurred in July of 2006; the department responded and found a vehicle accident with no injuries. The third was a motorcycle accident with injuries in June of 2008.

Corning Fiber Optics

FH Occupancy ID:	CORN 32
Business Address:	310 North College Road
Business Phone:	910-784-7200 or 910-784-7577
Business Fax:	910-784-7493
After Hours Contact:	Joe Gioielli
After Hours Phone:	910-784-7608
Terminal Size:	66 acres
Number of Buildings:	38
Size of Buildings:	200-1,000,000 square feet
Number of Tanks:	4
Range of Tanks:	3 above 6,000-gallon diesel fuel and 1 above ground 65,000-gallon silicon fluid
Number of Vessel Docks:	0

The plant was built in 1966 as a resistor plant and began optical fiber production in 1979. Corning Manufacturing is a worldwide known manufacturer of many different household and industrial products used all over the world. The plant is one of the world's largest telecommunications industrial facilities. The plant was the original manufacturing site for commercial glass optical fiber in 1979 and continues to be a world leader. Glass optical fiber is critical to the continued expansion of cell phone usage, the internet and increased worldwide communications.

The facility is involved in the manufacturing of fiber optic technology which is based on the principal that light in a glass medium can carry more information over a longer distance than electrical signals can carry in a copper or a coaxial medium or radio frequencies through a wireless medium. The process of transforming highly pure solid glass into the finished product is a vast process that involves many highly volatile and dangerous chemicals throughout the transformation. (See appendix A- chemicals) The facility is a major consumer of electricity and houses an onsite power substation to provide its power requirements.

The main facility located at 310 North College Road sits on approximately 66 acres of land and contains 7 major buildings (See appendix B-buildings) with sizes ranging from 200-1,000,000 square feet. There are also 31 smaller buildings. These buildings are constructed of Type 2- Non-combustible and the closest exposure is less than 11 feet away. The tallest structure is between 7-8 stories in height. Access in and around the facility requires extraordinary effort due to the many structures and piping throughout the site. The facility is protected by automatic fire detection and chemical detection systems that are present throughout the plant and is protected by automatic water and halogenated extinguishers for fire and chemical control. The plant receives its water from the local utility but provides its own pressurized water system for local fire and utility consumption. There are automatic fire protection devices in place in all areas that do not have production related issues preventing them. Additionally, there are automatic Halon FM-200 systems for computer rooms and individual CO2 suppression systems for specific production equipment. There are two water tanks on site, each 300,000-gallon tanks, each with an electric and diesel fire pump that automatically start. There are 23 fire hydrants and 4 fire pumps (2 electric, 2 diesels), all the hydrants exceed 1500 gpm. All the exits conformed to the code at the time it was constructed.

The plant does have an onsite fire response team that is well trained and capable of handling the emergencies of fire, medical and rescue on a day-to-day basis during production operations and

provides medical care to injured employees with a full-time nurse on staff and EMS (medical responders). There is an UL listed automatic fire alarm system (Notifier) that alerts throughout the plant that automatically alarms with a staffed central alarm office (security) to contact the 911 Center if an event exceeds the on-site structural fire brigade capabilities.

The storage facility located at 525 North College Road is approximately 100,000 square feet of storage of their finished product protected by a sprinkler system. The facility employees over 1,000 personnel during the work week and 165 people on nights and weekends with a 24-hour 7 day a week production schedule. The facility has an excellent safety record of injuries due to its high standard of safety training, which is an ongoing requirement for all employees. The facility has a 24-hour a day security force on site that maintains awareness of all personnel that enter or leave the site. All employees are required to wear badges and safety goggles, and some must wear helmets, gloves, and work aprons in addition within certain areas of the plant. Employees are annually trained on environmental, health, and safety topics. Additionally – individual departments have more specific training annually and on an as needed or required on topics directly related to the employee's jobs.

The facility received an Occupancy Vulnerability Assessment Profile Score (OVAP) in the significant category. The facility has annual drills for all 4 off shifts and the day shift, and they additionally have annual tornado drills and hurricane preparedness planning.

Fire Risk:

The risk of fire at this facility is high because of the vast amount of electricity, chemicals, and flammable gas used in the production process. The most significant fire risk of the facility is the Natural Gas or Proprietary Chemical flame production equipment. This is mitigated by automatic CO2 suppression systems for all this equipment. The structures containing the greatest fire risk have sprinklers and alarms present. The presence of such a fire in these circumstances is generally small and quickly contained by personnel on site with minimal damage and loss of property. The onsite emergency response team has quick response times to such accidents and can control them without much outside intervention by the local fire department. There has been a total of 78 responses as reported within Firehouse software. Sixty-3 were fire related and fifteen are EMS related. 3 of the responses have been significant.

The facility had a major fire in 2010 in which a glass blank was dropped into a kiln and ignited several parts of the building where exhaust piping burned and ignited the asphalt built-up roofing. This required a local fire response to extinguish the roof and piping outside the structure. The plant's response team was also present and contained the fire to the apparatus where the fire first started. Considering the possibilities, the fire was quickly brought under control due to the quick response of the fire department and the emergency response team of the plant. The 2010 fire was the most significant event in the facility's history. All previous fires were minimal and handled by the structural fire brigade. The facility has made extensive changes to prevent a similar event from occurring in the future – both in equipment design, additional process changes and monitoring in exhaust ductwork for heat issues. All other events were limited to a single piece of equipment and were extinguished within 10 minutes or less.

Hazardous Materials Risk:

This facility poses a very dangerous and serious hazardous materials response risk. This is due largely in part to the wide array of dangerous chemicals stored and used in the production process.

These significant hazards would be to the employees exposed to an accidental release or accident within the plant work area and considering the amount of personnel on scene it would require a large-scale response from the local emergency entities. The local hazardous materials response team takes annual tours of the facility to maintain a state of awareness and open communications with the facilities safety managers. The material safety data sheets (MSDS's) are located in the safety office, maintenance office, and guard house.

Technical Rescue Risks:

This facility poses a great risk of a technical rescue response due to the massive configuration of piping and ironwork on this site. There are high angles and many confined spaces that must be considered. Most of these spaces are protected by security measures that prevent entry unless operations have been shut down due to maintenance and repair. The technical rescue team takes annual tours to maintain a state of awareness and open communications with the facilities safety managers. The technical rescue team also has utilized the plant to conduct ongoing technical rescue training.

EMS Risk:

The facility does pose a serious risk of chemical and trauma accidents due to the wide variety of chemicals on site and the massive building configuration of moving machines and high energy electrical providing the needed services for daily operations. The onsite nurse and medical personnel would provide an immediate and hopefully lifesaving service to the employees present.

ChemServe Terminal

FH Occupancy ID:	KOCH000001
Terminal Address:	3325 River Road, Wilmington, NC 28412
Terminal Phone: Office:	910-799-0180
Terminal Fax:	910-799-6880
After Hours Emergency Contacts:	Billy Keinath- 252-422-7865, Jason Rona- 910-471-6977,
Matt Law (commercial):	757-544-0784
Arthur Bachelor:	910-471-6980
Terminal Size:	15.65 acres at tank farm; 31.03 acres total
Number of Buildings:	5
Size of Buildings:	350-1365 square feet
Number of Tanks:	7- (Tank 301 and Tank 402 out of service)
Range of Tanks:	1,680,000-4,620,000 gallons
Number of Vessel Docks:	0 - dock was sold to Carolina Marine Terminal in 2012

The terminal facility is located on 31.03 acres of property and is geographically bordered on the western side by the river. The tank farm itself is comprised of 15.65 acres with 5 buildings and 7 storage tanks. The five buildings are all no taller than two stories. All five of the structures are Type II- Non-Combustible. The closest exposure distance is over 101 feet away. Accessibility is unimpeded to the buildings and tanks. There are no insurmountable barriers such as masonry fencing, waterways, utilities, common walls with other structures, and transportation corridors. Generally, there are two full-time employees, one supervisor that visits two to 3 times a week and one part-time training employee. Including import and export of product and contractors there are no more than 10 personnel at the facility. There can be as many as 5-10 rail car shipments per day and one barge per week. Although the facility has no dock, they still have a pipeline for product transfer and an agreement in place. The facility has a central alarm system in the office only. After normal business hours there is no security guard on the premises. However, the telephone number to the security guard located on Highway 421 North is posted. All the exits that are located conform to the building code at the time they were constructed. There is no access to unauthorized personnel and all visitors are required to check in, register, and have an orientation at their plant located at 421 North and be dressed in the proper personnel protective equipment. The facility has a ring manifold system that can supply 4000 gallons of water per minute. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the moderate category. The facility has a history of two calls since 2000.

The facility is inspected by the North Carolina Department of Environmental and Natural Resources and its different divisions of air quality, hazardous materials, and permits on a quarterly basis. Chemserve Terminal is also a member of the Clean Land and Harbor Consortium. Regarding training of their personnel, they have a one-day orientation and then have on-going safety classes held by computer based on a program called “Virtual Training”. They hold periodic safety meetings as needed for their employees.

Fire Risk/ Hazmat Risk:

Primary risks at this location are 7 insulated, Para xylene (heated flammable hydrocarbon) storage tanks. The fire suppression system employs 3% fluor protein foam, which is fit for use on hydrocarbon fuels only. The foam tank and pump are located within the foam building and have capacity of 2050 gallon of foam. The foam system has the capability to discharge 60 gpm @ 200 psi to fire department assets should the need arise. This system must be manually activated by a

person. There are four monitors that are strategically posted in locations for suppression efforts. Each tank has a separate foam discharge that will discharge foam into the top of tanks. The site's firefighting water is supplied to the system by an external (city) source and can be complemented by fire department connections located on the "delta-side" of the foam and system storage house. Fire flow is estimated to be 3,500 gpm at 20 psi. Fire hydrants are indicated on the site's plot plan, with one beside the foam building and another is in the rear southeast corner of the property near Worth Avenue. The single most significant fire threat is associated with a paraxylene railcar load-out area. That is located along the property line at the edge of River Road and crosses the highway slightly to the south. This area is perilously close to heavy roads and daily railroad switch traffic. This area is not protected by automated firefighting or detection systems. It will pose a particularly complex firefighting challenge should a traffic collision and fire occur.

There is a 10,000-gallon Fuel Oil #2 tank located in the boiler room and four -1000-pound propane tanks located at the "flare" station and two 100-pound propane tanks located in the boiler room. The facility also has a designated hazard waste site in the middle of the facility that holds drums for 90 days and is picked up by a third party.

There was a notification of a small spill in April of 2010; Battalion One was notified by dispatch that a small amount of methanol was released. The caller told dispatch that they were required to notify the local fire department but not require a response.

Tactical Rescue Risk:

This facility has 7 storage tanks that periodically are inspected. These tanks are permit required confined spaces and the likelihood of an incident occurring is significant. All these inspections are required by the American Petroleum Institute (API). There are bids conducted on a third-party basis to inspect these tanks every 10 years. All safety measures are taken into consideration. Personnel working above ground would be at risk of a possible fall requiring the use of high angle or low angle rescues.

Marine Risk:

This site can be supported by marine assets. There may be considerable effort on the part of fire department personnel to deploy by hand large diameter hose (LDH) to support riverside land-based firefighters. The use of the existing dock would need to be confirmed by Carolina Marine Terminal. The end of the water supply from the docks has been crimped off. Therefore, use of this water supply would not be possible. The only alternative would be to hand lay hose.

EMS Risk:

The facility generally has 2-4 personnel on site. The likelihood of an EMS incident is moderate. There has been little to no history; however, medical emergencies of any nature could occur. Access within the facility is adequate. The history for this facility is one vehicle accident with general clean up in January of 2012.

Tribute Properties- (formerly Kinder Morgan Main Office Facility)**

FH Occupancy ID:	CHEM000001
Contact:	Andy Keith-Manager-910-540-8592
Terminal Address:	2005 North 6th Street-Wilmington, NC 28401-2843
Terminal Phone:	910-762-8588
Terminal Fax:	910-251-8670
Terminal Size:	74 acres
Number of Buildings:	5
Size of Buildings:	500-3000 square feet
Number of Tanks:	44
Range of Tanks:	600 gallons- 2.6 million gallons
Number of Vessel Docks:	1(31' MLW)

The facility is located on 74 acres of property and is geographically bordered on the western side by the river. The facility is comprised of 5 buildings and 44 storage tanks. The five buildings are all no taller than two stories. 3 of the five structures are Type III- Joisted Masonry and there is a Type V- Wood Frame structure as well as a single Type I Fire Resistive structure. The closest exposure distance is 31-60 feet. Accessibility is quite good with the exception that some tanks may be in the same immediate vicinity as others. Generally, there are no more than 10 personnel on the facility at any one time and the facility has a manual alarm system that reports locally to the facility itself. After normal business hours there is a security guard on the premises. All the exits that are located conform to the building code at the time they were constructed. There is no access to unauthorized personnel and all visitors are required to check in, register, watch a safety film, and be dressed in the proper personnel protective equipment. The facility has a ring manifold system that can supply 4000 gallons of water per minute. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the Significant category. The facility has a history of five calls since 2000.

Fire Risk/ Hazmat Risk:

Regarding the storage tanks themselves, the greatest danger is Tank 104 which holds ethanol on site 365 days a year. The site's one and only ethanol storage tank has a department supplied rim seal foam system installed. Fire department operations here require properly proportioned alcohol resistant foam solution to be supplied to storage tank's system via FDC. second most significant liquid fuel risk at this site is molten asphalt. Organic, agricultural, and commercial commodities such as caustic soda and urea ammonium nitrate solution make up a large portion of site storage. However, they may be unto themselves problematic in the unlikely event that liquid hydrocarbons become co-mingled.

Tank truck and rail loading racks are the most likely problem areas and are totally unprotected. Firefighting operations at the loading racks will require manual foam stream application from an engine's foam inducting monitor, portable, oscillating ground monitors, and foam trailer and or purpose-built firefighting trailer with industrial size 300 to 3000 gpm solution capabilities. The site's proximity to the head end of the city water works affords adequate fire flow. They contain heated, molten asphalt. No systems in place at its loading rack or storage tanks. Loading rack fire events will need to be managed by portable foam monitors and or handlines.

On February 8, 2000, the department responded and found oil in a processing area burning due to a motor seal leak. The fire was extinguished with foam and a second handline was used for firefighter protection. On November 7, 2008, the department was dispatched to 2005 N. 6th St. for a reported chemical leak. Arrived and contacted Bruce Kirk, terminal employee. He advised that the product that was leaking was 32% Nitrogen, liquid fertilizer. Mr. Kirk also advised that the terminal had a diking process already in progress. The tank was leaking around the bottom flange of the tank. There was a false alarm call in October 2004.

At that time the facility was under the name of ChemServe. On April 15, 1992, tank vapors ignited resulting in fire and explosion in storage tank containing 340,000 gallons of methanol. The cause was later to be determined by welding. The tank itself was approximately half full and the resulting explosion blew the top off. There were no injuries and over 100 responders were on the scene with various agencies and environmental officials. A small amount escaped into northeast Cape Fear River and the fire was allowed to burn out that evening. During the incident evacuation plans were readied, but never used.

The facility generally receives marine shipments 6-8 times a month and receives rail shipments of ethanol, 3 days a week. Kinder Morgan transported products from their facility by rail approximately 12 rail cars per day with each rail shipment ranging from 17,000 gallons to 28,000 gallons per rail car shipment. They also transport approximately 70 tractor-trailer loads per day ranging between 3800 gallons and 7000 gallons. The facility is inspected by the North Carolina Department of Environmental and Natural Resources and its different divisions of air quality, hazardous materials, and permits on a quarterly basis. The next owners, Kinder Morgan is a member of the Clean Land and Harbor Consortium. Regarding the training of their personnel, all new employees spent at least one month reviewing the policies and procedures of Kinder Morgan. Following that, they were taken into the field and work for at least six months with another employee that has tenure. Kinder Morgan holds daily safety meetings that last 10-15 minutes. Every Thursday, they had weekly safety topics that last 30-45 minutes. Kinder Morgan had 4 employees that are trained and certified as first responders and CPR certified. All employees undergo a basic air monitoring class and conduct an annual confined space drill.

Tactical Rescue Risk:

This facility has 44 storage tanks that are periodically inspected. These tanks are permit required confined spaces and the likelihood of an incident occurring is significant. All these inspections are required by the American Petroleum Institute (API). Kinder Morgan had bids conducted on a third-party basis to inspect these tanks every 10 years. All safety measures are taken into consideration. Personnel working above ground could also at risk of a possible fall requiring the use of high angle or low angle rescues.

Marine Risk:

Marine water supply access to this location is adequate but caution should be exercised due to variable tidal conditions. However, in the early 1990's the department responded and made use of its fireboat for a large chemical fire that occurred. At that time, we were using our previous fireboat, Atlantic V. The dock itself is 176 feet and 5 inches long. The facility receives 6-8 shipments of asphalt, caustic soda, and fertilizer per month. The USCG inspects this facility weekly in most cases.

EMS Risk:

The facility generally has approximately 10 personnel on site. The likelihood of an EMS incident is moderate. There has been little to no history; however, medical emergencies of any nature could occur. Access within the facility is adequate. The history for this facility was two calls, one occurred in August 2002. The department responded to assist EMS with patient packaging of a man who had a chemical spill of sulfuric acid. The second incident occurred in April 2000, the department responded and assisted EMS with patient removal and packaging from a ship on their dock.

**As of June 22, 2023, this property moved to Tribute Properties, a local real estate and development company. The location is not in use at the time of publication but is expected to transfer to use in the next 5 years.

Contact Tribute Properties:

332 Military Cutoff Rd | Wilmington, NC 28405

Main Phone: 910-251-5030

Kinder Morgan Woodbine Terminal

FH Occupancy ID: PAKT000001
Terminal Address: 1710 Woodbine St.
Terminal Phone: 910-763-0104
Terminal Fax: 910-763-1244
Contact info: Mike Alexander
After hour's phone: 910-200-9683
Terminal Size: 21
Number of Buildings: 8
Size of Buildings: 450-2500 square feet
Number of Tanks: 19
Range of Tanks: 28,632-3,764,562 gallons
Number of Vessel docks- 1-300 feet

The facility is located on 21 acres of property and is geographically bordered on the western side by the river. The facility is comprised of 8 buildings and 19 storage tanks. The eight buildings are all no taller than two stories. Six of the eight structures are Type II- Non-Combustible and two are Type V- Wood Frame structures. The closest exposure distance is 11-30 feet. Accessibility is excellent on all sides. Generally, there are no more than 30 personnel on the facility at any one time. This included 20 employees and up to 10 contractors. The alarm system is a locally monitored alarm and the fire control panel is located within the dispatch office. After normal business hours there is always a representative from the company on the premises. All the exits that are located conform to the building code at the time they were constructed. There is absolutely no access to unauthorized personnel and all visitors are required to check in, register, watch a safety film and be dressed in the proper personnel protective equipment. Any contractors on site have a job safety analysis on the task they are performing. General employees conduct a daily 10 15-minute safety briefing.

The facility's storage tanks are mostly methanol, glycols, paraxylene and herbicides. The facility on a daily average load and sends out into our community 80-100 tanker truck load of product ranging in capacity from 7000-8000 gallons of product. The facility transports 20-30 rail cars per day and 5-6 marine shipments per month. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the Moderate. The facility is inspected by the North Carolina Department of Environmental and Natural Resources annually for hazardous waste, air quality and storm water. Environmental Protection Agency inspects annually as well. The United States Coast Guard inspects the facility quarterly and OSHA inspects as needed.

The company ensures that all its employees have 24 hours of HAZWOPER training along with an annual refresher. They also conduct 15-20 computer-based modules annually on a variety of safety subjects to include but not limited to ergonomics, ladders, and haz-mat. Every other year they train their employees in either fire extinguisher training or CPR. This facility inspects their storage tanks in accordance with the American Petroleum Institute's recommendations. The company inspects their foam concentrate and their hydrants annually.

<u>Fire /Haz-Mat Risk:</u>

There are 19 hydrocarbon and solvent storage tanks: 1 unprotected truck load rack and 2 unprotected rail load racks. All require manual fire department intervention should a spill/fire occur in any of these areas. Rail racks are protected by modern fire water monitors atop yard

hydrants. The north hydrant system is tied into the city water system and provides the primary source of water for terminal and fire suppression efforts. The city water is supplied to this terminal by a four-inch main line that extends 1600 feet from the main gate throughout the terminal, and it runs parallel to the dock access road. Yard hydrant monitors do not have fire foam capabilities. If foam is needed at any of these hydrant/monitors, a self-inducting foam nozzle will need be substituted for the 1000 GPM water-only nozzle. 7, 265-gallon totes of 3%, alcohol resistant foam concentrate are in a storage building, north of the truck loading rack, near the north property line. Regarding electrical hazards, the facility is supplied with a 3 phase 480-volt system.

There is a 10-inch, aluminum water main located on the pier's north-side pipe rack, terminating at an inlet designed to be supplied up to 6000 gpm @ 150 psi by the department's fire boat, Atlantic VI. The river water can be efficiently transmitted to the northeastern end of the pier. Since this water main is not connected to the fresh water loop it can only be used for river water distribution for firefighting appliances supported by Atlantic VI. There is a six-inch freshwater main running the length of south side pier with two - 2.5" hose taps along the way.

One fire call occurred on June 29, 2006, firefighters arrived and found light smoke coming from the main office building. We confirmed that lightning had struck an outside pole and run into to this building catching a circuit breaker on fire. We used a dry chemical extinguisher to extinguish a small fire. Progress energy (provider) arrived and cut the power to building. We watched for any fire extension with a thermal imaging camera.

Tactical Rescue Risk:

This facility has 19 storage tanks that are inspected by the company. Currently they have oversight of these mandatory inspections, and they occur every 10-15 years. These tanks are permit required confined spaces and the likelihood of an incident occurring is significant. Prior to entry into any permit required confined space all lock out procedures and proper air monitoring occurs. Personnel working above ground could be at risk of a fall requiring the use of high angle or low angle rescues. There are internal pontoon floating roof tanks located on all flammable products.

Marine Risk:

Marine water supply access to this location is adequate; the dock has a mean depth of 38 feet of water, which is more than adequate for access of our fireboat. The facility's normal schedule is to receive products via ship 5-6 times per month. The average stay for these marine vessels is 24 hours.

EMS Risk:

The facility generally has approximately 30 personnel on site. The likelihood of an EMS incident is moderate. There have been two EMS calls since 2000. One call was cancelled, and the second call was a possible diabetic patient. Since there is little history; we should remain cognizant that medical emergencies of any nature could occur. Access within the facility is excellent.

FH Occupancy ID: NCST 31
Terminal Address: 1 Shipyard Boulevard
Terminal Phone: 910-251-2725
Terminal Fax: 910-343-6327
Safety Manager: Kevin Cowan- Cell-910-520-5804
Terminal Size: 284 acres
Number of Buildings: 25
Size of Buildings: 1000- 200,000 square feet
Number of Tanks: 3
Range of Tanks: 1 -1000 gallons and two 10,000-gallon diesel tanks above ground
Number of Vessel docks-9- for a total length of 1.1 miles

The North Carolina State Ports Facility located in Wilmington, North Carolina is a shipping and receiving terminal located on 284 acres of property. The facility is geographically bordered on its western side by the Cape Fear River and the eastern side by Burnett Boulevard. The site is comprised of 25 buildings ranging in size from 1000 – 200,000 square feet. The buildings are Type II Non-Combustible, and all buildings are less than 2 stories tall. The accessibility is excellent on site. However, we may encounter logistical problems aboard ships and cranes. The whole facility has a local alarm system. Both during and after normal business hours the site has a police force. All visitors must be signed in and all personnel working on the facility possess a TWIC card granting access to various areas. The ports are annually inspected by the Office of the State Fire Marshal and by the Department of Environmental and Natural Resources. The United States Coast Guard inspects annually as well as periodically throughout the year. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the Moderate category.

The Port of Wilmington employs 183 personnel and has experienced record growth in the recent years. They ship and receive over 320,000 TEUs annually, which is roughly 160,000 40-foot cargo containers. They move more than 2,000,000 tons of general cargo annually. The port receives product from 32 shipping lines, seeing over 450 ships each year.

Product is imported and exported primary from China, Great Britain, Belgium, South Korea, and Turkey. The imports are generally chemicals, grains, urea, ore, retail merchandise and the exported materials are generally phosphate, wood chips, metal products, and military related materials. The methods used to import, and export include air, rail, roadway, and marine. The on-site training for the police department is Medical First Responder along with Automatic External Defibrillator training and HAZWOPER Awareness. The maintenance departments are trained in confined space, fire sprinkler technician, and HAZWOPER operations level.

Fire Risk/ Hazmat Risk:

There are 25 structures on this site. T6 is a 200,000 square foot warehouse that is fully sprinkled and is protected by a 2000 gallon per minute (GPM) fire pump. There are 3 unprotected storage tanks within this facility that contain anywhere from 1000 to 10,000 gallons of diesel fuel. There is a halogen system located in the service room of the maritime building. There are also dry pipe sprinkler systems located in various buildings. The worst hazard on site are the DRI- Iron Pellets that are stored in the DRI building located on Industrial Boulevard. Next would be the military

usage of this port and the explosives which are transported in and out of the facility at nighttime and on weekends. These shipments are brought in and shipped out within four hours. The ports have always maintained a close working relationship with the fire department, and they notify us when these shipments occur. Most of the other warehouses contain salt or other bulk fertilizer. The site also has silos with grain storage, and wood chipping operations. The material safety data sheets are filed within the facility and all Tier 2 reports are reported annually.

Tactical Rescue Risk:

This facility has several storage tanks that are inspected by a third party in compliance with the American Petroleum Institute (API). These tanks are permit required confined spaces and the likelihood of an incident occurring is significant. Prior to entry into any permit required confined space all lock out procedures and proper air monitoring occurs. Personnel working above ground are at risk of a fall requiring the use of high angle or low angle rescues. High angle rescues have taken place on the cranes themselves. In addition, there are the ships themselves and the confined spaces that they have. There are lift and sewer stations that require permits as well.

Marine Risk:

Marine water supply access to this location is adequate; the dock has a mean depth of 42 feet of water, which is more than adequate for access of our fireboat. The average stay for these marine vessels is 12 hours.

EMS Risk:

The facility generally has approximately 10 personnel on site. The likelihood of an EMS incident is moderate. There has been little to no history; however, medical emergencies of any nature could occur. Access within the facility is excellent.

Aircraft Risk:

The North Carolina State Ports at Wilmington has received in the past significant numbers of rotary wing aircraft from the military. During both Persian Gulf wars, there was a huge increase of flights into the site. Helicopters were then disassembled to a shipping status and were placed upon marine vessels to be transported overseas. During all landings and take offs the military requests that a fire department apparatus stands by in the event of an unforeseen emergency. The last military move was September 2012; where approximately 25 helicopters were offloaded and assembled. We work closely with the safety officer for the transportation unit that coordinates this job. Safety briefings were done daily so that everyone is on the same page.

Electrical Risk:

Within the facility there is an extreme electrical hazard. The 281-foot container cranes are powered by a 13,200-volt system and the service entering the facility is 4,160 volts with 12,000 amps.

Novant - New Hanover Regional Medical Center

FH Occupancy ID:	NEWH000004
Business Address:	2131 South 17th Street
Business Phone:	910-343-7000
Business Fax:	910-343-7083
Emergency Contact:	Laura Mattison- Manager- Safety
Office:	910-343-2451
Cell:	910-297-5968
Number of Buildings:	10 separate buildings or areas that are interconnected.
Size of Buildings:	Total all areas 1.3 million square feet
Number of Tanks:	15 above and below ground
Range of Tanks:	500-20,000 gallons
Facility Size:	63 acres

Novant NHRMC is a Level II trauma center that was originally completed in 1967. In 1976 3 additional floors were added and further additions and renovations are always underway. Currently, there are ten structures or areas on the site that are interconnected and 15 storage tanks. The ten structures vary in height and the main structure is 10 stories. There are two floors located underground. All these structures are built with Type II non-combustible materials. The closest exposure distance is 31-60 feet, which is the physical plant. Accessibility is excellent in all areas of the site. The hospital has a capacity of 620 patients at full capacity and employs over 5000 personnel. All the exits are located to conform to the building code at the time they were constructed. The facility has a central automatic alarm system within the main building. There is always a police force on scene. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the maximum category. The facility has a history of 621 calls for service since 1999. The facility generally receives on average 25 shipments of product from vendors such as UPS, Federal Express, and food services per day. The company has biohazard waste removed appropriately per standards of Clean Harbor. In the event of an emergency response, the hospitals protocol is to have their special police meet with the responding agency by the rear door of the fire command center. The hospital recently improved their radio system to better communicate in the event of an incident.

Regarding the training of their employees, all new employees are given a one-day orientation that entails policies and procedures, safety awareness, benefits, and the code alerts. Once this is completed each department that an employee is located within generally has a one to four-day safety program. The hospital additional utilizes an online computer system that employees are required to complete monthly. The hospital is very highly regulated and must maintain mandatory compliance with many agencies including but not limited to the Environmental Protection Agency, Department of Environmental Resources and the Department of Health and Services Resources. Access within the facility is badge controlled access.

Fire Risk/ Hazmat Risk:

This facility has several fire/haz-mat risks. Some of the primary concerns onsite are varying quantities of liquid O2, diesel fuel, formaldehyde, nitrous oxide, bio-hazard material, and various radiological materials. The array of hazardous material and fire risks are extreme. The presence of their Magnetic Resonance Imaging (MRI) presents a unique set of problems. Primarily, once

power is terminated to this area, it takes on average about 30 minutes to completely power down. This room is guarded, and access is denied.

The facility is equipped with an automatic extinguishing system to include wet-pipe sprinkler, dry pipe sprinkler, dry chemical, and halogen throughout the facility. The halogen system is located within the data room and the MRI facility. Dry chemical system is located in the kitchen area; dry pipe system is located in the distribution and the outside canopy areas. All other areas are wet pipe system. The fire department riser locations and fire department connections are strategically located throughout the facility and are indicated in the site's plot plan. Fire pumps are located strategically as well and are indicated on the plot plan. There is one pump that is 1500 gallons per minute (GPM) located at the main tower and two pumps each 750 GPM. One is located at the Zimmer building and the other is outside the rehab facility. The 1500 GPM PUMP was tested in October 2012 and tested 2001 GPM at 140 psi. The Zimmer 750GPM pump flowed 1143 GPM at 100 PSI and the rehab pump flowed 754 GPM at 70 PSI. There are 11 hydrants located on site and are indicated on the map as well. There are flow test records kept on site for the fire pumps on location. There are biannual fire drills conducted with the assistance of the department and there is one fire drill per shift per quarter. The natural gas is located underground in the utility plant. Natural gas does not feed into the main tower facility itself.

Electrical Risk:

This facility obviously has a severe risk of electrocution. The system is 480 volts with 8000 amps in the main building. There is also a 3-pad mounted transformer that each pad is 480 volt and 4000 amps. All power interruptions should be done through a coordinated effort with the power company and the hospital's electrician.

Tactical Rescue Risk:

This facility obviously has various storage tanks such as the diesel fuel that are inspected as mandated by the American Petroleum Institute. If needed to be entered some of these tanks are permit required confined spaces and the likelihood of an incident occurring is significant. All safety measures are taken into consideration, and this work is contracted out to a third party. However, employees that work around these storage tanks have received awareness level training as mandated by OSHA 1910.146. Personnel working above ground could also fall victim to a possible fall requiring the use of high angle or low angle rescues. New Hanover Regional Medical Center Hospital could pose a risk in the event someone was on the roof and an emergency took place. In addition, there are several underground storage tanks that if breached and a significant fire/explosion occurs, there may be structural damage to the facility itself causing the use of our structural collapse element of our team.

EMS Risk:

New Hanover averages from 2000-10000 patients and personnel on site depending on time of day. The likelihood of an EMS incident is significant. There has been little history; however, medical emergencies of any nature could occur. Access within the facility is adequate. The history for this site is four calls since 2000.

Aircraft Risk:

Novant NHRMC currently operates as a Level II trauma center. They receive patients and transport patients to other hospitals in North Carolina by helicopter. The hospital will request a fire

department company to stand by to comply with standing orders from military flights into or from the hospital. There are approximately 24 flights per year arriving from outside New Hanover (i.e. Duke, UNC, Pedro). Air link transports approximately 647 flights into and away from New Hanover per year.

Marine Risk:

This site cannot be supported by marine assets. There are no bodies of water within the facilities site.

Novant New Hanover Orthopedic Hospital

FH Occupancy ID:	Cape000005
Business Address:	5301 Wrightsville Avenue, Wilmington, NC 28402
Business Phone:	910-452-8100
Business Fax:	910-452-8600
Contact Name:	Lee Mosley
Contact Phone:	910-452-8717 (best time to contact 0830 hours)
Contact Email:	lee.mosley@nhrmc.org
After Hours:	910-341-3780
Number of Buildings:	13
Size of Buildings:	1780-111,670 sq. /ft.
Property Size:	15.75 acres
Number of Tanks:	4- (2 above ground and 2 underground)
Range of Tanks-	3000-5000 gallons diesel fuel

Novant New Hanover Orthopedic Hospital is located on 15.75 acres of land off the 5300 block of Wrightsville Avenue. The hospital contains 141 beds and specializes in the practice of orthopedics. There are thirteen structures on the site and four storage tanks. The thirteen structures are no taller than 3 stories and within the main structure there is a basement floor. All these structures are built with Type II Non-combustible materials. The closest exposure distance is 31-60 feet. Accessibility is excellent in all areas of the site. Novant New Hanover Orthopedic Hospital has an occupant load well over 300 patients and personnel. All the exits that are located conform to the building code at the time they were constructed. The facility has a central automatic alarm system within the main building. The remaining twelve leased structures have only local alarm systems. After normal business hours there is a security guard on the premises. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the Significant category. The facility has a history of 93 calls since 2000. The facility generally receives on average 8 shipments of product from vendors such as UPS, Federal Express, and food services. On average they send out about two shipments a day; this is primarily between Cape Fear and New Hanover Regional Medical Center. In the event of an emergency response, the hospitals protocol is to have their special police and a nursing supervisor meet with the responding agency by the front door of the main entrance. The hospital is also in the process of improving their public-address system to better communicate in the event of an incident.

Regarding the training of their employees, all new employees are given a two-day orientation that entails policies and procedures, safety awareness, benefits, and the code alerts. Once this is completed each department that an employee is located within generally has a one to two-week mentoring program. The hospital additional utilizes a system called Net Learning that employees are required to complete on a quarterly basis.

Fire Risk/ Hazmat Risk:

This facility has a number of fire/haz -mat risks. Some of the primary concerns onsite are varying quantities of liquid O2, diesel fuel (up to 5000gallons), formaldehyde, nitrous oxide, bio-hazard products, and various radiological materials. Since this site contains a main hospital and various other structures that are leased to doctors, medical service providers and such; the array of hazardous material and fire risks are extreme. The presence of their Magnetic Resonance Imaging (MRI) located beside the emergency entrance presents a unique set of problems. Primarily, once

power is terminated to this area, it takes on average about 30 minutes to completely power down. This room is guarded, and access is denied until safe entry can be made.

The facility is equipped with an automatic extinguishing system (wet-pipe sprinkler) throughout the entire main building. The remaining twelve structures do not have an automatic extinguishing system. It is important to point out that all nowhere on this facility are there any fire pumps. Therefore, it is imperative that the fire department hooks in and supports the automatic extinguishment system through the fire department connection(s) on site. The facility is equipped with combination heat and smoke detectors that are linked back to the fire alarm control panel located in the basement dating back to 1979 and the fire alarm control panel located within the facilities building.

Fire hydrants are strategically placed on the facilities site and are indicated on the sites plot plan. Fire department connection is located on the south side of the main lobby area. The natural gas shut-offs are behind the kitchen area and another one next to the main entrance to the hospital. Material Safety Data Sheets are located in the facility building

Electrical Risk:

This facility obviously has a severe risk of electrocution. The system is 480 volts with 1600 amps. Any and all power interruptions should be done through a coordinated effort with the power company and the hospital's electrician. The location of the main electrical switch gear electrical is room B-14 located in the basement of the main building built in 1990 and labeled Mechanical EQ-1. There are two elevator control switches; one is in the basement of the 1990 portion of the main building in the basement in Room B-26 and in Room 3 of the mechanical equipment room.

Tactical Rescue Risk:

This facility obviously has various storage tanks such as the diesel fuel that are inspected annually as mandated by the American Petroleum Institute. If needed to be entered some of these tanks are permit required confined spaces and the likelihood of an incident occurring is significant. All safety measures are taken into consideration, and this work is contracted out to a third party. Personnel working above ground could also fall victim to a possible fall requiring the use of high angle or low angle rescues. Novant New Hanover Orthopedic Hospital could pose a risk in the event someone was on the roof and an emergency took place. In addition, there are several underground storage tanks that if breached and a significant fire/explosion occurs, there may be structural damage to the facility itself causing the use of our structural collapse element of our team.

EMS Risk:

Novant New Hanover Orthopedic averages 250-300 patients and personnel on site depending on time of day. The likelihood of an EMS incident is significant. There has been little history; however, medical emergencies of any nature could occur. Access within the facility is adequate. The history for this site is four calls since 2000.

Marine Risk:

This site cannot be supported by marine assets. There are no bodies of water within the facilities site.

Nu-Star Asphalt

FH Occupancy ID:	CITG000002
Terminal Address:	3345 River Road
Terminal Phone:	910-799-0483 extension 12
Terminal Fax:	910-799-8327
Contact:	Mike Watkins
Contact Afterhours #:	910-512-6410
After Hours Contact:	Greg Dillard-910-617-5981 James McCauley-910-617-6410 Stacy Kirk-910-547-8736
Terminal Size:	13acres terminal and 30 acres property
Number of Buildings:	4
Size of Buildings:	650-50,000 square feet
Number of Tanks:	12 (7 inactive)
Range of Tanks:	211-84,636 gallons
Number of Vessel Docks:	1- 900 feet

Nu Star Terminal facility is located on 30 acres of property and is geographically bordered on the western side by the river. The facility is comprised of 4 buildings and 12 storage tanks. The four buildings are all no taller than two stories. One of the four structures are Type V- Wood Frame construction and the other 3 are Type II- Non-Combustible. The closest exposure distance is 61-100 feet. Accessibility is excellent on all sides. Generally, there are no more than 10 personnel on the facility at any one time. The central alarm system monitors the facility, and the control panels are in the main entrance and the break room of the main office. After normal business hours there is no security guard; but there is an employee on duty. All the exits that are located conformed to the building code at the time they were constructed. There is absolutely no access to unauthorized personnel and all visitors are required to check in, register. All staff and contractors on site have a daily 10 to15 minute safety briefing.

Fire/ Hazmat Risks:

Primary risks are five 100-foot molten asphalt storage tanks, and the remaining tanks are inactive. This site includes a truck loading rack. Firefighting water is available onsite via an aging, looped water main formerly supplied by a now defunct fire pump. city water is connected to the sites fire main with capability of 3500 GPM. Hot asphalt transits to and from marine vessels via a dedicated, insulated pipeline, shared with other nearby locations. The city survey indicates water main on River Rd. is capable of 4000 GPM @ 20 psi. The facility's storage tanks are all asphalt. The facility on a daily average load and sends out into our community 100 tanker truck load of product ranging in capacity from 7000-8000 gallons of product. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the Moderate category. The facility has a history of one call located in Firehouse software. The facility is inspected by the North Carolina Department of Environmental and Natural Resources every 2-3 years. They are to comply with Carolina Star state requirement. The Internal Revenue Service inspects every other month. The United States Coast Guard inspects the facility quarterly and OSHA inspects as needed. Nu-Star ensures that all its employees have 24 hours of HAZWOPER training along with an annual refresher. They also conduct 15-20 computer-based modules annually on a variety of safety subjects to include but not limited to, ergonomics, ladder haz-mat. Every other year Nu-star trains their employees in either

fire extinguisher training or CPR. Nu-star facility inspects their storage tanks in accordance with the American Petroleum Institute's recommendations. There are 12 unprotected storage tanks within this facility. 7 of these tanks are inactive. Within the facility there is an electrical hazard posed by 3 phases- 480 volts.

Tactical Rescue Risk:

This facility obviously has 12 storage tanks that are inspected by Nu-Star. Currently Nu-star has oversight of these mandatory inspections, and they occur every 10-15 years. These tanks are permit required confined spaces and the likelihood of an incident occurring is significant. Prior to entry into any permit required confined space all lock out procedures and proper air monitoring occurs. Personnel working above ground could also fall victim to a possible fall requiring the use of high angle or low angle rescues.

Marine Risk:

Marine water supply access to this location is adequate; the dock has a mean depth of 38 water, which is more than adequate for access of our fireboat. The facility's normal schedule is to receive products via ship every 3 weeks unless summer once a week. The average stay for these marine vessels is 18-24 hours. Additional water supply can be via fire boat, Atlantic VI pumping to relay assets from Deepwater Pier at the Cape Fear River.

EMS Risk:

The facility generally has approximately 10 personnel on site. The likelihood of an EMS incident is moderate. There has been little to no history; however, medical emergencies of any nature could occur. Access within the facility is excellent.

University of North Carolina at Wilmington (UNCW)

FH Occupancy ID:	UNCW01
Business Address:	601 South College Road (Note: all buildings have their own physical addresses)
Contact Information:	Eric Griffin- Assistant Director of Environmental Health and Safety/ Emergency Manager
Cellular:	910-512-2492
	In case of emergency dial 911
Emergency Informational Hotline:	910-962-3991 or 888-657-5751
UNCW Police Non-Emergency-	910-962-2222
Number of Buildings:	125 (main campus only) 158 all facilities in New Hanover, Pender, and Brunswick Counties
Size of Buildings:	94- 169,438 square feet – East Side parking deck 308,801 square feet
Site Size:	647.50-main campus only- 984.23 off campus-total- 1631.73 acres

The University of North Carolina at Wilmington (UNCW), sometimes referred to as UNC Wilmington, is a public, co-educational university located in Wilmington, North Carolina. UNCW enrolls approximately 14,000 undergraduate, graduate and doctoral students each year as part of the 17-campus University of North Carolina System. UNCW was founded in 1947 as Wilmington College and in 1968-69; by vote of the Board of Trustees of the University of North Carolina, with subsequent approval by the North Carolina Board of Higher Education, and by an act of the General Assembly of North Carolina, Wilmington College became the University of North Carolina at Wilmington. Today, the college employs 1808 full-time faculty and staff and 388 part-time faculty members. UNCW offers 52 bachelor's degrees in various majors, 38 master's degrees and 2 doctoral degrees in marine biology and educational leadership and administration within its five educational colleges. The educational colleges are the College of Arts and Sciences, School of Nursing, College of Health and Human Sciences, Watson School of Education, Cameron School of Business. In addition, there is a graduate school.

The college has an appraised land value of $52,151,800. 00. UNCW has an appraised building value of $242,118,600.00, and a total appraised value of $294,270,400.00. The college operates on a $286 million-dollar annual budget. 30-3 (33%) percent of the revenue is appropriated by the state. There is a combined foundation and university endowment of 68.7 million dollars as of the end of February 2012.

A new economic impact study has revealed that the University of North Carolina Wilmington is a significant catalyst for the economic engine of Southeastern North Carolina, generating more than $1 billion in annual economic activity during academic year 2011-12. The study, conducted by UNCW's David and Diane Swain Center for Business and Economic Services, focused on UNCW's economic impact in four major areas: construction and renovation projects, student spending, faculty/staff spending and the day-to-day operations of the campus. Data collected for the study show that UNCW is supporting more than 4 percent of total economic activity in the region. Sources for the data included university records, a survey of a sample of UNCW students and a survey of a sample of faculty and staff. The surveys asked respondents about their spending habits in the areas of housing, retail shopping, restaurants, entertainment and other relevant economic sectors. The study focused on eight counties in UNCW's service region: Bladen, Brunswick, Columbus, Duplin, New Hanover, Onslow, Pender and Sampson.

Currently, there are 158 structures located on all UNCW properties. A sizable number (33) of these structures are off-site structures and available throughout New Hanover, Pender, and Brunswick Counties. There is 647.50 acres located on the main campus with an additional 984.23 acres in the counties being utilized currently or available for future growth. There are 125 structures on the main campus. There are 81 occupied structures related to academics, support, and other functions and 44 residential structures that house students the structures vary in height and the tallest structure is Galloway Hall which has six floors. There are underground vaults in various buildings on campus. The majority of structures (eighty (80)) are constructed with Type II Non-combustible materials. There are forty-four (44) Type V-Wood Frame structures, one (1) Type-I-Fire Resistive. Of the one hundred and twenty-five (125) occupied buildings on site fifty-six (56) of them are 0-10,000 square feet, fifteen (15) are 10,001-25,000 square feet, 30-3 (33) are 25,001-50,000 square feet and twenty-one (21) are greater than 50,000 square feet. The closest exposure distance is 11-30 feet on the campus. Regarding accessibility, it is excellent in most areas of the campus. There are sides of some buildings that fire apparatus would not have access due to the ground. In some areas, the concrete pads may not be adequate to fully support apparatus weights. Emergency traffic is slowed down considerably due to the speed humps that are located throughout the campus roads. In addition, the college has bollard posts that can be removed or fold down if access is needed in these areas.

UNCW maintains their fire hydrant system. The department inspects these hydrants twice a year as a courtesy and reports any hydrants in need of repair to UNCW. The water distribution system is looped system that is supplied at the front by a 16-inch main on South College Road and a 10-inch main along Riegel Road and a 12-main along Randall Drive. With this distribution system, the campus has adequate water supply for firefighting purposes.

The college has an enrollment of approximately 17,500 students and over 2100 staff and faculty. All the exits that are located conformed to the building code at the time they were constructed. The facility has a central automatic alarm system within its site. During all hours there is a police force on scene. The facility received an Occupancy Vulnerability Assessment Profile (OVAP) in the significant category. The facility has a history of 856 different types of calls between January 1, 2018 and December 31, 2022 and 291 calls in 2022. The following chart represents the types of calls for the 5-year period between January 1, 2018 and December 31, 2022 and the one-year period of 2022.

Incident Type	5-year (Jan 2018 thru Dec 2022)	1-year (Jan 2022 thru Dec 2022)
100-Fires	26	9
200-Overpressure	12	7
300-EMS	128	53
400-Haz. Cond. No fire	27	10
500-Service Calls	59	11
600-Good Intent Calls	74	35
700-False Calls	529	165

800-Severe Weather	0	0
900-Special Incident Type	1	1
Totals	**856**	**291**

UNCW generally receives over 100 shipments of product from vendors such as UPS, Federal Express, and food services per day. It should be noted that currently there are thirteen different dining locations on campus. These range in size from Wagoner Hall to small coffee shops and grills in various buildings. A map of these has been provided with this analysis.

Regarding the training of their employees, all new employees are given a one and one-half day orientation that entails policies and procedures, safety awareness, benefits, and the code alerts. Once this is completed, each department that an employee is located within generally has a safety program that is tailored according to job function. In the event of an emergency response, the campus protocol is to have their special police meet with the responding agency at the location of the alarm.

The college is highly regulated and maintains mandatory compliance with agencies included but not limited to the North Carolina Department of Labor, North Carolina Health and Human Services, Department of Environment and Natural Resources and the North Carolina Department of Insurance.

Although the university is overseen by the North Carolina Department of Insurance, they have a written memorandum of understanding with the city regarding fire safety, fire prevention, training, drills, and planning.

<u>Fire Risk/ Hazardous Materials Risk:</u>

This facility has several fire/ haz-mat risks. Some of the key concerns are particular assembly areas, residential housing and several academic buildings that hold various hazardous materials and biological matter. I have provided a brief description of these structures below.

The campus is equipped with automatic extinguishing systems to include wet-pipe sprinkler, carbon dioxide system and halogen systems in various buildings. The halogen system is located within the telecommunications room upstairs in Hoggard Hall. The carbon dioxide system is located in the server room of Hoggard Hall. All other areas are wet pipe system. The fire department riser locations and fire department connections are strategically located throughout the campus. Fire pumps are located strategically as well.

Trask Coliseum

Trask hosts a variety of events for the college as well as the community. The seating capacity is 6,100 persons and the building is 100,075 square feet and composed of 3 stories. The coliseum is not protected by fire sprinklers and the fire alarm system is old and resets itself after four minutes, on its own.

Kenan Auditorium

Kenan auditorium is another assembly that is 29,352 square feet. This auditorium is also used frequently by the performing arts to put on various events and shows. This facility is sprinklered. The auditorium has a seating capacity of 1,000 persons and is equipped for use as a theater and contains seminar rooms for the Department of Music.

All the residence halls on the UNCW campus have automatic smoke detection systems that notify emergency responders when an alarm is activated. Additionally, these devices are supervised which means that if the device is tampered with or power is interrupted to the system, it will also notify emergency responders. Additionally, all residence halls and most facilities structures have automatic fire sprinkler systems installed.

University Apartments

These thirteen-wood frame residential structures are equipped with a sprinkler system, smoke detectors in each sleeping area as well as common areas. Each of the thirteen residential structures has a square footage of 3,694 square feet. These thirteen buildings have the capacity to house 400 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. There are fire extinguishers in the kitchens of each suite.

Belk Hall

Belk Hall is a four-story residential structure with a total gross area of 40,387 square feet. Belk is constructed of non-combustible materials and is equipped with a sprinkler system throughout as well as smoke detectors in each sleeping area as well as common areas. This building has the capacity to house 192 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located throughout the residence hall and fire department standpipes are located in the stairwells. Secondary exits have delayed egress doors connected to the fire alarm system.

Cornerstone Hall

Cornerstone Hall is a 3-story residential structure with a total gross area of 63,615 square feet. Cornerstone is constructed of non-combustible materials and is equipped with a sprinkler system throughout as well as smoke detectors in each sleeping area and common areas. This building has the capacity to house 264 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located throughout the residence hall and fire department standpipes are located in the stairwells. Additionally, there are smoke doors installed that close upon activation of the fire alarm to preclude the rapid advance of smoke and fire. Secondary exits have delayed egress doors connected to the fire alarm system.

Galloway Hall

Galloway Hall is a six-story residential structure with an added penthouse. It is the tallest building on campus. The building is no longer in service and is closed and slated to be demolished in 2023.

Graham / Hewlett Halls

Graham and Hewlett Halls at one time were not connected. However, in the recent past these two halls were connected by a one-story structure on the front side. These residential buildings are each

four stories in height and together have a gross area of 81,094 square feet. Graham and Hewlett are constructed of non-combustible materials and are equipped with a sprinkler system throughout as well as smoke detectors in each sleeping area as well as common areas. This building has the capacity to house 384 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located throughout the residence hall and fire department standpipes are located in the stairwells. Additionally, there are smoke doors installed in the connector building that close upon activation of the fire alarm to preclude the rapid advance of smoke and fire. Secondary exits have delayed egress doors connected to the fire alarm system.

Honors House

Honors House is a two-story residential building that has a gross area of 23,605 square feet. Honors House is constructed of non-combustible materials and is equipped with a sprinkler system throughout as well as smoke detectors in each sleeping area and common areas. This building has the capacity to house 100 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located throughout the residence hall and fire department standpipes are located in the stairwells. Additionally, there are smoke doors installed that close upon activation of the fire alarm to preclude the rapid advance of smoke and fire. Secondary exits have delayed egress doors connected to the fire alarm system.

International House

International House is a two-story residential building that has a gross area of 23,605 square feet. International House is constructed of non-combustible materials and is equipped with a sprinkler system throughout as well as smoke detectors in each sleeping area and common areas. This building has the capacity to house 100 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located throughout the residence hall and fire department standpipes are located in the stairwells. Additionally, there are smoke doors installed that close upon activation of the fire alarm to preclude the rapid advance of smoke and fire. Secondary exits have delayed egress doors connected to the fire alarm system.

Schwartz Hall

Schwartz Hall is a 3-story residential structure with a total gross area of 41,853 square feet. Schwartz is constructed of non-combustible materials and is equipped with a sprinkler system throughout as well as smoke detectors in each sleeping area and common and mechanical areas. This building has the capacity to house 155 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. 3 fire extinguishers are located on each floor and fire department standpipes are located for hose connections in each of the 3 stairwells that offer egress. Additionally, there are smoke doors installed that close upon activation of the fire alarms system. Stairwell exit doors are delayed egress doors connected to the fire alarm system.

Seahawk Crossing

These four-wood frame residential structures are each 3 stories in height. Each of the four residential structures has a square footage of 65,841 square feet. Seahawk Crossing consists of four wood frame constructed residential buildings equipped with a sprinkler system throughout as

well as smoke detectors in each sleeping area and common areas. These buildings have the capacity to house 662 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located throughout the residence hall and fire department standpipes are located in the stairwells. Range hoods in common areas also have automatic fire suppression systems. Additionally, there are smoke doors installed that close upon activation of the fire alarm to preclude the rapid advance of smoke and fire.

Seahawk Landing

Seahawk Landing 7 residential buildings are all 3-stories in height and buildings numbered 1 through 6 are each 36,687 square feet. Building # 7 is 46,461 square feet. Seahawk Landing consists of 7 wood frame constructed buildings equipped with sprinkler system throughout as well as smoke detectors in each sleeping area and common areas. These buildings have the capacity to house 603 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located throughout the residence hall and fire department standpipes are located in the stairwells. There is also a one-story pool house on this site that is 1,360 square feet.

Seahawk Village

Seahawk Village has six residential structures that are all 3 stories in height. Of the six buildings there are two types. Type "A" buildings are buildings numbered #2 and # 5 each are 34,614 square feet. Type "B" buildings are buildings numbered 1, 3, 4, and 6 and are each 34,284 square feet. Seahawk Village consists of six wood frame residential constructed buildings equipped with a sprinkler system throughout as well as smoke detectors in each sleeping area and common areas. These buildings have the capacity to house 524 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located throughout the residence hall and fire department standpipes are located in the stairwells. There is a 7th structure that is one story and has 6,625 square feet that serves as Seahawk Village Clubhouse.

University Suites

University Suites has 7 residential structures and one service building. Of these 7, Buildings Lettered "O, P, Q.R, S and U" are 3 stories in height and 14,616 square feet each. Building "T" is two stories in height and has a square footage of 9,744 square feet. University Suites consists of 7 residential structures and one service building that are constructed of non-combustible materials and is equipped with a sprinkler system throughout as well as smoke detectors in each sleeping area and common and mechanical areas. These buildings have the capacity to house 460 persons. The smoke detectors are connected to a supervised fire alarm control panel. Alarms report to the police station of UNCW where the alarm is then transferred to 911 Center. Fire extinguishers are located in the kitchens of each suite.

Wagoner Hall

Wagoner Hall is a one-story structure with a total area of 38,345 square feet. Wagoner Hall is the primary food service area for students and faculty. Located on the northeast side of Wagoner Hall is Madeline Suite. Madeline Suite is a catered dining facility suited for meetings and special events. There are more catering offices located on the southwest side of Wagoner Hall.

Warwick Center

Warwick Center is a one-story structure with a total area of 46,924 square feet. Warwick Center currently houses auxiliary services, a dining location, scholarships and financial aid, student accounts and cashier services, and a large multi-purpose ballroom that can be sub divided into smaller spaces, the lobby and nearby meeting room are available to the university and the community at large for meetings, conference proceedings and other functions.

Dobo Hall

Dobo Hall is a two-story structure with an attic space as a third floor. The total square footage for the entire structure is 110,951 square feet with 8,847 square feet of that as attic space

Dobo Hall is the primary science building located on campus. This facility is composed of 71 laboratories with 100 fume hoods. This facility has the most significant number (over 7000) of hazardous materials on campus. Most of these hazardous materials are contained in low-volume containers and may range from 10 grams to 1 kilogram and 1litre to 5 gallons. Each classification of hazardous materials is represented by the materials present. It should be mentioned that there are very low quantities of radioactive C-14 isotope present. All of the hazardous materials are under lock and key and a full-time safety officer is present within this building.

Friday Hall

Friday Hall is a 3-story structure and has a total square footage of 49,942 square feet.

Friday Hall is the primary biology building located on campus. This facility contains 30 laboratories. There is a considerable number of hazardous materials located in this structure. There is a sizeable collection of biological vertebrates contained in diluted alcohol solutions.

DeLoach Hall

DeLoach Hall is a two-story structure that has a square footage of 44,132 square feet.

DeLoach Hall is the primary geology/geography, oceanography, and physics structure located on campus. There are small amounts of corrosives and other hazardous materials. There is also an x-ray machine located here.

Physical Plant/Others

There are two 3,000 gallon above-ground storage tanks that contain gasoline and diesel fuels. Within the campus there are many non-occupied structures that contain very small amounts of hazardous materials (i.e., workshops, pesticide storage, and lawn maintenance).

UNCW has considerable amounts of chlorine for pool maintenance. Currently, there are 6 pools located on campus: 2 within the student recreation center, 2 within the natatorium, 1 within Seahawk Landing, and 1 in Seahawk Village.

<u>Electrical Risk</u>

The campus is divided into two electrical feeds of 23,000 volts each from Progress Energy. One feed (from Cedar Avenue) goes to a 5000 KVA electrical substation on Macmillan Avenue (near Isaac Bear Early College); the other (from Rose Avenue) goes to another 5000 KVA substation on Lionfish Drive across from Facilities Admin. Our operating voltage from each substation is 12,470 volts, which we step down to the normal 120/208V and 480/277V via transformers.

The campus electrical feed is on a loop system, which means that we do have the capability of feeding the whole campus (at reduced electrical loads) from just one substation in an emergency. It should be noted that the university apartments A-M are fed from a separate Progress Energy line from off Wooddale Drive, and it supplies individual transformers for each building. If electrical service needs to be shut down, a coordinated effort should be used with Duke Energy and the electrician of UNCW.

Natural Gas Risk

As far as gas distribution on campus goes, almost all occupied buildings have supplied natural gas for various reasons but mainly for heating purposes such as to run boilers, hot water heaters, etc. The gas mains are 6-inch main lines that are located at the front of campus and one at the rear of the campus. All the metal piping has been replaced with polyethylene gas pipe and all supplied buildings have meters and regulators on them.

UNCW trains their staff and faculty to provide basic information in the event someone notices the smell of natural gas or another strange odor. They ask the reporting part take prompt action to notify appropriate parties to investigate and to evacuate to a safe distance and meet with authorities to provide information regarding the odor or leak.

Tactical Rescue Risk

This facility obviously has a water tower and cellular tower along with various vaults. If needed to be entered some of these vaults are permit required confined spaces and the likelihood of an incident occurring is significant. All safety measures are taken into consideration, and this work is contracted out to a third party if needed. However, employees that work around these towers have received awareness level training as mandated by OSHA 1910.146. Personnel working above ground could also fall victim to a possible fall requiring the use of high angle or low angle rescues. UNCW continues to grow as a campus. As this growth continues, construction and renovations are an on-going occurrence. These construction sites have the potential for tactical rescues in many ways. There is the possibility of trench rescue, structural collapse and high angle on campus. UNCW has a ropes confidence course located in the woods east of Reynolds Drive and behind Seahawk Landing. This course is utilized throughout the year and the possibility does exist that incidents could take place despite all the safety precautions. The parking deck also poses a risk from the standpoint of collapse.

EMS Risk

UNCW averages from 10,000-16,000 personnel on site depending on time of day. The likelihood of an EMS incident is significant. There has been some history; however, medical emergencies of any nature could occur. Access within the facility is adequate. The history for this site is 128 EMS calls between January 1, 2010 and December 31, 2012 that the fire department responded to. This is due in part to the fact that we respond to calls only that are coded Delta and Echo. In 2012 we had 53 of those calls.

Marine Risk

This site can be supported by marine assets in several areas. However, there are a few small bodies of water that would be not accessible by boat, (i.e. pond at Bluethenthal Wildflower Preserve) In the event, that the mitigation of an incident would take place in these areas, the water

rescue/recovery team would have to walk or utilize an off-road vehicle to access the area. These sites are mostly retention ponds and one small pond on the flower preserve.

Aircraft Risk

UNCW is below several of the approach and departure headings for aircraft flying into or from Wilmington International Airport (ILM). In the event, that an airborne emergency is declared, the responders are given an alert status and appropriate action is taken among the responding agencies.

Special Needs Risk

University of North Carolina at Wilmington does in fact have students that have special needs. On the campus they have some designated rooms for ADA purposes (although not all persons with disabilities are in those units due to limited numbers) with additional notification devices.

They also have notification devices such as bed shakers in non-ADA rooms with ADA students. UNCW encourages those with disabilities to alert the residential advisors or the residential counselors, as well as room/hall mates of their needs during emergencies at the beginning of the semester. In the event of an emergency if able to evacuate, then do so. If not, call 911 and alert personnel of location and type of event taking place. The residential advisors or residential counselors should try to account for persons with disabilities during emergencies and alert emergency personnel there may be a person that needs assistance if not accounted for. The department has provided reflective stickers to UNCW to place on windows and doors of those with disabilities to allow emergency personnel to identify their residences with greater ease (only one student has taken advantage of this option).

Fire Exit Drills

Fire exit drills are conducted four times each year cooperatively between Environmental Health & Safety and Housing & Residence Life. The purpose of these drills is to educate residents of fire exit procedures and familiarize them with the building exits and fire protection systems.

During these drills, University Police is notified of the time and location, the alarm is activated, and residents timed to see how long it takes to evacuate the building. Activation of the notification is confirmed and is reset. Staff are placed at all exits and residents are routed to a

Pre-determined location. After all persons are out of the building, they are given an educational briefing the purpose of the drill and building specific considerations. Logs of these fire exit drills including date, time, and number of persons evacuated and other comments are maintained by Environmental Health & Safety. Participation in fire drills is mandatory and failure to evacuate the building during a Fire alarm will result in disciplinary action.

Fire Safety Education and Training

UNCW has taken a very proactive stance regarding fire safety. They do not allow certain items of any amount within on site residences. Some of the items are space heaters, incense, candles, toaster ovens, and halogen lamps. All residential walls should not be more than 50 percent covered. Smoking is not permitted within 25 feet of any structure. Residents are encouraged to discuss fire evacuation procedures with their room/suitemates or Resident Advisor. All students enrolled receive orientation in regard to safety and the tampering with fire systems. Firefighting, detection and alarm equipment is provided for the protection of all residents. Misuse of, or tampering with, this equipment is a violation of university regulations and state criminal statutes. UNCW utilizes

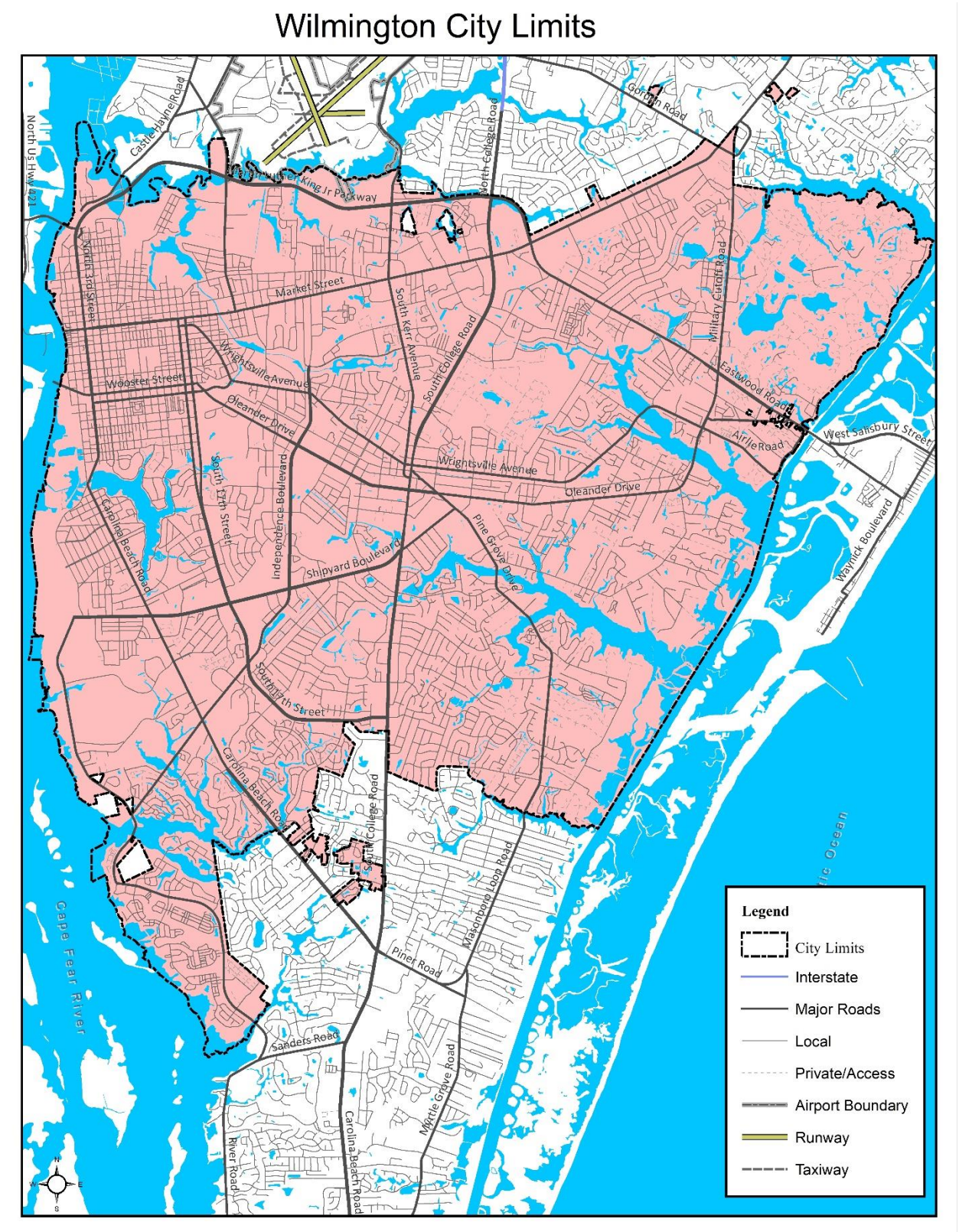
a Code of Student Life, Guide for On Campus Living as well as other websites that apply to tampering with these systems. All cases of persons tampering with fire alarm systems are taken seriously and are routed through the campus judicial system.

Residence Hall Staff receive intensive and comprehensive fire and emergency training prior to the start of every fall semester. Topics include a review of the fire prevention policies, weather safety, followed by a hands-on fire extinguisher demonstration, and an emergency evacuation exercise and educational opportunities. Fire safety training programs are also provided to other student, staff, and faculty groups on campus by request. Environmental Health & Safety actively seeks out opportunities to reach out to the community and partner with the department during these programs. This program typically consists of a community building event, a review of fire prevention and evacuation procedures followed by a hands-on fire extinguisher demonstration. Bulletin Board kits are provided to Resident Advisors as a tool to educate their residents. Fire Safety Information is distributed to students and parents via the monthly Housing & Residence Life newsletter.

Communication Risks

The university has updated their radios to digital. In years past, we have typically encountered communication issues and would have to physically switch our radio channel to a talk group that did not utilize repeaters. However, with the updated changes and future improvements we continue to successfully minimize communications issues. UNCW currently has 137 emergency callboxes strategically located throughout the campus. These callboxes are tied directly to the campus police force. The campus also utilizes an alert system in the event there is an active shooter, tornado or hazardous materials incident. The alert siren will sound throughout the campus and students have been instructed to immediately seek shelter in the closest building and close all doors and windows. Further instructions will follow by use of cell phone text messages and the use of the emergency hotline.

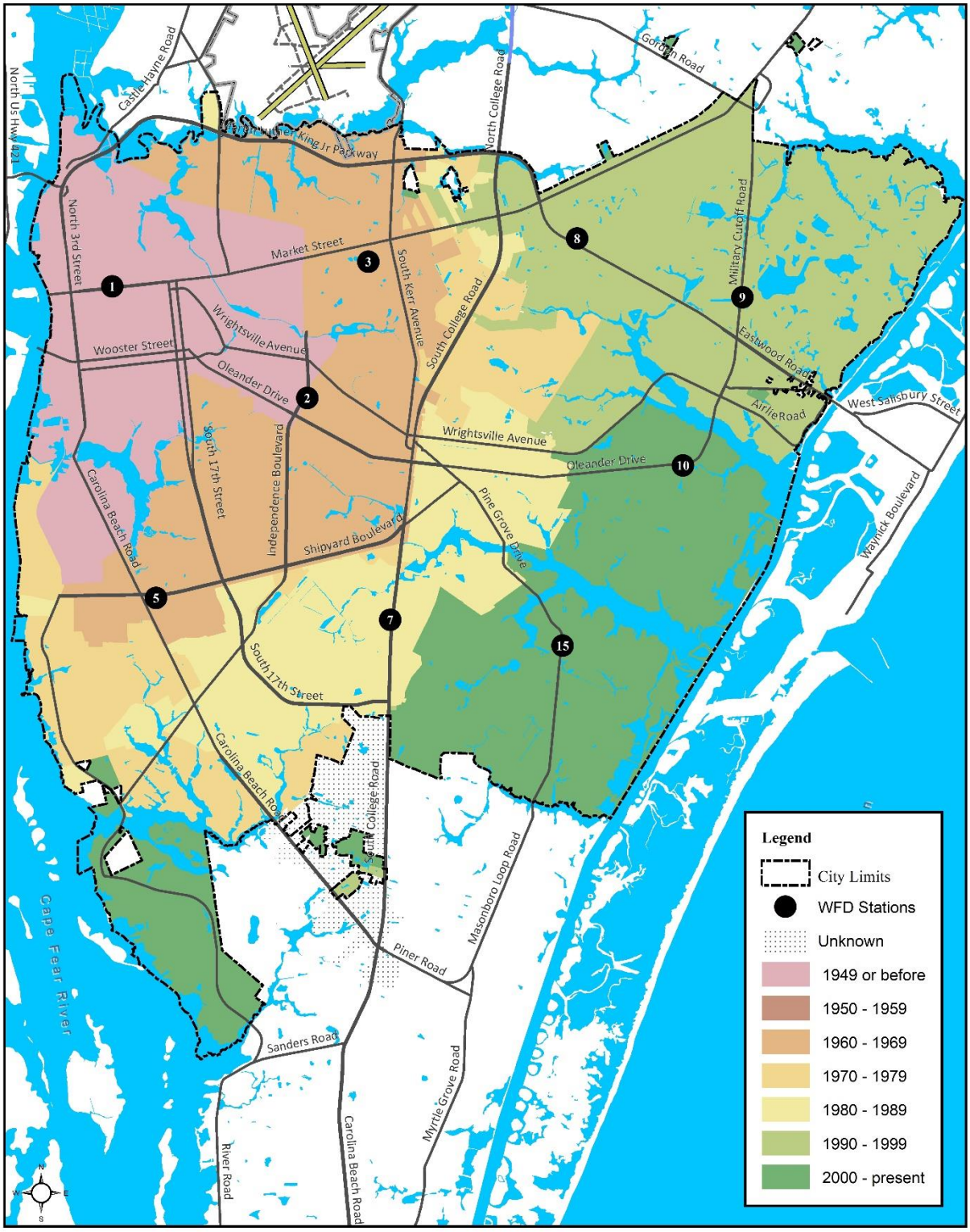
FULL SIZE MAPS



WMPO Map

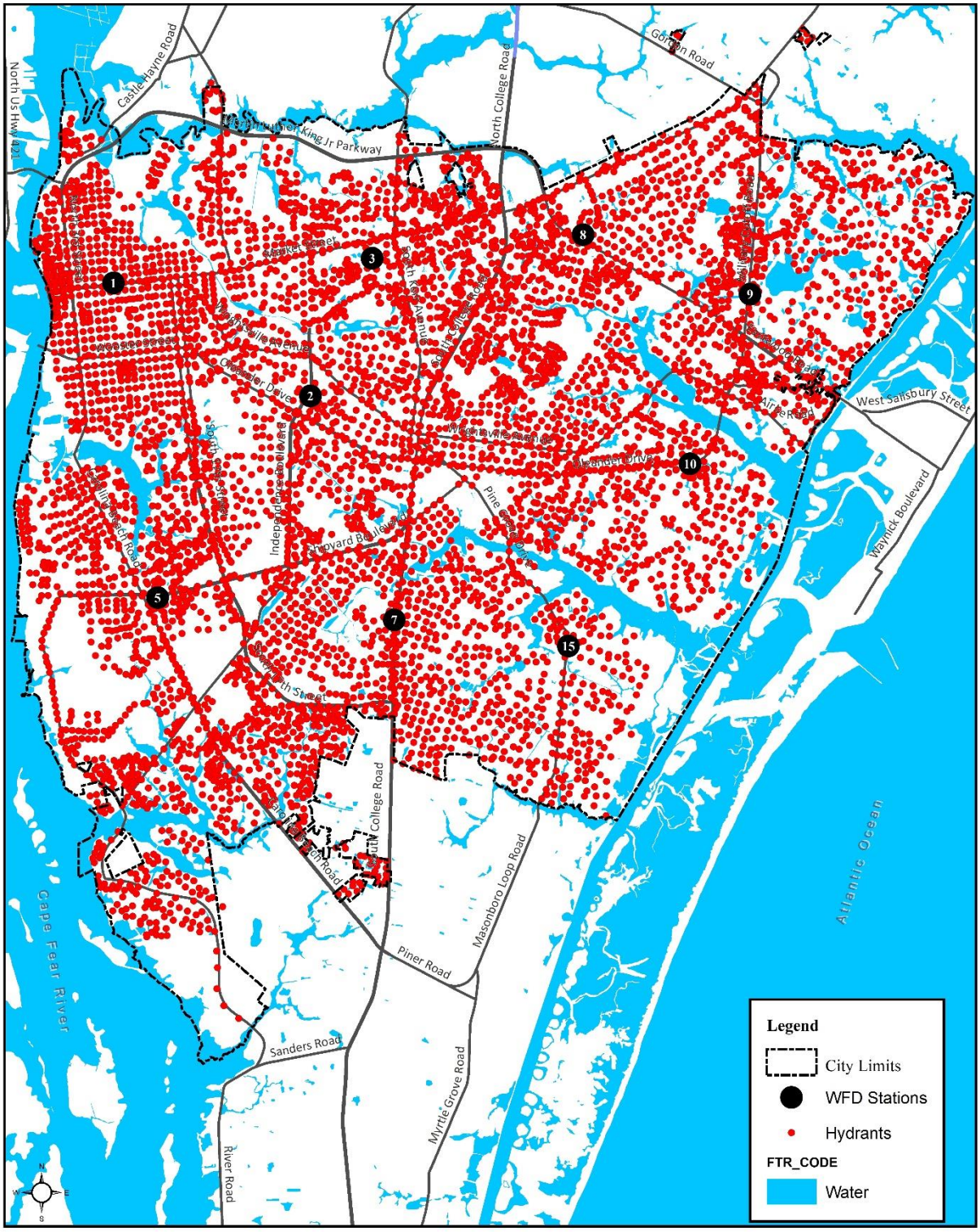

Pender County
New Hanover County
Navassa
Leland
Belville
Wilmington
Brunswick County
Wrightsville Beach
Carolina Beach
Kure Beach

Wilmington Growth

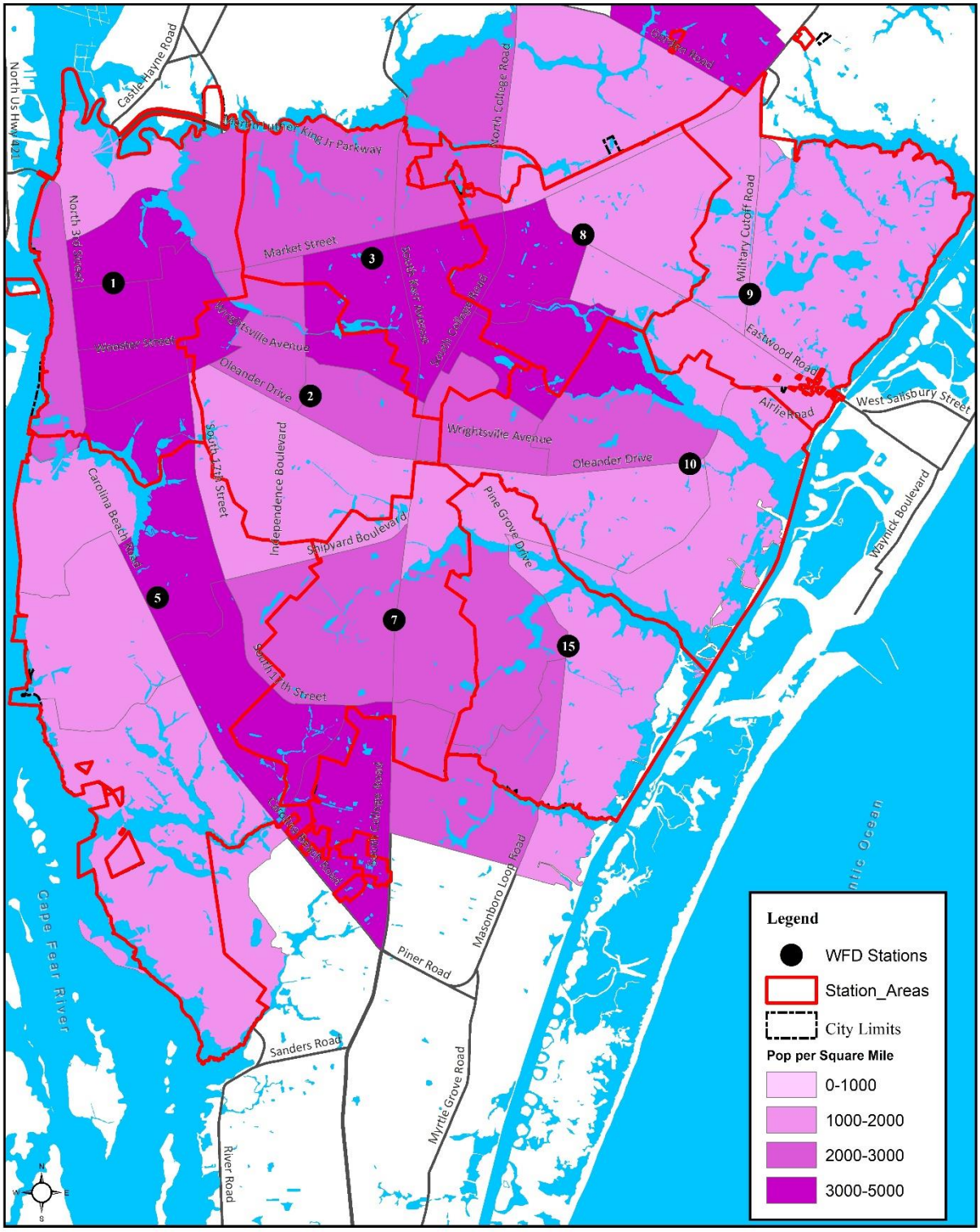


Water Distribution Map

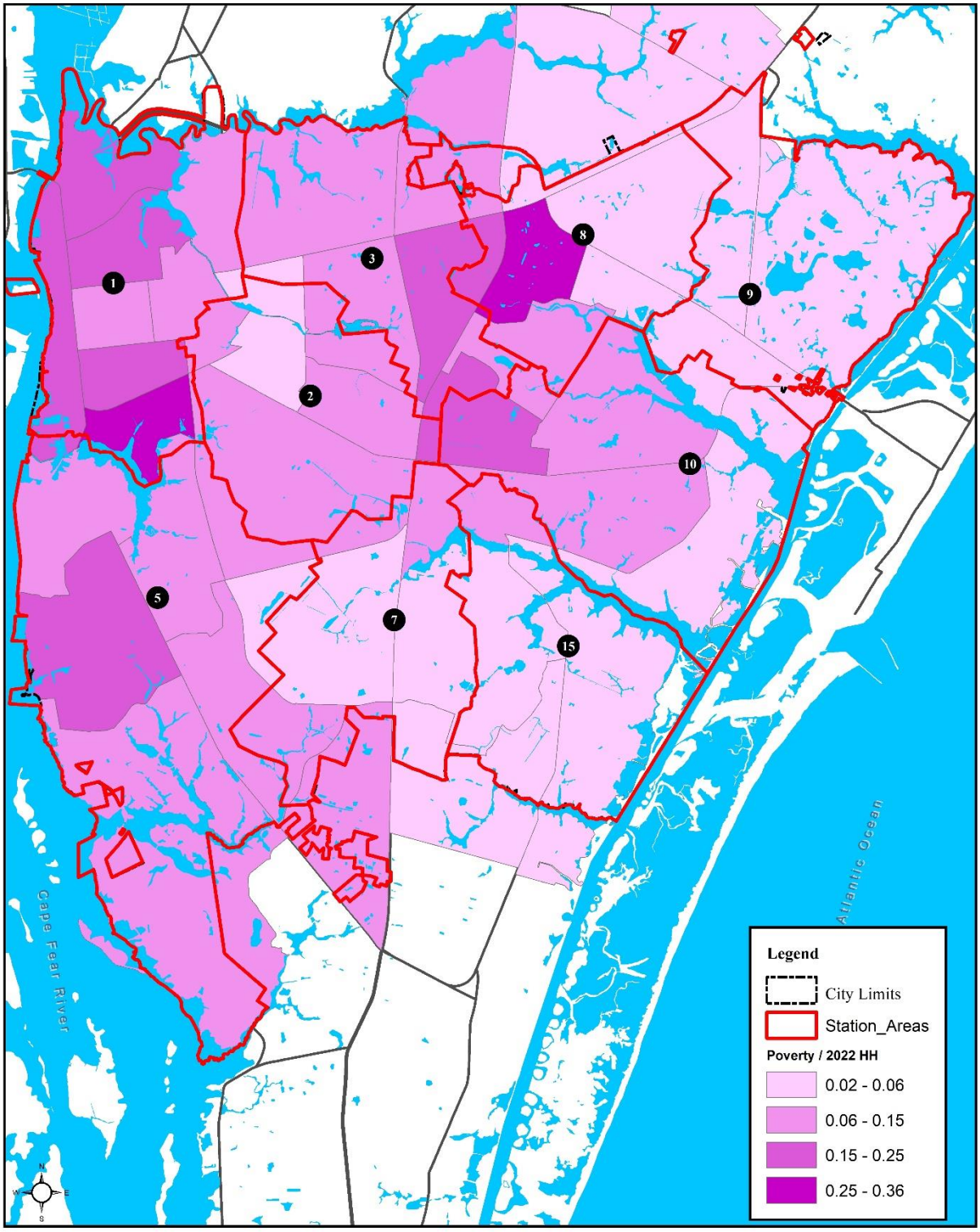
Hydrant Map


Castle Hayne Road
North US Hwy 421
Martin Luther King Jr Parkway
North College Road
Gordon Road
Market Street
South College Road
Wilmington Avenue
S Chandler Drive
Independence Boulevard
Carolina Beach Road
Shipyard Boulevard
South 17th Street
Pine Grove Drive
Alexander Drive
Wrightsville Avenue
Airlie Road
West Salisbury Street
Waynick Boulevard
Masonboro Loop Road
Piner Road
Sanders Road
Myrtle Grove Road
River Road
Cape Fear River
Atlantic Ocean
1
2
3
5
7
8
9
10
15
Legend
City Limits
WFD Stations
Hydrants
FTR_CODE
Water

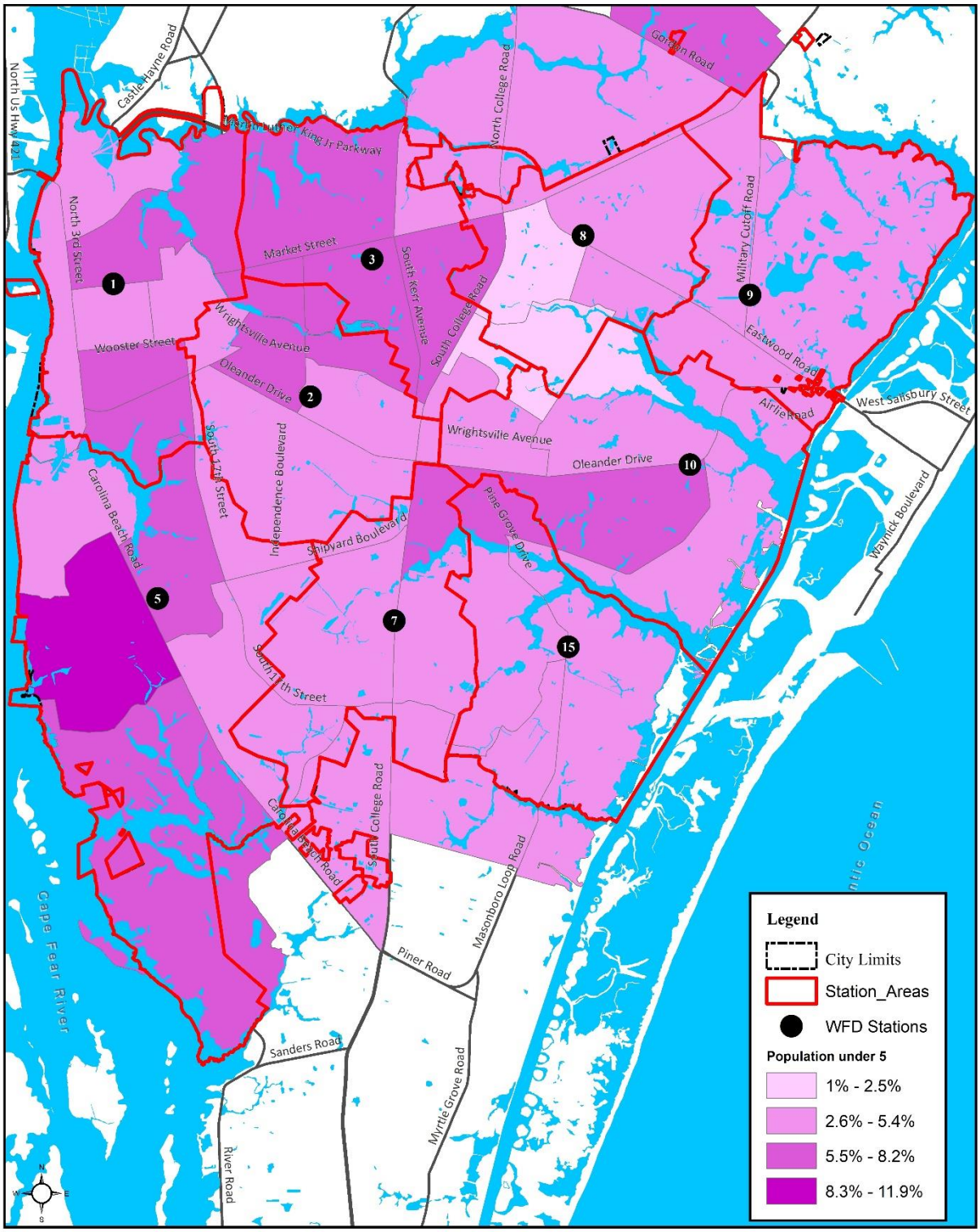
Population Density



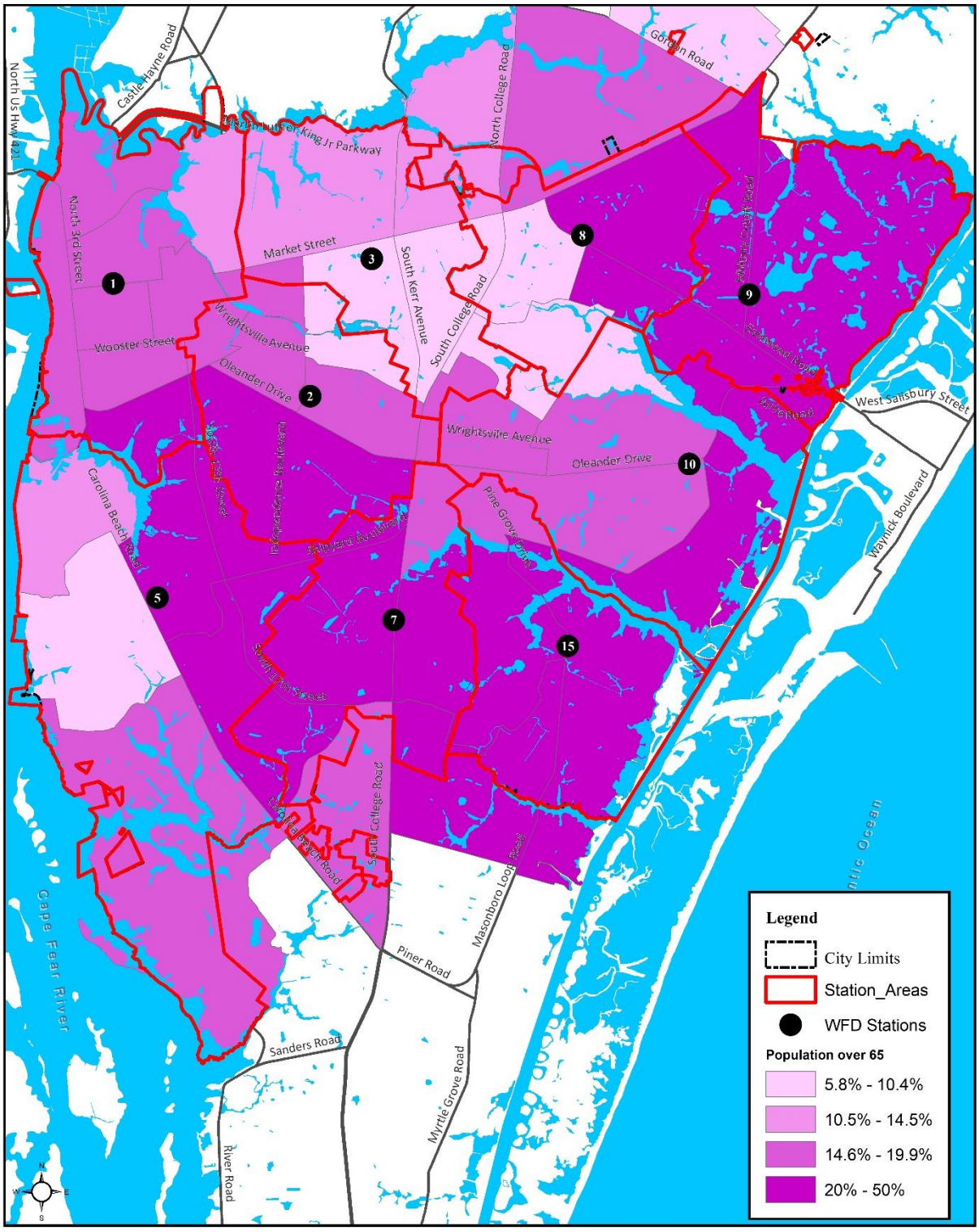
Population Below Poverty Level



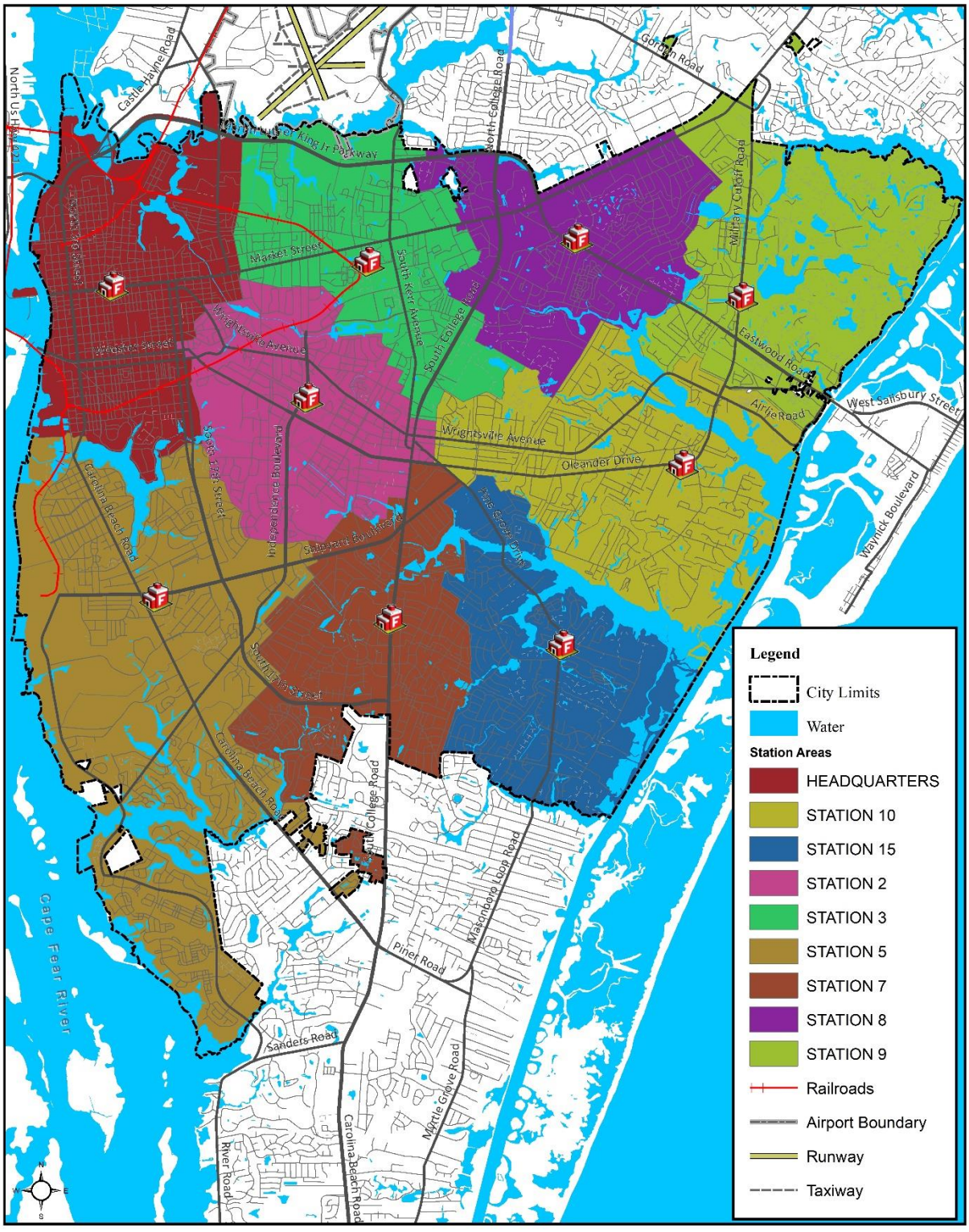
Population Under 5



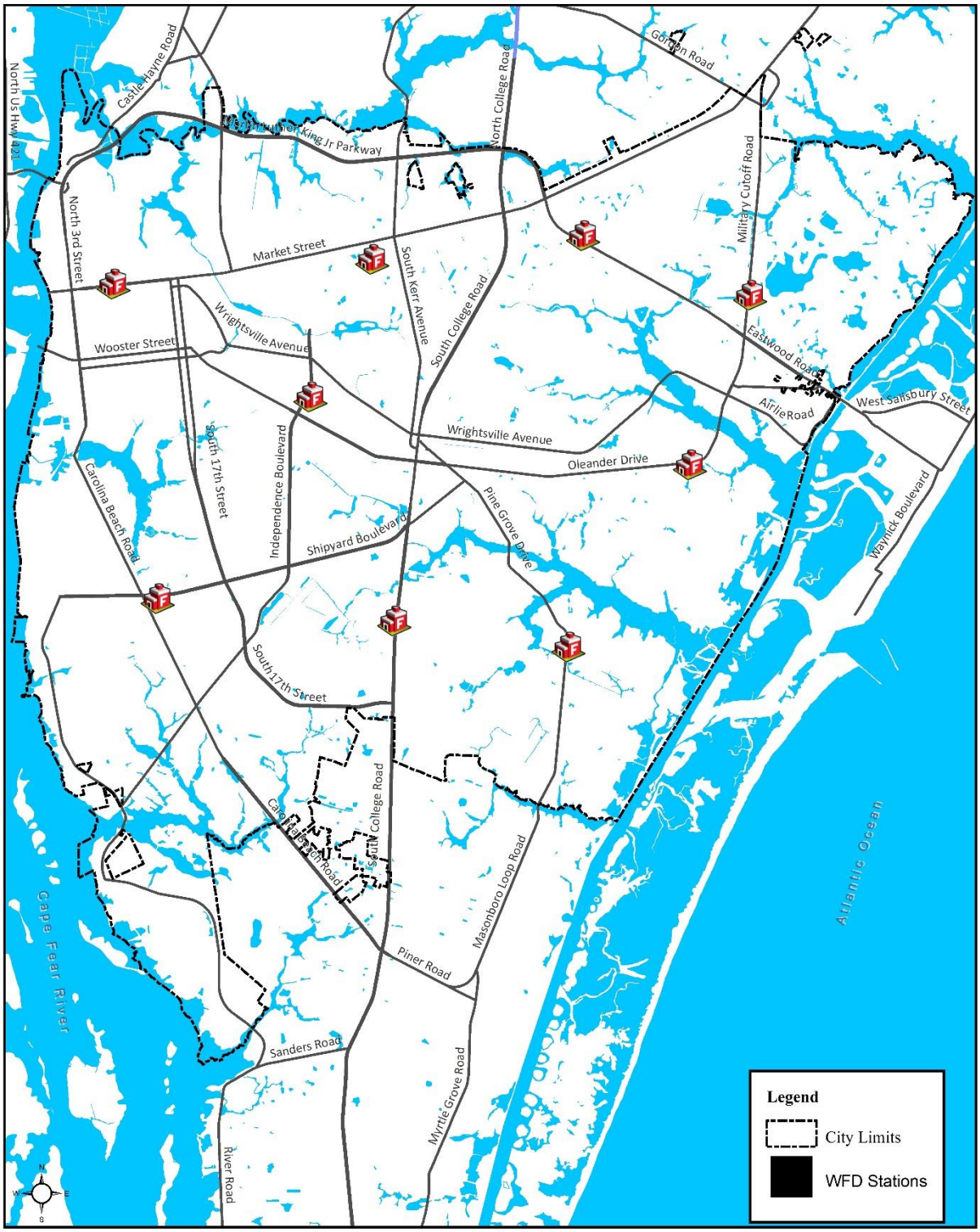
Population Over 65 Years Old



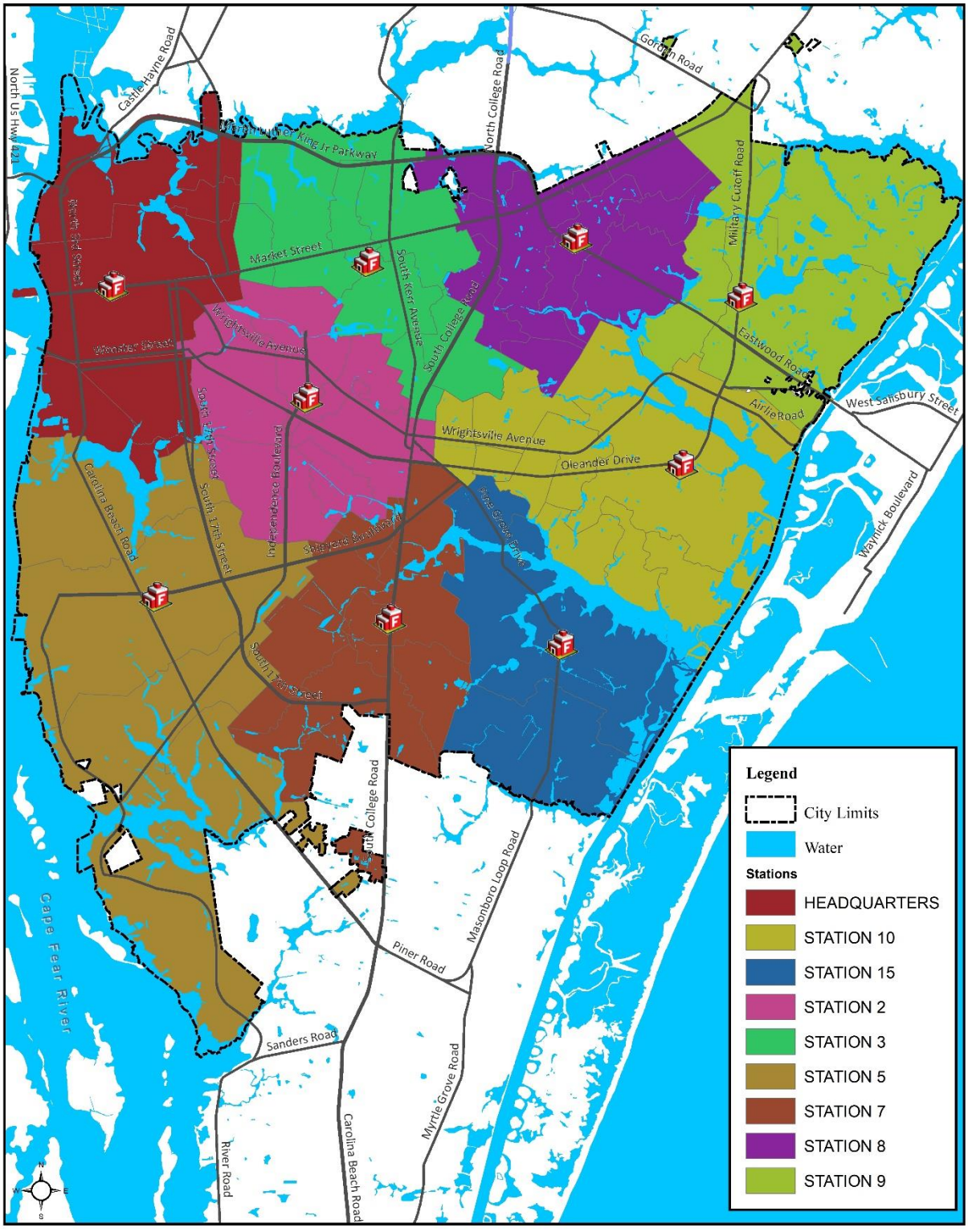
Transportation Systems

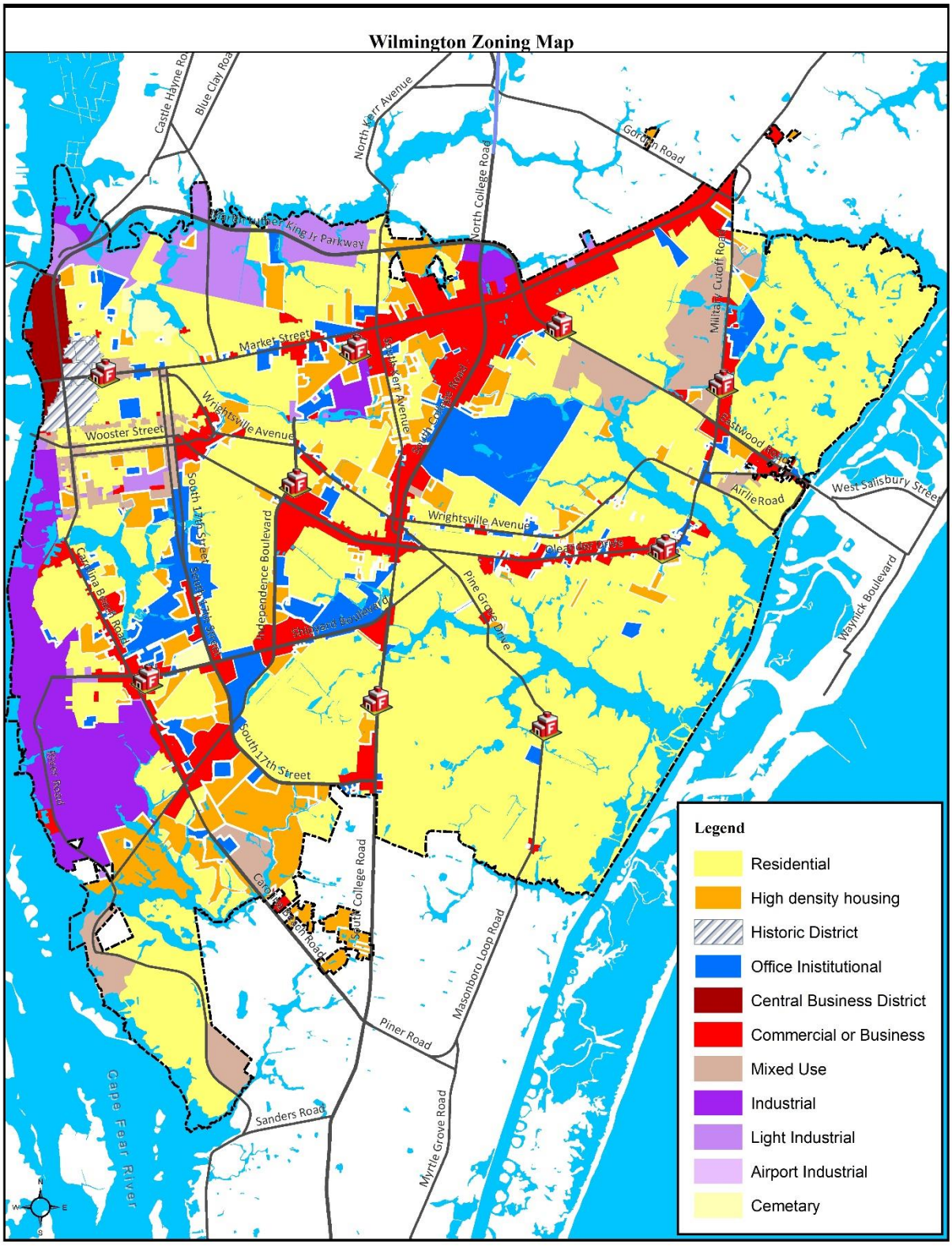


Stations

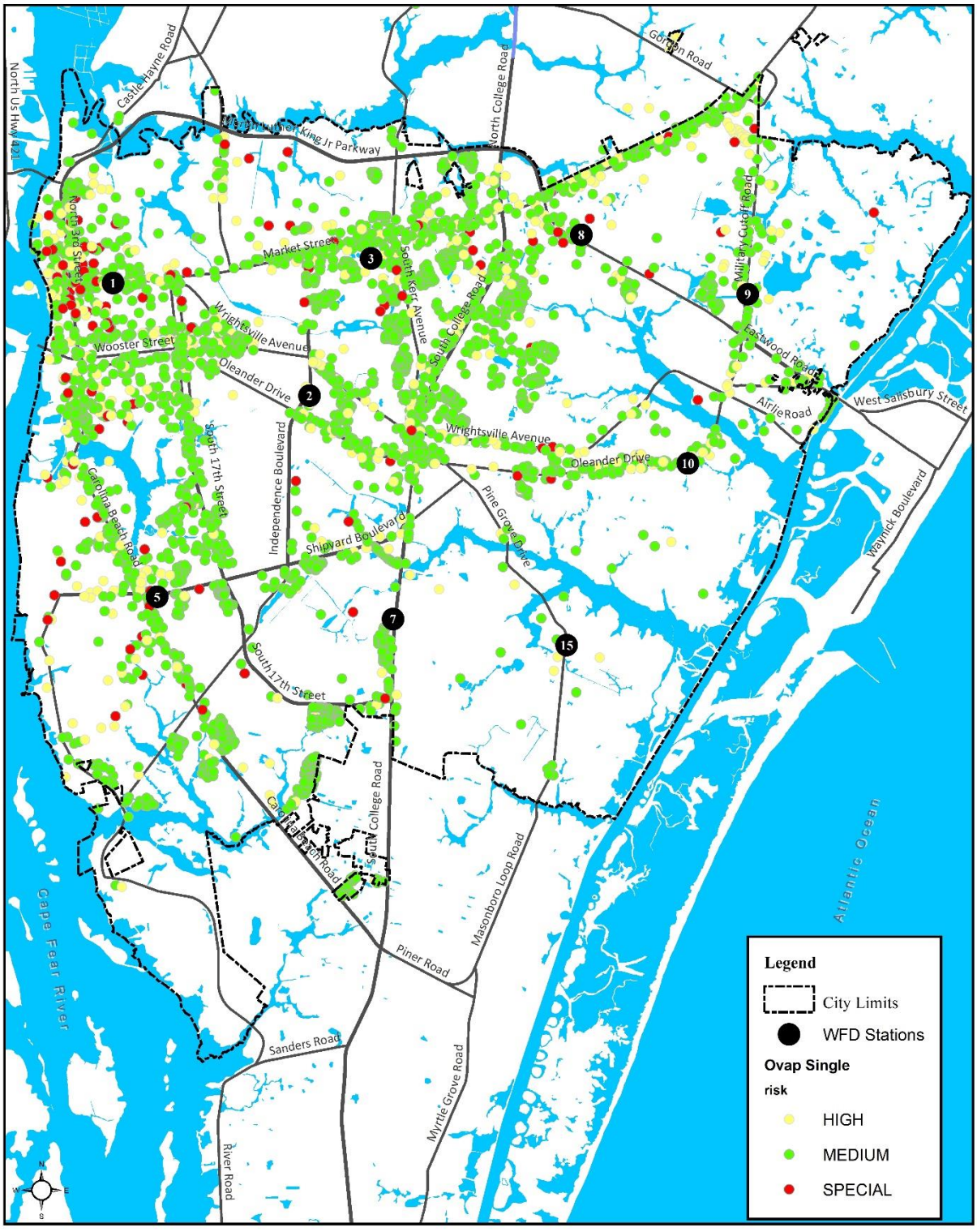

North Us Hwy 421
Castle Hayne Road
Martin Luther King Jr Parkway
North College Road
Gordon Road
Military Cutoff Road
North 3rd Street
Market Street
South Kerr Avenue
South College Road
Wooster Street
Wrightsville Avenue
Eastwood Road
Airlie Road
West Salisbury Street
Wrightsville Avenue
Oleander Drive
Carolina Beach Road
South 17th Street
Independence Boulevard
Shipyard Boulevard
Pine Grove Drive
Wayvick Boulevard
South 17th Street
South College Road
Carolina Beach Road
Masonboro Loop Road
Piner Road
Sanders Road
Myrtle Grove Road
River Road
Cape Fear River
Atlantic Ocean
Legend
City Limits
WFD Stations

Station Response Zones

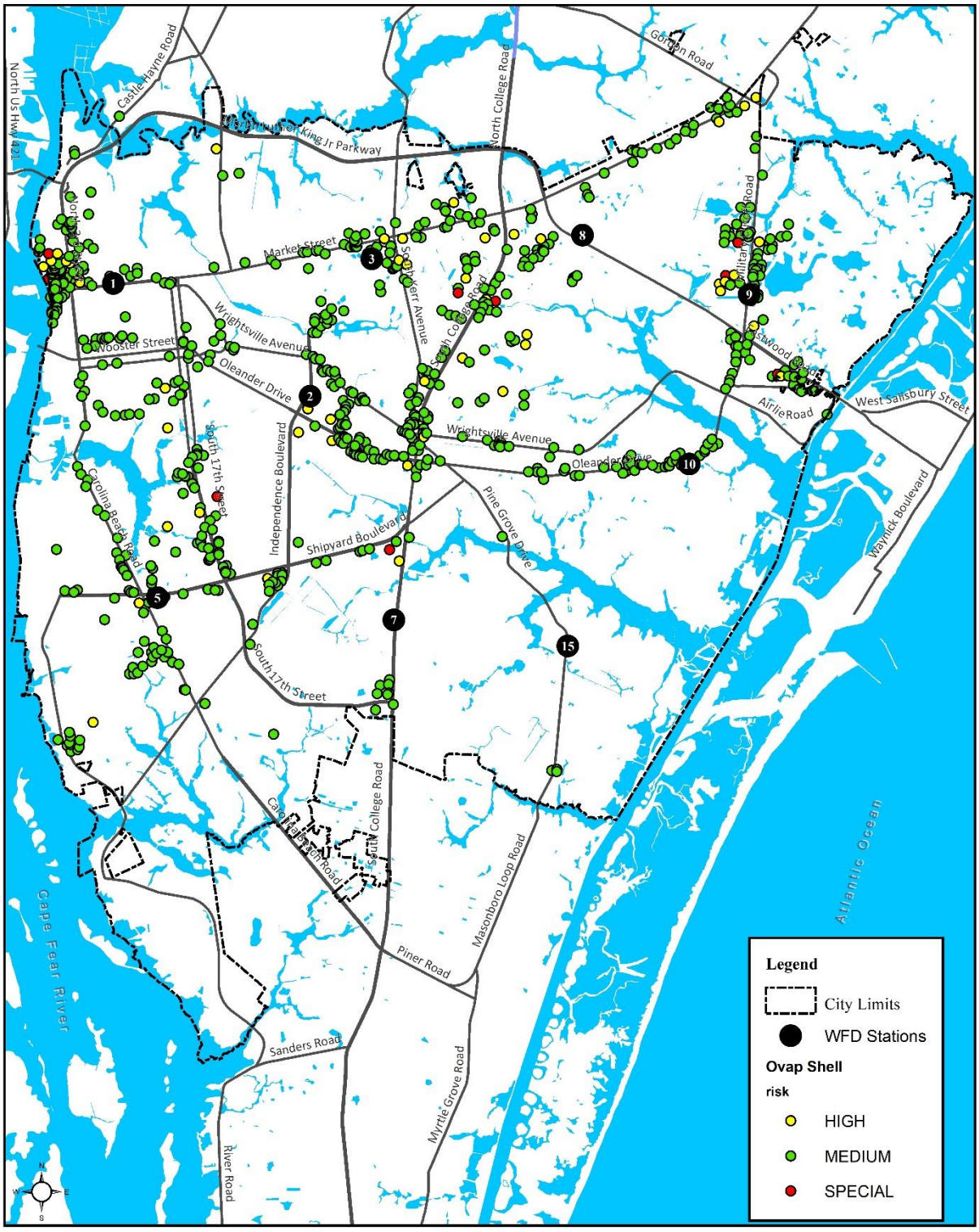


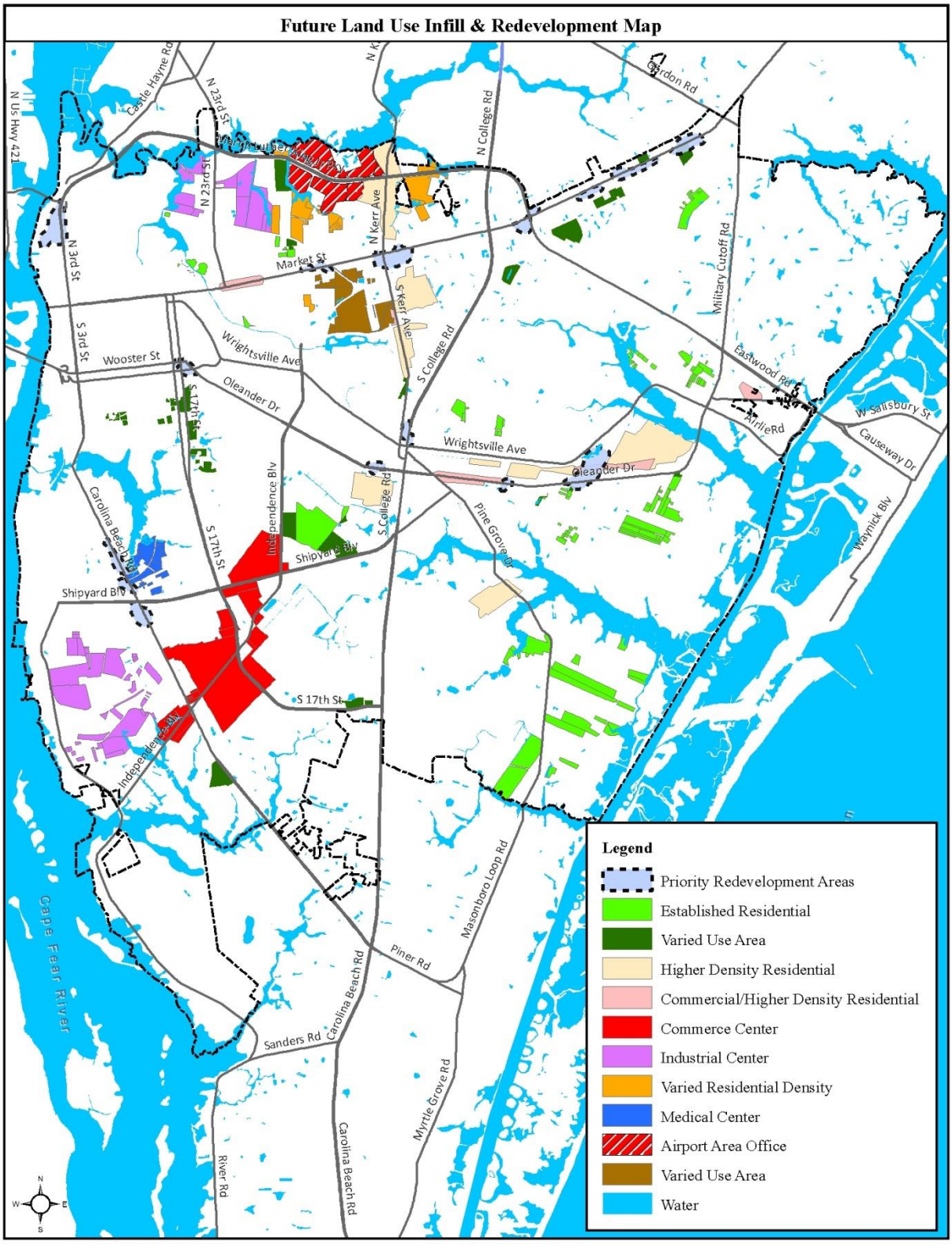

Wilmington Zoning Map
Castle Hayne Road
Blue Clay Road
North Kerr Avenue
North College Road
Gordon Road
Martin Luther King Jr Parkway
Military Cutoff Road
Market Street
Eastwood Road
Wrightsville Avenue
Wooster Street
South College Road
South 16th Street
Independence Boulevard
Airlie Road
West Salisbury Street
Wrightsville Avenue
Oleander Drive
Carolina Beach Road
Pine Grove Drive
Waynick Boulevard
Shipyard Boulevard
South 17th Street
Burnett Road
Carolina Beach Road
South College Road
Masonboro Loop Road
Piner Road
Sanders Road
Myrtle Grove Road
Cape Fear River
Legend
Residential
High density housing
Historic District
Office Inistitutional
Central Business District
Commercial or Business
Mixed Use
Industrial
Light Industrial
Airport Industrial
Cemetary

Occupancy Vulnerability Assessment Profile Scores (Singles)

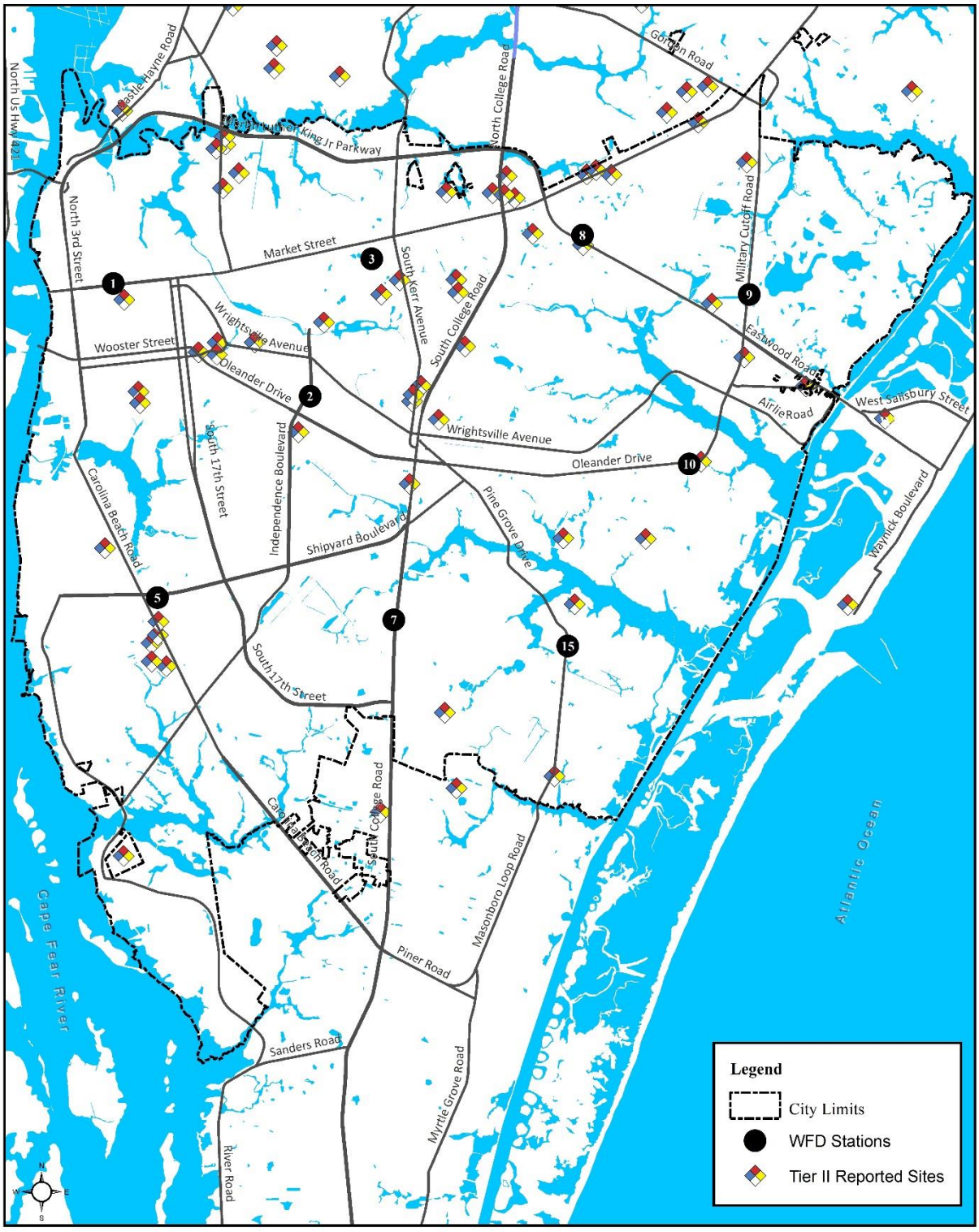


Occupancy Vulnerability Assessment Profile Scores (Multiple)

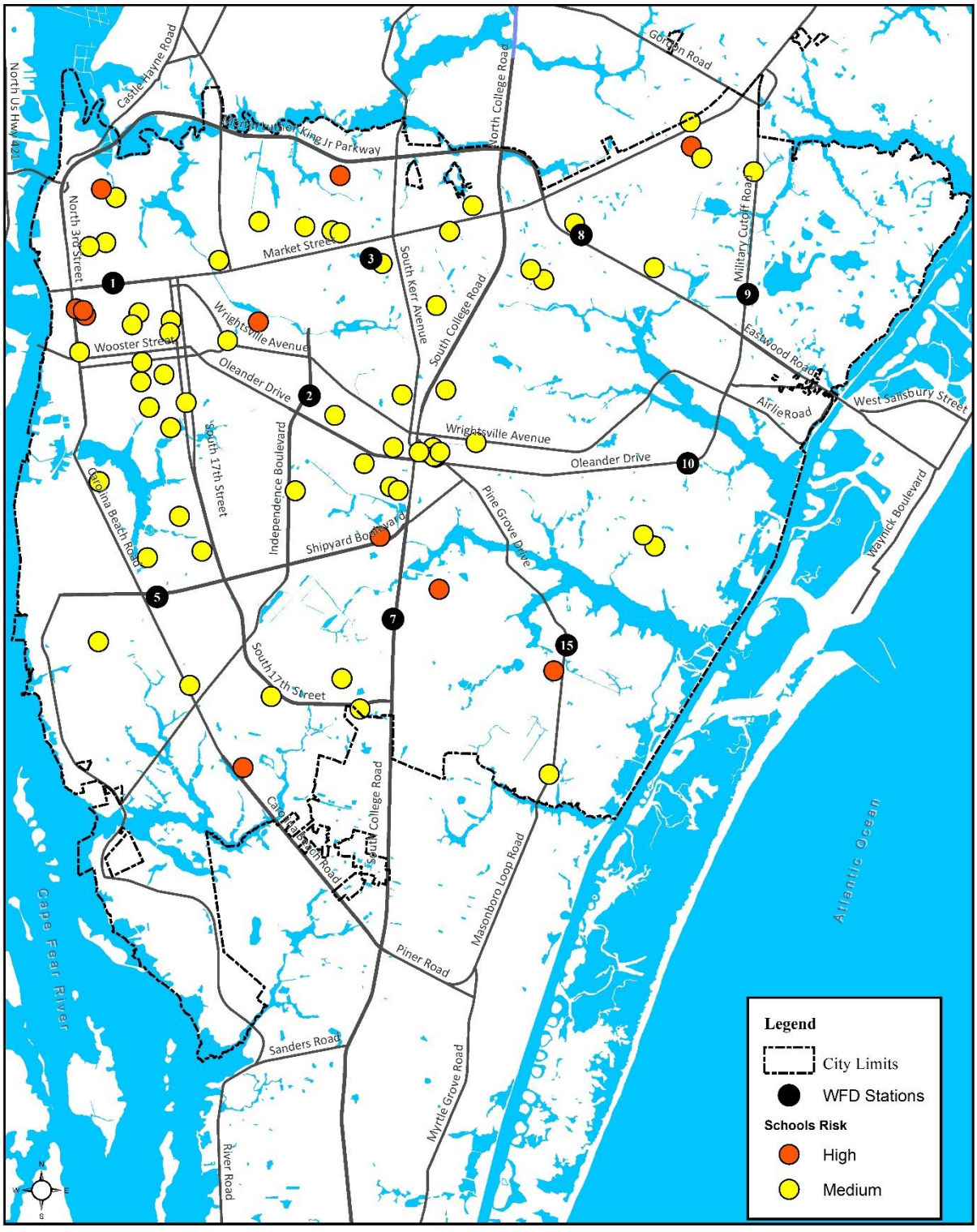



Future Land Use Infill & Redevelopment Map
Castle Hayne Rd
N Us Hwy 421
N 23rd St
Wilmington Airport
N College Rd
Gordon Rd
N Kerr Ave
Market St
N 3rd St
S 3rd St
Wooster St
Wrightsville Ave
Oleander Dr
S Kerr Ave
S College Rd
Military Cutoff Rd
Eastwood Rd
Airlie Rd
W Salisbury St
Causeway Dr
Waynick Blv
Pine Grove Dr
Carolina Beach Rd
S 17th St
Independence Blv
Shipyard Blv
S 17th St
Cape Fear River
Piner Rd
Masonboro Loop Rd
Sanders Rd
Carolina Beach Rd
Myrtle Grove Rd
River Rd
N
W
E
S
Legend
Priority Redevelopment Areas
Established Residential
Varied Use Area
Higher Density Residential
Commercial/Higher Density Residential
Commerce Center
Industrial Center
Varied Residential Density
Medical Center
Airport Area Office
Varied Use Area
Water

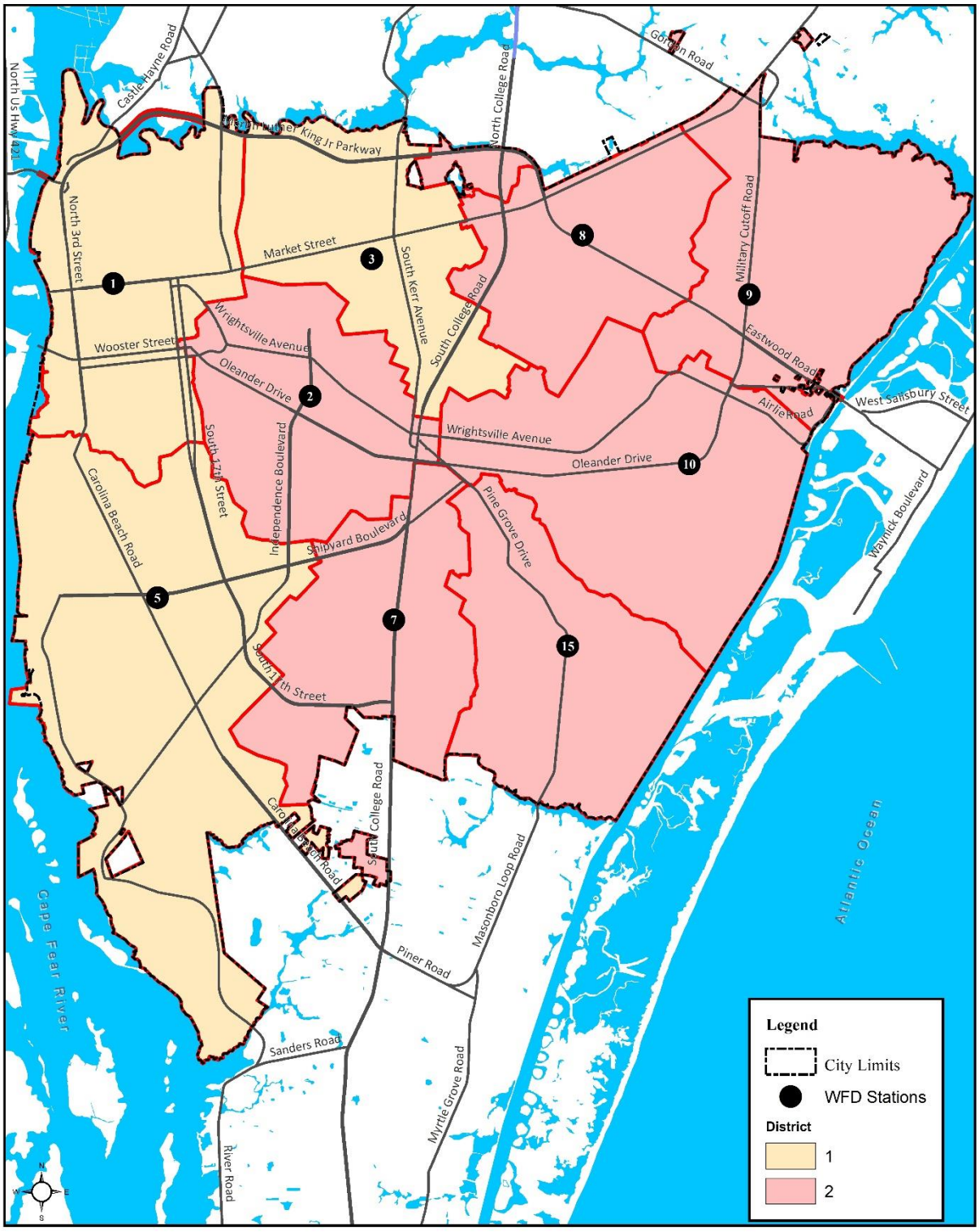
Tier II Chemical Inventory (Reported Sites)



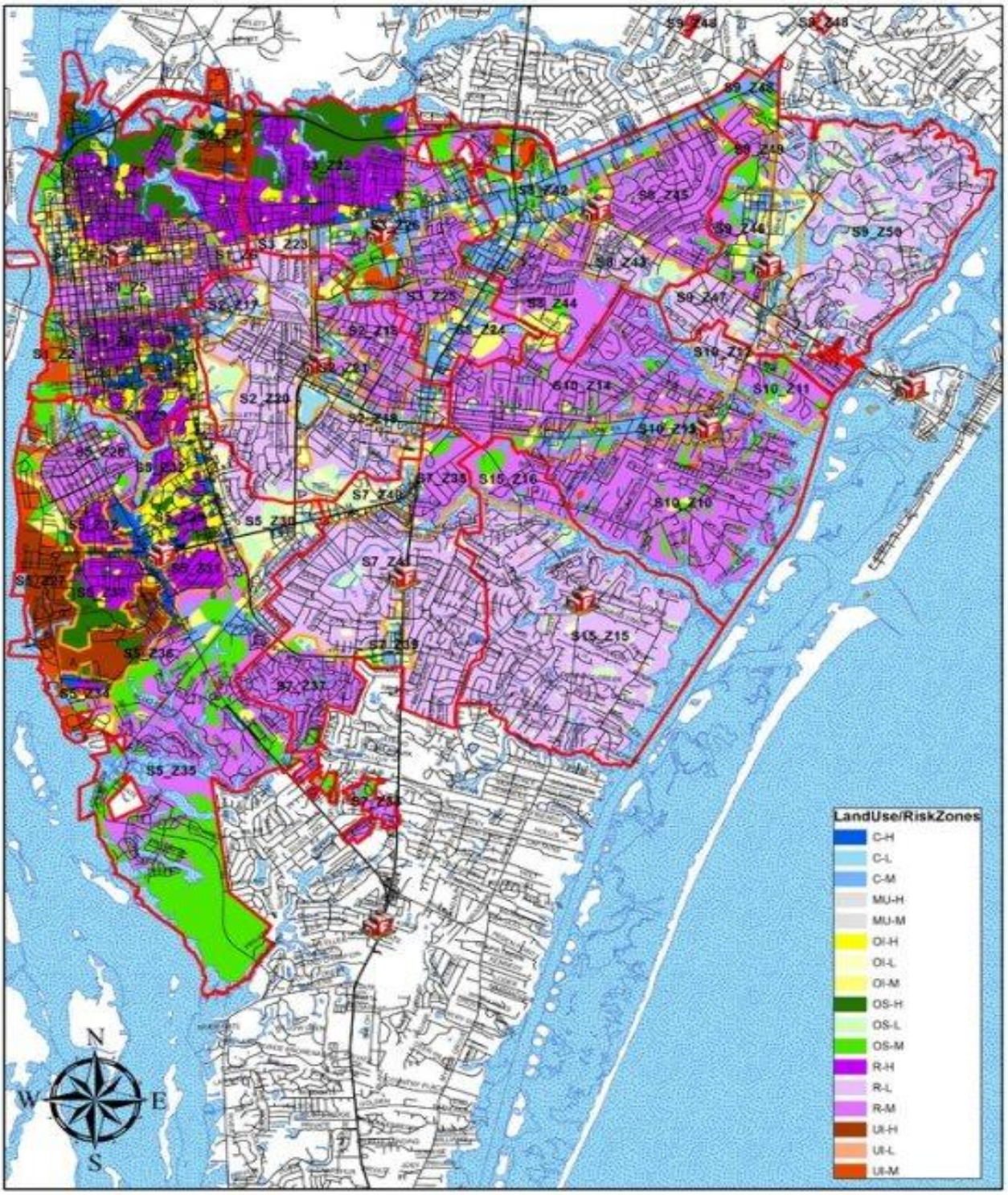
Risk Scores for School Sites



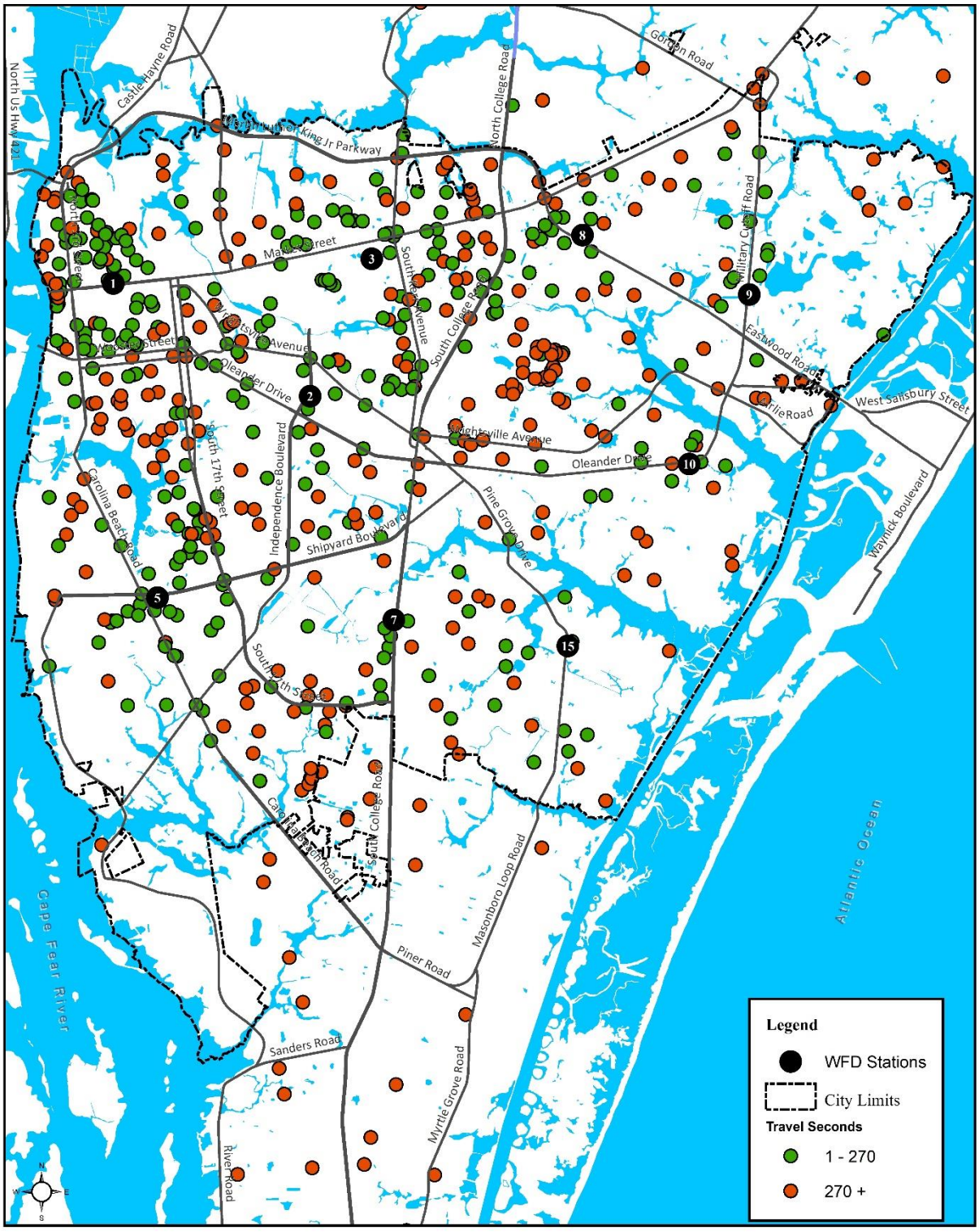
Response Districts



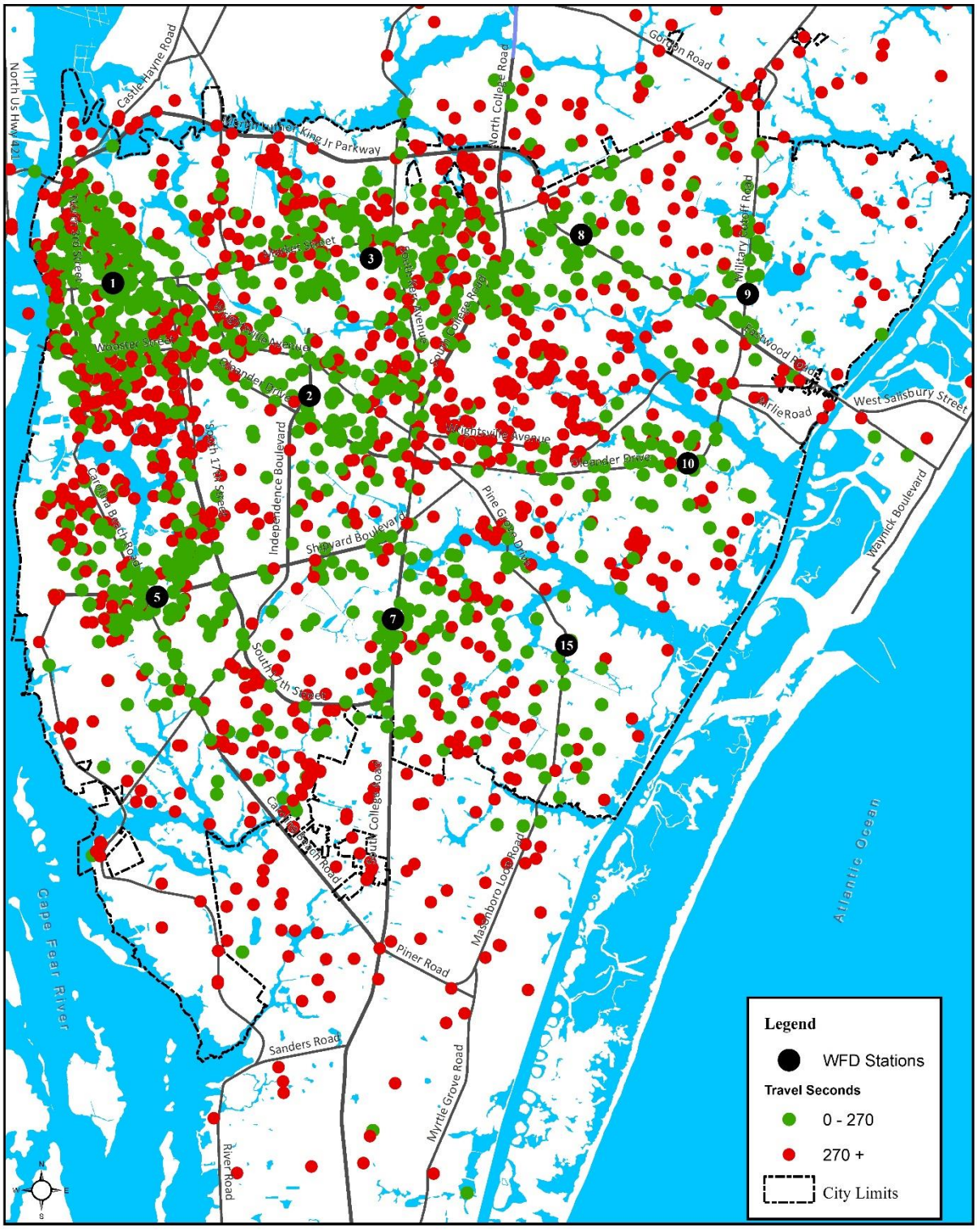
Community Risk Reduction Zones



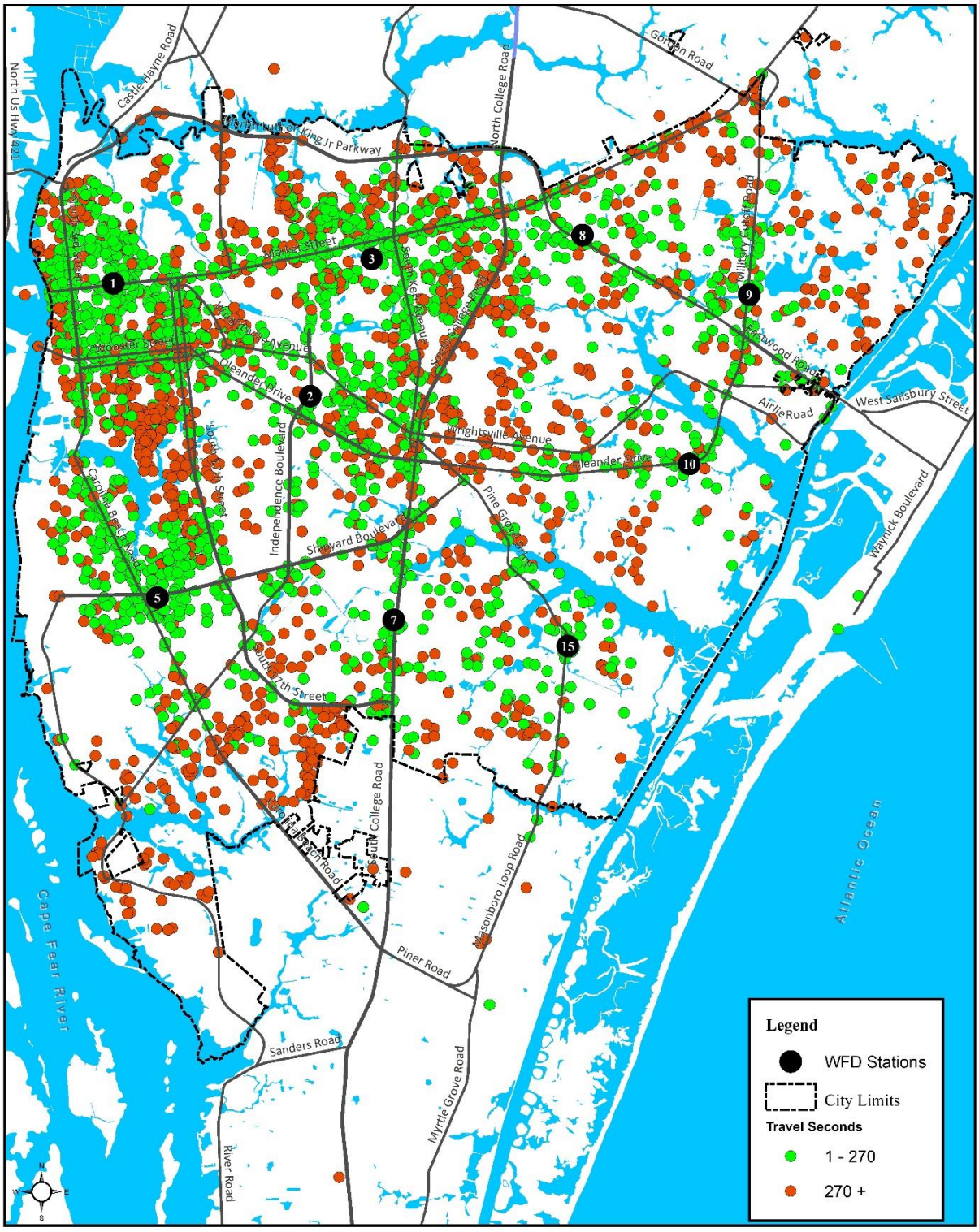
All Fires 1 Year



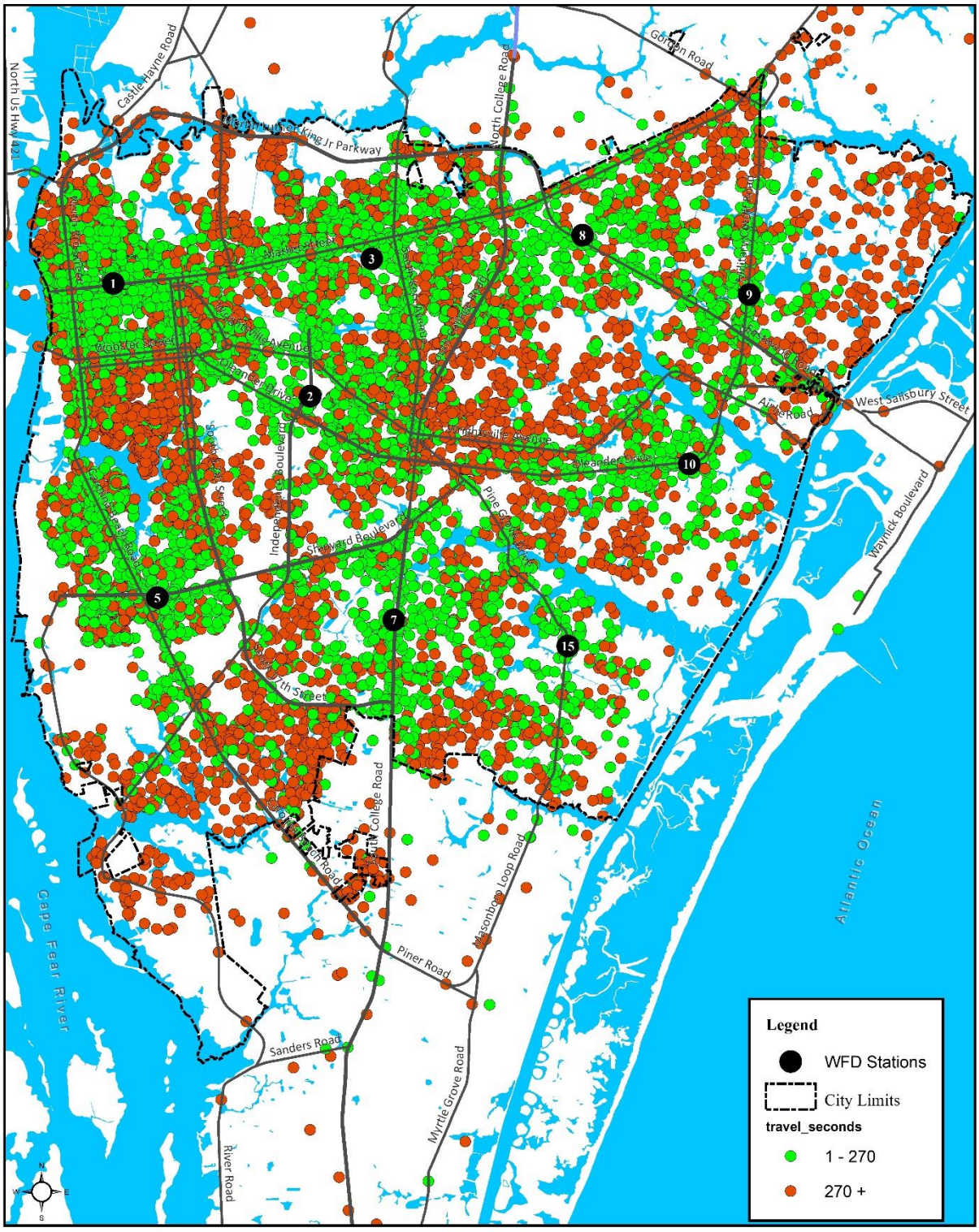
All Fires 5 Years



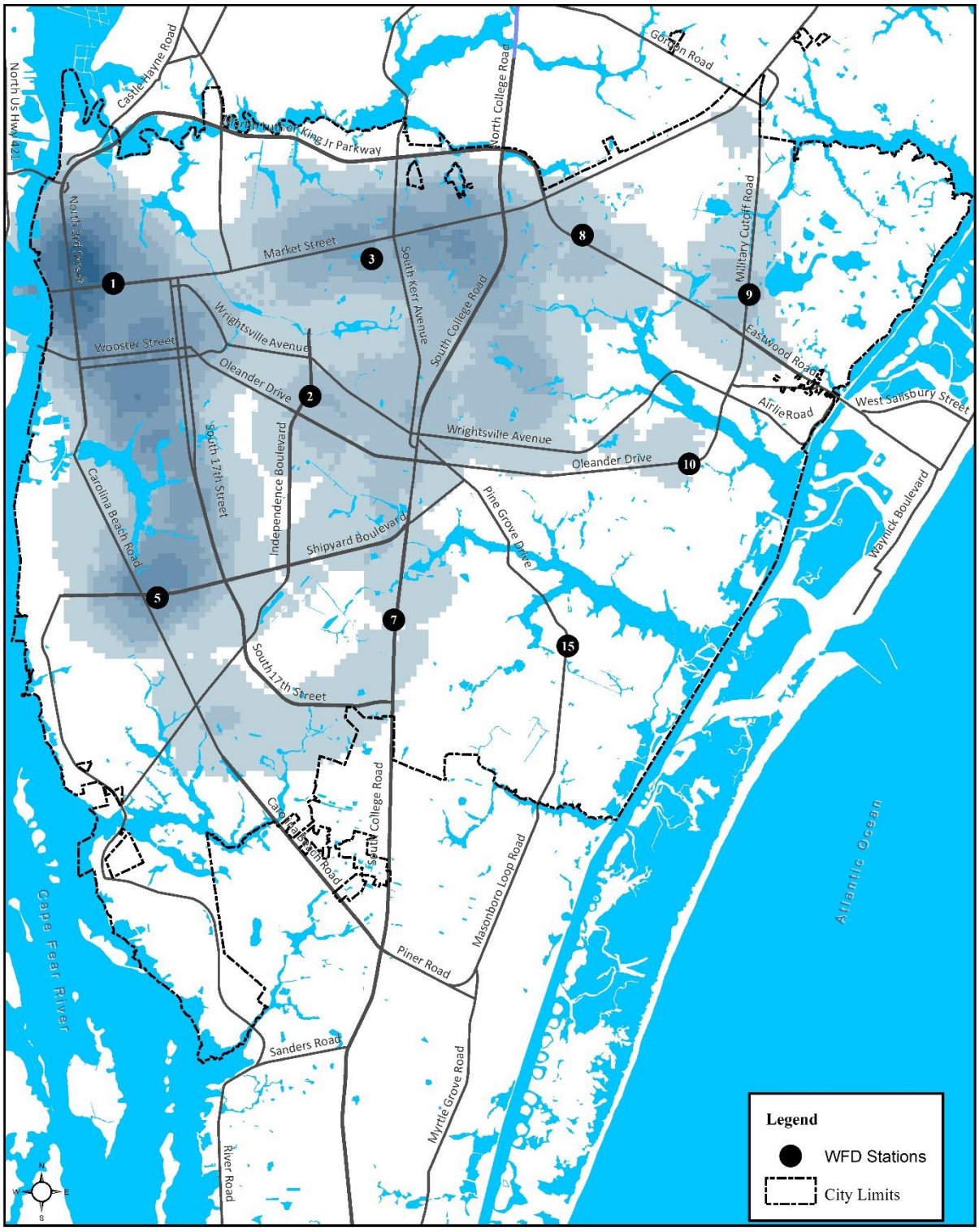
All EMS 1 Year



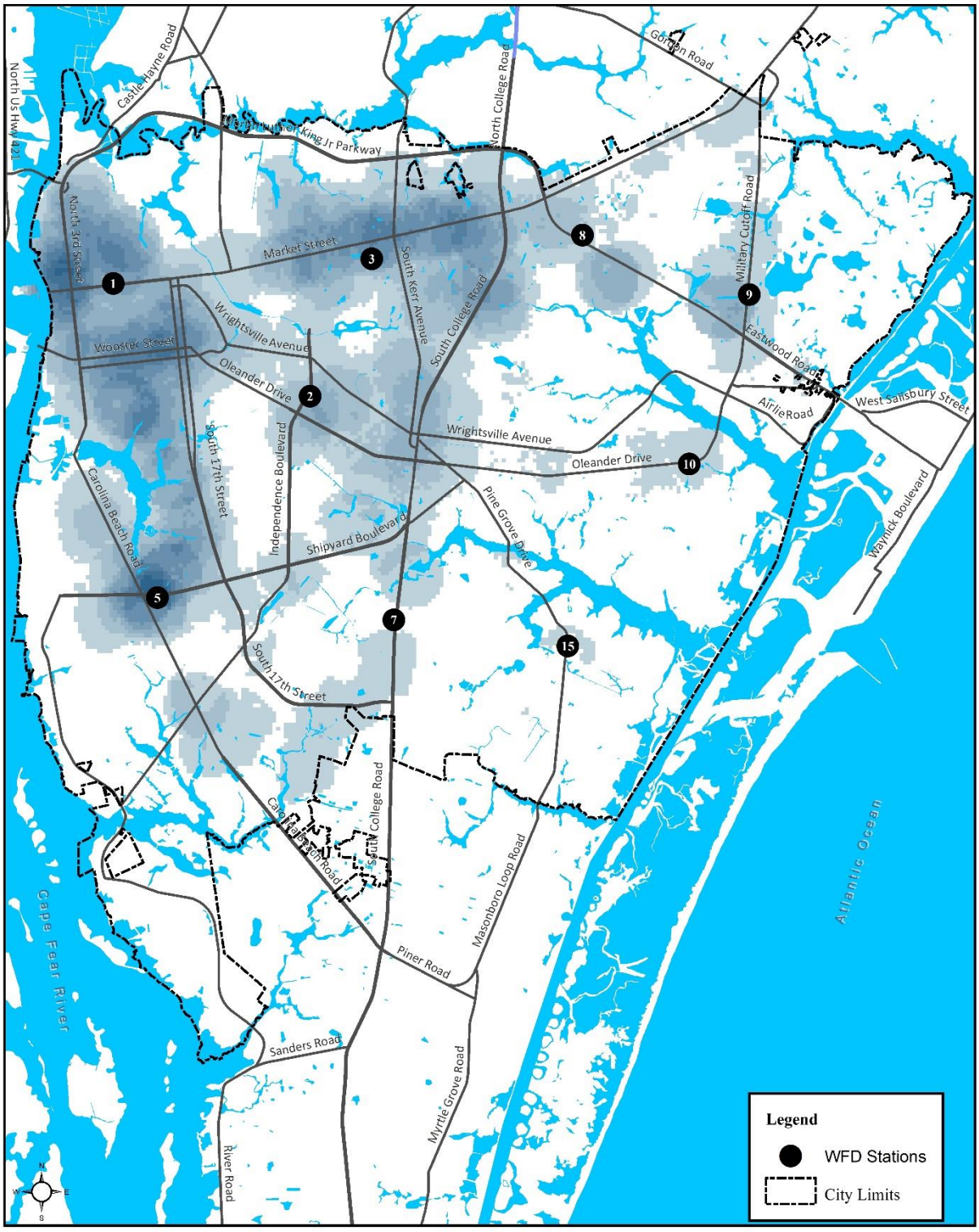
All EMS 5 Year



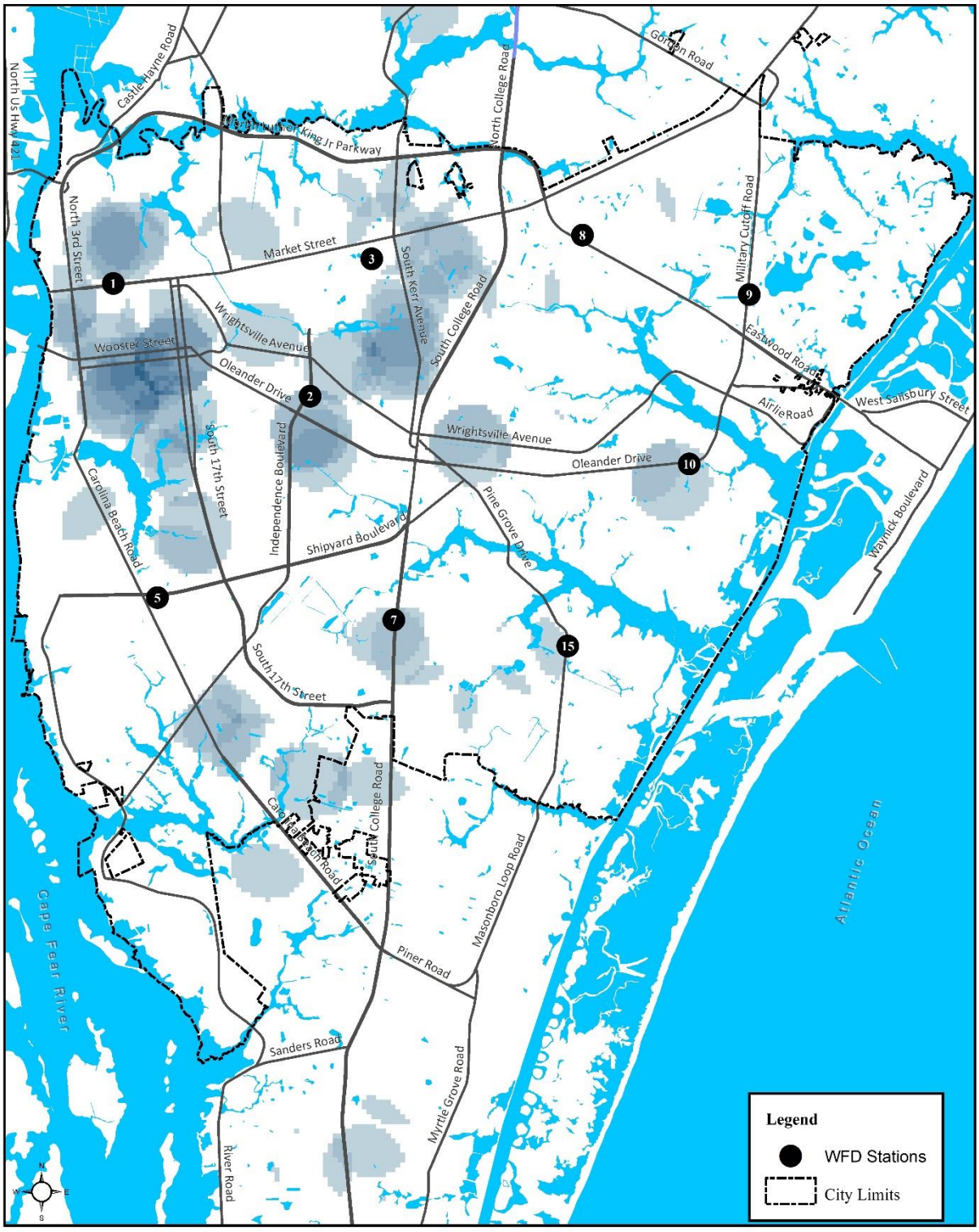
All Calls 1 Year Hotspot



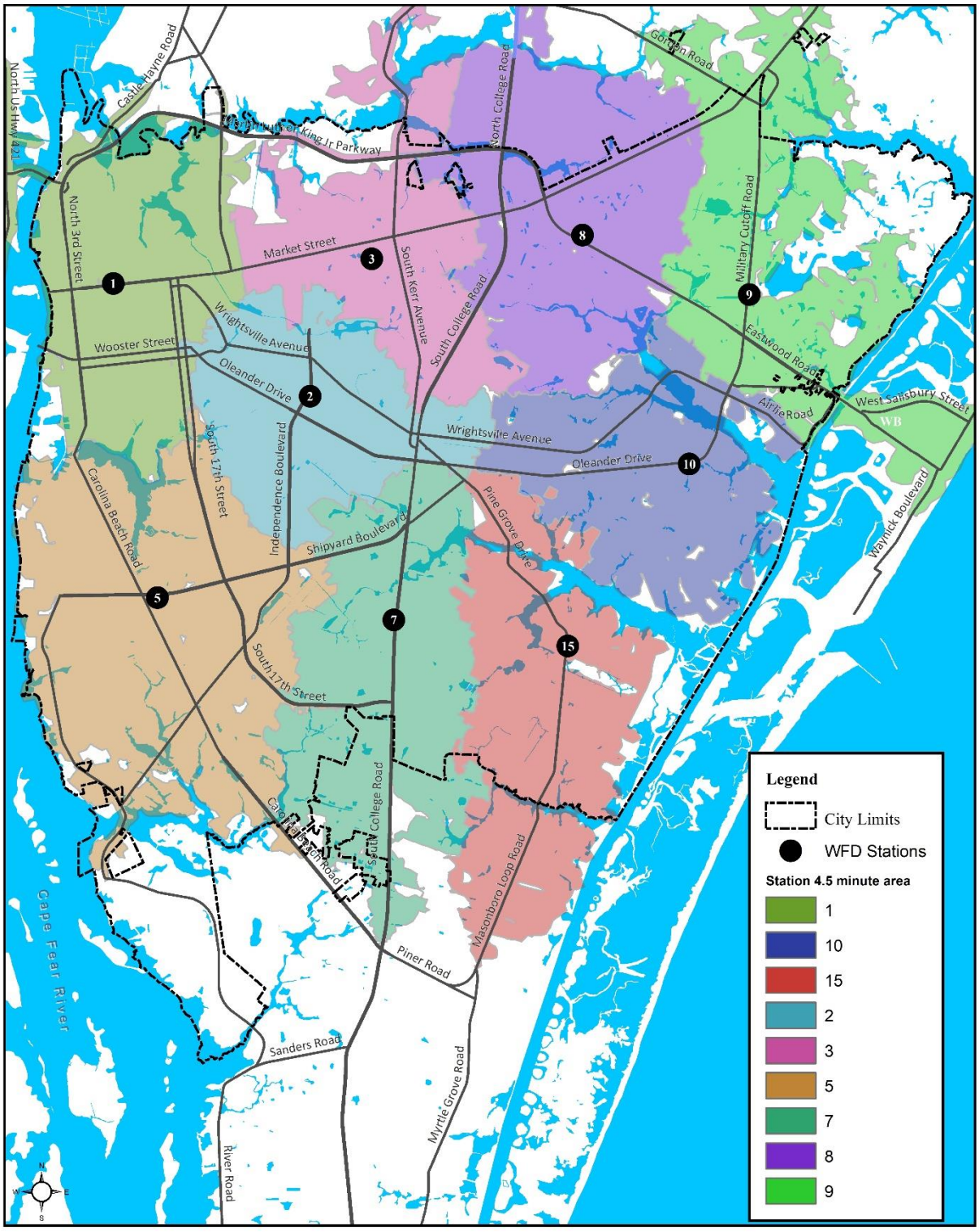
EMS Calls 1 Year Hotspot



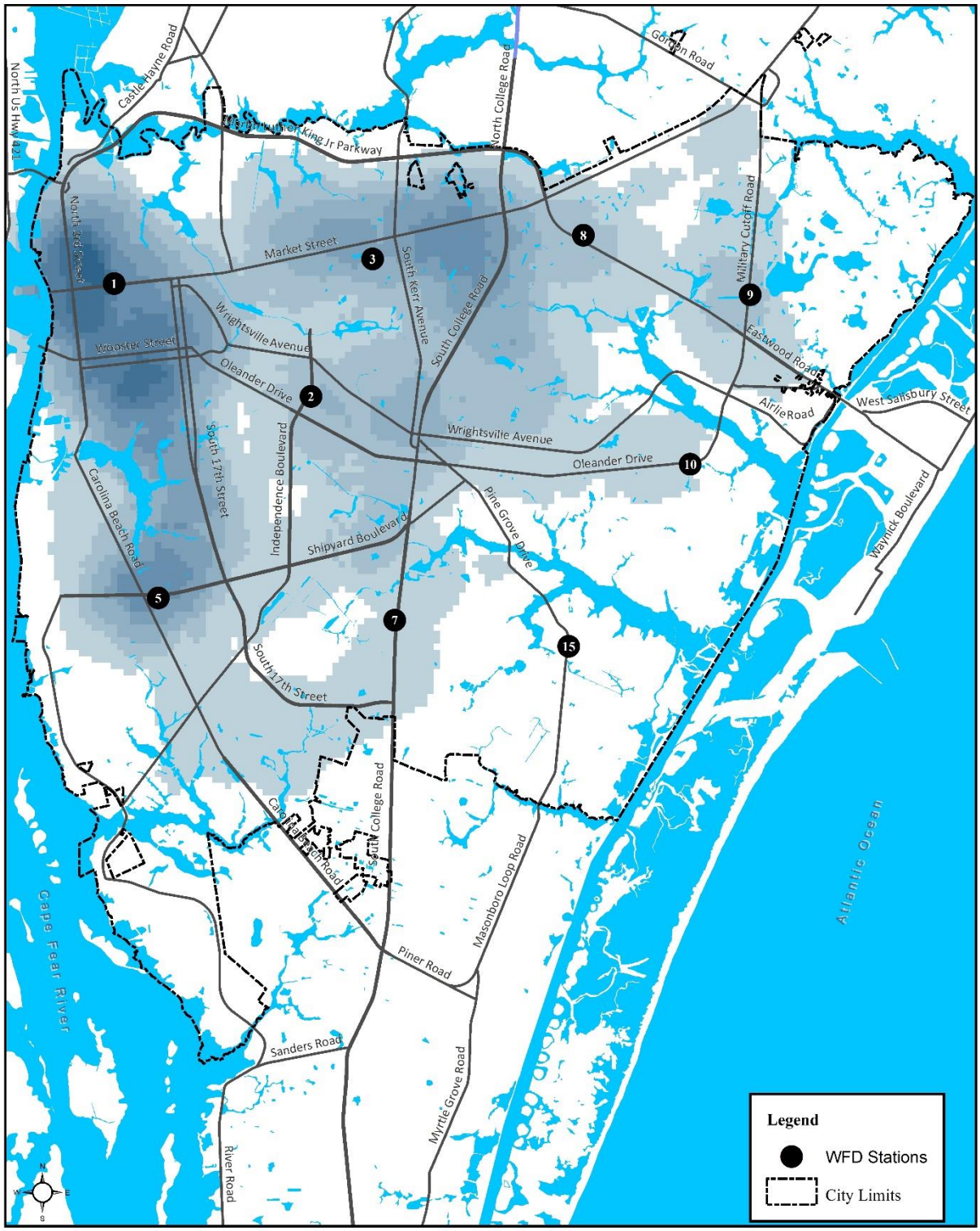
Structure Fires 1 Year Hotspot



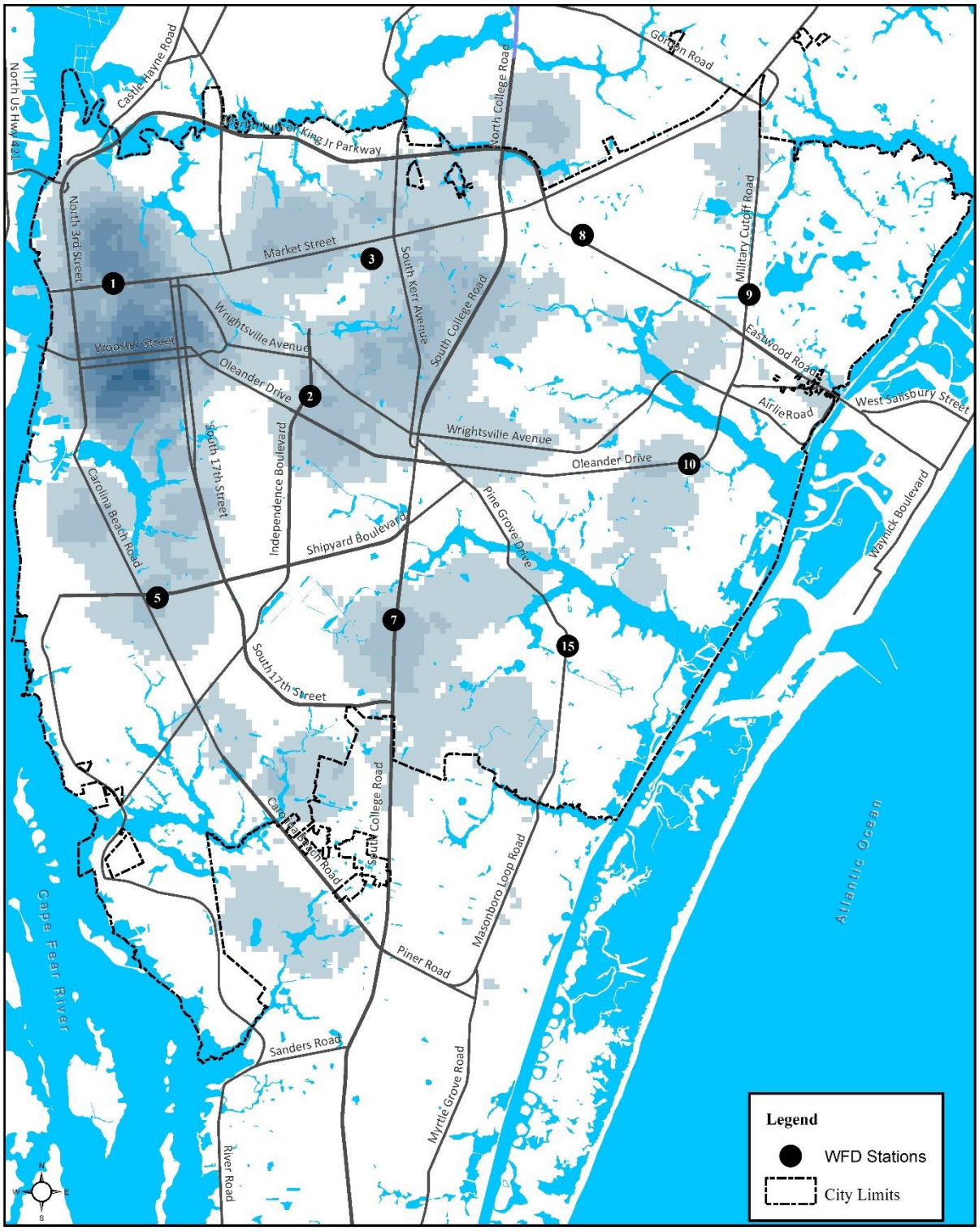
Travel Model



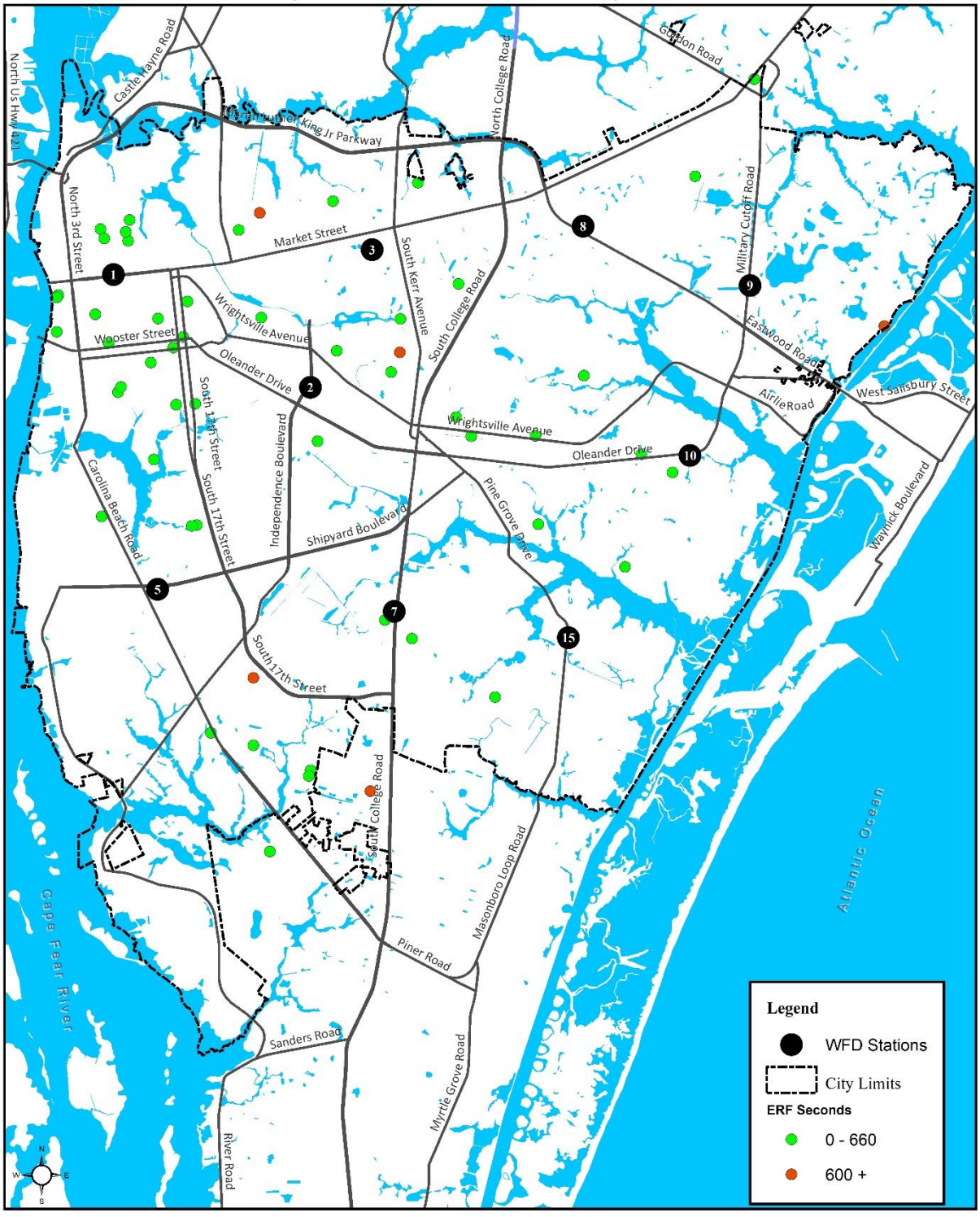
All Calls 5 Year Hotspot



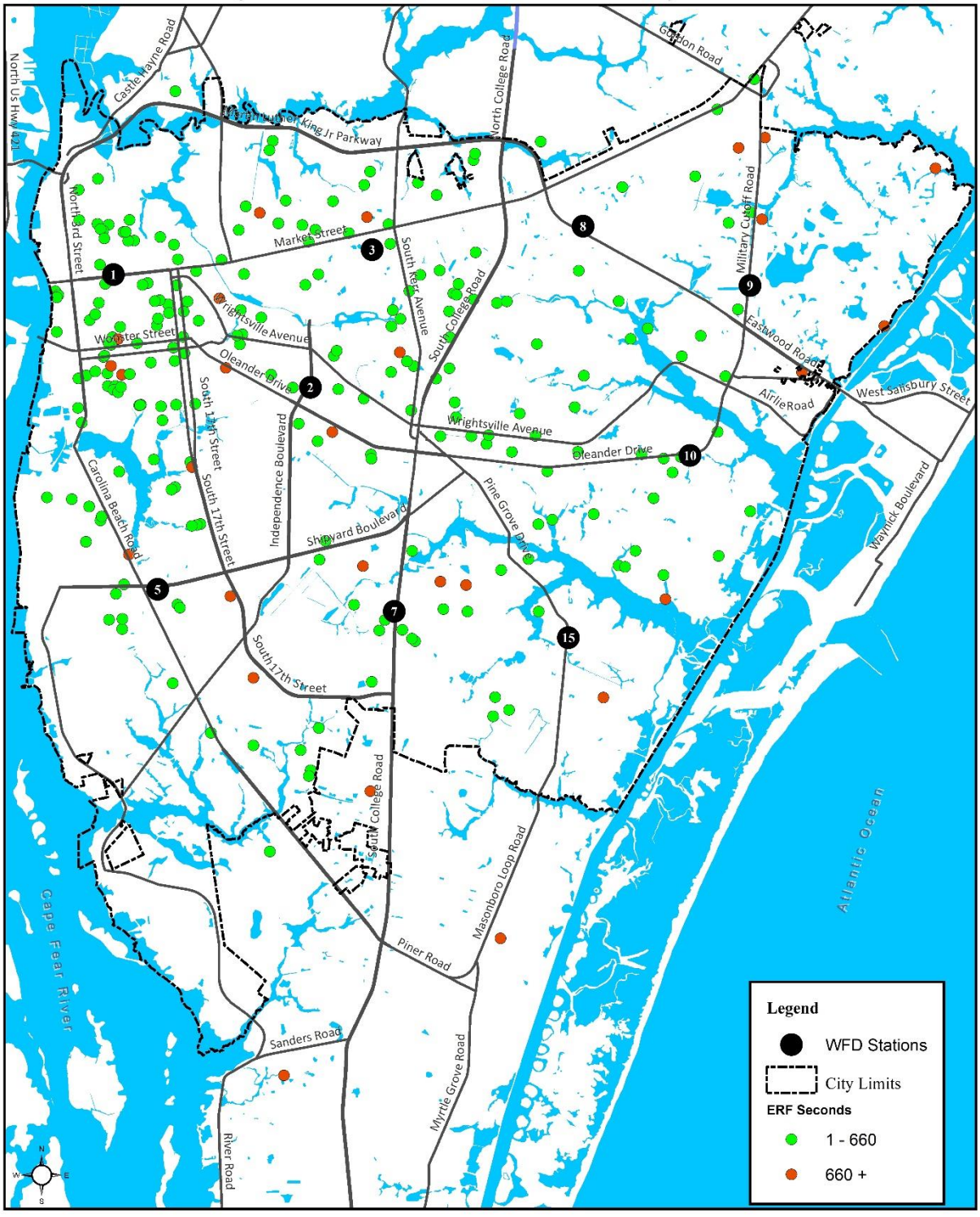
Structure Fires 5 Year Hotspot



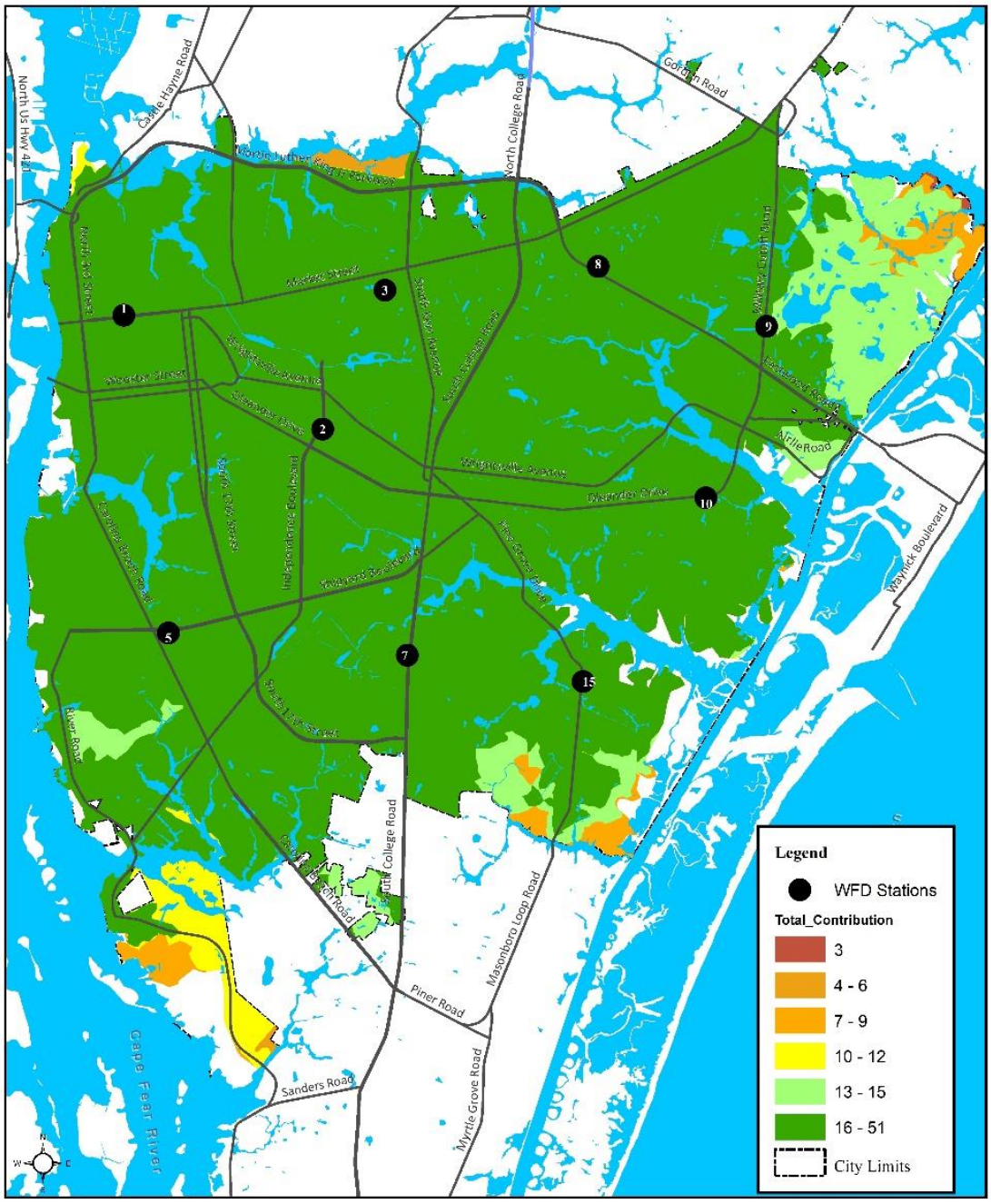
Travel Time Performance for Effective Response Force (Structure Fires 2022)



Travel Time Performance for Effective Response Force
(Structure Fires 2018 - 2022)



Concentration Model
(8-Minute Travel Time)



Adopted FY23 Budget
https://www.wilmingtonnc.gov/home/showpublisheddocument/15533/637988530293970000

5-YEAR IMPROVEMENT PLAN
https://www.wilmingtonnc.gov/departments/major-construction-projects/5-year-plan