LAWRENCE-DOUGLAS COUNTY FIRE MEDICAL

2022
COMMUNITY RISK ASSESSMENT/ STANDARDS OF COVER

City of Lawrence

DOUGLAS COUNTY
KANSAS

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Lawrence-Douglas County Fire Medical

Fire Chief Richard Llewellyn

Community Risk Assessment/Standards of Cover

2022

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Executive Summary

On December 16, 1996, the City of Lawrence entered into an inter-local agreement with Douglas County to merge the existing Lawrence Fire Department and the Douglas County Ambulance Service into one combined agency. This combined agency was named *Lawrence-Douglas County Fire Medical*. Since then, the department has grown into an all-hazards organization, consisting of 148 sworn and 5 non-sworn (civilian) men and women. The department's operational infrastructure consists of five fire medical stations in the city of Lawrence, two ambulance stations in Douglas County, three engines, two quints, one rescue tiller, seven advanced life support ambulances, and two operations chief officer vehicles. The department's scope of operational service includes fire suppression, emergency medical services (EMS), technical rescue, and hazardous materials response. A history of the department and a description of its coverage area are included in Section B.

The department is led by Fire Chief Richard Llewellyn and is directly supported by sworn employees and non-sworn personnel across five divisions. The administrative division is managed by the division chief of administration and is responsible for facilities, fleet management, human resources, and finance operations. The division chief of prevention manages the prevention division. Their primary goal is to reduce the incidence and severity of preventable injuries and fire loss through public education, code inspections, plan reviews, and investigations. The division chief of EMS manages the EMS division and is responsible for EMS quality control and EMS billing, and serves as the liaison to the department's medical director. The training division is managed by the division chief of training and is responsible for developing and delivering training, covering all service delivery areas, including fire suppression, EMS, technical rescue, and hazardous materials. The training division is also responsible for ensuring all applicable local, state, and federal training requirements are met or exceeded. The operations division consists of the department's effective response force to the community and is overseen by two operations chief officers per shift. Section C of the Community Risk Assessment/Standards of Cover (CRA/SOC) describes the current levels of service for delivery programs within the department.

Section G in the CRA/SOC document includes a three-axis risk assessment model used to establish levels of risk in each of the department's service programs: fire suppression, EMS, technical rescue, and hazardous materials. The evaluated dimensions were probability of occurrence, consequence to the community, and impact on the department. Resultant scores for low, moderate, high, and maximum levels were identified while considering an associated critical task analysis of responders and equipment to establish baselines and benchmark service level objectives for each program provided to the community.

Historical department response performance is assessed in Section H which measures distribution and concentration response data. The department performed a travel time analysis to determine areas of the community capable of being reached in four minutes or less to comply with National Fire Protection Association Standard 1710: *Organization and Deployment of Fire Suppression Operations, EMS and Special Operations in Career Fire Departments* (NFPA 1710). Service gaps were identified based on areas of the community which could not be reached from a fire medical station in four minutes or less. Additional travel studies were conducted against travel times of eight minutes for the arrival of the multiple resources needed on an incident or the "effective response force" required to mitigate all incident types and risk levels.

Through this process, service gaps were identified, particularly in the city's northwest, north, and south. In May 2022, the Lawrence City Commission was presented with information regarding the annexation of land west of Kansas Highway 10. This area is located on the city's western edge and is being considered for further development. The City of Lawrence Planning & Development Services staff estimate the population for this

area to be potentially 18,000 people. The department has requested two expansion fire medical stations, plus the relocation of an existing station, through the City of Lawrence budget process at a Capital Improvement Plan (CIP). These requests were not granted by the City Commission for the 2023-2027 CIP; however, the existing plan is to present these options as a potential fall ballot initiative.

Since becoming an accredited agency through the Commission on Fire Accreditation (CFAI) in 2008, the department's response performance for all service programs has been regularly evaluated. The results for this edition of the CRA/SOC are included in Section H. The department has identified all components of the total response time as needing improvement. Alarm handling, turnout time, and travel times consistently exceed the department's benchmark for concentration and distribution. Benchmark response objectives included in Section H represent what are considered best practices. These benchmarks were developed using industry standards such as NFPA 1710. Additionally, two key performance indicators related to the *2020 City of Lawrence Strategic Plan* that the department uses to measure its success, directly related to total response time benchmarks, include "Safe and Secure (SaS)-3: percent of fires contained to their room of origin" and "SaS-4: percent of cardiac arrest patients with pulsatile rhythms upon arrival to a hospital."

The department is dedicated to maintaining and improving service on a continuous cycle. To accomplish this task, the Compliance Team consisting of administrative staff, operations personnel, and chief officers will review service baselines quarterly and annually. The review will cover response time baselines compared to benchmarks, and demand counts. The data will be presented during the quarterly Governance Committee meeting between the department, the City of Lawrence, and Douglas County. Section J of the CRA/SOC describes the continuous improvement strategy utilized by the department.

Recommendations for Improved Effectiveness in Deployment and Coverage

Based on the information available at the time of this publication, the department has identified time-specific recommendations to address performance gaps and assist in the effectiveness of deployment and coverage. These objectives were identified to address challenges ranging from statistical analysis, technology enhancements, and operational expansion to embrace the dynamic changes in the community and Douglas County.

Immediate Recommendations (within 18 months):

Recommendation 1: The department should review call types and critical tasking based on new community risk information to identify potential deployment enhancements.

Recommendation 2: The department should secure a funding source for the land acquisition for Fire Medical Station 6 due to inadequate response capabilities to the rapid growth in the northwestern portion of the city.

Recommendation 3: The department should secure a funding source for the land acquisition for the relocation of Fire Medical Station 3 to address an inadequate response capability in the northern portion of the city and more effectively provide consistent service to the broader community.

Recommendation 4: The department should secure a funding source for the land acquisition for Fire Medical Station 7 due to inadequate response capabilities to the rapid growth in the southern portion of the city.

Recommendation 5: The department should develop and implement the approved Mobile Integrated Health Program to de-escalate the increase in call volume and provide more efficient resource connections to the community.

Recommendation 6: The department should review all current prevention and education programming to identify and propose progressive community risk reduction programs for implementation.

Recommendation 7: The department should analyze and recommend alternative solutions for non-emergency medical transfers to retain local ambulances within Douglas County.

Recommendation 8: The department should increase operational staffing on Ladder 5 (rescue tiller) from three to four personnel to provide consistent staffing on all fire apparatus.

Recommendation 9: The department should collaborate with Douglas County Emergency Communications to identify and implement a new fire medical station alerting system to maximize deployment performance with progressive technology.

Short-Term Recommendations (within 36 months):

Recommendation 1: The department should review and update station optimization analysis to include west annexation.

Recommendation 2: The department should network and collaborate with partners in Douglas County to form a community risk data team to share information and develop more global solutions to improve community safety.

Recommendation 3: The department should construct Fire Medical Station 6 and place an additional fire apparatus and ambulance in service.

Recommendation 4: The department should construct a relocated Fire Medical Station 3 and retain a fire apparatus and ambulance for deployment.

Recommendation 5: The department should collaborate with the City of Lawrence Municipal Services and Operations Department to construct a new facility to improve emergency vehicle repair and maintenance.

Long-Term Recommendations (within the next five years):

Recommendation 1: The department should construct Fire Medical Station 7 and place an additional fire apparatus and ambulance in service.

Recommendation 2: The department should evaluate training facilities and recommend strategies to enhance training opportunities for all risk classifications, including fire, EMS, hazmat, and technical rescue.

A. Description of Community Served

Introduction

In December 1996, the International Association of Fire Chiefs (IAFC) and the International City Managers Association formally created a trust known as the Commission on Fire Accreditation International. This trust is supervised by the Center for Public Safety Excellence (CPSE). Today, the CPSE oversees the Commission on Fire Accreditation International (CFAI).

The focus of CFAI is to develop a comprehensive system to assist local government in risk management evaluation to establish performance goals and link long-term strategic planning to the development of a standard of cover document. As part of the process, it is paramount that an agency qualifies for its customers through community expectation assessment, self-assessment, risk analysis, establishing response goals, and developing a system of performance measurement; its mission, vision, and expected delivery of service.

CPSE defines the standards of cover for a fire department as being those "adopted written policies and procedures that determine the distribution, concentration, and reliability of fixed and mobile response forces for fire, emergency medical services, hazardous materials and other forces of technical response." There have been many attempts to create a standard for the response of firefighters and paramedics without being able to gain national or international consensus. Several industry standards have been adopted, namely *National Fire Protection Association* (NFPA) *1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, attempting to create a standard for staffing of fire and medical response apparatus in a community. While many communities have theoretically adopted the staffing and response mandates of NFPA 1710, few have the ability to completely comply.

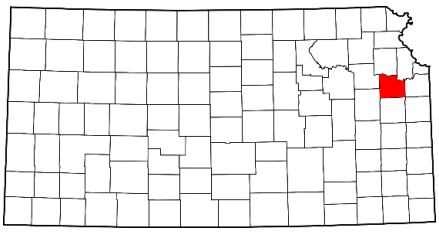
The City of Lawrence initiated the self-assessment process for achieving international accreditation in 2004. The department is committed to maintaining accredited status to demonstrate its ability to provide superior service. As such, the department commits to submitting all required documentation annually to maintain accreditation. Three components must be submitted to be considered for initial accredited status. These include a strategic plan, a community risk assessment/standards of cover (CRA/SOC) document, and a self-assessment.

This accreditation effort has been a collaborative process whereby employees of the department with varying knowledge and tenure contributed substantially to its written content. In addition to these internal members, employees from the City of Lawrence Information Technology Department and the Douglas County Emergency Communications Center (DCECC - dispatch) contributed their perspectives. These are the same employees that contribute daily to the needs of the department and the constituents served.

Accreditation was first achieved in 2008, was successfully renewed in 2013, and again in 2018. The department continues to maintain a high level of commitment to the service to Douglas County and the City of Lawrence.

Before 2007, Lawrence had not used a standards of cover document or official statement to guide its operations. Instead, it operated under various documents, including a merger plan, operational guidelines, policies and procedures, emergency medical services protocols, and verbal requirements from command staff. As a part of the accreditation model, the department worked to determine acceptable levels of service based on the NFPA fire curve models, EMS criteria, and other related response factors.

Community and Department Legal Basis



The City of Lawrence was chartered in 1854 and is currently governed by a commission-manager form of government. Five commissioners are elected at large and then select a mayor annually. Fire protection in Lawrence was first organized in 1857 as the "Free State Engine Company #1."

In 1859, the fire protection services became known as the "Republican Engine Company #1 and the AETNA Hook & Ladder Company."

In 1869, the local volunteer department became a formal paid department known as the "Head Center Hose Company."

On December 16, 1996, the City of Lawrence entered into an inter-local agreement with Douglas County to merge the existing Lawrence Fire Department and the Douglas County Ambulance Service into one combined agency. This combined agency was named *Lawrence-Douglas County Fire and Medical*. Pursuant to this agreement, the City of Lawrence adopted Chapter VIII, Article I, section 8-101 of the municipal code that legally establishes within the City of Lawrence *Lawrence-Douglas County Fire and Medical*.

In 2021, the City of Lawrence and Douglas County signed an updated EMS Cooperation Agreement. Through this agreement, all liabilities for the department fall under the city's authority.

The city commission appoints the city manager, who then employs department directors. The city manager has the ultimate approval of all employees and acts as the city's chief executive officer. The city manager is responsible for carrying out city commission policies through professionally trained and experienced city staff.

History of the Community

The City of Lawrence was founded in 1854. Douglas County, located in the northeast part of Kansas, was created in 1855. In its early days, the county was known as a hub for abolitionists who pushed for Kansas to be a Free-State.

Lawrence is a diverse and multifaceted city in northeast Kansas, with an estimated 2021 population of 94,934, making it the sixth-largest city in Kansas. Lawrence provides many of the amenities of a large metropolitan area while maintaining a strong sense of community. Lawrence is the county seat for Douglas County. The city is located 30 minutes west of Kansas City and 20 minutes east of the state capital, Topeka. Lawrence offers a rich and fascinating history, a wide range of exciting cultural experiences, nationally recognized educational institutions, and some of the most unique and enjoyable shopping opportunities in the Midwest.

Lawrence possesses all the aspects of a friendly, active, and culturally diverse community. With the perfect combination of small-town hospitality and big-city attractions, Lawrence lays claim to its share of national recognition and historical significance.

The city is located between the Oregon and the Santa Fe Trails, which run through Lawrence and other parts of Douglas County. Several Lawrence streets are named after the states in the order in which they came into the Union, beginning with Delaware. Massachusetts Street was designated the "main" street because Lawrence's founders were from Massachusetts.

Lawrence was founded in 1854 by the New England Emigrant Aid Society to keep the territory free from slavery. On August 21, 1863, Lawrence was attacked by pro-slavery guerillas led by William Quantrill.

Approximately 180 boys and men were killed in a town with a population of only 3,000. The downtown area was also largely destroyed by fire. From this event, the city seal featuring a phoenix rising from fire-destroyed buildings and the motto "*From Ashes to Immortality*" was created. The city still utilizes the seal and motto today. The areas on the eastern side of Kansas and western side of Missouri where these pre-civil war clashes over slavery occurred have been designated as part of Freedom's Frontier National Heritage Area.

Lawrence is the boyhood home of writer and poet Langston Hughes whose novel *Not Without Laughter* is said to be based on his life in Lawrence. It is also home to beat-writer and artist William S. Burroughs.

Lawrence boasts one of the most vibrant downtown shopping, dining, and entertainment districts in the Midwest. Massachusetts Street, referred to as "Mass" by residents, has been noted as one of the most beautiful main streets in America.

Lawrence provides many recreational opportunities for the community, such as the Prairie Park Nature Center, outdoor and indoor aquatic centers, the Lawrence Sports Pavilion, and numerous bike/walking trails, such as the Lawrence Loop. Lawrence Parks and Recreation operates and maintains 64 parks and open spaces, three recreation centers, one sports pavilion, two community centers, and four swimming facilities. The city is home to one public golf course, Eagle Bend, and two private golf courses, Lawrence Country Club, the Orchards Executive Golf Course, and Jayhawk Golf Club.

A new business park, VenturePark, was opened in 2015 within city limits. It is located on over 200 acres and is adjacent to the existing East Hills Business Park. These business parks have primarily housed warehousing facilities.

In 2018, the City of Lawrence brought online a second $74 million wastewater treatment plant located on the city's southeast edge. With its completion, new growth began in the south and east portions of the City of Lawrence due to the ability to provide wastewater service where it had not been possible before.

Lawrence is also home to the University of Kansas (KU) and Haskell Indian Nations University. Approximately 28,500 students attend KU, ranked as one of the nation's most beautiful campuses. Haskell Indian Nations University is the nation's only inter-tribal university for Native Americans, representing more than 150 tribes across the country.

Dr. James Naismith, the inventor of basketball and KU's only basketball coach with a losing record, is buried in Lawrence, where he lived and coached most of his adult life. The DeBruce Center was constructed onto historic Allen Fieldhouse to house the original rules of basketball as developed by Dr. Naismith. The KU Jayhawk basketball program is among the best in the country.

Baldwin City, incorporated in 1870, is home to Kansas's oldest university, Baker University.

The city of Eudora, incorporated in 1859, has strong ties to historic native settlements and committed strong support to the Union during the American Civil War.

Community Financial Basis

The fire department is funded by the city's general fund, which is shared by nine city departments. The largest portion of the city's general fund is supported by sales tax, followed by property tax and franchise fees. The 2022 budget for the department makes up 26% of the general fund budget at $27,246,000. The overall budget for the City of Lawrence in 2022 is $418,309,000.

Douglas County's share of the total operating budget is 36% for the provision of emergency medical services (EMS) in Douglas County. The city's share of the total operating budget is 64% for the provision of fire and

rescue services in the city. All costs associated with coroner scene investigation (CSI) services are the county's responsibility.

The City of Lawrence and Douglas County signed an updated EMS Cooperation Agreement in 2021. The agreement creation process focused on updating provisions and examining methodologies related to equity – such as levels of service, call volume, types of responses, etc. The agreement separates expenses into three main categories: fire suppression, emergency medical services, and shared. The City of Lawrence is responsible for 100% of the fire suppression expenses. Douglas County is responsible for 100% of the emergency medical services expenses. All expenses that fall under the "shared" category are split between both entities. The City of Lawrence is responsible for 64% of the expenses, while Douglas County is responsible for 36%. With this agreement, all financials have also been designed to run through the City of Lawrence. Quarterly reporting is made through the city's finance department to Douglas County on revenue and expenses. The department believes the new EMS agreement will streamline the process and strengthen the relationship between the City of Lawrence and Douglas County.

The city commission sets budget priorities and adopts the city budget. The City of Lawrence staffs and provides accounting and financial resources to the entire organization. The finance department and city manager's office, in cooperation with the city executive team, are responsible for the preparation and management of the budget, as well as financial forecasting based on actual revenue and predicted expenditure trends. The city's general fund is developed based on revenue from sales and property taxes collected. The fire chief and select staff assist in developing the annual budget based on an examination of existing service levels, new programs, staffing requirements, and previous fiscal year trends.

Taxes and charges for service make up the largest portion of general fund revenues. Almost one-third of the resources supporting the general fund come from various sales/use taxes:

1% - City
0.3% - Infrastructure
0.2% - Transit
0.05% - Affordable Housing
1% - County-Wide

The 2022 budget estimated total revenue from EMS fees is $2.4 million. Per the *2021 EMS Cooperation Agreement* with Douglas County, the city collects revenue from ambulance transports (user fees) and, quarterly, offsets their balance due to the city for the provision. Also quarterly, charges for special event standbys are deposited to the city for the provision. The county funds three full-time medical claims positions in the fire medical department.

Capital improvements of facilities, suppression apparatus, rescue apparatus, and large equipment over $100,000 and with a five-year lifespan are part of the city's *Capital Improvement Plan* (CIP) or *Maintenance Plan*. These projects are largely funded by general obligation debt from the City of Lawrence. The county is responsible for 100% of the cost of the preplacement or addition of all vehicular and other capital equipment used primarily for medical purposes. The infrastructure sales tax provides the department with $500,000 annually to support an ongoing replacement plan for fire apparatus. The infrastructure sales tax expires in 2029 unless reapproved through a ballot election.

General Operating Fund Resources

The department's total operating budget has increased over the last five years from $21.8 million to $27.3 million due to increased personnel, maintenance, and equipment costs. In the last five years, the annual budget

for the department increased by 25.8% from 2018 to 2022. The increase includes the expansion of the three chief officers in 2019. Another large portion of the increase is related to the addition of internal service fees to fund city services such as legal, human resources, finance, IT, and maintenance garage. The 2022 budget amount for these internal services is approximately $3 million.

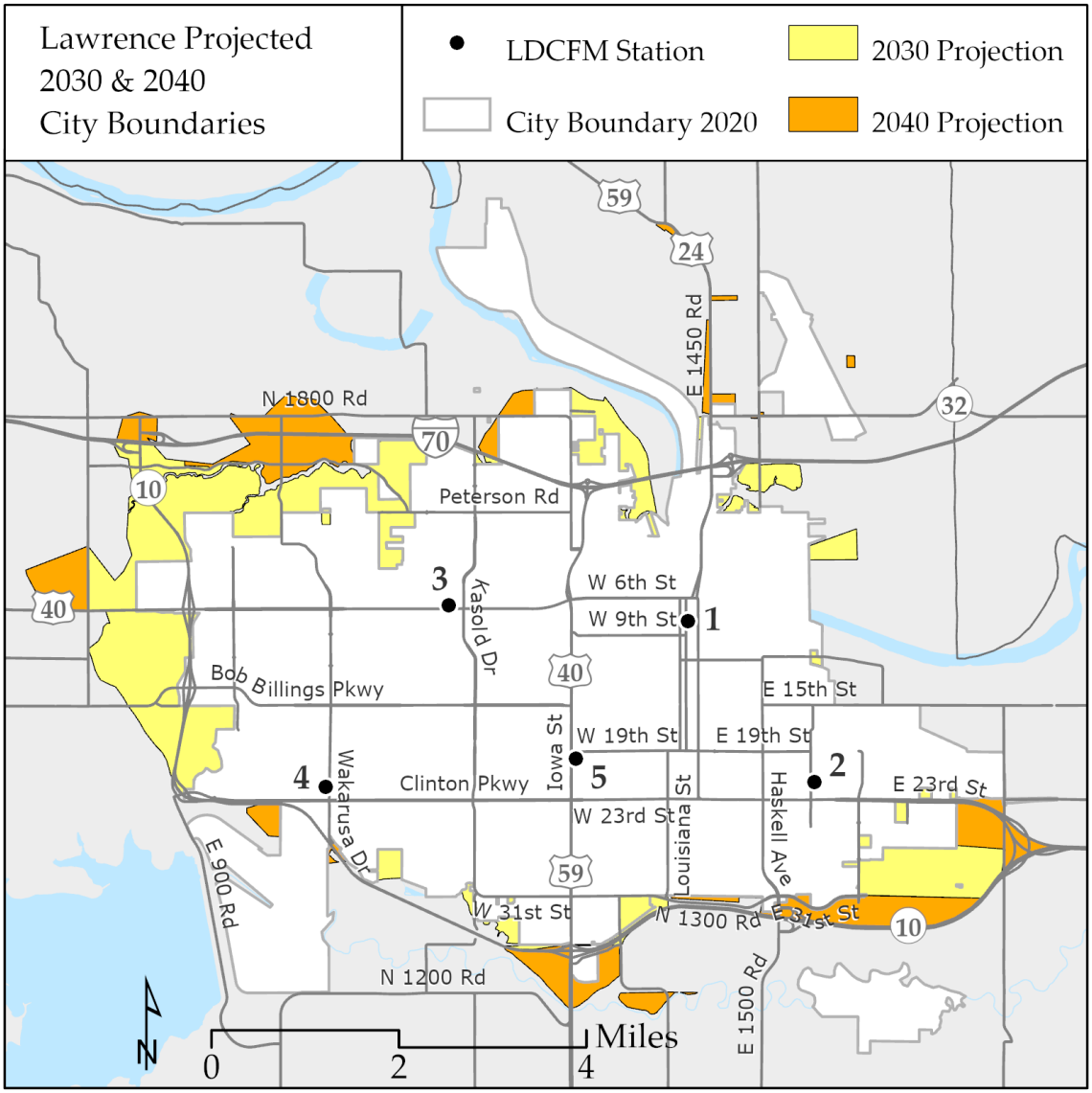
The department's executive staff and city budget staff monitor and evaluate the department's budget throughout the year to ensure the maintenance for fiscal responsibility. The finance department monitors and provides updates throughout the year on revenue projections, and fiscal adjustments are made as necessary. The city manager's office implemented a new transparency reporting platform, *OpenGov*, as part of the 2018 budget development process. *OpenGov* allows citizens direct online access to financial reporting.

The city has been awarded the *Certificate of Achievement for Excellence in Financial Reporting* from the Government Finance Officers Association (GFOA) for the *Comprehensive Annual Financial Report* for 29 consecutive years. The *Distinguished Budget Presentation Award* for the budget book has been awarded 17 times out of the last 18 years. In 2021, the City of Lawrence also received *Popular Annual Financial Report* (PAFR) by GFOA. This award completed the GFOA "Triple Crown," earning all three awards offered by GFOA for the City of Lawrence.

Community Boundaries

The city has grown significantly since its original 1854 Charter. The growth of the city has been concentrated in the west and southeast. The historical view of growth illustrates a great land expansion starting in the 1960s, which lasted until the mid-2000s, with expansion slowing considerably in the period between 2001 and 2016, in part due to the downturn of the national economy and the city's decision to encourage development within the city prior to expanding the boundaries. Looking at growth beyond 2016, the Department of Planning and Development Services models indicate future city limits expanding in Lawrence's northwest, west, and southern areas.

Map 1: Lawrence Projected Growth 2030 and 2040



Community Planning Areas

Douglas County is composed of both urban and rural areas. The department provides varied response services to different parts of Douglas County. Urban areas in Douglas County include the city of Lawrence, the city of Eudora, and Baldwin City.

The department provides fire suppression, EMS, hazardous material response, and technical rescue to the city of Lawrence.

East Lawrence is primarily made up of unique neighborhoods and is known as the art district.

North Lawrence, located north of the Kansas River and adjacent to downtown, is a small neighborhood composed of residential areas, riverside parks, and historic businesses such as the Union Pacific Depot.

West Lawrence is the newest and fastest-growing neighborhood area for homes, restaurants, retail, and recreational areas.

South Lawrence is a mixture of residential and retail areas, heavily diluted by recreational nature centers.

Downtown Lawrence is centralized by Massachusetts Street, lined with building-to-building retail businesses, restaurants, and activities. This area is highly valued for its historic arts culture.

Lawrence is home to two University campuses, the University of Kansas and Haskell Indian Nations University. The City of Lawrence does not have regulatory authority over planning and development on either campus.

The State of Kansas has jurisdiction over all University of Kansas property. The Office of Design and Construction Management at the University oversees all planning, zoning, design, and construction. The office conducts fire code reviews and inspections of buildings three stories or less under the commissioned authority of the Office of the State Fire Marshall through the University Fire Marshal Authority. Inspections for buildings four stories or greater are conducted by the Office of the State Fire Marshall.

Haskell is a federally operated tribal university funded by the United States Department of Interior. Multiple federal offices are involved in overseeing Haskell and have jurisdiction over planning, development, and construction. The University maintains fire protection systems on campus.

The City of Lawrence includes a handful of business parks on the city's east and north sides.

The department provides EMS, hazardous material response, and technical rescue to the city of Eudora, Baldwin City, and the other rural areas of Douglas County.

The city of Eudora, located on the east side of Douglas County, is home to a growing community that includes residential neighborhoods and a historic downtown area with its own school district and recreational facilities. Eudora maintains a small-town atmosphere with a population of less than 7,000.

Baldwin City, with a population of less than 5,000, is located on the south end of Douglas County. The city hosts an annual event featuring arts and crafts, live music, and a parade that draws in nearly 25,000 visitors.

Baker University is a private institution in Baldwin City, established in 1858, and was also the first university in Kansas. Less than a thousand students attend this university.

Douglas County is home to multiple bodies of water, including Clinton Lake, the Kansas River, Wakarusa River, Douglas County Lake, Lone Star Lake, Mary's Lake, and Potter's Lake, located on the University of Kansas Campus.

Areas of noted expansion include:

- East 23rd Street/O'Connell Road: the addition of "Section 8" housing on that corner includes an apartment complex, duplexes, and fourplexes.
- East of O'Connell Road and south of East 23rd Street, there are plans for a church and a grocery store. Homes have been steadily built in this area for years, and there are plans for 200 more homes.
- There are plans to add 400 new houses near Rock Chalk Park.
- The City of Lawrence has adopted new ordinances to allow for "double-density" building projects on the city's east side. This allows for building two homes on a single lot, which was done to create more affordable housing within the community. Many neighborhoods on the east side of Lawrence are seeing these types of projects, leading to an increase in the population density in this area.

Community Transportation Systems

The far eastern side of the city, which includes the East Hills Business Park and VenturePark, is easily accessed from the Kansas State Highway 10 (K-10) bypass. K-10 bifurcates at the eastern edge of Lawrence. K-10 is a four-lane limited-access highway, which runs west from Interstate 435 in Johnson County, south around the city of Lawrence, connecting with US Highway 59, and further west connects to Interstate 70 west of Lawrence. K-10 provides a divided four-lane exit on the east side of Lawrence that becomes East 23rd Street. Currently, O'Connell Road is at the transition of K-10 and East 23rd Street exit. O'Connell Road has become a primary residential artery, extending south from K-10 to the city limits and providing access to the east side of the Prairie Park neighborhood and the Douglas County Jail. Until the K-10 bypass was completed in 2016, East 23rd Street was previously designated as the truck route, and all hazardous materials traveled on East and West 23rd Street. Since the completion of the K-10 bypass, the hazardous material shipments have been reduced through the city by routing them to the southern edge of the city.

K-10 bypass ends north of I-70 at US Highway 40. With the completion of the K-10 bypass, there is now access to US Highway 24, US Highway 40, US Highway 59, and I-70. The US highway routes provide two-lane services from the Kansas City and Topeka metropolitan areas to points in the eastern quarter and northeast quadrant of Kansas. I-70 is a multi-lane highway that carries a significant amount of interstate traffic through the heart of Kansas. These routes are the primary routes for transporting and distributing substantial quantities of consumer goods and hazardous materials.

Access to north Lawrence on the north side of the Kansas River is gained by the Kansas River Bridge or remotely by I-70. Access is normally not a problem, but contingency plans for access and suppression capability have been developed in the event access cannot be accomplished in the event of a flood.

The Union Pacific and Burlington Northern Santa Fe (BNSF) Railroads transect the city. The Union Pacific travels through north Lawrence approximately 40 to 50 times a day with no passenger service and BNSF with fewer than 10 daily, including Amtrak twice daily through central and east Lawrence.

The Lawrence Municipal Airport (LWC) is located approximately three miles north of downtown Lawrence on East US Highway 24/40 and is a general aviation facility. The City of Lawrence has owned and operated the airport at its current location since its dedication in October 1929. The airport is one of the oldest, continuously-operating airports at its original location in Kansas. The uncontrolled airfield averages more than 100 daily flight operations of single-engine, twin-engine, business jets, and helicopters. The airport is open 24/7 for aircraft operations. With the assistance of a 5,700 feet runway and Class I Instrument Landing System, LWC provides an all-weather airport for business and recreational planes.

Lawrence-Douglas County Metropolitan Planning Organization

The Lawrence-Douglas County Metropolitan Planning Organization (MPO) is a transportation policy-making body comprised of representatives from local government and transportation agencies with authority and responsibility in metropolitan planning areas. Federal legislation requires the formation of an MPO for any urbanized area (UA) with a population greater than 50,000.

In 1982, the U.S. Census Bureau designated Lawrence, Kansas as an urbanized area and created the Lawrence-Douglas County Metropolitan Planning Organization to ensure that existing and future expenditures for transportation projects and programs were based on a continuing, cooperative, and comprehensive (3-C) planning process.

Public Transit

Lawrence Transit System is a division of the City of Lawrence. With the University of Kansas, it provides safe, convenient, affordable, reliable, and responsive public transportation services to enhance the social, educational, economic, and environmental well-being of the community. This encompasses 20 fixed routes: 10 city routes, 2 coordinated routes, and 8 university routes, covering 31-square miles within the city limits of Lawrence. Lawrence Transit System also provides complementary Americans with Disabilities Act paratransit services (T Lift) and nighttime demand response service (Night Line).

Other transportation services are provided in Lawrence and Douglas County by various non-profit, public, and quasi-public agencies such as Independence, Inc. and the Douglas County Senior Resource Center for disabled, elderly, and general public use.

Community Critical Infrastructure

The department has identified important public infrastructure that supports emergency response. Infrastructure is an essential resource that plays a role in determining the department's ability to "reach, control, and terminate an emergency incident."

Energy - Lawrence Energy Center (Electricity)

- 530-megawatt coal plant located in Lawrence, Kansas
- First commissioned in 1938
- Third largest plant in the state of Kansas
- Fueled by low-sulfur coal
- Plans to close this facility by 2023 are being formulated

Black Hills Energy (Natural Gas)

- Provides natural gas service in Lawrence

Street Maintenance Division

Lawrence has 871 lane-miles of streets that are maintained by the street maintenance division, which is also responsible for the following:

- Routine maintenance of the city's streets, alleys, curbs, ADA ramps, and guardrails
- Street sweeping
- Ice and snow control on public streets
- Maintenance of Kansas River and Mud Creek levee
- Maintenance of signs, traffic signals, and pavement marking
- Operational crew for the stormwater utility
- Maintaining enclosed pipe-inlet systems, channels, and water detention facilities

Central Maintenance Garage

The central maintenance garage (CMG) operates as an internal service fund to provide fuel, vehicle management, and repair services for the city's fleet of vehicles and equipment. The maintenance facility is located at 11th and Haskell. Fuel stations are located at 11th and Haskell, the airport fuel site at 2515 Airport Road, and the "West 40" property near 18th and Wakarusa. The CMG provides essential fleet management services for all city departments. This division provides technical management related to the development of vehicle and equipment specifications, evaluates fleet efficiency, is the primary data collection entity, and provides disposal services of surplus equipment. The CMG provides direct support to the department of risk management related to fleet safety and incidents, as well as direct support to finance in the tracking of the city's capitalized fleet assets.

Environmental Health & Science

Environment health & science is the environmental, regulatory compliance, and water/wastewater quality monitoring and testing division of municipal services and operations (MSO). Key functions include laboratory operations, household hazardous waste, permitting, state and federal reporting, environmental services and regulations, industrial pretreatment, cross-connection control programs, composting, instrumentation, science, and analytics. Testing laboratories are located at the water and wastewater treatment facilities.

The household hazardous waste facility is located on Kresge Road and is open to Lawrence residents, other Douglas County residents, and small-quantity generating businesses. The household hazardous waste facility serves as a storage and distribution center for COVID-19 testing kits for the community, personal protective equipment (PPE), and cleaning supplies for all city employees as part of the incident command system (ICS) logistics section.

The city's compost facility, located on East 11th Street, is available to Lawrence residents to drop off yard waste and pick up compost and woodchips.

Within this division, MSO manages seven National Pollutant Discharge Elimination System (NPDES) permits, which are issued by the Kansas Department of Health and Environment (KDHE) under the authority of the Clean Water Act to control pollution from discharges into the waters of the United States. The division assesses environmental and public health impacts associated with sanitary sewer overflows (SSOs). Cross Connection Control Program safeguards public health by protecting the drinking water system from sources of possible contamination.

Storm Water Engineering Division

The stormwater engineering division was created in 1996 to manage the stormwater utility and to implement other recommendations of the *Stormwater Management Master Plan*. Stormwater utility fees are charged to all landowners based on impervious surfaces on each property. The resulting revenue supports system reconstruction projects, system maintenance, development review, and pollution prevention measures.

In 2021, *Stormwater Management Plan 2021-2024* was created. The plan outlines the programs and practices the city will implement to comply with the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System permit. The focus of the plan is to document how the city will manage and reduce the discharge of pollutants from its storm system to the maximum extent practicable by implementing best management practices consistent with the provisions of the permit.

Solid Waste Division

Comprehensive solid waste management services are provided in the context of a growing university community (University of Kansas and Haskell Indian Nations University), resulting in a highly transient population. The collection and disposal of garbage became a municipal service in 1946. The city continues to provide exclusive trash service for residential and commercial customers and curbside single-stream recycling and yard waste collection for residential customers. Additionally, cardboard and office paper recycling collections are offered to commercial customers, and there are 11 city-operated recycling drop-off locations for newspaper, cardboard, mixed paper, and/or glass.

The solid waste division hosts several public events throughout the year, including Lawrence's Earth Day Celebration, compost and woodchip sales, and electronic recycling events. Additionally, the division operates facilities that are open to Lawrence and Douglas County residents for compost and brush drop-off and household hazardous waste.

The solid waste division utilizes an enterprise fund account for its operations. The city's solid waste services are financed and operated like private business enterprises. The intent of the governing body is that the costs of providing services (collection, disposal, recycling, and technical assistance) to the general public are financed or recovered primarily through user charges.

Water Distribution Division

The water distribution division is responsible for the installation, maintenance, inspection, and repair of the water pipelines that deliver drinking water from the water treatment plants to the taps. The system consists of pipes ranging in size from large 24" transmission lines to small 3/4" service lines. Five rural water districts and Baldwin City also receive water from the city's distribution system. The utilities department is constantly striving to ensure that clean, safe water is available for both consumption and fire protection needs. The distribution system is continually being upgraded and updated. Each year, sections of pipe that have been identified, for various reasons, as needing replacement are either replaced by distribution personnel or outside contractors.

The City of Lawrence Utilities Department manages the testing and maintenance of all public hydrants in the city. Private hydrants and those located at Haskell Indian Nations University as well as the University of Kansas campuses are not maintained by the City of Lawrence Utilities Department.

The City of Lawrence provides fire protection to Grant Township through a fire protection agreement. There is a plan in place for a water shuttle supply using water tenders due to the lack of a hydrant system for firefighting purposes.

Water Treatment Division

The water treatment division is responsible for all water treatment activities, in-house engineering, and management of water treatment projects and water rights procurement management. The division works in cooperation with the distribution and quality control divisions to ensure a safe, reliable, and aesthetically pleasing water supply to the citizens of Lawrence and surrounding communities. The water treatment division operates two treatment facilities: the Kaw River Water Treatment Plant and the Clinton Reservoir Water Treatment Plant.

The Kaw River Water Treatment Plant was completed in 1917, and an addition to this plant was completed in 1958. The capacity of this plant stands at 16.5 million gallons per day. This plant draws water from the Kansas River and six alluvial wells on the river banks.

The Clinton Reservoir Water Treatment Plant has a capacity of 15 million gallons per day and was put into service on March 1, 1980. An expansion in 2008 increased the capacity from 10 million gallons per day to 25 million gallons per day. The Clinton Reservoir serves as the source of raw water for this plant.

Wastewater Collection Division

The wastewater collection division is responsible for maintaining the sanitary sewer collection system that collects and delivers wastewater to the wastewater treatment plant for treatment. The collection system infrastructure includes 400 miles of gravity and forced sewer mains, 15,000 maintenance holes, and 38 lift stations. The sewer lines are constructed of vitrified clay pipe and PVC truss pipe. The pipes range in size from 8 inches to 48 inches in diameter.

Wastewater Treatment Division

The wastewater treatment division is responsible for all water treatment activities, in-house engineering, and management of water treatment projects and water rights procurement management.

This division works in cooperation with the distribution and quality control divisions to ensure a safe, reliable, and aesthetically pleasing water supply to the citizens of Lawrence and surrounding communities. This division operates two treatment facilities, the Kansas River Wastewater Treatment Plant and the Wakarusa River Wastewater Treatment Plant.

The Kansas Wastewater Treatment Plant, located on East 8th Street, is permitted to treat 12.5 million gallons per day with peak flows of 25 million gallons per day through a conventional activated sludge treatment. During rain events, an additional 40 million gallons per day can be treated through a chemically treated excess flow treatment process (ACTIFLO®). City staff manage the biological mass that ensures effluent water quality meets daily/weekly/monthly NPDES permit limits and internal goals.

The Wakarusa River Wastewater Treatment Plant, located on West 41st Street, is permitted to treat 2.5 million gallons per day, with peak flows of 5 million gallons per day through a three-state biological nutrient removal process.

Water Quality Laboratory Division

The water quality laboratory division monitors the physical, chemical, and microbial characteristics of the drinking water and treated wastewater. Laboratory services generate and provide high-quality data to the operational groups within MSO and external regulatory groups such as the Kansas Department of Health and Environment (KDHE) and the U.S. Environment Protection Agency (EPA). This division is responsible for monitoring the drinking water to ensure these standards are met to deliver safe potable water.

Community Land Use and Zoning

The newly developing areas of the community are continuing with commercial development along main thoroughfares with fill-in of residential and multi-family residential around the commercial development. The industrial areas of the community are currently located along the outskirts of the community near the highways needed to transport manufactured products. The community has a complement of green spaces and parks throughout the city for citizens and visitors to enjoy.

Lawrence has adopted *Plan 2040* as their comprehensive land-use plan. This comprehensive plan expresses the community's desires for the future image of the community. It provides the foundation and framework for making physical development and policy decisions. Before *Plan 2040*, Douglas County had *The Guide Plan*, the City of Lawrence had *Plan 95*, and following these was *Horizon 2020: The Comprehensive Plan for Lawrence and Unincorporated Douglas County*. These plans were used as guides in comprehensive planning. The planning process for Plan 2040 was initiated in 2013. After years of public involvement, *Plan 2040* was adopted in 2019 to serve as the comprehensive land-use plan for the City of Lawrence and unincorporated areas of Douglas County. *Plan 2040* can be amended to address changing trends and beliefs about development in the community.

The comprehensive plan provides a vision and expresses the community's desires for the future. It provides the foundation and framework for future physical development and policy decisions. The comprehensive plan allows for a look at the entire community and the effects of land use decisions on the community to determine whether individual proposals are consistent with the overall community goals and visions.

Plan 2040 reflects resiliency in an ever-changing world (changes that are short-term and multi-generational in nature) and recommends goals to promote a high quality of life in both urban and rural settings. It establishes policies that guide future growth while preserving and enhancing the natural environment, improving public health and safety, and bolstering economic vitality. This plan is a product of substantial community input. It is intentionally flexible through the public amendment process to accommodate future development ideas and innovations that would help achieve the community vision. *Plan 2040* directs growth in a manner that preserves and enhances the heritage and spirit of community and creates unique places to live, work, learn and play.

The trend in Lawrence's total number of building permits issued annually had been steadily decreasing since 2000, reaching a decade-long low in 2009. The number of annual permits trended up from a low in 2012 but dropped again in the following two years. In 2018, the level of permits issued rose to the highest it had been in the previous decade but was followed by a significant decrease in the preceding years.

Community Topography

Lawrence is located in the northeast corner of Douglas County with a land mass of 34.8 square miles, a water area of 0.70 square miles, and an elevation between 866 feet and 1,036 feet. Douglas County has a land mass of 475 square miles, a water area of 19 square miles, and a top elevation of 1,164 feet. Lawrence is known for the hills and valleys of the area. Lawrence is bordered by the Kansas River on the north, which separates North Lawrence from the rest of Lawrence to the south. On the southern border is the Wakarusa River, fed by Clinton Lake. Lawrence has 3,953 acres of parks, of which 155 acres are undeveloped and 153 are preservation land. Lawrence has 84 miles of hiking and biking trails; Douglas County has 151 miles of trails.

Lawrence has several lakes in the area, including Clinton Lake, Douglas County Lake, Lone Star Lake, Mary's Lake, and Potter's Lake on the Kansas University Campus. Clinton Lake was built by the Corps of Engineers as a result of the Flood Control Act of 1962, with construction beginning in 1972 and was completed in 1975. It is a large recreational lake with several bike trails, camping facilities, and boating amenities. Lawrence is also complemented by 82 miles of biking, walking, and hiking trails throughout the city and along the Kansas River.

Kansas University is located in the center of the city and sits on an area known as Mount Oread (due to the elevation) and is referred to as "The Hill" by the people of Lawrence.

Community Geography

Mount Oread is the highest point in Lawrence at 1,037 feet. The city lies on the southern edge of the Dissected Till Plains, bordering the Osage Plains to the south.

Lawrence is situated along the banks of the Kansas and Wakarusa Rivers. There are several major creeks that flow through Lawrence. Burroughs Creek is located in eastern Lawrence, and Baldwin Creek in northwestern Lawrence, converging with the Kansas River. Yankee Tank Creek in southwest Lawrence and an unnamed creek that flows through central Lawrence converge with the Wakarusa River south of the city. Yankee Tank Creek is dammed to form Lake Alvamar, originally called Yankee Tank Lake. The Wakarusa River is dammed to form Clinton Lake. There are also the Haskell-Baker Wetlands which are maintained by Haskell University and Baker University.

Community Geology

Douglas County lies in northeast Kansas, with Lawrence in the northeast portion of the county. Northeastern Douglas County is part of the Glaciated Region, while the remainder of the county is part of the Osage Cuestas. The Osage Cuestas have created gently dipping hills with alternating hard and soft rock layers. This gives Douglas County its gently rolling hills.

The main rock deposits found in this area are sandstone, shale, and limestone. Sandstone is a common sedimentary rock in the area, while shale is composed of hardened, compacted clay or silt. The shale deposits have been used for making bricks in eastern Kansas, which is used in the construction of area homes and businesses.

Community Physiography

Douglas County and the city of Lawrence sit within the Osage Cuestas region of Kansas. This area is made up of mostly undulating plains with some woodland areas, perennial streams, and larger bodies of water. The city

and county have two rivers, the Kansas River in the northern area of the county, and the Wakarusa River, which is more centrally to the area. The ground is made up of silty and clayey residuum and colluvium, with alternating layers of Pennsylvanian sandstone, limestone, and shale. The vegetation of the area is mostly made up of tallgrass prairie and a combination of upland forest that contains shagbark hickory, bitternut hickory, red oak, white oak, and black oak. The land use of Lawrence and Douglas County is made up of cropland, woodland, grassland, and developed land. The city of Lawrence is developed land within Douglas County, along with the three other small cities of Lecompton (west), Baldwin City (south), and Eudora (east). In all these cities, the vegetation transitions from tall prairie grass to developed areas with no buffer between the transitions.

Community Climate

As a Midwest city, Lawrence annually experiences four seasons. The city has a humid continental climate with hot summers and no dry season. The temperatures range from an average low of 22 degrees Fahrenheit in January to an average high of 90 degrees Fahrenheit in July. Lawrence's average temperature is nearly 55 degrees Fahrenheit with a high temperature of 108 degrees and a low of 4 degrees. Lawrence has a south prevailing wind. The summer is typically hot and humid, and the winter is dry.

The Lawrence weather information was provided by *Weather Underground* and describes the typical weather at the Lawrence Municipal Airport (LWC) weather station over an average year. It is based on the data from 2017 to 2021.

The length of the day varies significantly over the course of the year. The shortest day is December 21, with 9:26 hours of daylight; the longest is June 20, with 14:55 hours of daylight. Over the entire year, the most common forms of precipitation are thunderstorms, light to moderate rain, and light snow.

Disaster Potential

Severe Thunderstorm Risk – High

The department has identified the risk of severe thunderstorms as high. Climate conditions that create severe thunderstorms exist mostly in the spring and summer months; however, there remains a potential for these storms year-round. These storms tend to occur in the late afternoon or evening.

Severe thunderstorms consist of high winds, lightning, some localized flooding, and at times, hail. Fallen trees and localized flooding can impact mobility in and around the city and have an impact on emergency responses. Downed power lines create an interruption in power supply, activation of alarms, and an electrical hazard for response units.

Because of the threat and risk of severe thunderstorms and lightning in Lawrence, homes and buildings could be damaged due to high winds and lightning strikes. Life loss should not be much of a factor in a severe thunderstorm. Mutual aid from neighboring communities could be activated but may be limited due to similar responses within those communities.

The department can provide the emergency response services needed to mitigate the various effects of thunderstorms. Operational parameters exist for thunderstorms in the department's SOP 210.10: *Severe Weather* that enhances responses, maintains responder and citizen safety, and utilizes resources in an efficient manner.

During severe weather events, the shift commander/battalion chief may assign an officer to assist at the Douglas County Emergency Communications Center (DCECC). This officer (known as the communications

coordinator) assists the fire medical dispatcher in handling/prioritizing emergency calls during these severe weather events.

SOP 210.10 also addresses how arcing line calls and power line down incidents should be mitigated by the department. This SOP discusses prioritizing incidents during high call volume related to severe weather identified by modified communications (when a chief officer is assigned to be a Communications Coordinator and help dispatch with the prioritization of incidents). Station apparatus preparation before severe weather is also addressed.

One operational parameter exists with the Douglas County Emergency Operations Plan covering thunderstorms and could be activated if needed. Historically, the department has maintained emergency response to impacts, as stated in this section.

Tornado/Microburst Risk – High

The department has identified the risk of tornadoes as high. The potential for impacts and effects from tornadoes and/or microbursts exist within the city of Lawrence. As is the case with severe thunderstorms, the climate conditions which spawn such meteorological events are ideal during the spring and summer months.

Microbursts are very strong winds that quickly descend from the base of a severe thunderstorm and then spread out quickly upon impact with the ground. These straight-line damaging winds can cause extensive damage across a large area.

Historically, these events have been random, but the potential exists as a by-product of thunderstorms. With tornadoes and microbursts come the potential for significant property damage, mass casualty, and great economic impact, depending on the magnitude of the damage.

Emergency warning sirens can alert citizens of any funnel cloud, tornado, or other hazardous weather conditions in the area. With proper warning, life loss can be kept to a minimum; however, estimating and preventing property damage would be difficult. The risk level for a tornado for loss of life and property would be high. Depending on the nature and scope of the incident, the Emergency Operations Plan would be implemented.

Any tornado moving through Lawrence would be devastating due to the density of population per square mile and the prevalence of slab-style homes due to high water tables and rocky soil.

The last major tornado to seriously affect Lawrence occurred May 8, 2003, and touched down in southwest Lawrence. The tornado caused heavy damage to about 40 homes and six apartment buildings. One resident was reported injured, and damage was estimated at $6.4 million.

On April 12, 1911, a tornado swept through the north end of the downtown area, killing a couple in their home.

On June 19, 1981, a tornado devastated southwest Lawrence with the heaviest damage and a single fatality occurring near the intersection of West 31st and Iowa Street. The west side of a K-Mart store collapsed, killing a 30-year-old Lawrence man. Damage was estimated at approximately $20 million, and 35 people were injured.

On March 12, 2006, a microburst struck Lawrence around 8 a.m. This microburst contained 70 to 90 mph straight-line winds. The event caused extensive damage to trees and power lines, and over $8.0 million in property loss.

On February 28, 2012, a weak tornado touched down in south-central Douglas County. Several barns were damaged or destroyed, and numerous trees were uprooted.

On May 28, 2019, Douglas County and the city of Lawrence experienced a severe weather event of an EF-4 tornado that touched down at 6:15 p.m. The tornado's path started in the southwest portion of the county and stayed on the ground for more than 31 miles. The storm damaged 60 homes and injured 17, 3 of which required hospitalization (Shepard, 2019).

Flood/Flash Flood Risk - Moderate

The department has identified the risk of flooding and flash flooding as moderate during any part of the year. The Kansas River has a long history of flooding that has caused significant damage and economic loss.

Historically, the early 1900s ushered in a wet cycle that persisted for nearly fifteen years. There were minor floods in 1901 and 1902, and then in 1903 came a significant flood. In 1903, the river channel was about one-half of its present width. After the flood, approximately one-third of north Lawrence was added to the channel of the Kaw River by the disastrous flood.

Floods of lesser proportions occurred in 1904, 1905, 1908, 1910, 1912, and 1915 with relatively minor property damage. This frequent reoccurrence was of sufficient significance and inconvenience to slow the development of North Lawrence.

Lawrence had to cope with two floods in less than a month in 1951. On June 23, the Kaw River water level reached 25.6 feet at the Lawrence dam, the highest it had been since 1903. The Great Flood of 1951 was the costliest catastrophe of its kind in local area history and occurred on "Black Friday," July 13, 1951. Surprisingly, not one life was lost in Lawrence or the immediate surrounding area during this event. Loss estimates ranged from $4 million to $6 million. The peak Kansas (Kaw) River reading at the Bowersock Dam in Lawrence was three- and one-half feet above the crest of the fabled 1903 flood, which had been recorded at 27 feet. The flood stage at the dam was 18 feet, the same as today. With the Flood Control Act of 1954, a series of reservoirs, including Clinton, Milford, Perry, and Tuttle, and a river levee system were constructed in northeast Kansas to reduce flooding and its effects.

The Kansas River's last flood outside of the river levee occurred in June of 1993, causing the evacuation of several residents and leading to millions in damage to North Lawrence.

As the city continues to grow, new residential and commercial development has shifted the flow of water during heavy storms to areas previously not considered a problem.

Drought/Heat Wave Risk - Moderate

The department has identified the risk of drought and heatwave as moderate during summer months. The threat of drought is persistent in Lawrence. The city of Lawrence has taken significant measures to reduce the impact of drought. Department operations and capabilities may be jeopardized due to a lack of a water supply. Loss of life could very well be a factor with the number of older adults in Lawrence. EMS capabilities could be stretched to the limit by an abundance of dehydration calls. Fire calls could greatly increase due to dry conditions. Economically, the city of Lawrence could be affected by the loss of vegetation (trees, shrubs, flowers, plants, and grass). Lawn watering and car washing restrictions should be in effect and monitored. Cooling stations would be established throughout the city of Lawrence. Senior citizens and those who are housebound would need to be checked regularly.

Winter Storms Risk - High

The department has identified the risk of winter storms and or heavy snowfall as high during winter months. Severe winter storms can cause widespread damage and disruption. Heavy snow often results in paralyzed transportation systems, automobile accidents, and stranded vehicles. The hazards posed by winter storms may be catastrophic. Glazing from ice storms and heavy snow can affect power lines and other utilities. Intense wind and extreme cold can have profound health effects, especially on the elderly.

Historical response data indicates that ice buildup can create problems. In January 2002, the city and Douglas County were part of the northeast Kansas federal disaster area after a January 30 storm knocked down tree limbs and power lines, and left thousands of Lawrence residents without power for several days.

Structural collapses may occur due to heavy snowfall on roofs. Life safety would be minimal, but property damage could be significant due to roof collapses and frozen water pipes.

In the event of severe winter weather and snow conditions, the department's severe weather standard operating procedure would be put into effect. The plan increases staffing and modifies response to ensure the highest level of service is maintained when roads and access to homes and businesses are adversely affected.

Earthquake Risk - Low

The department has identified the risk of a high-impact earthquake as low. The risk of earthquakes in Kansas is relatively low, according to a report completed in 2000 by the Federal Emergency Management Agency (FEMA). Kansas ranked 43 of 50 states in the amount of damage caused by earthquakes in an average year.

According to the U.S. Geological Survey (USGS), the earthquake count for Kansas from 2016-2021 shows a positive trend. Over the last five years, Kansas experienced 23 earthquakes of a magnitude 4.0 or above, 319 earthquakes between 3.0 and 4.0, and 1109 earthquakes below magnitude 2.0.

On September 3, 2016, an M5.6 earthquake struck near Pawnee, Oklahoma. Multiple states in the Midwest felt the quake, and it was the largest reported in the state of Oklahoma.

This region has had notable examples of earthquakes, including the three very large accounts in New Madrid, Missouri, that shook the eastern half of the United States in the winter of 1811-1812. In terms of the amount of land shaken, these earthquakes were the largest in recorded U.S. history.

Kansas is not generally associated with earthquakes but does sit on the Nemaha fault. The largest earthquake to strike Lawrence occurred on April 24, 1867. This tremor was estimated to be 5.1 on the Richter Scale. It was centered near Wamego and affected an area estimated at 300,000 square miles, including much of Nebraska.

The potential for large devastating earthquakes has sparked a great deal of ongoing research concerning mitigation and hazard reduction of possible future earthquakes. Major structural damage to buildings, utilities, and infrastructures may result. Injuries and casualties could be significant. Evacuation, housing, food, and

water would pose significant operational concerns. The size of the quake would determine the life risk and property loss involved.

Water/Ice Rescue Risk - Moderate

The department has identified the hazard level for drowning and water rescue as moderate. The department provides water rescue primarily within the city but responds countywide to support the EMS mission and provide mutual aid. The department has identified itself as a highly prepared agency available to provide this service due to the overlapping needs of fire, rescue, EMS, response time, personnel staffing, certifications, and equipment deployment.

The department provides a trained team of ice rescue and swift water rescue personnel. These team members respond with rescue boats and related equipment to the many ponds, lakes, and rivers within the department response area. The department has identified several small ponds, Clinton Lake, and a segment of the Kansas River as a risk within its response area.

Recovery services are provided by the Douglas County Sheriff Underwater Recovery Team, with boat support provided by the department.

Community Population/Population Densities

Since 1980, Lawrence's population has risen from 52,738 to approximately 94,934 (2020 Census) residents, an 80 percent increase. Douglas County's population during the same time has risen from 67,640 to 118,785, a 75.6 percent increase. During the last five years, the number of calls for fire and EMS services has risen from 12,536 in 2017 to 14,560 in 2021, a 16 percent increase. This is an increase of five percent from the previous ten years. Calls for service in 2022 are expected to exceed 15,000.

Population projections for Lawrence, Kansas indicate a majority of the growth for the period of 2020-2040 will be in the west, northwest, and in the area towards the south of the current city limits.

Community Demographic Features

Lawrence and Douglas County are located in northeastern Kansas, 40 miles west of downtown Kansas City, Missouri, and 28 miles east of downtown Topeka, Kansas. It enjoys direct access to I-70, Kansas Highway 10, US-59, US-40 and is a short distance from Interstate 435, Interstate 635, and Interstate 35. Lawrence is 50 miles southeast of Kansas City International Airport (KCI).

Douglas County was organized in 1855 in honor of Stephen A. Douglas, a United States Senator from Illinois, a candidate for the presidency in 1860. In 1854, Senator Douglas took a leading part in securing the adoption of the "popular sovereignty" principle. This political doctrine allowed settlers of a territory to decide whether to be admitted into the Union as a free state or slavery state. Years later, this principle was a key factor in the proposal of the Kansas-Nebraska Act (presented by Senator Douglas) which would assist in organizing the Territory of Nebraska (leading to the formation of Kansas, Nebraska, Montana, and the Dakotas as states).

County Area Demographics

Total: 475 square miles

Land: 456 square miles

Water: 19 square miles

Population Density per Square Mile (includes all cites): 260.6

Population Density per Square Mile (unincorporated areas): 27.5

Population: 5th largest county in population out of 105 Kansas counties

City of Lawrence Demographics

Population (6th Largest city in Kansas): 94,934 (2020 Census)

Area: 34.86 Square Miles

Population Density per Square Mile: 2,723

City of Lawrence (Census)

Table 1: Demographics - Population

Year	Population
2020	118,785
2010	110,826
2000	99,962
1990	81,798
1980	67,640
1900	25,096

Map 2: Disadvantaged Populations

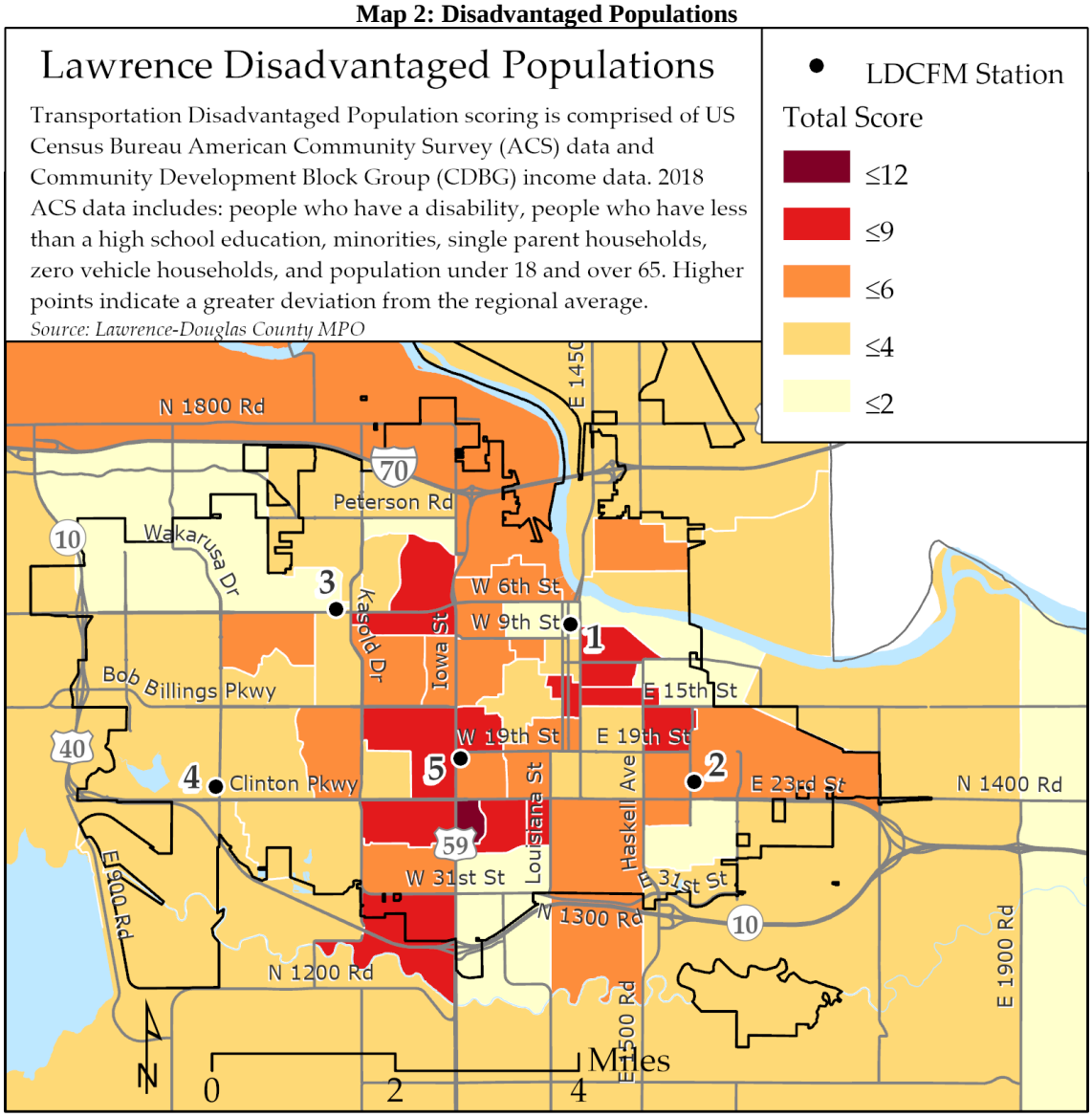


Table 2: Demographics - Population by Race

Race (2020 Census)	Population	Percentage
African American	4,868	5.3%
American Indian and Alaska Native	2,346	2.47%
Asian	4,506	4.75%
Hispanic or Latino	7,329	7.72%
Other	421	0.44%
Native Hawaiian and Other Pacific Islander	65	0.07%
Population of Two Races	5,985	6.30%
White	69,414	73.12%

Table 3: Demographics - Population by Gender

Gender (2020 Census)	Population	Percentage
Female	50,209	51.13%
Male	47,987	48.87%

Table 4: Demographics - Median Age

Median Age (ACS 2019)	28.4

Table 5: Demographics - Population by Age

Population Distribution (ACS 2019)	Population	Percentage
0-9 Years	10,783	10.98%
19-30 Years	13,186	13.43%
20-29 Years	27,491	28.00%
30-39 Years	11,570	11.78%
40-49 Years	11,109	11.31%
50-59 Years	7,794	7.94%
60-69 Years	8,494	8.65%
70-79 Years	5,590	5.69%
80+ Years	2,179	2.22%

Table 6: Demographics - Housing

Housing	
Average Household Size (per person)	2.28
# of Owner-Occupied Housing Units (2019 ACS)	17,250
# of Renter-Occupied Housing Units (2019 ACS)	21,145
# of Occupied Housing Units (2020 Census)	39,688
# of Vacant Housing Units (2020 Census)	3,733

Table 7: Demographics - Education

Educational Attainment, over age 25 (ACS 2019)	
9-12, No Diploma	4.70%
High School Diploma	15.80%
Some College	18.50%
Associate's Degree	7.70%
Bachelor's degree	27.00%
Graduate Degree	26.30%

Table 8: Demographics - School Enrollment

School Enrollment (2019 ACS)	Population	Percentage
Nursery School / Preschool	1,331	4.30%
K-12	16,860	31.30%
Kindergarten	1,718	
Elementary (Grades 1-4)	6,324	
Elementary (Grades 5-8)	4,210	
High School (Grades 9-12)	4,608	
College (Undergraduate)	19,655	53.30%
Graduate/Professional School	3,593	11.10%

Table 9: Demographics - Income

Income Amount (2020 Census)	
Median Family Income	$86,070
Median Household Income	$57,829

Table 10: Demographics - Household Income

Household Income (2019 ACS)	
Less than $10,000	6.40%
$10,000 to $14,999	3.70%
$15,000 to $24,999	8.50%
$25,000 to $34,999	9.80%
$35,000 to $49,999	15.00%
$50,000 to $74,999	18.10%
$75,000 to $99,999	13.20%
$100,000 to $149,999	12.90%
$150,000 to $199,999	4.90%
$200,000 or more	7.50%

Table 11: Demographics - Educational Institutions

Educational Institutions	
Public Elementary Schools	13
Public Middle Schools	4
Public High Schools	2
Private Schools	7

Table 12: Demographics - Colleges/Universities Enrollment

Colleges/Universities (2021 Enrollment)	
University of Kansas	28,500
Haskell Indian Nations University	701

Table 13: Navigable Waterways

Navigable Waterways
Kansas River
Wakarusa River

Table 14: Parks and Recreation

Parks and Recreation	
Golf Courses	4
Parks	58
Park Acreage	4,000
Playgrounds	30
Public Pools	4
Public Tennis Courts	18
Recreation Centers	4
Sports Complexes	3
Sports Pavilion	1
Trails (in miles)	82

The city of Lawrence has an excellent distribution of city parks throughout the jurisdiction. The city continues to expand its boundaries and add more parks to provide recreation for the community.

Table 15: Public Utilities in Lawrence

Public Utilities in the City of Lawrence
Electric Power – Evergy
Water/Sewer – City of Lawrence
Natural Gas – Black Hills Energy and Southern Star
Telephone – Midco and Southwestern Bell (AT&T)
Cable Television/Internet – Midco, Wicked Broadband, and AT&T U-Verse
Reclaimed Water – City of Lawrence
Storm Water Management – City of Lawrence
Solid Waste/Recycling – City of Lawrence

LMH Health, previously known as the Lawrence Memorial Hospital (LMH), is a 174-bed facility with a Level 4 Trauma designation, Level 2 Nursery designation, and 29-bed Emergency Department. All emergency room beds can be used for general medical; however, five beds are designated specifically for psychiatric patients, and two rooms are available for critical trauma or medical emergencies. LMH Health provides adult diagnostic, interventional cardiac catheterization, adult and pediatric surgical rooms with post-surgical intensive care, as well as general medical intervention and diagnostic services.

Watkins Health Clinic (KU) - provides medical services to KU Students and is capable of handling minor injuries, illnesses, pharmacy, and x-ray exams.

Haskell Indian Health Center - provides minor medical care and evaluation to the Native American population in the area. As long as there are monies set aside by the Indian Health Service & Bureau of Indian Affairs, medical visits are free of charge to Native American members of a federally recognized Tribe.

Table 16: Top 10 Largest Employers in Douglas County

Top 10 Largest Employers (Douglas County)

University of Kansas (Higher Education)
Lawrence Public Schools (Education)
Maximus (Call Center)
LMH Health (Hospital)
Hallmark Cards (Printer/Publisher)
City of Lawrence (City Government)
Amarr Entrematic (Manufacturer)
Berry Global (Manufacturer)
Baker University (Higher Education)
SS&C Technologies (Data Services)
Douglas County (County Government)

(Information from Lawrence Chamber of Commerce, 2020 U.S. Census, EDC of Lawrence and Douglas County, Kansas Department of Labor, and the U.S. Department of Labor)

B. History of the Agency

Major Historical Milestones of the Department

The department is an organization that emerged in 1997 as a result of combining the Lawrence Fire Department and the Douglas County Ambulance Service.

The Lawrence Fire Department was first organized in 1859 as "Republic Engine Company No. 1." This volunteer fire company was formed after purchasing a steam engine and hose cart from St. Louis, Missouri in the winter of 1858. In 1862, this company was disbanded because of a lack of funds from the city due to the ongoing Civil War. In 1868, after constant persuasion for better fire protection from local business people, the city council created a volunteer fire department deemed the Head Center Hose Company. The initial firehouse, the "old engine room," was a barn at 11th street and Vermont. In 1869, the Head Center Hose Company moved to the Market Building that became City Hall at 8th and Vermont. There has been a station in this location for over 140 years.

In 1915, the Head Center Hose Company became the Lawrence Fire Department, a fully paid department, thus ending the volunteer fire service era in Lawrence.

In the 1950s, the Lawrence Fire Department received an E & J resuscitator from the Sertoma Club of Lawrence and started running "resuscitator calls" in Lawrence when needed, the first venture into the world of Emergency Medical Service (EMS).

Gold Cross Ambulance Service (a private provider) provided medical service to Douglas County until 1974. In 1974, the Douglas County Ambulance Service (DCAS) was established as the first county-provided ambulance service. DCAS provided basic and advanced life support emergency medical care for citizens in Douglas County. DCAS operated two or three ambulances out of two stations providing advanced life support (ALS) services for the entire county.

In 1996, the City of Lawrence entered into an inter-local agreement with Douglas County to merge the existing LFD and the DCAS into one combined agency. This combined agency was named “Lawrence-Douglas County Fire and Medical (LDCFM).”

Today, the department responds to over 14,000 calls out of seven response stations across Douglas County. The department provides all service missions to the city of Lawrence, Grant Township, the University of Kansas, and Haskell Indian Nations University. Emergency medical services are provided to all cities and unincorporated areas within Douglas County.

In 2016, the City of Lawrence attained a fire protection rating class from the Insurance Services Office (ISO) of Class 1 (with 1 being the highest on the 10-point scale). This performance scale measures how a fire department performs against ISO standards, which determines property insurance costs within the community. Higher ISO ratings can lead to lower property insurance premiums within the fire services-covered community.

Current Legal Boundary of Service Area

The department provides all fire suppression services to the city of Lawrence, Grant Township, the University of Kansas, and Haskell Indian Nations University. The city of Lawrence encompasses 34.86 square miles. Additionally, the department provides emergency medical services to all residents within the 475 square miles of Douglas County. This includes Baldwin City, the city of Eudora, and the city of Lecompton.

The department has the capability to request additional resources from the Kansas City Metro Area fire departments. These additional units are available upon request through the normal communications channel. The department is required to request mutual aid through the Douglas County Emergency Communication Center, which then contacts the Johnson County Emergency Communications Center, requesting mutual aid.

Current Organization, Divisions, Programs, and Services

The department is led by the fire chief and directly supported by ten chief officers. The fire chief performs various technical, administrative, and supervisory work in planning, organizing, directing, and implementing fire prevention, suppression, and emergency medical services to prevent or minimize the loss of life and property. This is accomplished through direct supervision of:

- Administrative Division
- Emergency Medical Services Division
- Operations Division
- Prevention Division
- Training Division

The administrative division is managed by the division chief of administration and supported by three civilian administrative personnel. The administrative division is responsible for the following:

- Accounting / Budget / Finance Operations
- Accreditation
- Data Analysis
- Human Resources / Payroll / Performance Management
- Emergency Communications
- Information Technology
- Facilities Management
- Fleet Management
- GIS / Mapping
- Records Systems Management
- Social Media / Website Management
- Standard Operating Procedures Management
- Strategic Planning
- Uniforms and Equipment

The emergency medical services division is managed by the division chief of EMS, who also oversees the medical billing division, supported by three civilian medical claims positions. The EMS division is responsible for numerous functions of the department. The most prominent are:

- Community Relations
- Douglas County EMS 1st Responder Program
- EMD Program
- Employee Wellness Program
- EMS Quality Control
- HIPAA Notice of Privacy Practices
- Marketing
- Medical Billing
- Medical Facility Liaison
- Medical Director Liaison
- Public Information Officer
- Recruitment/ Hiring
- Risk Management
- Special Events
- Infection Control Program

The operations division is made up of six chief officers. They're responsible for the emergency and administrative activities of all members assigned to their shift. The operations division provides the following:

- Emergency Medical Services
- Fire Suppression
- Hazmat
- Prevention
- Technical Rescue Teams
    - Confined Space
    - Mass Casualty
    - Rope Rescue
    - Structural Collapse
    - Water/ Ice Rescue

The prevention division is managed by the division chief of prevention and supported by a captain and lieutenant. The primary goal of the prevention division is to reduce the incidence and severity of preventable injuries and fire loss through public education, code inspections, plan reviews, and fire investigations. The prevention division accomplishes these goals through various activities, which include:

- Building Code Board of Appeals
- Burn Permits
- Commercial Permit Plan Review & Inspections
- Code Consultation
- Code Enforcement
- Company Inspection District Assignments
- Coroner Scene Investigations
- Fire and Life Safety Investigations
- Fire Investigation Bureau
- Home Fire Safety Inspection Program
- KNOX-BOX Security Program
- Night Consultants
- Occupant Services
- Public Education
- Tactical Medic

The training division is managed by the division chief of training and supported by a captain and lieutenant. The goal of the training division is to provide competency-based training for department members, county EMS first responders, and to facilitate public awareness. The training division is responsible for overseeing the following:

- Employee Development/ Training
- Employee Mentoring
- Community Education and Outreach
    - Greek Academy
    - High School Career Day
    - Public Education Programs
    - Public CPR
    - Safety and Hazard House
    - Wheeled Sports Program
    - Youth Firesetter Prevention and Intervention Program
- Douglas County 1st Responder Training
- EMS Preceptor Program
- Explorer Post
- Incident Safety
- Professional Standards
- Promotion Coordination
- Recruit Academy

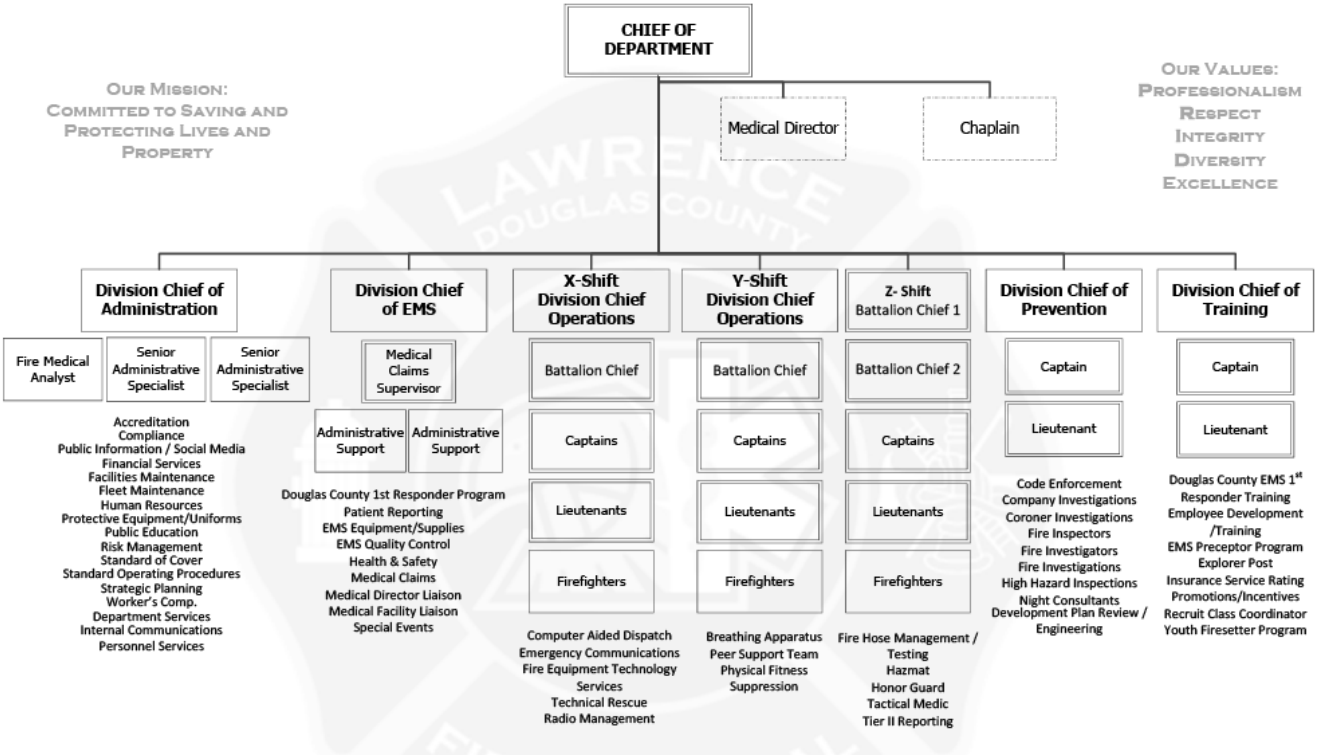


Figure 1: LDCFM Organization Chart (2021)

Fire Medical Stations, Training Facilities, Apparatus, Equipment, and Staffing

The department operates under three 24-hour rotating shifts (X-Shift, Y-Shift, and Z-Shift), each consisting of 2 chief officers, 5 captains, 8 lieutenants, and 29 firefighters.

Each 24-hour shift consists of emergency staff and equipment dispersed throughout the city of Lawrence among five fire medical stations and one station located in Baldwin City (Fire Medical Station 11), approximately 20 miles south and east of Lawrence. The department also staffs one station in the city of Eudora (Fire Medical Station 12), located about 6 miles east of Lawrence. Each of the five stations in Lawrence is comprised of one primary fire apparatus with minimum staffing of one officer, one engineer, and two firefighters. Each of the five stations in Lawrence also houses one medic unit staffed with one officer and one firefighter/paramedic. Fire Medical Station 5 houses an additional rescue unit with one officer, one engineer, and one firefighter. The medic units at Stations 11 and 12 are staffed with one officer and one firefighter/paramedic. The minimum staffing for each shift is 38 personnel, and the maximum scheduled staffing is 43 personnel.

Fire Medical Station 1

746 Kentucky Street, Lawrence, KS, 66044

Fire Medical Station 2

2128 Harper Street, Lawrence, KS, 66049

Fire Medical Station 3

3708 West 6th Street, Lawrence, KS, 66049

Fire Medical Station 4

2121 Wakarusa Drive, Lawrence, KS 66047

Fire Medical Station 5

1911 Stewart Avenue, Lawrence, KS 66046

Fire Medical Station 11

212 Kibbee Street, Baldwin City, KS, 66006

Fire Medical Station 12

930 Main Street, Eudora, KS 66025

Training Center

1941 Haskell Avenue, Lawrence, KS 66046

Investigation Center

1839 Massachusetts Street, Lawrence, KS 66046

The department staffs Stations 1-5, 11, and 12 with the listed apparatus and their required minimum staffing per unit:

Table 17: Apparatus Staffing

Apparatus Name	Apparatus Description	Staffing Requirement
Engine 1 (640)	2019 Pierce Velocity	4 Personnel Minimum
Engine 10 (646)	2010 Pierce Velocity	Secondary
Medic 1 (662)	2021 Ford F-550	2 Personnel Minimum
Medic 10 (667)	2015 Ford F-550	Secondary
Utility 1 (616)	2016 Ford F-350	Support
Quint 2 (649)	2015 Pierce Velocity	4 Personnel Minimum
Quint 20 (642)	2009 Pierce Velocity	Secondary
Medic 2 (664)	2018 Ford F-550	2 Personnel Minimum
Medic 20 (686)	2016 Ford F-550	Secondary
Brush 2 (651)	2006 Ford F-350	Cross-Staffed
Utility 2 (639)	2017 Ford F-350	Support
UTV 2 (657)	2019 Polaris Ranger	Support
Gator 2 - EMS (697)	2004 John Deere Gator	Support
Quint 3 (644)	2013 Pierce Velocity	4 Personnel Minimum
Medic 3 (660)	2019 Ford F-550	2 Personnel Minimum
Medic 30 (668)	2015 Ford F-550	Secondary
Utility 3 (653)	2014 Ford F-350	Support
UTV 3 (661)	2019 Polaris Ranger	Support
Engine 4 (648)	2012 Pierce Velocity	4 Personnel Minimum
Engine 40 (650)	2017 Pierce Velocity	Secondary
Medic 4 (663)	2018 Ford F-550	2 Personnel Minimum
Medic 40 (688)	2016 Ford F-550	Secondary
Brush 4 (652)	2006 Ford F-350	Cross-Staffed
Utility 4 (659)	2007 Ford F-250	Support
Hazmat Support Trailer (6014)	2004 Wells-Cargo	Support
Engine 5 (641)	2022 Pierce Velocity	4 Personnel Minimum
Ladder 5 (654)	2022 Pierce Aerial	3 Personnel Minimum
Quint 50 (643)	2009 Pierce Velocity	Secondary
Medic 5 (684)	2021 Ford F-550	2 Personnel Minimum
Medic 50 (682)	2014 Ford F-550	Secondary
Utility 5 (658)	2007 Ford F-250	Support
Boat 1 (6001)	2005 Rescue One	Support
Boat 2 (6002)	2005 Rescue One	Support
Boat 3 (6003)	2005 Rescue One	Support
Boat 4 (6004)	2009 Mercury	Support
Medic 11 (669)	2015 Ford F-550	2 Personnel Minimum
Medic 12 (688)	2016 Ford F-550	2 Personnel Minimum
Gator 1 - Fire (698)	1998 John Deere Gator	Support
Mass Casualty Trailer (6015)	2008 Pace	Support
Safehouse Trailer (6023)	1998 Scotty	Support
Search & Rescue Trailer (6026)	2012 H&H	Support

C. Current Descriptions of Levels of Service with Delivery Programs

Fire Suppression

The department provides a broad range of responses to structure fires involving single-family dwellings, multi-family dwellings, and high-rise commercial and industrial occupancies. Additionally, high-hazard structures such as institutional facilities, schools, nursing homes, assisted living facilities, and congregate housing (sororities/fraternities). Other fire-related responses involve mobile property such as passenger vehicles, road freight, rail freight, watercraft, recreational vehicles, aircraft, dumpster or rubbish fires, and heavy equipment fires. The department provides contractual services for Grant Township, comprised of agricultural, residential, and some commercial structures.

Emergency Medical Services

The department provides first responder medical care at the basic life support (BLS) and advanced life support (ALS) service levels. Calls for EMS continue to be the dominant emergency type within the city and county. To better serve the citizens within Douglas County, the department now requires all new operations hires to acquire their paramedic certification within the first three years of employment. Medical responses continue to account for approximately 67% of all annual emergency responses managed by the department. All sworn department members are, at a minimum, certified emergency medical technicians (EMTs), while approximately 55 are state and/or nationally certified paramedics. The department provides ALS services utilizing paramedics countywide.

The department provides the best available service within Douglas County due to the overlapping needs of fire, rescue, EMS, member staffing, certifications, and equipment deployment. The department provides seven primary and five secondary ALS ambulances. Each primary unit is staffed by one officer and one firefighter/paramedic. The department's five primary fire apparatus and one rescue truck are full-time ALS units. All primary fire apparatus and the rescue truck are equipped with a full complement of ALS equipment, including cardiac monitors, advanced respiratory equipment, as well as cardiac medications, and intravenous therapy supplies.

EMS includes first response, rescue, treatment, transportation, and reporting for medical emergencies to approximately 9,380 calls per year out of the 14,561 within the city of Lawrence and Douglas County in 2021. Responses to these calls include but are not limited to, cardiac and respiratory emergencies, difficulty breathing, childbirths, cardiac arrests, strokes, and trauma. Medical supervision is provided on shift by an operations chief officer and medical direction provided by the department's medical director. For the majority

of ALS-level EMS calls, the basic response is one medic unit staffed with a paramedic and AEMT, one of which is an officer.

Technical Rescue

The department provides technical rescue services within the city, supports the EMS mission in the county, and provides mutual aid as needed to surrounding areas. The department provides firefighters trained in various aspects of technical rescue to respond to emergencies for confined space, vehicle extrication, trench rescue, structural collapse, high-angle rope rescue, and water/ice rescue. The technical rescue team is based out of Fire Medical Station 5. The department has identified major highways, water towers, utility services, new construction, remodeling of structures, and water/sewer pipe maintenance as potential sites for technical rescue. The department continually performs ongoing evaluations to identify potential technical rescue hazards or sites.

Technical rescue operations generally require specialized training and equipment. Providing sufficient resources to mitigate a protracted or complicated rescue would be difficult for the department. The department, in many instances, would need the support of regional technical rescue teams for complex and time-demanding operations. The technical rescue component of the department is part of Kansas Task Force 2. Kansas Task Force 2 is a regional response team for the northeast region of Kansas, managed by the Kansas Department of Emergency Management (KDEM). The often complex and dangerous nature of a technical rescue requires that responders be both highly trained and rapidly deployable.

Hazardous Materials

The department is staffed and equipped to respond to county-wide hazardous materials (hazmat) incidents. Hazmat operations are based out of Fire Medical Station 4. Engine 4 is staffed with an officer, an engineer, and two firefighters. Engine 4 is a dual-purpose unit with specialized hazardous materials response equipment and fire suppression capabilities. Medic 4 is staffed with one officer and one paramedic/firefighter. Fire Medical Station 4 also houses a hazmat trailer that responds in tandem to incidents that require more resources which enhances capabilities. The department currently maintains approximately 43 members trained to National Fire Protection Association 472 (NFPA 472) standard: *Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*. The remaining members are trained to the hazardous materials operations level. Hazmat technicians are dispersed throughout the department to offer a higher-level initial response to hazmat incidents.

The department is the primary agency within Douglas County to respond to hazmat incidents and receives mutual aid from Johnson County (approximately 35 miles to the east). The agency is responsible for offensive and defensive operations; however, the department does not collect or dispose of any hazardous materials.

Wildland Fire Services

The department provides wildland/grass fire suppression services within the city and Grant Township while also providing mutual aid to surrounding areas. This program is developing within the department as the need to mitigate these incidents within the covered area increases each year. Currently, the department is working on developing a dedicated budget for this program to allow for the expansion that will include updated/needed wildland fire mitigation equipment and personnel training. The department has identified the need for this program and a more standardized process to ensure response effectiveness and efficiency. The department currently utilizes two brush trucks, one located at Fire Medical Station 2 and the other at Fire Medical Station 4. These brush trucks are staffed by cross-trained members and are deployed along with Engine 40 to mitigate wildland fire incidents.

Specialized Services

The department has been progressive over the years and continues to be progressive in its efforts to serve the citizens of Lawrence and Douglas County. Within the department are several incentive positions for members to expand their career choices. Incentive positions include fire investigator, coroner scene investigator (CSI), and tactical medic.

Fire Investigations

The division chief of prevention is designated by the fire chief as the fire marshal for the City of Lawrence. A captain within the prevention division oversees the activities of the six certified fire investigators: two per shift. Fire investigators meet the State of Kansas' requirements to be certified as a Fire Investigator II.

The fire investigator position is an incentive position designed to determine the origin and cause of all fires within the city of Lawrence and Grant Township. The fire investigator collects evidence, prepares legal documents for case presentation in the court of law, and maintains powers of arrest through the State of Kansas Office of the Fire Marshal, with a State of Kansas Fire Investigator II certification.

Coroners Scene Investigator

The division chief of prevention is designated by the fire chief as the CSI program manager for Douglas County. A lieutenant within the prevention division oversees the activities of the six certified investigators: two per shift. Investigators meet the requirements of the American Board of Medicolegal Death Investigators (ABMDI).

The CSI position is an incentive position designed to assist the coroner with information gathering at the scene that will aid in the final determination as to the cause and manner of death of individuals within Douglas County. Department standard operating procedures (SOPs) guide the performance of investigations. Forensic Medical, a local medical examiner, receives, evaluates, and stores investigation documents.

In 2022, the department will no longer provide CSI services and will transition this responsibility solely to Douglas County.

Tactical Medic

A division chief of operations is designated by the fire chief as the program manager for the Tactical Medic Program. The program manager oversees the activities of the six tactical medics (two per shift) and is the

department liaison for the Crisis Response Team within the Lawrence Police Department (LPD). The department's tactical medics meet the Tactical Medical Emergency Support (TEMS) requirements.

Tactical medic is an incentive position designed to assist the LPD and Douglas County Sheriff's Office (DCSO) by providing medical assistance at the scene of high-risk warrant service, hostage situations, and other law enforcement activities where the increased potential of law enforcement officer injury is possible. The tactical medics are trained to the State of Kansas AEMT or paramedic level with specialized training in treating traumatic/penetrating injuries, wound care, and airway management.

Community Safety and Remediation Programs

The department is committed to reducing the incidence and severity of fire loss through public education, code inspection, plan reviews, and investigations. The city currently has adopted the 2018 International Fire Code and has amended it as contained in Chapter 8, Article 2 of the Code of the City of Lawrence. Additional programs include building plan reviews, multi-family residence fire inspections, and night-time public assembly inspections (night consultants).

Public Education

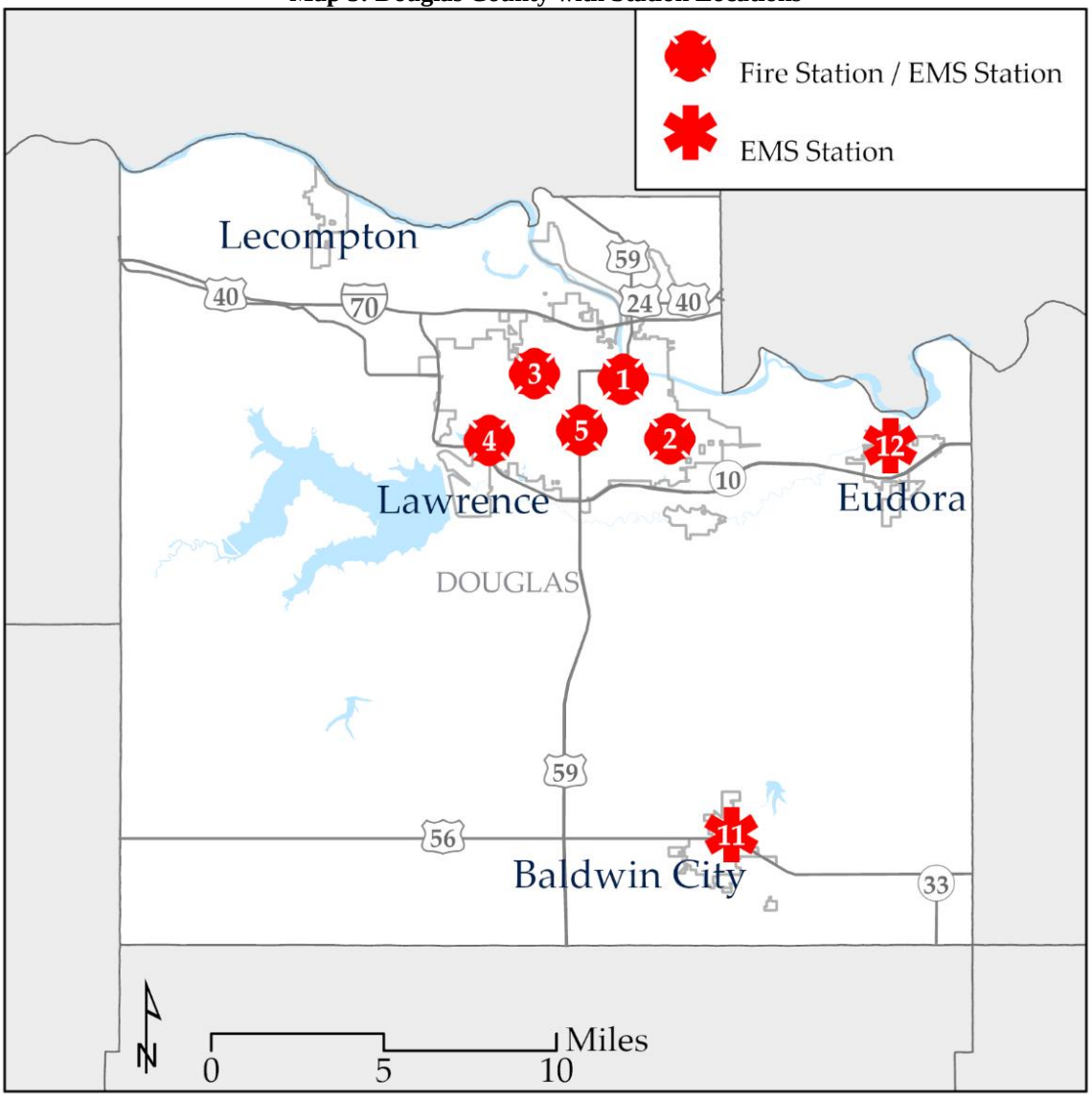
The training division oversees the department's public education program. The training division chief is responsible for the overall coordination of all aspects of the department's education mission by increasing public awareness of the potential hazards they face and how they can combat them with proper knowledge and life safety awareness. Community education and outreach programs include Greek Academy, High School Career Day, Public CPR classes, Safety and Hazard House, Wheeled Sports Program, and Youth Firesetter Prevention and Intervention Program. Teaching the various programs is handled by on- and off-duty personnel. Six public education specialists (two on each shift) provide for the delivery of the program and work with the shift personnel to deliver the public education program.

In 2020, the Public Education Program had to re-evaluate and re-design the means of how education was facilitated and communicated. The impacts and restrictions that the COVID-19 pandemic created led to innovation and the use of virtual public education events. The department created personalized educational videos that were then shared to the public via online outlets such as Facebook.

D. Current Deployment and Coverage Areas

Points of Service Delivery

Map 3: Douglas County with Station Locations

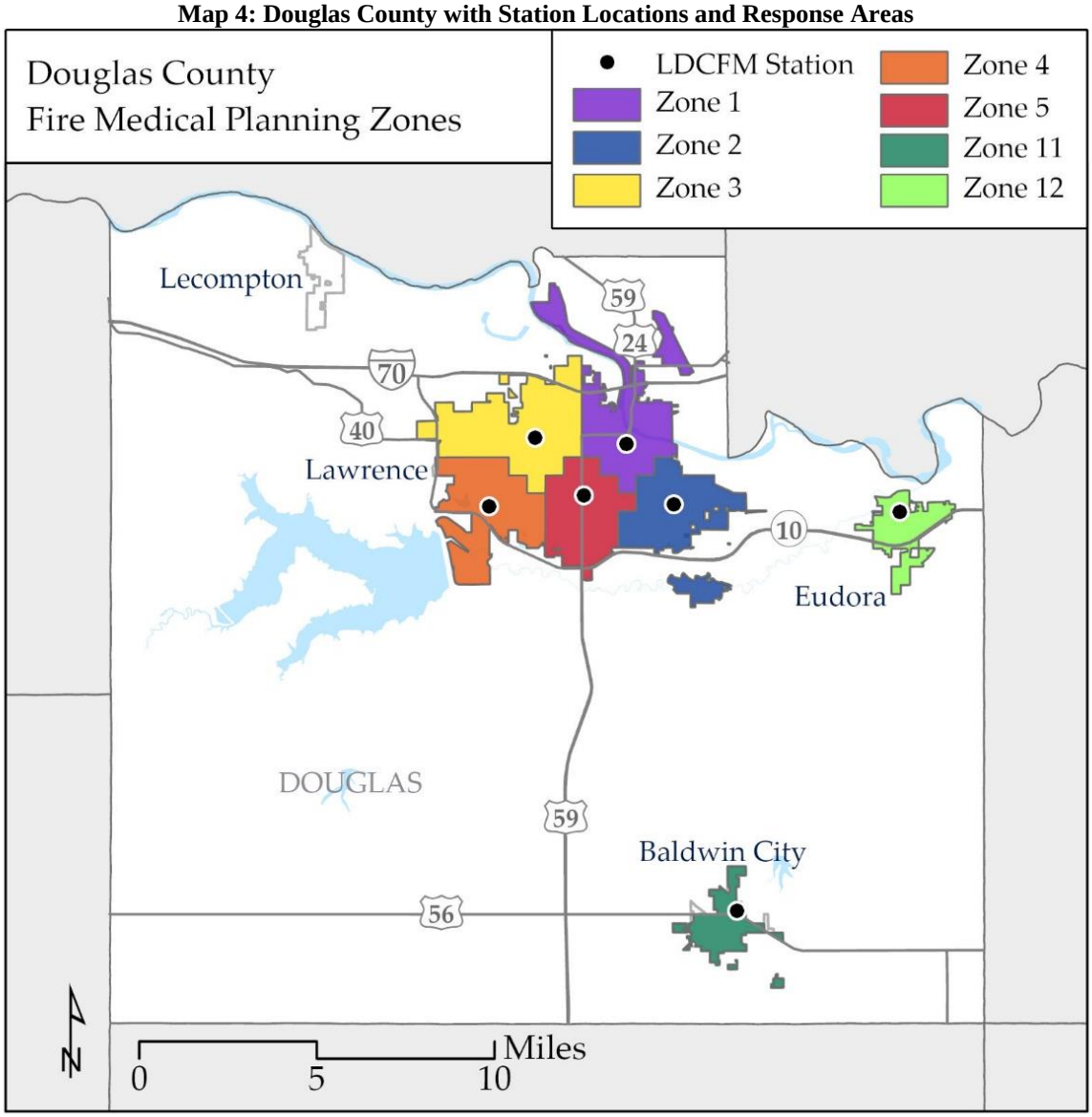


Minimum Deployment Resources

This information can be found in the Fire Medical Stations, Training Facilities, Apparatus, Equipment, and Staffing section.

Response Areas

Map 4: Douglas County with Station Locations and Response Areas



The department's fire suppression response area includes the city limits of Lawrence and the limits defined in agreement with Grant Township. However, the department has written mutual aid agreements with all fire service agencies within the county. Additionally, response plans are crafted to provide the fastest and most effective response to emergencies that happen within the county. Examples are coverages of I-70, K10 Highway, and 59 Highway.

The department provides a primary response within Douglas County for EMS and hazardous materials incidents covering approximately 475 square miles of land and approximately 521 lane miles of bituminous surfaced roads, and 519.94 miles of gravel-surfaced roads. Many areas of Douglas County, outside the city of Lawrence, are protected by other local emergency first responders for the primary response.

E. Summary of Community Response History

Table 18: Number of Incidents by Year (2017-2021)

Incident Type	2017	2018	2019	2020	2021
Fire (100 Series)	238	243	191	242	259
Overpressure Rupture, Explosion, Overheat – No Fire (200 Series)	19	10	12	19	8
Rescue & EMS (300 Series)	8,802	9,089	8,781	8,624	9,380
Hazardous Condition – No Fire (400 Series)	286	263	327	255	318
Service Call (500 Series)	811	977	937	1,026	1,201
Canceled / Good Intent (600 Series)	923	1,174	1,227	1,101	1,766
False Alarm (700 Series)	1,213	1,340	1,328	1,173	1,467
Severe Weather & Natural Disaster (800 Series)	7	0	4	1	2
Special Incident Type (900 Series)	237	198	199	218	159
Total Incidents	**12,536**	**13,294**	**13,006**	**12,659**	**14,560**

* Information provided from *FIREHOUSE* Software®, record management system (RMS), and *ESO Solutions*, Inc., record management system. *

Table 19: Program Activity Summaries (2017-2021)

Program	2017	2018	2019	2020	2021
Public Education Events	73	82	85	17	45
Fire Inspections	6,207	6,207	6,441	6,200	4,247
Fire Investigations	238	243	191	242	259
Training Hours	30,563	54,172	50,845	56,239	50,437

* Information provided from *ESO Solutions,* Inc., record management system, and *Vector Solutions*, training management system. *


T5

F. Community Priorities, Expectations, and Performance Goals

Mission Statement

During the 2021 Strategic Plan work sessions, the mission statement "Committed to Saving and Protecting Lives and Property" was reviewed. The department decided to make minor changes to the statement. The newly adopted mission statement is as follows:

We are committed to saving and protecting lives and property through service to our community.

Community Service Priorities

It was communicated to the stakeholders that different coverage areas are provided different programs and services. Those coverage areas are based on whether the person lives or has a business in the city of Lawrence proper, Grant Township, or the Douglas County area. With that, the community stakeholders were asked to prioritize the programs offered by the department through a process of direct comparison. The results were as follows:

Table 20: Service Program Priorities as Identified by the Lawrence City Community Stakeholders

PROGRAMS	RANKING	SCORE
Emergency Medical Services	1	165
Fire Suppression	2	127
Technical Rescue	3	109
Tactical Medic	4	107
Hazardous Materials Mitigation	5	83
Prevention	6	79
Public Fire & Life Safety Education	7	61
Public Information and Engagement	8	47
Fire Investigation	9	35

Table 21: Service Program Priorities as Identified by the Grant Township Community Stakeholders

PROGRAMS	RANKING	SCORE
Fire Suppression	1	6
Emergency Medical Services	2	5
Technical Rescue	3	4
Hazardous Materials Mitigation	4	3
Public Information and Engagement	5	2
Public Fire & Life Safety Education	6	1
Tactical Medic	7	0

Table 22: Service Program Priorities as Identified by the Douglas County Community Stakeholders

PROGRAMS	RANKING	SCORE
Emergency Medical Services	1	60
Technical Rescue	2	42
Hazardous Materials Mitigation	3	41
Tactical Medic	4	22
Public Fire & Life Safety Education	5	15
Public Information and Engagement	5	15

Community Service Expectations

To ensure that community needs were incorporated in the planning process of the fire department, a facilitated community-driven strategic planning process was initiated by the department. Community stakeholder meetings took place virtually in August and September 2021. The participants in the external stakeholder meeting provided a total of 33 expectations of the department and its members. Additional expectations are documented in the 2021-2026 Strategic Plan; listed below are the top 10 verbatim:

1. Show up quickly when called. Respond and provide emergency service in a timely manner. Respond rapidly to calls for assistance. That fire of medical will respond in a timely manner. Prompt response to calls for service. Respond quickly to fire and/or medical emergencies. Will respond in a timely and appropriate manner. Timely response. Arrive in a timely manner. Quick response time for fire and medical calls. Response times to emergencies are reasonable. Respond quickly to fire or medical emergency. Prompt response to emergency calls. Answer promptly to emergencies. quick response times. Timely response. Quick response to fires and/or medical emergencies. Response time will be adequate to save lives and/or reduce negative outcomes. On time assistance for medical calls. Quick response times (not a fire station on every corner, more EMS components in the system). Fast response times to critical calls for service. To respond swiftly to emergency situations. (108)
2. Staff is trained properly for the emergency at hand. Ensure techniques and training are contemporary. Technical expertise. Well-trained, professional staff. Well-trained personnel in fire medical procedures. Adequate and sustained training. Well-trained responders. Staffed by professionals who are well trained and paid accordingly. Training - keeping up with the latest information, equipment. High level of expertise (technical and relational). Skilled fire/medical staff who address emergencies professionally. Knowledge/experience how to handle the situation. Ability to administer lifesaving services on site. First responders will be qualified and trained according to the best standards. Towering competence - always gained by strong training programs. Maintain high training standards. Staff are adequately trained to respond to calls for service. (65)
3. Provide highest quality service and customer care. Responsiveness. Excellent fire suppression and medical response in service area. That fire or medical will respond when there is an emergency. Will protect its community, people, resources, and culture. Respond to fire and medical situations. Public safety - EMS, fire protection, etc. Effective response. The delivery of quality fire and medical services to the citizenry. (41)
4. Be nice! Integrity. Treat all community members respectfully. Open to cultural differences if responding to medical. Be open and friendly. Just treatment of all people, regardless of race, gender, sexuality, age, and class. Kindness. Treat patients as you would want to be treated. Compassionate fire/medical staff who do their best to support the dignity of those they help. Be attentive to special needs. First responders will perform their duties free of biases. Be kind. (32)
5. Have the equipment to do the job. Possess equipment necessary to provide fire/medical. Have current equipment and training. The equipment whether vehicles, computers or other are well maintained and ready for service. Maintain/properly functioning equipment. Will have the appropriate and updated equipment required to perform fire and medical service. State-of-the-art equipment and processes. (22)
6. Educate the general public about ways they can avoid risks related to fire events. First aid FAQ. Basic community training. Will work to educate the community about issues that affect safety. Educational

outreach to all. Be active in educating community with fire detectors, first aid/CPR, and enforcing fire codes. Community education outreach to prevent emergencies. Education and training to the public. Strong public education and prevention programs-less focus on operations. Community education beginning in elementary school. (17)

7. Work well with all partners agencies in the county region. Cooperation and leadership with other county fire/medical agencies. Will support LPD and Douglas County Sheriff where appropriate. Collaboration. Work with all other fire agencies in the county to improve services for all of Douglas County. (16)
8. Highly effective communication. Ability to communicate with other community emergency services rapidly. That the fire/medical response team communicate their arrival/departure and progress and be available for follow-up questions or information. Communication with residents, citizens. The ability to obtain the maximum amount of information of facilities or homes prior to arrival on the scene. (15)
9. Deliver fire mitigation services in an efficient and safe manner in all necessary events. Fire safety. Fire suppression. (14)
10. Prevention. Courteous and thorough safety inspections. Prevention plans. Prevention. Ensure that fire prevention standards are upheld across the community. (13)

Historical Performance Goals

Based on the assessed risk, the department has a standard for the delivery of services. These services are based on many factors and have served to develop what is considered as an acceptable level of risk.

The department has had a long-standing history of established response time goals. The previous performance level goals were published in the 2017 Standards of Cover document. These goals were originally derived more from an expectation and assumption rather than as a measurable fact. The effective service area of each station is the area that is accessible by fire units within four minutes driving time, taking into account street patterns, terrain, and traffic arrangement of stations as factors that impact response and station location. The following represents historical performance goals, based on the previous edition of the adopted standards of cover.

2017 Standards of Cover

The department's structure fire benchmark service level objectives are as follows:

Distribution / First unit to stop loss

For 90 percent of all **low-fire responses**, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total, shall be: 6 minutes and 30 seconds within urban areas and 12 minutes and 30 seconds in rural areas. The first arriving unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **moderate-risk fire responses**, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total, shall be: 6 minutes and 30 seconds within urban areas and 12 minutes and 30 seconds in rural areas. The first arriving unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **high-risk fire responses**, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total, shall be: 6 minutes and 30 seconds within urban areas and 12 minutes and 30 seconds in rural areas. The first arriving unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations shall be performed utilizing safe operational procedures.

Concentration / Effective Response Force

For 90 percent of all **low-risk fire responses**, the total response time for the arrival of the effective response unit (ERF), with a minimum of 3 firefighters and 1 officer, (4) total, shall be: 6 minutes and 30 seconds within urban areas and 12 minutes and 30 seconds in rural areas. The first arriving unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **moderate-risk fire responses**, the total response time for the arrival of the effective response force (ERF), with a minimum of 7 firefighters and 3 officers; (10) total, shall be: 10 minutes and 30 seconds within urban areas and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; providing a water supply; advancing an attack line and a backup line for fire control; complying with the requirements of two in-two out; searching and rescuing at-risk victims. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **high-risk fire responses**, the total response time for the arrival of the effective response force (ERF), with a minimum of 10 firefighters and 6 officers; (16) total, shall be: 10 minutes and 30 seconds within urban areas and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; safety; providing an uninterrupted water supply or rural water operation; advancing an attack line and a backup line for fire control; complying with the requirements of two in-two out; establishing a rapid intervention team; completing forcible entry; searching and rescuing at-risk victims; evacuation; ventilating; exposure protection; controlling utilities; and performing salvage and overhaul. These operations shall be performed utilizing safe operational procedures.

The department's EMS benchmark service level objectives are as follows:

Distribution / First unit to stop loss

For 90 percent of **low-risk emergency medical incidents**, the total response time for the arrival of the first-due unit, with a minimum of 1 Advanced Emergency Medical Technician (AEMT); (1) total, shall be: 6 minutes and 30 seconds in urban areas, and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations shall be performed utilizing safe operational procedures.

For 90 percent of **moderate-risk emergency medical incidents**, the total response time for the arrival of the first-due unit, with a minimum of 1 AEMT; (1) total, shall be: 6 minutes and 30 seconds in urban areas, and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations shall be performed utilizing safe operational procedures.

For 90 percent of **high-risk emergency medical incidents**, the total response time for the arrival of the first-due unit, with a minimum of 1 AEMT; (1) total, shall be: 6 minutes and 30 seconds in urban areas, and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations shall be performed utilizing safe operational procedures.

For 90 percent of **maximum-risk emergency medical incidents**, the total response time for the arrival of the first-due unit, with a minimum of 1 AEMT; (1) total, shall be: 6 minutes and 30 seconds in urban areas, and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations shall be performed utilizing safe operational procedures.

Concentration / Effective Response Force

For 90 percent of **low-risk emergency medical incidents**, the total response time for the arrival of the effective response force, with a minimum of 1 paramedic and 1 AEMT; (2) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; conducting initial patient assessment; obtaining vitals and patient's medical history; performing cardiopulmonary resuscitation; and utilizing an automatic external defibrillator. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **moderate-risk emergency medical incidents**, the total response time for the arrival of the ERF (ALS unit), with a minimum of 1 paramedic and 1 AEMT; (2) total, shall be: 10 minutes and 30 seconds in urban areas, and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and equipment packaging for transport; and transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **high-risk emergency medical incidents**, the total response time for the arrival of the ERF (ALS unit), with a minimum of 1 paramedic, and 2 AEMTs; (3) total, shall be: 10 minutes and 30 seconds in urban areas, and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; communicating with family or other witnesses; scene documentation; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and equipment packaging for transport; and transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **maximum-risk emergency medical incidents**, the total response time for the arrival of the ERF (ALS unit), with a minimum of 2 paramedics and 2 AEMTs; (4) total, shall be: 10 minutes and 30 seconds in urban areas, and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; communicating with family or other witnesses; scene documentation; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and equipment packaging for transport; and transportation of multiple patients to the hospital. These operations shall be performed utilizing safe operational procedures.

The department's hazardous materials benchmark service level objectives are as follows:

Distribution / First unit to stop loss

For 90 percent of all **low-risk hazardous materials response incidents**, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total; shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **moderate-risk hazardous materials response incidents**, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total; shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **high-risk hazardous materials response incidents**, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total; shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

Concentration / Effective Response Force

For 90 percent of all **low-risk hazardous materials response incidents**, the total response time for the arrival of the effective response force (ERF), with a minimum of 3 firefighters and 1 officer, (4) total; shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The effective response force shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **moderate-risk hazardous materials response incidents**, the total response time for the arrival of the effective response force (ERF), with a minimum of 4 firefighters and 2 officers, (6) total; shall be: 6 minutes and 30 seconds in urban areas and 18 minutes and 30 seconds in rural areas. The effective response force shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; providing a hose line for protection; providing advanced medical care; transporting the patient to the hospital; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **high-risk hazardous materials response incidents**, the total response time for the arrival of the effective response force (ERF), with a minimum of 10 firefighters and 6 officers, (16) total, 4 being hazardous materials technicians; shall be: 6 minutes and 30 seconds in urban areas and 18 minutes and 30 seconds in rural areas. The effective response force shall be capable of: establishing command; performing an initial scene assessment; establishing a hazard zone; establishing a hazmat group; performing research; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; performing technical decontamination; providing a hose line for fire protection; providing

advanced medical care; transporting the patient to the hospital; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

The department's technical rescue benchmark service level objectives are as follows:

Distribution / First unit to stop loss

For 90 percent of all **low, moderate, high, and maximum risk technical rescue incidents**, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, shall be: 6 minutes and 30 seconds in urban areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; these operations shall be performed utilizing safe operational procedures.

For 90 percent of all **moderate-risk technical rescue incidents**, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, shall be: 10 minutes and 30 seconds in urban areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; these operations shall be performed utilizing safe operational procedures.

For 90 percent of all **high-risk technical rescue incidents**, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, shall be: 10 minutes and 30 seconds in urban areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; these operations shall be performed utilizing safe operational procedures.

For 90 percent of all **maximum-risk technical rescue incidents**, the total response time for the arrival of the first due unit, with a minimum of 2 firefighter and 1 officer; (3) total, shall be: 10 minutes and 30 seconds in urban areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; these operations shall be performed utilizing safe operational procedures.

Concentration / Effective Response Force

For 90 percent of all **low-risk technical rescue incidents**, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, shall be: 6 minutes and 30 seconds in urban areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; these operations shall be performed utilizing safe operational procedures.

For 90 percent of all **moderate-risk technical rescue incidents**, the total response time for the arrival of the first due unit, with a minimum of 4 firefighters and 2 officers; (6) total, shall be: 10 minutes and 30 seconds in urban areas. The effective response force shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; providing patient care; providing transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **high-risk technical rescue incidents**, the total response time for the arrival of the first due unit, with a minimum of 6 firefighters and 4 officers; (10) total, shall be: 10 minutes and 30 seconds in urban areas. The effective response force shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; performing mechanical

extrication; providing patient care; providing transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all **maximum-risk technical rescue incidents**, the total response time for the arrival of the first due unit, with a minimum of 10 firefighters and 6 officers; 4 being technician level rescuers; (16) total, shall be: 10 minutes and 30 seconds in urban areas. The effective response force shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; performing mechanical extrication; performing air-quality analysis; performing a confined space rescue; performing a trench rescue; performing a water/ice rescue; performing a high angle rescue; providing patient care; providing transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

G. Community Risk Assessment and Risk Levels

Risk Assessment Methodology

A community risk assessment, according to the Center for Public Safety Excellence (CPSE), is the evaluation of the community's fire and non-fire hazards and threats, taking into account all pertinent facts that increase or decrease risk to define standards of cover (SOC). The CPSE defines risk as "the exposure or chance of injury or loss." When designing the appropriate community risk assessment model, the department understands there must be a combination of objective and subjective criteria to guide the development of department programs. The methodology must produce results generally reflective of what the organization believes to be the true risk in the community.

The department utilizes a three-axis methodology considering three separate dimensions to calculate a measure of risk: probability, consequence to the community, and agency impact. The three-axis methodology analyzes types of risk by program classification (fire, emergency medical services, technical rescue, and hazardous materials). The three-axis methodology is applied by assigning a score for the three risk dimensions. When the risk dimension scores are inserted into Heron's Formula Modified for Tetrahedrons, a risk calculation is quantified and represented visually in the surface area of the triangle. This standardized approach allows the department to identify the severity of risk, by risk category, in each risk class through the stratification of risk scores.

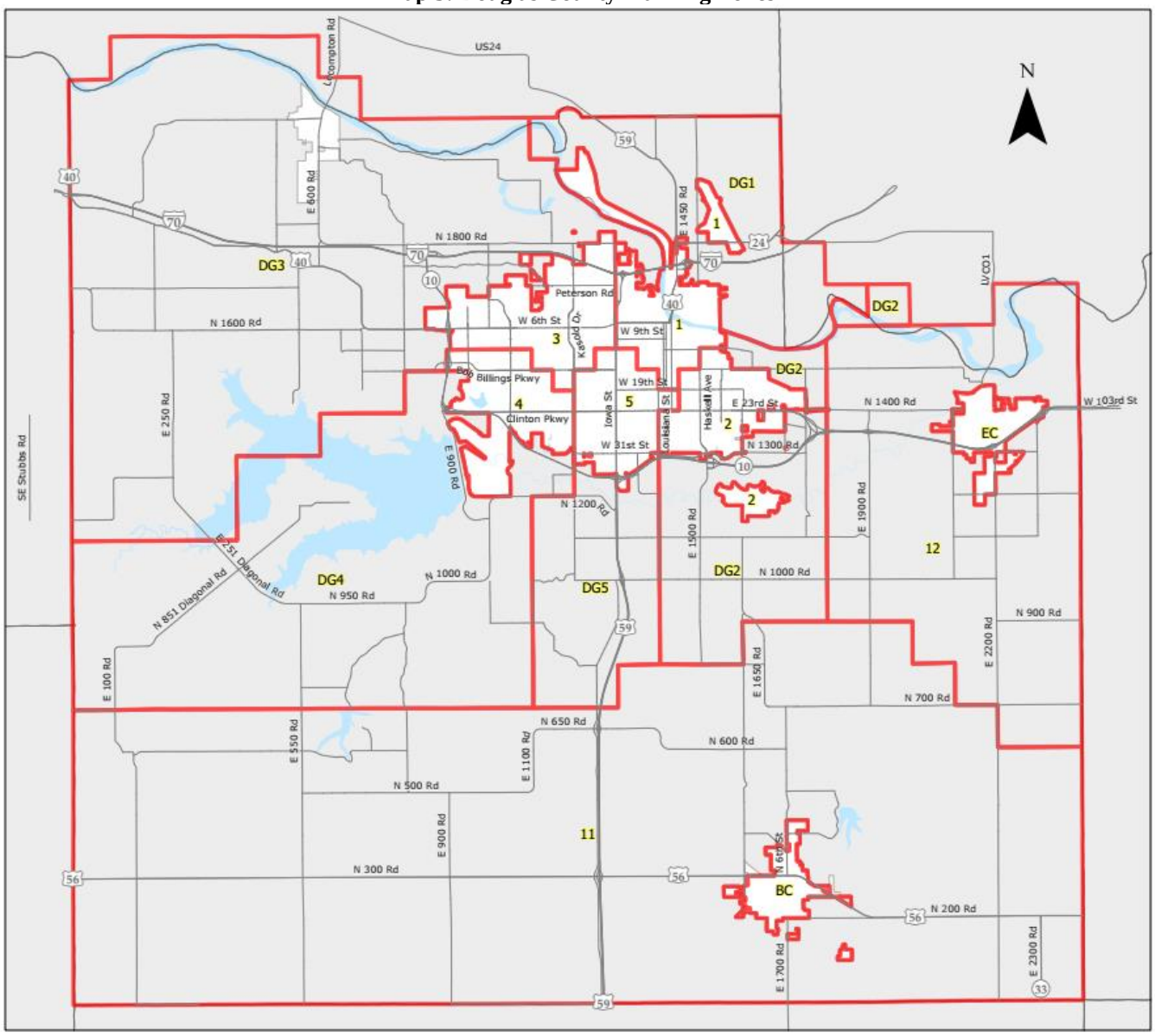
Geographical Planning Areas/Zones

The department has identified 14 station response areas in which to analyze risk as well as service levels. There are five planning zones within the city of Lawrence and nine outside the city boundary within the county. Each planning zone can be then further divided into smaller zones referred to as map references. Map references in outlying (outside the city of Lawrence) planning zones are one square mile. Map references inside the city of Lawrence are one-quarter square mile.

The department has further categorized the 14 planning zones into urban and rural density zones. Seven zones are determined as urban population density, and seven zones are rural population density.

The department began using automatic vehicle locators (AVL) in 2015 in its computer-aided dispatch (CAD) system. The CAD uses an AVL system to track the location of units using a global positioning system (GPS) receiver. AVL allows the Emergency Communications Center to utilize information from GPS to recommend units based on their current location and proximity to the incident. The GPS system allows the dispatcher to view live interactive maps with all the units and their status.

Map 5: Douglas County Planning Zones



Methodology (Probability/Consequence/Impact of Event Risk)

Three-Axis Model

The three-axis methodology operates by assigning each response a score for the three risk areas: probability, community consequence, and agency impact. In the model, a score in each risk area is expressed as a point on the axis. Each axis is scored on a scale of 2 to 10 (even numbers) where a 2 indicates a low risk and 10 is a high-risk score. CFAI defines risk as "the program classification type and category degree of potential danger and/or peril of injury of loss." The three-axial methodology established a process of evaluating risk through a systematic approach that assesses the all-hazards risks in the service area.

Scores for the risk areas are inserted into Heron's Formula Modified for Tetrahedrons to calculate the risk score. Heron's formula computes the area of a tetrahedron represented as a risk score. The stratification of risk scores in each risk classification determines a risk category based on the degree (low, moderate, high, or maximum). The risk category, or level, helps define the relationship between community requirements and

commitment or resources. The risk-based response provides logic and a rational strategy for company deployment.

Heron's Formula modified for tetrahedrons:

$$Risk\ Score = \sqrt{\frac{(PC)^2}{2} + \frac{(CI)^2}{2} + \frac{(IP)^2}{2}}$$

P = Probability (Y axis)
C = Consequence to the community (X axis)
I = Impact on the agency in drawdown vulnerability (Z axis)

Figure 2: Heron's Formula

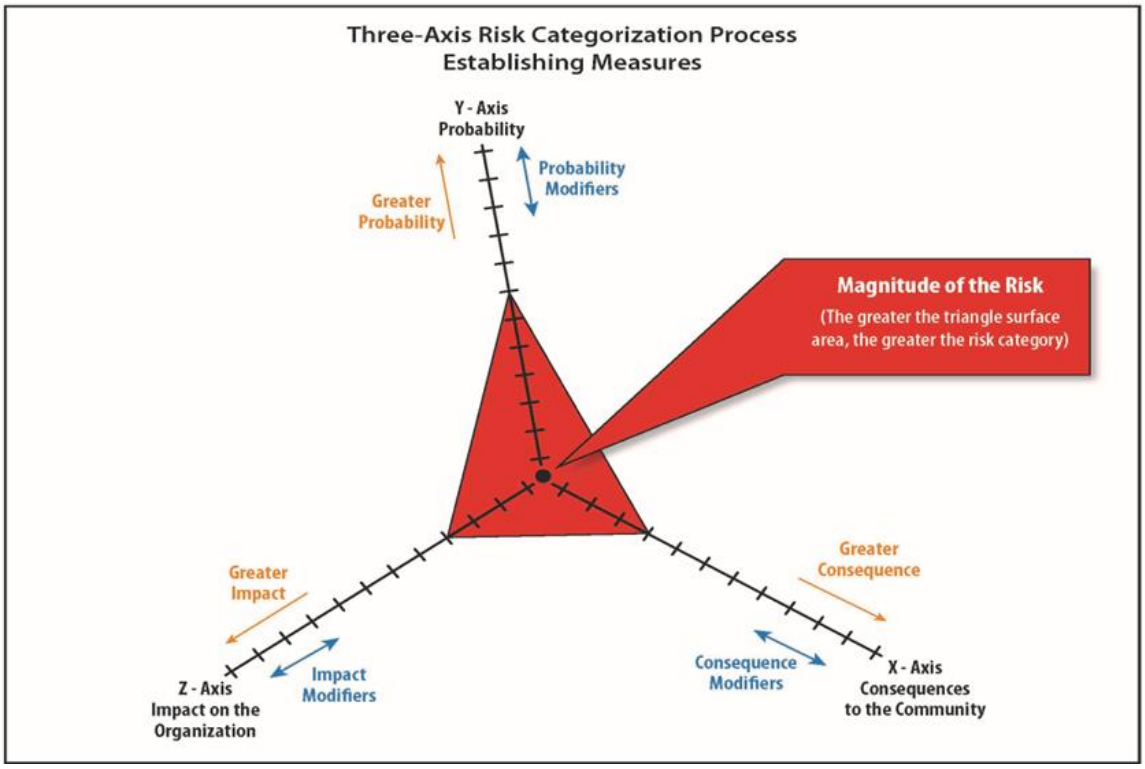


Figure 3: Three-Axis Categorization Process

The magnitude of the risk is determined by the greater the total area of mass, the greater the risk category level. For example, a tetrahedron with a greater mass will translate to a higher category of risk level than a tetrahedron with a smaller mass.

Y Axis: *Probability*

Assessing probability for an incident type is defined by CPSE as "measuring the likelihood an emergency situation will occur in a given period." The department calculated probability by determining the average annual incidents for each response over a five-year period from 2017- 2021. Based on historical call data, the more likely an incident type will occur, the higher the risk score assigned to the incident type (2- low probability, 10-very high probability).

X Axis: *Community Consequence*

Community consequence is defined by CPSE as "the study of what is the impact magnitude or expected loss that will be experienced by the response area, community, and residents of the area." It is the significance of the actual loss to the community. Factors to consider are potential economic loss, property loss, historical importance, and life loss/injury. Community consequence is scored on a scale of 2 to 10 (even numbers), with 2 indicating low community consequence and 10 indicating high community consequence.

Z Axis: *Agency Impact*

Agency impact is defined by CPSE as "the drain effect on the community's standard of deployment and coverage capacity when an emergency event occurs." Impact of an incident type is calculated by evaluating the number of agency resources utilized for the emergency event based on the established critical tasks. Residual coverage effect refers to the reserve capacity for area protection, deployment and/or coverage. Agency impact is scored on a scale of 2 to 10 (even numbers), with 2 indicating low agency impact and 10 indicating high agency impact.

All emergency incident types were reviewed and discussed for each program classification Utilizing the risk assessment criteria for calculating probability, community consequence, and agency impact, the values used for Heron's Formula for each incident type were determined by the members of the SOC team and executive team. The SOC team consists of individuals from all levels of the organization: the fire chief, two operations chiefs, two captains, five lieutenants, one acting officer, and the accreditation manager. An officer from IAFF Local 1596 was included in the group as well. This group represented a diverse set of skills and years of fire service experience. Based on the established risk assessment methodology, the members assign values for each axis. The risk scoring process allowed the incident types to fall into levels of low, moderate, high, and maximum risk.

Risk classes (low, moderate, high, and maximum) correlate with increased incident complexity and the threat to the community and responders. Low risk event types are generally handled with one response unit, an ambulance or suppression unit, depending on the risk category. Moderate events and higher-level risk classifications (high and maximum) require more resources to complete the required critical tasks to mitigate the emergency. These higher-risk (high and maximum) incidents pose a significant potential for life and property loss, and utilize multiple response units, including suppression units, ambulances, and chief officers.

Risk Assessment

Fire Suppression Services

The area included in the city limits of Lawrence and Grant Township was assessed to evaluate the community's fire risks. Three primary components were utilized as part of the evaluation, as described below.

Y Axis

Probability: Measuring the likelihood an emergency situation will occur in a given period. Probability is calculated by determining the average annual incidents over a five-year period, 2017-2021. Based on historical data, the more likely an incident type will occur, the higher the risk score.

Table 23: Fire Suppression Probability Risk Scoring

Risk Score	2	4	6	8	10
Average Annual Incidents (2017-2021)	0-500	501-1000	1001-1600	1601-2000	>2000

X Axis

Community Consequence: The study of the impact importance or expected loss that will be experienced by the response area, community, and residents of the area. It is the significance of the actual loss to the community.

Community consequence for fire incidents is determined by potential economic loss and life loss/injury. Potential life loss or injury from fire is a greater risk if it is either in a place of employment or sleeping area/home. While a fire incident at a place of employment is a risk, usually people are alert and able to avoid serious injury. Businesses are more likely to be inspected annually and have fire protection systems installed. Residential areas pose a great potential for life loss/injury because there are sleeping areas that may be difficult to escape. According to the United State Fire Administration (USFA), from 2016 to 2020, civilian fire fatalities in residential buildings accounted for 96 percent of all fire fatalities. Additionally, USFA states that in the same period, 82 percent of fire-related firefighter injuries reported to NFIRS were associated with structure fires. Three times as many firefighter injuries occurred in residential structures as in nonresidential structures.

Considerations when determining the Fire Consequence Scoring:

- Structure or non-structure fire
- The state of the fire relative to fire growth
- The size of the object on fire and or associated contents

Z Axis

Agency Impact: Impact measures the drain effect on the community's standard of deployment and coverage capacity when an emergency event occurs. The more resources needed for a response, the fewer residual resources available in the system to respond to emergencies. Agency resources are based on the critical tasks of the incident type. The number of people needed to complete an ERF is used to calculate the risk score. The more resources needed for a response, the fewer residual resources available in the system to respond to emergencies.

Table 24: Fire Suppression Impact Risk Scoring

Risk Score	2	4	6	8	10
Number of people based on Response Matrix	1-2 people	3-4 people	5-11 people	12-18 people	>19 people

Table 25: Fire Suppression Incident Type Risk Score and Category

Call Nature	Risk Class	Risk Category	Probability	Consequence	Impact	Total Risk Scoring
Structure Fire LVL 1	Fire	High	2	10	10	73.4847
Grant Township Structure Fire LVL 1	Fire	High	2	10	10	73.4847
Structure Fire 2017	Fire	High	2	10	10	73.4847
Aircraft Emergency	Fire	High	2	10	8	59.3970
Alarm/Fire LVL 1	Fire	Moderate	2	8	8	48.0000
Grant Township Structure Fire LVL 2	Fire	Moderate	2	6	8	36.7696
Structure Fire LVL 2	Fire	Moderate	2	6	8	36.7696
Semi Fire	Fire	Moderate	2	8	6	36.7696
Semi Fire (un-incorporated)	Fire	Moderate	2	8	6	36.7696
Alarm/Fire LVL 2	Fire	Low	4	2	4	13.8564
Alarm Fire 2017	Fire	Low	4	2	4	13.8564
Lift Assist	Fire	Low	4	2	4	13.8564
Grass Fire Grant Township	Fire	Low	2	2	6	12.3288
Structure Fire LVL 3	Fire	Low	2	2	6	12.3288
Grant Township Structure Fire LVL 3	Fire	Low	2	2	6	12.3288
Arcing Line	Fire	Low	2	2	4	8.4853
Car Fire	Fire	Low	2	2	4	8.4853
Dumpster Fire	Fire	Low	2	2	4	8.4853
Fire Other	Fire	Low	2	2	4	8.4853
Grass Fire	Fire	Low	2	2	4	8.4853
Power line Down	Fire	Low	2	2	4	8.4853

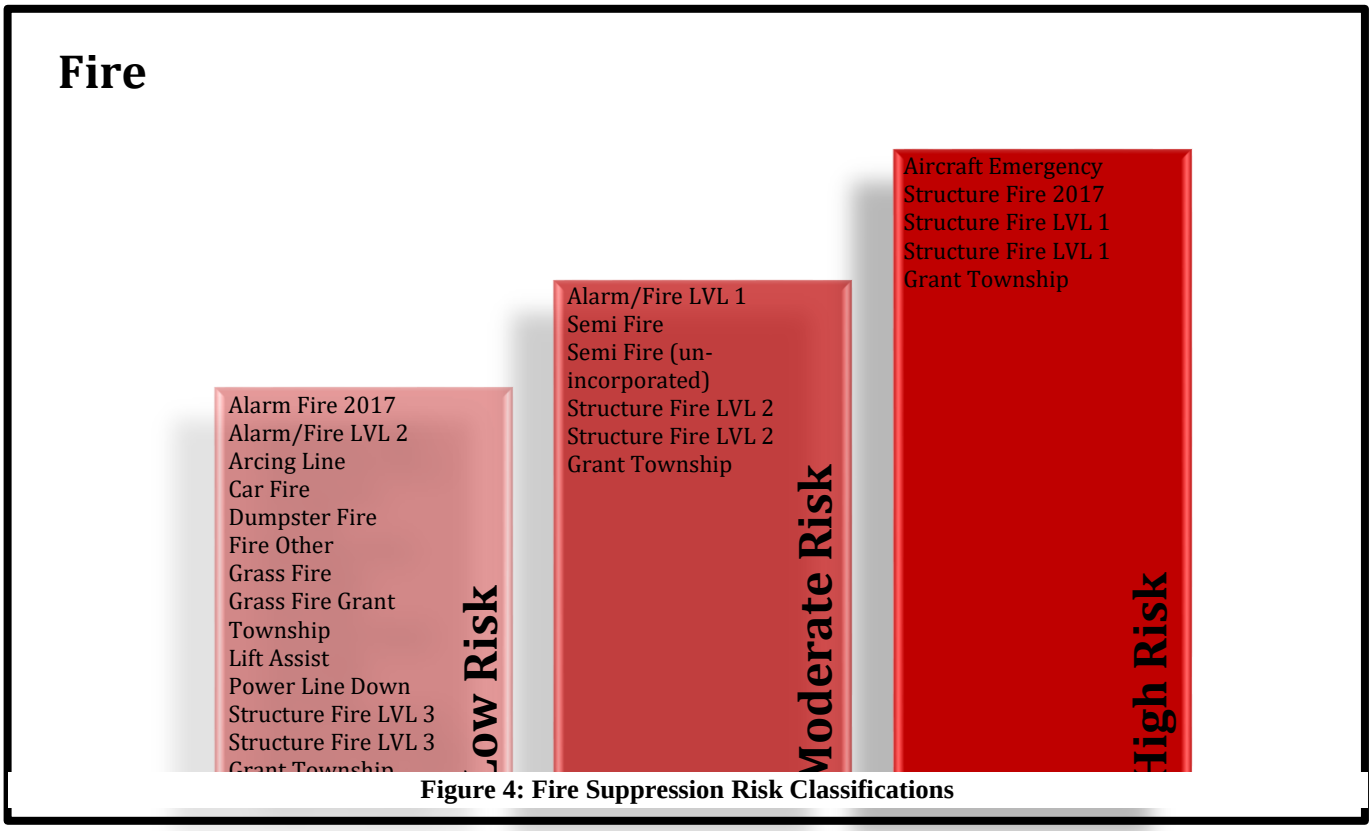
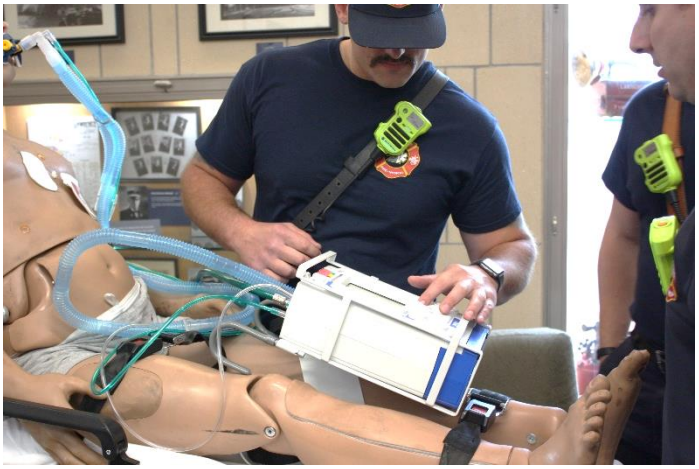


Figure 4: Fire Suppression Risk Classifications

Incident type identifiers from 2017, for example, "structure fire 2017" changed in August 2017 to "structure fire level" 1, 2, or 3. For a detailed description of call types, please reference Appendix A: Lawrence-Douglas County Fire Medical Procedure 202.10 Alarms and Responses.

Emergency Medical Services



The area of Douglas County was assessed to evaluate the community's emergency medical services risks. Three primary components were utilized as part of the evaluation, as described below.

Y Axis

Probability: Measuring the likelihood an emergency situation will occur in a given period. Probability is calculated by determining the average annual incidents over a five-year period, 2017-2021. Based on historical data, the more likely an incident type will occur, the higher the risk score.

Table 26: EMS Probability Risk Scoring

Risk Score	2	4	6	8	10
Average Annual Incidents (2017-2021)	0-500	501-1000	1001-1600	1500-2000	>2000

X Axis

Community Consequence: The study of the impact magnitude or expected loss that will be experienced by the response area, community, and residents of the area. It is the significance of the actual loss to the community. Community consequence for EMS incidents is determined by potential economic loss and life loss/injury. Considerations when determining the EMS consequence scoring:

- Level of patient care needed
- Number of patients
- Public safety threat
- High safety/health risk
- Specialized training needed
- Presents danger to firefighters or other public safety personnel

Z Axis

Agency Impact: Impact measures the drain effect on the community's standard of deployment and coverage capacity when an emergency event occurs. The more resources needed for a response, the fewer residual resources available in the system to respond to emergencies. Agency resources are based on the critical tasks of the incident type. The number of people needed to complete an ERF is used to calculate the risk score.

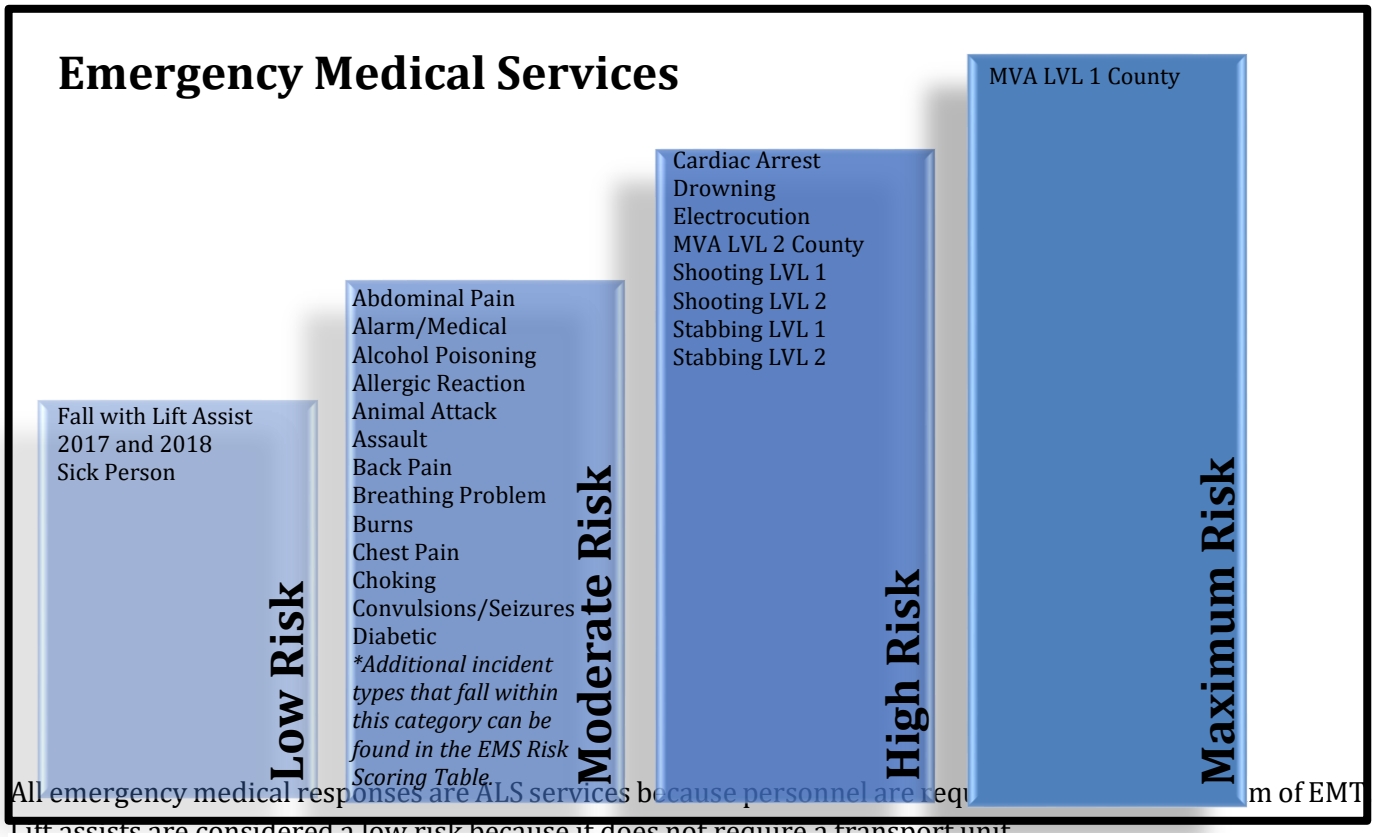
Table 27: EMS Impact Risk Scoring

Risk Score	2	4	6	8	10
Number of people based on Response Matrix	1-2 people	3 people	4-11 people	12-18 people	>19 people

Table 28: EMS Incident Type Risk Scores and Risk Category

Call Nature	Risk Class	Risk Category	Probability	Consequence	Impact	Total Risk Scoring
MVA LVL 1 County	EMS	Maximum	2	10	8	59.3970
Shooting LVL 1	EMS	High	2	8	8	48.0000

Stabbing LVL 1	EMS	High	2	8	8	48.0000
Drowning	EMS	High	2	8	6	36.7696
Cardiac Arrest	EMS	High	2	8	6	36.7696
Electrocution	EMS	High	2	8	6	36.7696
Shooting LVL 2	EMS	High	2	8	6	36.7696
Stabbing LVL 2	EMS	High	2	8	6	36.7696
MVA LVL 2 County	EMS	High	2	8	6	36.7696
Chest Pain	EMS	Moderate	4	6	6	34.9857
Unconscious	EMS	Moderate	4	6	6	34.9857
Breathing Problem	EMS	Moderate	4	6	6	34.9857
Fall	EMS	Moderate	6	2	6	28.1425
Long Fall	EMS	Moderate	2	6	6	28.1425
Pregnancy	EMS	Moderate	2	6	6	28.1425
Suicide Attempt	EMS	Moderate	2	6	6	28.1425
Choking	EMS	Moderate	2	6	6	28.1425
Convulsions/Seizures	EMS	Moderate	2	6	6	28.1425
Diabetic	EMS	Moderate	2	6	6	28.1425
Heart Problems	EMS	Moderate	2	6	6	28.1425
Overdose	EMS	Moderate	2	6	6	28.1425
Stroke	EMS	Moderate	2	6	6	28.1425
Allergic Reaction	EMS	Moderate	2	6	6	28.1425
Animal Attack	EMS	Moderate	2	6	6	28.1425
Traumatic Injury	EMS	Moderate	2	6	2	12.3288
Abdominal Pain	EMS	Moderate	2	6	2	12.3288
Alarm/Medical	EMS	Moderate	2	6	2	12.3288
Alcohol Poisoning	EMS	Moderate	2	6	2	12.3288
Assault	EMS	Moderate	2	6	2	12.3288
Back Pain	EMS	Moderate	2	6	2	12.3288
Burns	EMS	Moderate	2	6	2	12.3288
Eye Problems	EMS	Moderate	2	6	2	12.3288
Headache	EMS	Moderate	2	6	2	12.3288
Hemorrhage	EMS	Moderate	2	6	2	12.3288
MVA LVL 3 County	EMS	Moderate	2	6	2	12.3288
Psychiatric	EMS	Moderate	2	6	2	12.3288
Unknown Medical	EMS	Moderate	2	6	2	12.3288
Sick Person*	EMS	Low	6	2	2	12.3288
Fall with List Assist 2017 and 2018	EMS	Low	2	2	4	8.4853



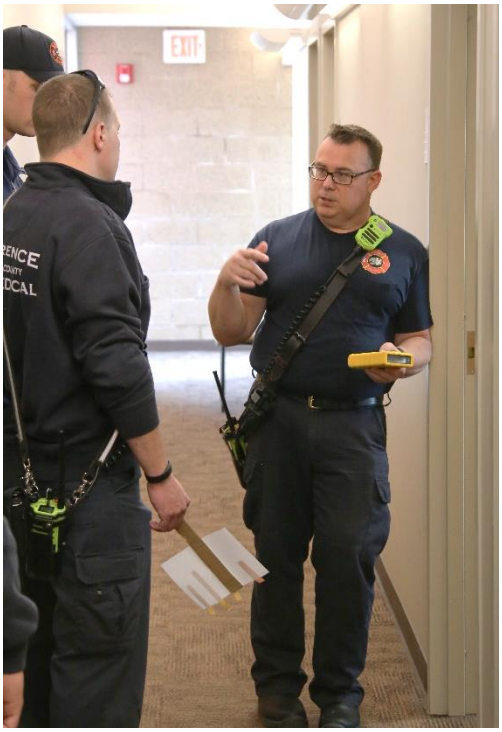
All emergency medical responses are ALS services because personnel are req m of EMT Lift assists are considered a low risk because it does not require a transport unit

Figure 5: EMS Risk Classifications

The Medical Priority Dispatch (EMD) protocols with pre-arrival instructions ensure an adequate number of personnel and units respond to out-of-hospital incidents to provide the best and quickest possible care. The EMD systems quickly dispatch units by chief complaint, allowing the department to define priority medical incidents in the computer-aided dispatching software.

Out-of-town transfers: The department facilitates emergent and non-emergent transfers from local care facilities within the city to Lawrence Memorial Hospital (LMH) or a return trip from the higher level of care (LMH) to a residence or long-term health care facility. The department also facilitates emergent and non-emergent transfers (inter-facility transfers) from LMH to hospitals in the metropolitan area. Only two non-emergency out-of-town transfers should occur at the same time. The drawdown of units affects the department's effective response within the city).

Hazardous Materials Services



The area of Douglas County was assessed to evaluate the community's hazardous materials risks. Three primary components were utilized as part of the evaluation, as described below.

The department is the primary agency responsible for providing a coordinated response to major releases or spills of hazardous materials in Douglas County. Responses within the city of Lawrence deliver more personnel trained at a higher level than a response in the county. The department responds to all risk levels in the city of Lawrence and only high-risk events in the county.

Y Axis

Probability: Measuring the likelihood an emergency situation will occur in a given period. Probability is calculated by determining the average annual incidents over a five-year period, 2017-2021. Based on historical data, the more likely an incident type will occur, the higher the risk score.

Table 29: Hazardous Materials Probability Scoring

Risk Score	2	4	6	8	10
Average Annual Incidents (2017-2021)	0-500	501-1000	1001-1600	1500-2000	>2000

X Axis

Community Consequence: The study of the impact magnitude or expected loss that will be experienced by the response area, community, and residents of the area. It is the significance of the actual loss to the community. Community consequence for hazardous materials incidents is determined by potential economic loss and life loss/injury.

Considerations when determining the hazmat consequence scoring:

- Level of patient care needed
- Extent of community impact: individual/ business/ community-wide
- High safety/health risk
- Specialized training needed
- Environmental concerns
- Presents danger to firefighters or other public safety personnel
- Entry with advanced protection

Z Axis

Agency Impact: Impact measures the drain effect on the community's standard of deployment and coverage capacity when an emergency event occurs. The more resources needed for a response, the fewer residual resources available in the system to respond to emergencies. Agency resources are based on the critical tasks of the incident type. The number of people needed to complete an ERF is used to calculate the risk score. The more resources needed for a response, the fewer residual resources available in the system to respond to emergencies.

Table 30: Hazardous Materials Impact Scoring

Risk Score	2	4	6	8	10
Number of people based on Response Matrix	1-2 people	3-4 people	5-11 people	12-18 people	>19 people

Table 31: Hazardous Materials Incident Type Scores and Risk Category

Call Nature	Risk Class	Risk Category	Probability	Consequence	Impact	Total Risk Scoring
Hazardous Materials LVL 1	HazMat	High	2	8	10	59.3970
Hazardous Materials 2017	HazMat	High	2	6	8	36.7696
Hazardous Materials LVL 2	HazMat	Moderate	2	6	8	36.7696
Gas Leak	HazMat	Moderate	2	6	6	28.1425
CO Alarm/Sickness	HazMat	Low	2	4	6	19.7990
CO Alarm	HazMat	Low	2	2	4	8.4853
Fuel Spill	HazMat	Low	2	2	4	8.4853
Gas Odor	HazMat	Low	2	2	4	8.4853
Odor	HazMat	Low	2	2	4	8.4853
Hazardous Materials LVL 3	HazMat	Low	2	2	4	8.4853

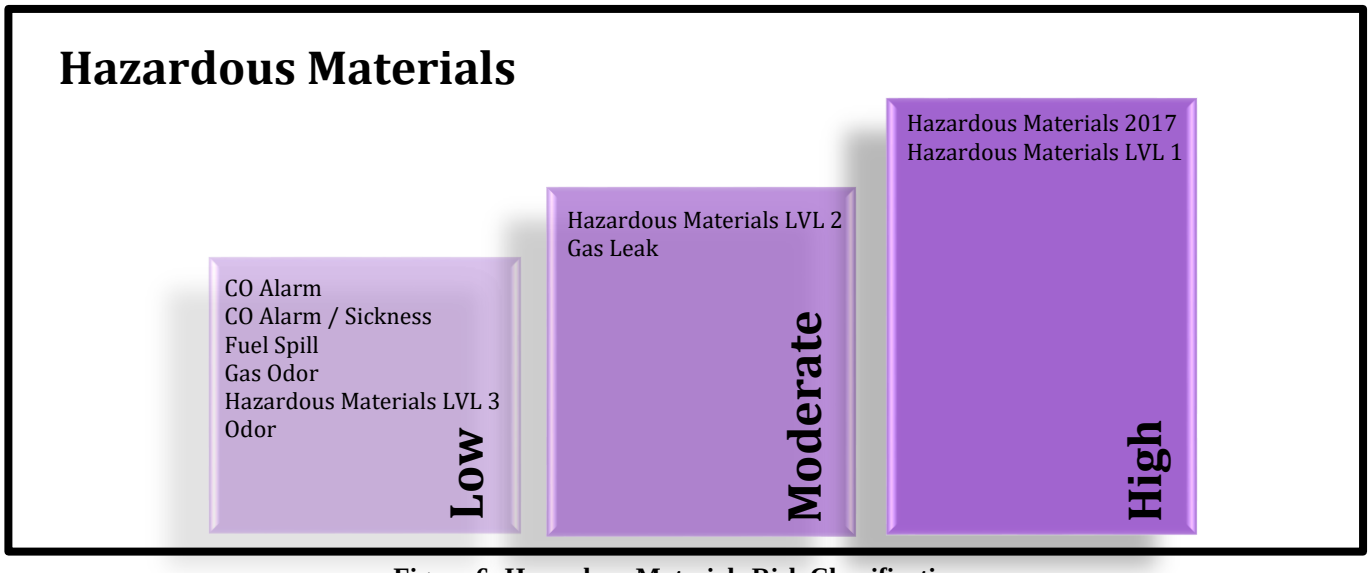


Figure 6: Hazardous Materials Risk Classifications

Technical Rescue Services

The area included in the city limits of Lawrence was assessed to evaluate the community's technical rescue risks. Three primary components were utilized as part of the evaluation, as described below.

The department provides assistance to the Douglas County first responder agencies with technical rescue, including motor vehicle accidents, though the primary responsibility of the agency is emergency medical care.

Y Axis

Probability: Measuring the likelihood an emergency situation will occur in a given period. Probability is calculated by determining the average annual incidents over a five-year period, 2017-2021. Based on historical data, the more likely an incident type will occur, the higher the risk score.

Table 32: Technical Rescue Probability Scoring

Risk Score	2	4	6	8	10
Average Annual Incidents (2017-2021)	0-500	501-1000	1001-1600	1500-2000	>2000

X Axis

Community Consequence: The study of the impact magnitude or expected loss that will be experienced by the response area, community, and residents of the area. It is the significance of the actual loss to the community. Community consequence for technical rescue incidents is determined by potential life loss/injury.

- Specialized training required
- Maximum equipment or tools needed
- Exposures or extent of potential damage
- Level of patient care needed
- Extent of community impact: individual/ business/ community-wide
- High safety/health risk
- Presents danger to firefighters or other public safety personnel

Z Axis

Agency Impact

Impact measures the drain effect on the community's standard of deployment and coverage capacity when an emergency event occurs. The more resources needed for a response, the fewer residual resources available in the system to respond to emergencies. Agency resources are based on the critical tasks of the incident type. The number of people needed to complete an ERF is used to calculate the risk score. The more resources needed for a response, the fewer residual resources available in the system to respond to emergencies.

Table 33: Technical Rescue Impact Risk Scoring

Risk Score	2	4	6	8	10

Number of people based on Response Matrix	1-2 people	3-4 people	5-11 people	12-18 people	>19 people

Table 34: Technical Rescue Incident Type Scores and Risk Category

Call Nature	Risk Class	Risk Category	Probability	Consequence	Impact	Total Risk Scoring
Building Collapse	Tech. Rescue	Maximum	2	10	10	73.4847
Confined Space Rescue	Tech. Rescue	Maximum	2	10	10	73.4847
MVA LVL 1 City	Tech. Rescue	Maximum	2	10	8	59.3970
High Angle Rescue	Tech. Rescue	Maximum	2	8	8	48.0000
Trench Rescue	Tech. Rescue	Maximum	2	8	8	48.0000
Water/Ice Rescue	Tech. Rescue	Maximum	2	8	8	48.0000
Industrial Accident	Tech. Rescue	High	2	6	6	28.1425
MVA LVL 2 City	Tech. Rescue	Moderate	2	4	6	19.7990
Elevator Rescue	Tech. Rescue	Low	2	4	4	13.8564

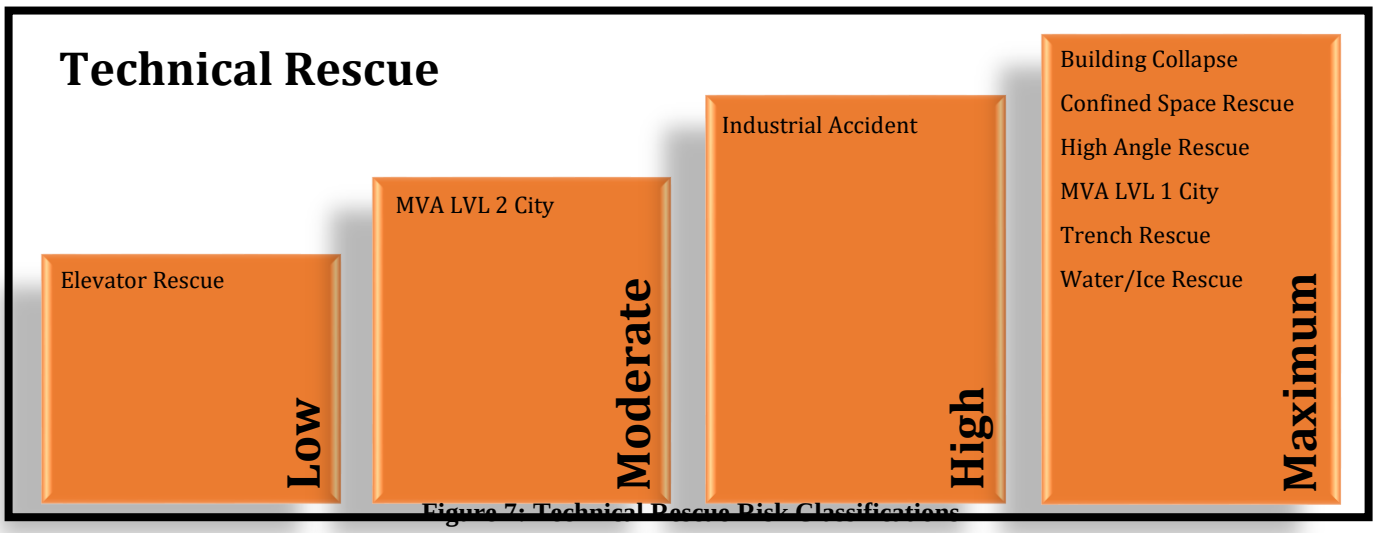


Figure 7: Technical Rescue Risk Classifications

Planning Areas/Zones

Response Areas

The department has identified 14 station response areas in which to analyze risk as well as service levels. There are five planning zones within the city of Lawrence and nine planning zones in the county. Each planning zone can be further divided into smaller zones referred to as map references. Map references in outlying planning zones are one square mile. Map references in the urban planning zones have been reduced to one quarter square mile.

Dispatchers use automatic vehicle locators (AVL) along with computer-aided dispatching (CAD) to track the location of units using the Garmin global positioning system (GPS), dispatching the closest available unit to incidents. The GPS system allows the dispatcher to view live interactive maps with all the units and their status. Based on the new dispatching model, the identified planning zones function as station reporting districts rather than response areas.

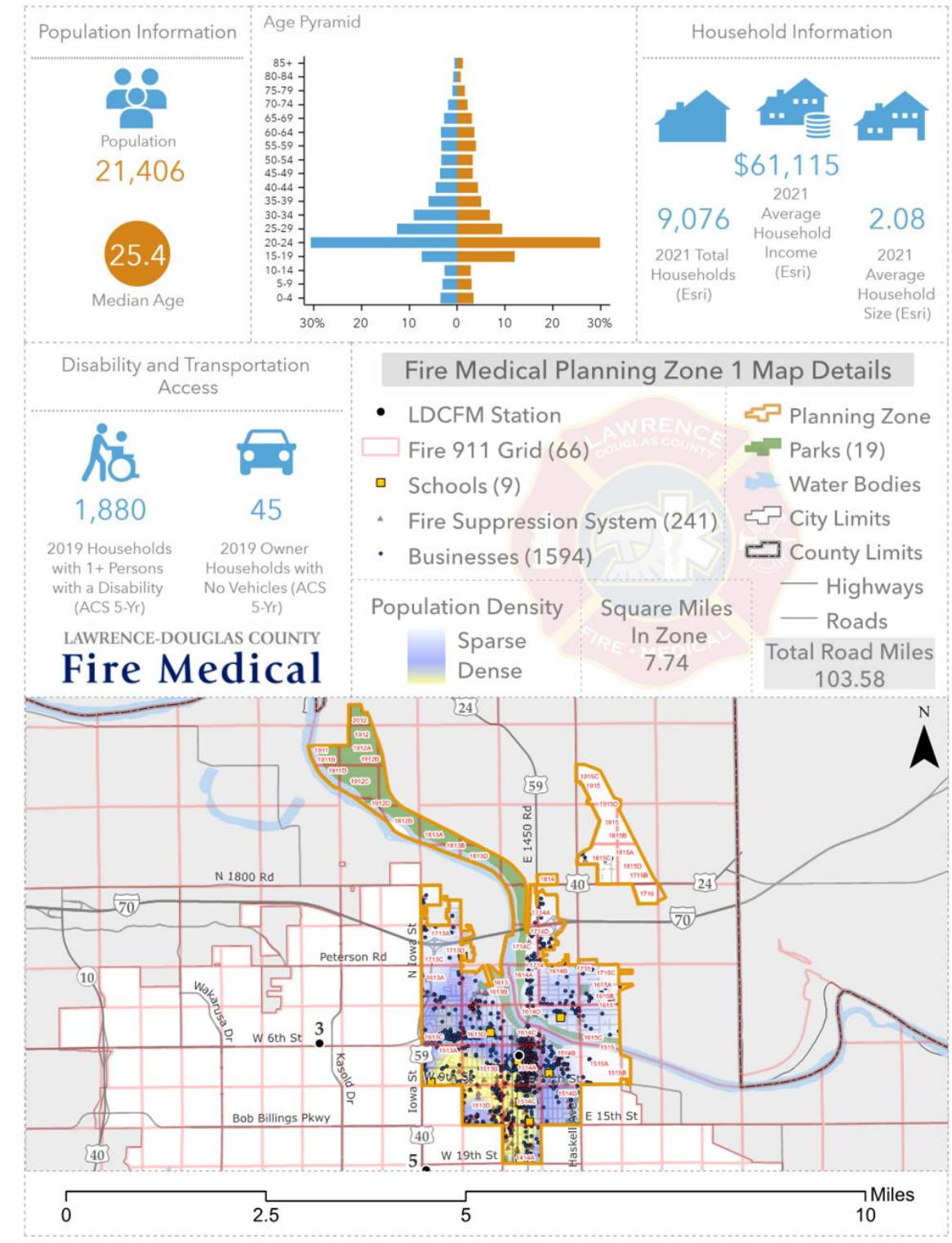


Figure 8: Planning Zone 1

Planning Zone 1 Map Reference(s): 1209C, 1414A, 1513A, 1513B, 1513D 1514A, 1514B, 1514C, 1514D, 1515A, 1515B, 1613A, 1613B, 1613C, 1613D, 1614A, 1614B, 1614C, 1614D, 1615A, 1615B, 1615C, 1713A, 1713C, 1713D, 1714A, 1714B, 1714C, 1714D, 1715B, 1715C, 1716A, 1811C, 1812B, 1813A, 1813B, 1813C, 1813D, 1814C, 1814D, 1815A, 1815B, 1815C, 1815D, 1911B, 1911D, 1912A, 1912B, 1912C, 1912D, 1915C, 1915D, 2012C

Planning Zone 1 Profile

This area includes the neighborhoods of Oread, Old West Lawrence, East Lawrence, North Lawrence, and Pinckney. The central business district (downtown) lies within this zone, as does a portion of the University of Kansas. Downtown is considered the hub of daily activity in the community and transitions into a popular evening destination for entertainment and dining. Massachusetts Street is named after the home state of the founders but is known to the locals as "Mass Street." Many commercial buildings are of vintage 19th Century ordinary construction and contain mixed occupancies with retail shops on the street level and residential apartments on the upper floors. There are also plenty of outdoor activities in the bicycle-friendly town. There are more than 50 public parks and trails.

There is a mix of owner-occupied homes and historic residential structures converted to apartments throughout this zone. The Oread, Old West, and Pinckney neighborhoods are predominantly comprised of larger, two-story Victorian / Queen Anne homes built from the mid-1800s to early-1900s and reflect the early affluence of these areas. Utilizing balloon framing, these homes can pose a significant firefighting challenge due to their size, construction type, and limited accessibility. East Lawrence and North Lawrence are comprised largely of smaller one-story and one-and-a-half-story framed homes indicative of the working-class industrial roots of these neighborhoods. Balloon framing is prevalent, and bungalow-style architecture is predominant. North Lawrence has struggled over the years due to the many floods, with the latest as recent as 1993. It is generally surrounded by farmland.

The downtown commercial district poses one of the greatest risks for this zone. The many commercial buildings have sporadic fire protection systems, share common walls, and as noted, have mixed occupancies making these buildings a challenge. Structural fires must be stopped, or entire city blocks could be threatened with loss.

This district has had a recent boom in mixed-use, multi-story buildings along New Hampshire Street and near campus in the Oread neighborhood. The 800 block of New Hampshire Street has the seven-story Hobbs Taylor Lofts. The Oread Hotel is a seven-story hotel with commercial and below-grade parking and entertainment use. The newest development in the Oread District is HERE Kansas, a seven-story mixed-use student housing project with 237 apartments, a parking garage, and retail space.

This area is comprised mainly of residential streets. Massachusetts Street is the primary thoroughfare for this zone. In the downtown area, the street is two driving lanes wide with diagonal parking on both sides. This street is heavily congested at many times of the day and evening, and the department typically travels streets to the east and west of Massachusetts to avoid this area.

The Lawrence Municipal Airport, which opened in 1929, is located northeast of the core of Lawrence, in Grant Township. Like many suburban airports, it is located near the city but is not fully encompassed by the city limits. The airport has a terminal and several hangar buildings for the storage and maintenance of aircraft.

Two railroads transverse this zone; the Union Pacific (UP), located north of the Kansas River, and the Burlington Northern Santa Fe (BNSF), located south of the Kansas River. Both railroads have main rail lines that generally travel east and west, and both have spur tracks and rail switching yards. The BNSF track is also used by Amtrak on their Southwest Chief route, which has a stop at East 7th and New Jersey streets in east Lawrence. Both railroads maintain numerous controlled and uncontrolled intersections throughout the city of

Lawrence and Douglas County. There is significant rail traffic, especially on the UP track, with significant quantities of consumer goods, coal, and hazardous material transported. Both railroads have high-speed and low-speed service through the city and county.

This area has quick access to US Highway 24, US Highway 40, US Highway 59, and Interstate 70. The US highway routes provide two-lane services from the Kansas City and Topeka metropolitan areas to points in the eastern quarter and northeast quadrant of Kansas. Interstate 70 is a multi-lane highway that carries a significant amount of interstate traffic through the heart of Kansas. These routes are the primary routes for the transportation and distribution of substantial quantities of consumer goods and hazardous materials.

A notable risk within this zone is the Kansas River, also known as the Kaw River. The Kansas River flows west to east along the northeast boundary of the city and divides Lawrence proper from North Lawrence. The levee system associated with the river provides walking, biking, and running surfaces with numerous off-shoots for mountain biking and hiking. There are three city parks along the river that provide recreational access to the river. A key feature of the river is a low-head dam located below the Kansas River Bridge at West 6th and Massachusetts Street. This dam provides flow to a new reconstructed private hydroelectric plant and is a popular fishing destination at times. There is also the Industrial Chemical Plant (ICL).

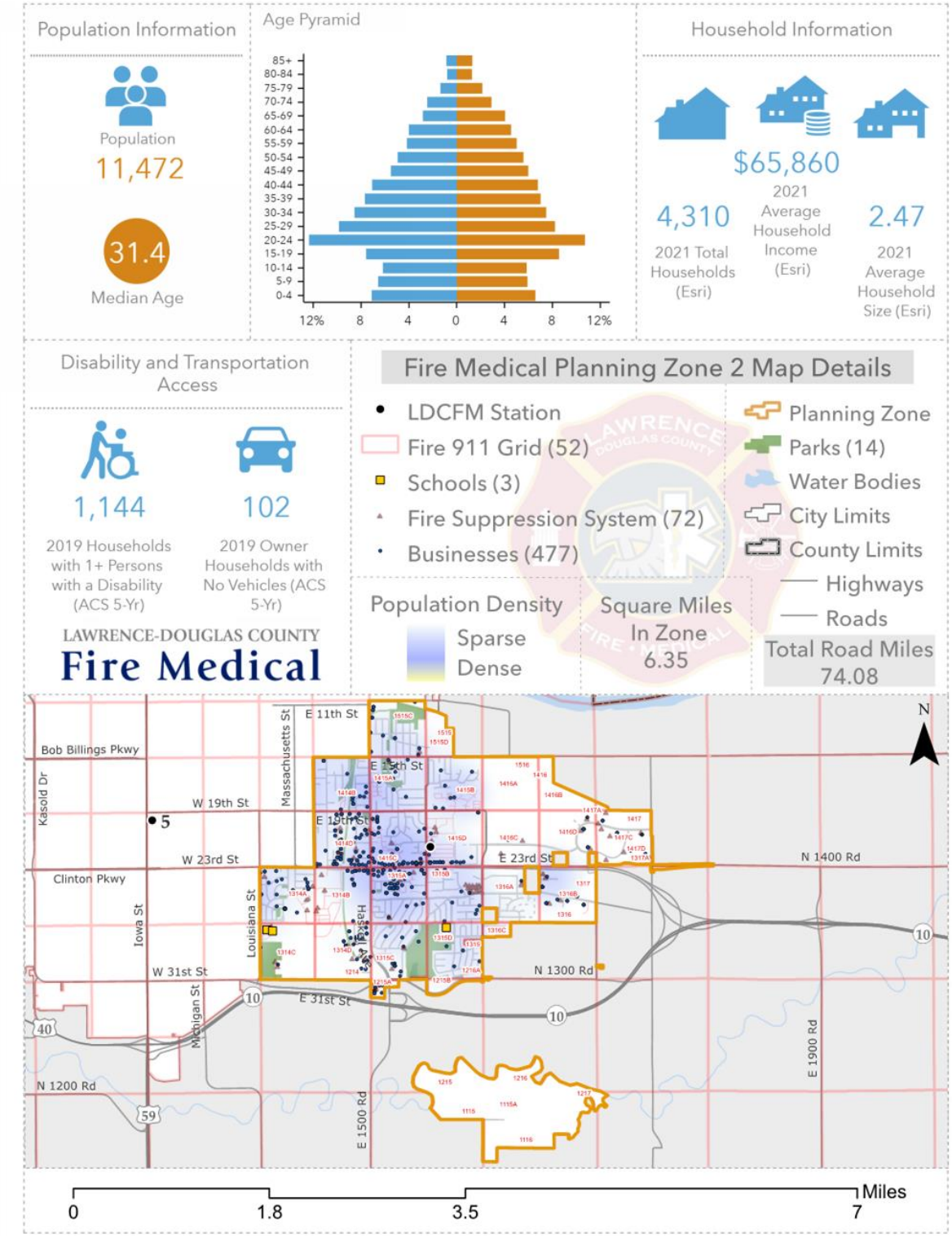


Figure 9: Planning Zone 2

Planning Zone 2 Map References: 1315, 1115A, 1215A, 1215B, 1216A, 1314A, 1314B, 1314C, 1314D, 1315A, 1315B, 1315C, 1315D, 1316A, 1316B, 1316C, 1317A, 1317B, 1317C, 1318A, 1414B, 1414D, 1415A, 1415B, 1415C, 1415D, 1416A, 1416B, 1416C, 1416D, 1417A, 1417C, 1417D, 1418C, 1515C, 1515D

Planning Zone 2 Profile

This area represents the city's eastern and southeastern expansion and growth from the early 1960s to the present. It is predominantly residential in nature with a mix of commercial, light industry, and Haskell Indian Nations University. This area includes the neighborhoods of Breezedale, Prairie Park, High Chaparral, East Hills, and Park Hill. These neighborhoods are largely owner-occupied, platform framing over slab, residences. As the city continues to grow, vacant areas within these neighborhoods are being developed with wood-frame duplexes and medium to large apartment complexes. This area also contains larger mobile home parks. Commercial development within this area lines East 23rd Street, Haskell Avenue south from east 19th Street, and Delaware Street.

East Hills Business Park, established in 1987, is a city-hosted, light industrial park located at the eastern edge of the city. Buildings within the park are large, tilt-up concrete over slab, structures. Two of these businesses located in the business park are in the top 10 for employment numbers for the city. South of the business park is the Douglas County Jail, a large correctional facility, and a large houseless shelter.

Haskell Indian Nations University (HINU) is a federally funded University offering free tuition to members of registered Native American tribes in the United States. Typical enrollment is approximately 1000, representing 150 tribes and all 50 states. Twelve campus buildings have been designated as U.S. National Historic Landmarks. Haskell is home to the Haskell Cultural Center and Museum, the American Indian Athletic Hall of Fame, and the Indian Leader, the oldest American Indian Student newspaper in the country.

Also located in this zone are the Douglas County Fairgrounds and Venture Park, the former site of Farmland Industries. The fairgrounds, located north of East 23rd Street on Harper Street, is a popular destination throughout the year as a host of frequent canine and equine events; a large annual swap meet in the spring; and a large County Fair in August. This now-defunct facility was a large producer of fertilizer, predominantly ammonium nitrate. It is currently a new industrial and business park with the new construction of Venture Park Building 1, and Pretzels Inc., a leading manufacturer of pretzels and other snack products, has constructed a state-of-the-art manufacturing facility inside of Venture Park.

The far eastern side of the city, which includes the East Hills Business Park, lies within a regional development project known as the K-10 Corridor. This corridor lies along the route of Kansas Highway 10 (K-10), a four-lane, limited access highway, which runs west from Interstate 435 in Johnson County to Lawrence. K-10 enters the city and becomes East 23rd Street. Because of the high speed associated with this highway, numerous accidents occur due to poor speed controls and highway urban interface. Located at the transition of K-10 and East 23rd street is O'Connell Road. O'Connell Road has become a primary residential artery extending south from K-10 to the city limits and provides access to the east side of Prairie Park neighborhood and the Douglas County Jail. The newly completed South Lawrence Traffic way provides a link from K-10 to US Highway 59, which will divert some drivers from using Lawrence city streets to connect the highways.

All occupancies within the East Hills Business Park meet protection requirements established by city code. Of note are API Foils and Prosoco. Due to the use and or production of hazardous material by these companies, their respective structures utilize state-of-the-art containment and suppression systems, including but not limited to high-density sprinkler heads; vapor ventilation; external containment with foam system; and blast walls.

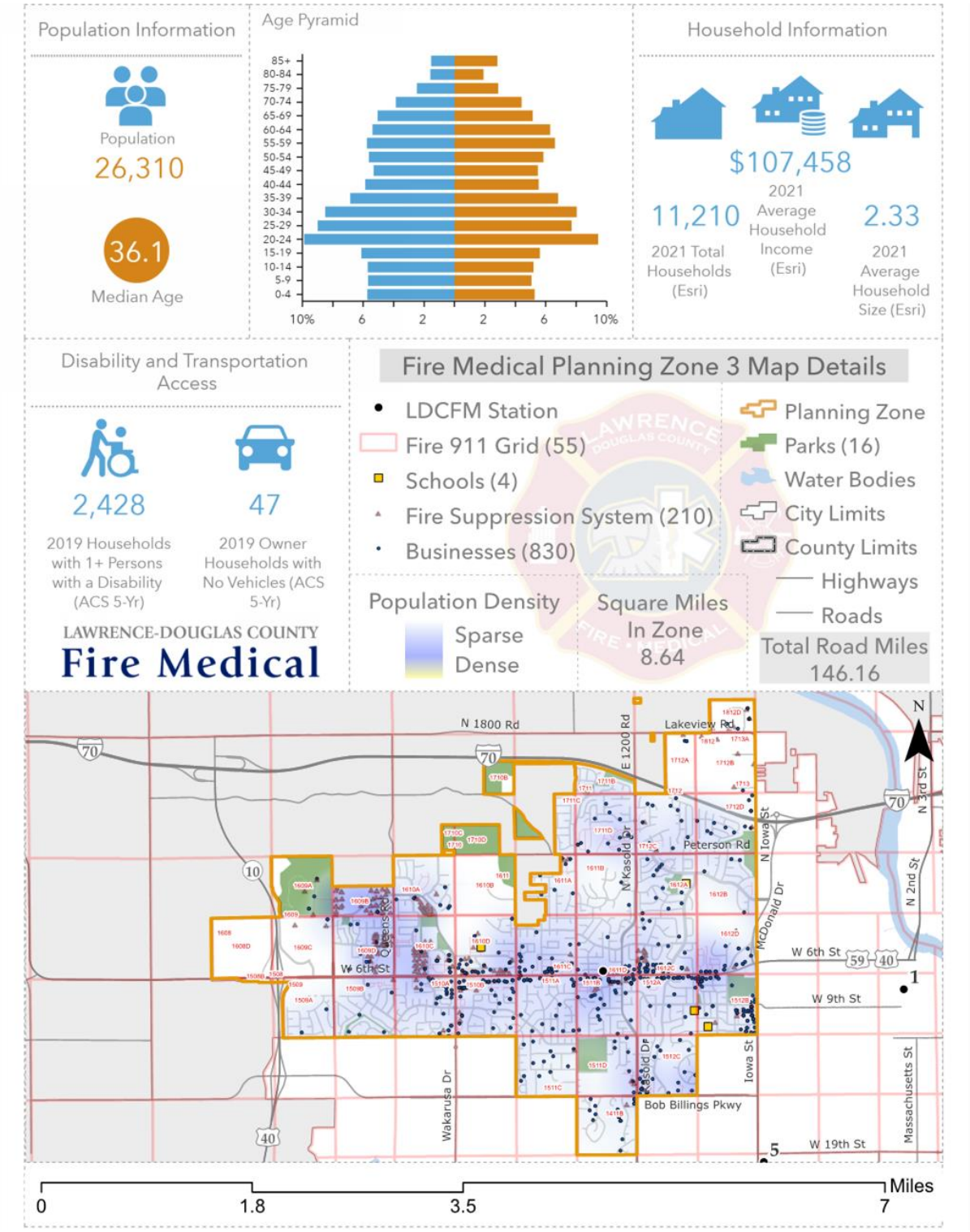


Figure 10: Planning Zone 3

Planning Zone 3 Map References: 1411B, 1508B, 1509A, 1509B, 1510A, 1510B, 1511A, 1511B, 1511C, 1511D, 1512A, 1512B, 1512C, 1608D, 1609A, 1609B, 1609C, 1609D, 1610A, 1610B, 1610C, 1610D, 1611A, 1611B, 1611C, 1611D, 1612A, 1612B, 1612C, 1612D, 1708A, 1710B, 1710C, 1710D, 1711A, 1711B, 1711C, 1711D, 1712A, 1712B, 1712C, 1712D, 1812C, 1812D

Planning Zone 3 Profile

This area represents the growth and expansion of the city to the northwest from the 1950s to the present. Neighborhoods within this area include Perry Park, Quail Run, Sunset Hills, and portions of West Lawrence. Homes within this zone are predominantly larger, two-story, platform wood frame over basement construction. Some areas of the zone that border the Kansas University or are in newer western areas have very large wood-frame apartment complexes. This area also is home to the Lawrence Country Club with its private 18-hole golf course and the Alvamar Orchards public nine-hole golf course. Homes bordering these courses are generally larger and more expensive. West 6th Street, also known as US 40 Highway, is a primary east/west artery and is commercially developed its entire length. Additional commercial and office park development extends south of West 6th Street along Wakarusa Drive. Bauer Farm Development on West 6th Street is planned as a New Urbanism development with retail, apartments, senior living, and urgent care facilities.

The northern boundary of this area contains a large industrial complex defined by the intersection of North Iowa Street and Lakeview Road. Structures within this area range from very large clear-span steel to tilt-up concrete. Occupancies include a Schlumberger, an oil well cable, Heinz Pet Food, Berry Plastics, a manufacturer of plastic dinnerware, and Hallmark Cards. These occupancies are covered by full fire protection systems. This area has wide two-lane roads and handles semi traffic in great volumes. A railroad spur cuts through this area for delivery to the industrial complexes located on the south side of Lakeview Road.

The greatest area of growth for Lawrence, which recently took place in the western section of town, includes Rock Chalk Park featuring a new track stadium softball complex. The recreation center, called Sports Pavilion Lawrence, provides numerous indoor and outdoor activities for residents.

The primary arteries that bisect the zone include West 6th Street (US Highway 40); Iowa Street and McDonald Drive, which provide access to Interstate 70 (I-70) to the north and US Highway 59 to the south; Peterson Road, Kasold Drive, and Wakarusa Drive. Large trucks can access I-70 from two directions, with access gates on McDonald Drive and at the intersection of US Highway 40 and Kansas Highway 10, thereby reducing the demand on the access routes. Congestion does become an issue along each of these arteries during peak morning and evening traffic periods in which there is substantial traffic in-flow/out-flow. Noon-time traffic is moderate to heavy and is impacted by Free State High School.

The greatest risk lies in the northern industrial park with a concentration of occupancies with significant fire loading. Access to this area and the commercial structures along West 6th Street and along Wakarusa Drive is good and does not present notable problems. Additional risks present are the numerous assisted living and nursing home occupancies. These occupancies tend to be large multi-story wood frame structures with large numbers of elderly and/or incapacitated residents. The occupancies also have higher EMS call volumes.

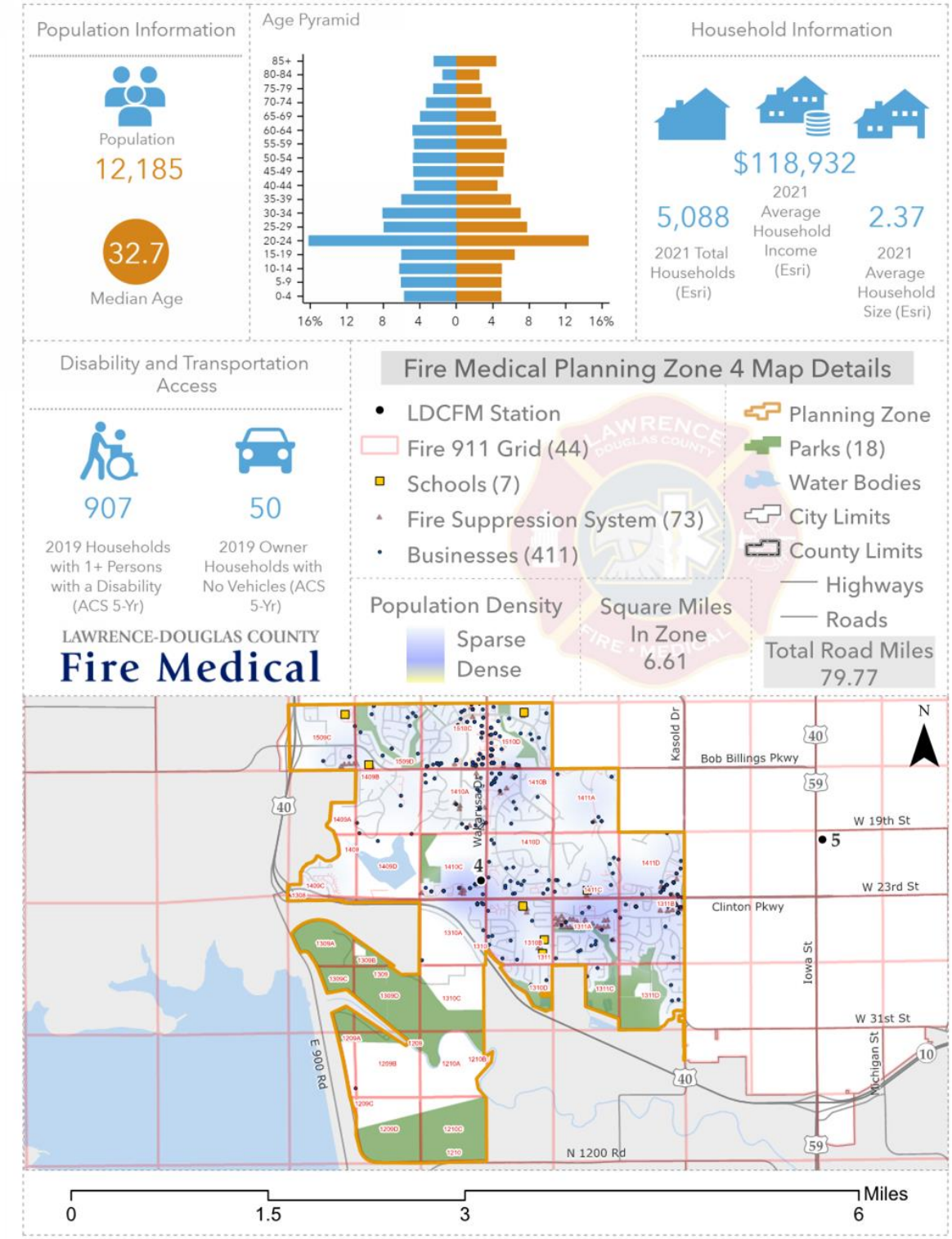


Figure 11: Planning Zone 4

Planning Zone 4 Map References: 1209A, 1209B, 1209D, 1210A, 1210B, 1210C, 1211B, 1309A, 1309B, 1309C, 1309D, 1310A, 1310B, 1310C, 1310D, 1311A, 1311B, 1311C, 1311D, 1409A, 1409B, 1409C, 1409D, 1410A, 1410B, 1410C, 1410D, 1411A, 1411C, 1411D, 1509C, 1509D, 1510C, 1510D

Planning Zone 4 Profile

This area is best described as residential in nature and represents the city's west and southwest growth and expansion. With the exception of a small area immediately west and adjacent to Kasold Drive, this area was constructed from 1990 to the present. Large land segments have been dedicated to recreational pursuits. The Jayhawk Club maintains a 27-hole private golf course. Homes adjacent to the golf courses and located within the Alvamar and Lake Alvamar sub-divisions are large and expensive. There are large multifamily apartment complexes located on the northwestern and southern sides of this zone. Construction within this zone is predominantly platform wood frame over slab or basement. Wakarusa Drive hosts commercial development and a medium-sized commercial park, Oread West Research, located at the intersection of Wakarusa Drive and Bob Billings Parkway.

The extreme southwest corner of this zone includes Corps of Engineers land that the city annexed for the purpose of recreation. It is comprised primarily of the Eagle Bend 18-hole golf course, the YSI sports complex (baseball, football, kickball, and soccer), and the Speicher baseball/softball complex. The city has constructed a wide concrete trail through this zone that provides access to the western recreational complexes and a scenic route for cycling, running, and walking. Clinton Lake lies adjacent to the western boundary, providing excellent aquatic and watercraft recreation, as well as hiking and cycling trails with easy access from the city.

The majority of roads in this area would be classified as residential. The current south and west borders of this zone is the south Lawrence Traffic-Way, a four-lane, limited access road. This trafficway is the westernmost leg of Kansas Highway 10 and is commonly referred to as the "bypass." Kasold Drive and Wakarusa Drive are the primary roads that shuttle residential traffic to Clinton Parkway and West 6th Street, providing access to the bypass and Interstate 70. These roads may become moderately congested during peak traffic periods. Bob Billings Parkway is the primary feeder into the westernmost areas of the city. Risks in this zone are the large motor vehicle accidents that occur on the bypass.

This zone hosts a substantial number of very large apartment complexes. These complexes are typically three stories, platform wood framing over slab, with high life hazard and significant exposure problems. Access into several complexes is limited, with narrow streets and tight radius turns producing access issues for large apparatus. In addition, this is an area of limited wildland/urban interface and some steep topography. Because of the terrain and this zone's southwest location, radio communication can be an issue in some areas. Water rescue is also a risk. This zone is adjacent to Clinton Lake and contains Lake Alvamar. Topography has produced numerous deep valleys with significant runoff and water flow directed to the lakes and the Wakarusa River. Many of these valleys and waterways lie adjacent to or pass-through development and are easily accessed by residents.

The district has had a steady increase in senior housing development projects to support the city as a retirement community. Additional risks present are the numerous assisted living and nursing home occupancies. These occupancies tend to be large multi-story wood frame structures with large numbers of elderly or incapacitated residents. These occupancies and urgent care facilities have higher EMS call volumes. In this zone, the city is considering a residential lot expansion west of the K-10 bypass.

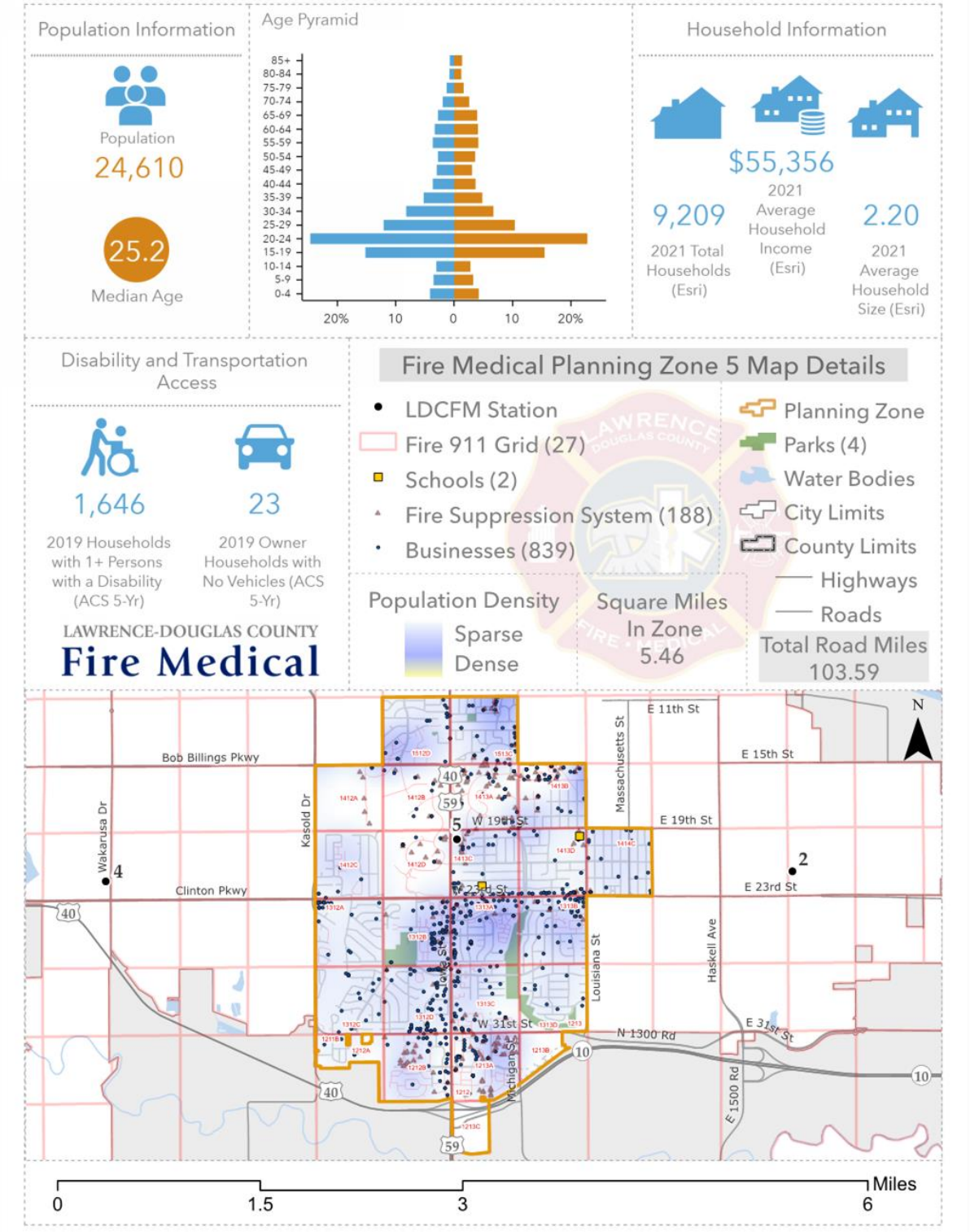


Figure 12: Planning Zone 5

Planning Zone 5 Map References: 1212A, 1212B, 1213A, 1213B, 1213C, 1312A, 1312B, 1312C, 1312D, 1313A, 1313B, 1313C, 1313D, 1412B, 1412C, 1412D, 1413A, 1413B, 1413C, 1413D, 1414C, 1512D, 1513C

Planning Zone 5 Profile

This area runs from the University of Kansas core to the south Iowa retail district. It has a higher population density representative of growth around the University of Kansas due to residential dorms located in this district. Areas south of Clinton Parkway represent newer growth and development from the mid-1970s to present, while areas south of West 23rd Street represent 1960 to the present. All construction types are represented in this area, from balloon and platform-framed residential structures to non-combustible high/midrise structures. At the very heart of this zone is the University of Kansas, with a student population of 26,744 (univstats.com/university-of-kansas). South Iowa Street bisects this zone and contains significant commercial and retail development and rivals the downtown area as a shopping destination with retailers such as Menards, Target, Wal-Mart, Kohl's, and Home Depot. There are also numerous restaurants, sports bars, and a large multiplex theater. This zone hosts the largest number of apartment complexes and contains one of the largest mobile home communities in the city.

West 23rd Street and Iowa Street intersect in this zone. Both routes are four lanes wide and are heavily developed with commercial and retail development. West 23rd Street is the west extension of East 23rd Street after Massachusetts Street and carries westbound traffic from Kansas Highway 10 into the city's core. Iowa Street runs north to south and is the city leg of US Highway 59 through Lawrence. US Highway 59 was reconstructed to interstate standards and opened in October 2012 to be a major route out of south Lawrence connecting to I-35. Due to the convergence of K-10 and US 59, there is a significant amount of heavy truck traffic through this zone. In 2016, an extension of K-10 was completed to connect K-10 to US Highway 59, which will divert some drivers from using Lawrence city streets to connect the highways. In addition, population density, commercial and retail development, and The University of Kansas creates extremely high volumes of traffic and congestion throughout this zone.

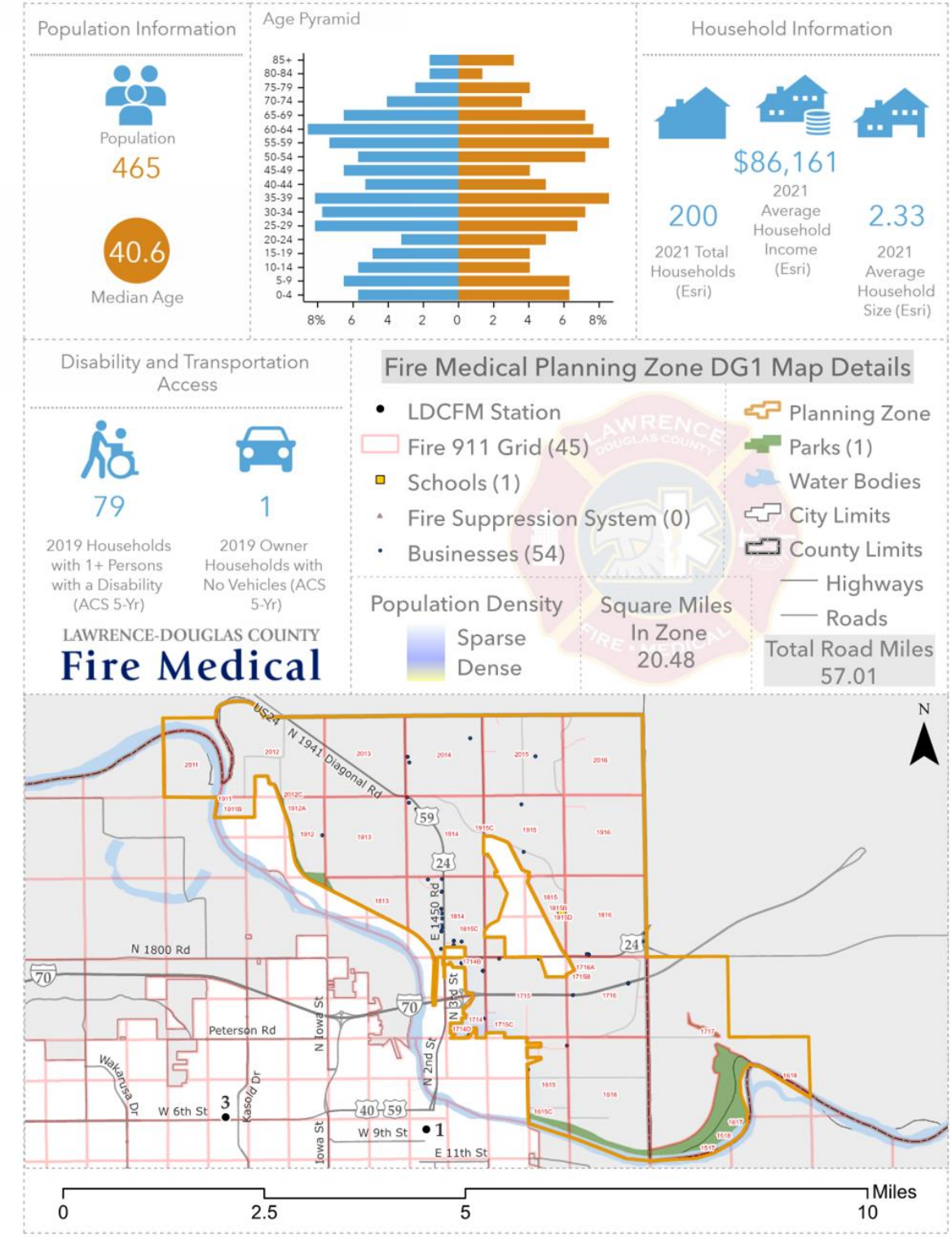


Figure 13: Planning Zone DG1

Planning Zone DG1 Map References: 1615, 1616, 1617, 1714, 1715, 1716, 1717, 1813, 1814, 1815, 1816, 1912, 1913, 1914, 1915, 1916, 2011, 2012, 2013, 2014, 2015, 2016

Planning Zone DG1 Profile

This zone is best described as rural in nature. This zone is north of the city of Lawrence and is commonly referred to as Grant Township, with a 2018 population of 400. Roads in this area generally are located one mile apart and follow a common grid pattern. Principal Roads; I-70, US Highway 24-40 and US Highway 24-59, and a few county roads, allow faster travel throughout the zone. The bulk of the roads are gravel, with a few being identified as minimum maintenance and commonly identified as dirt roads and impassable except in the best conditions. The Kansas River flows through this zone. This zone surrounds Lawrence municipal airport. Responses to and along I-70 have extended travel times due to this highway being six lanes with restricted access and median barriers. Responding units frequently must respond to a service area several miles east of the county line, turn around and respond back to a scene located across the barriers.

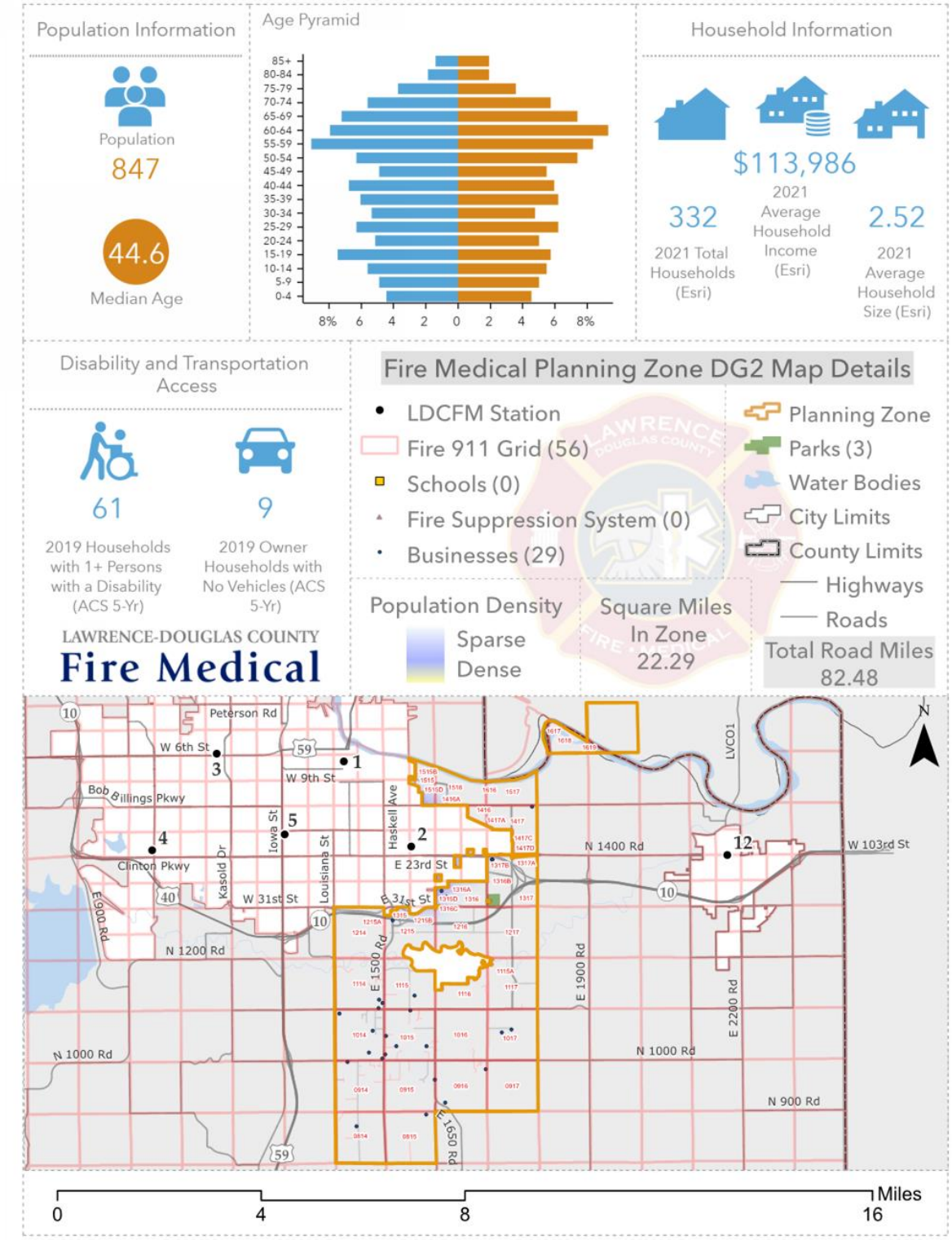


Figure 14: Planning Zone DG2

Planning Zone DG2 Map References: 0814, 0515, 0914, 0915, 0916, 0917, 1014, 1015, 1016, 1017, 1114, 1115, 1116, 1117, 1214, 1215, 1216, 1217, 1316, 1317, 1416, 1417, 1515, 1516, 1517, 1618, 1619

Planning Zone DG2 Profile

This zone is best described as rural in nature. This zone is east of Lawrence and surrounds the area outside of Eudora. Roads in this area generally are located one mile apart and follow a common grid pattern. Principal Roads – Interstate 70, Kansas Highway 10, County Road 438 (N1800), County Road 442 (N1600), County Road 1023 (E175/E250), County Road 1029 (E600), allows faster travel throughout the zone. The bulk of the roads are gravel, with a few being identified as minimum maintenance and commonly identified as dirt roads and impassable except in the best conditions. The Kansas River is on the north border of this zone.

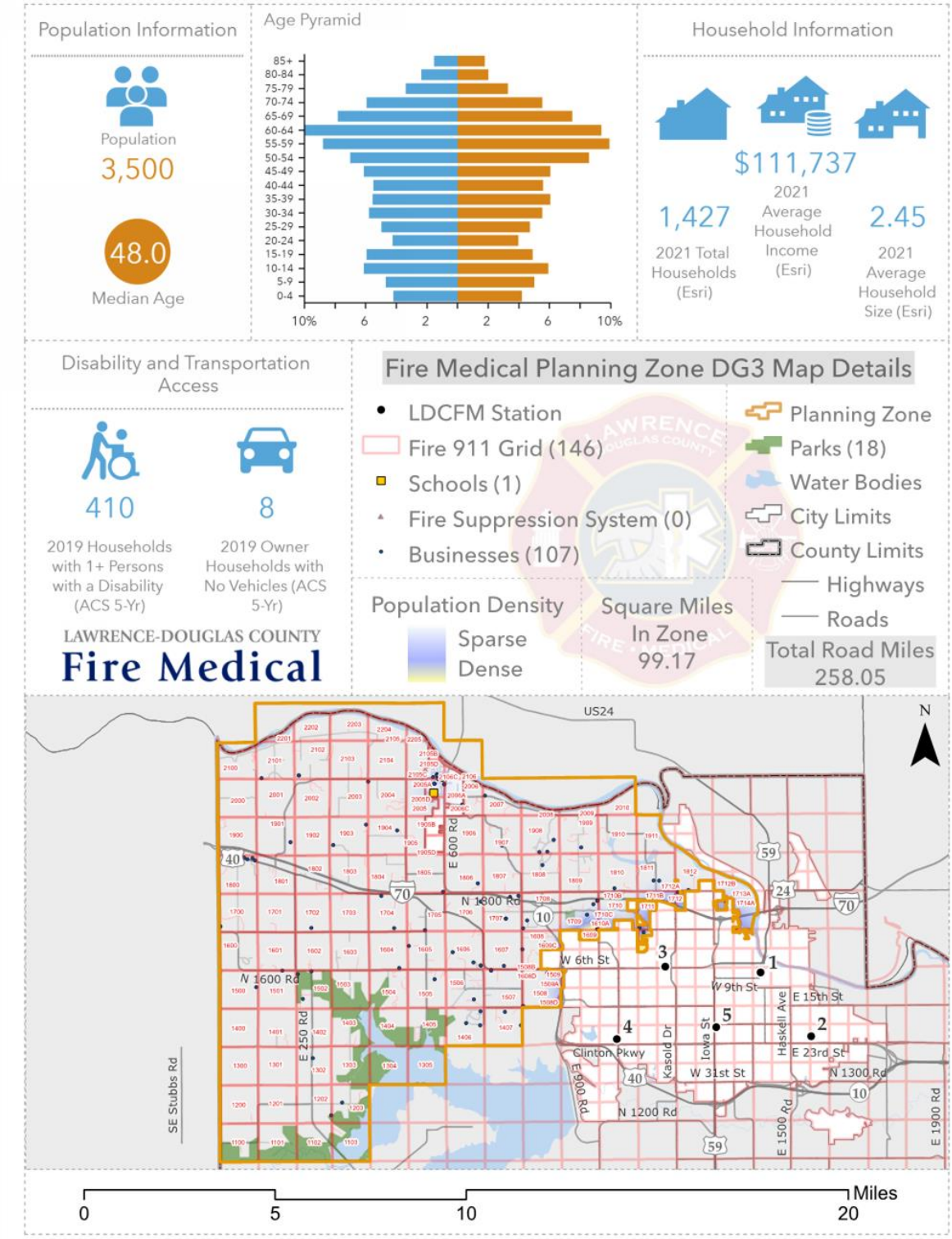


Figure 15: Planning Zone DG3

Planning Zone DG3 Map References: 1100, 1101, 1102, 1103, 1200, 1201, 1202, 1203, 1300, 1301, 1302, 1303, 1304, 1305, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1613, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2201, 2202, 2203, 2204, 2205, 1508D, 1905B, 1905D, 2005A, 2005B, 2005D, 2006A, 2006C, 2105B, 2105C, 2105D, 2106D

Planning Zone DG3 Profile

This zone is best described as rural in nature. This zone is west of the city of Lawrence and contains the city of Lecompton, with a 2020 population of 857; the zone extends to the Shawnee County line. Roads in this area generally are located one mile apart and follow a common grid pattern. Kansas Highway 10 and US Highway 40, as well as a few county roads, allow faster travel throughout the zone. I-70 travels through this zone; however, its limited access provides no faster travel for areas within the county except on the Interstate proper. The bulk of the roads are gravel, with a few being identified as minimum maintenance and commonly identified as dirt roads and impassable except in the best conditions. Responses to and along I-70 have extended travel times due to this highway being six lanes with restricted access and median barriers. Responding units frequently must respond to a service area at the western county line, turn around and respond back to a scene located across the barriers. The Kansas River borders the northern edge of this zone. Clinton State Park and lake is the southwest border of this zone.

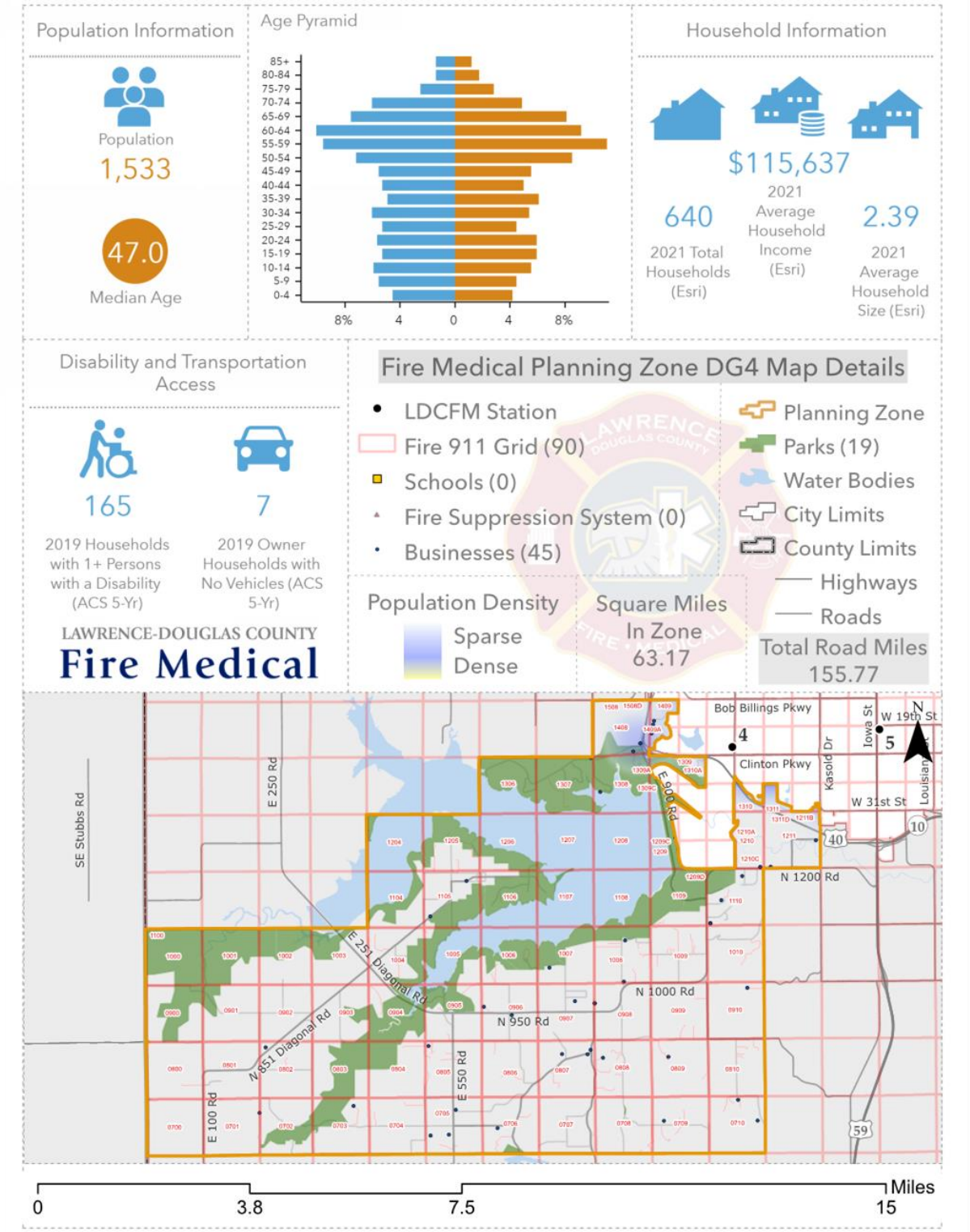


Figure 16: Planning Zone DG4

Planning Zone DG4 Map References: 0700, 0701, 0702, 0703, 0704, 0705, 0706, 0707, 0708, 0709, 0710, 0800, 0801, 0802, 0803, 0804, 0805, 0806, 0807, 0808, 0809, 0810, 0900, 0901, 0902, 0903, 0904, 0905, 0906, 0907, 0908, 0909, 0910, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1204, 1205, 1206, 1207, 1208, 1210, 1211, 1306, 1307, 1308, 1309, 1310, 1311, 1408, 1409

Planning Zone DG4 Profile

This zone is best described as rural in nature. This zone is west of the city of Lawrence and borders the southern part of the Clinton Lake area, and extends west to the Shawnee county line. Roads in this area generally are located one mile apart and follow a common grid pattern. Kansas Highway 10, as well as a few county roads, allow faster travel throughout the zone. The bulk of the roads are gravel, with a few being identified as minimum maintenance and commonly identified as dirt roads and impassable except in the best conditions. The majority of Clinton Lake is also located in this zone. The lake provides full recreation for the residents and travelers to the area.

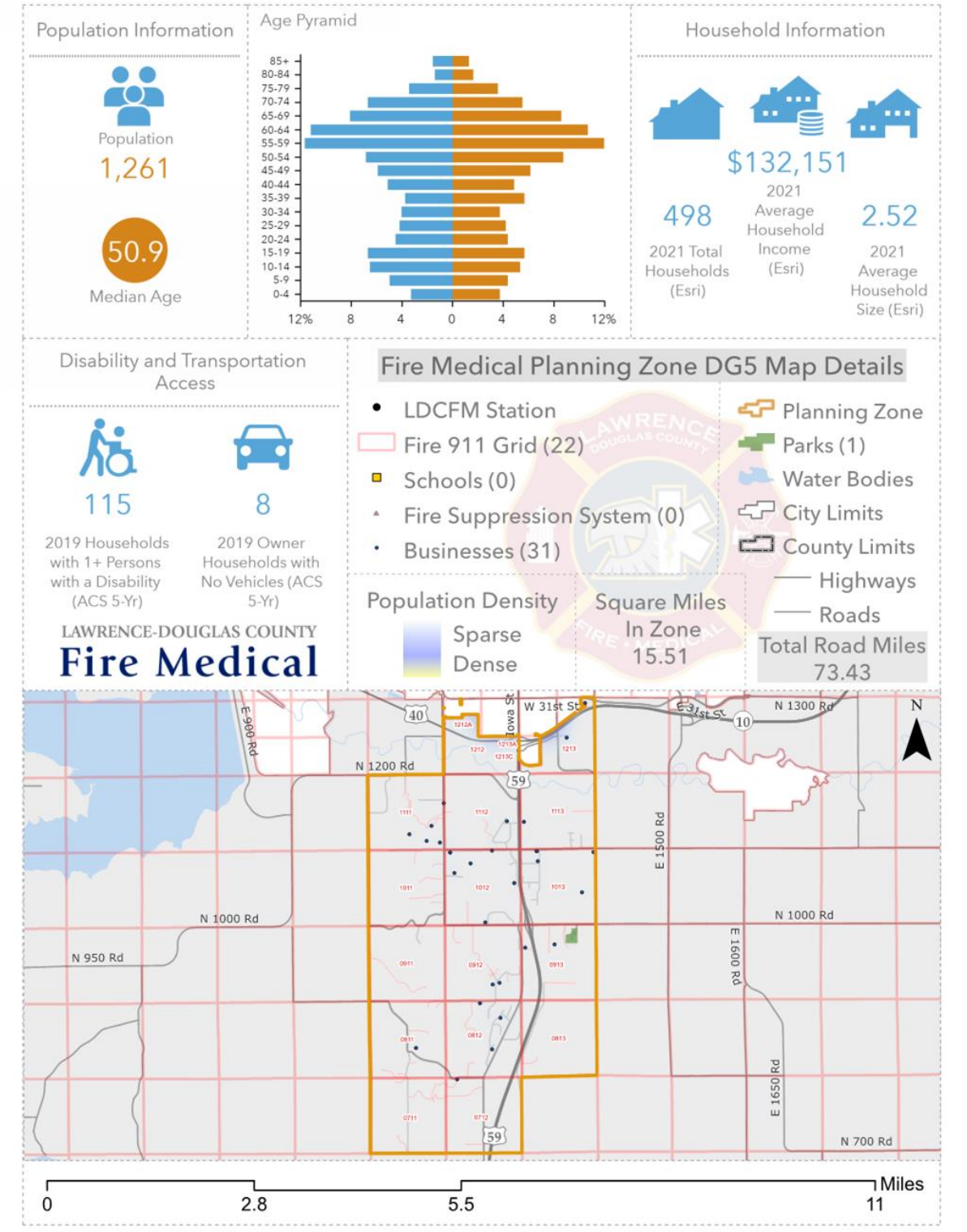


Figure 17: Planning Zone DG5

Planning Zone DG5 Map References: 0711, 0712, 0811, 0812, 0813, 0911, 0912, 0919, 1011, 1012, 1013, 1111, 1112, 1113, 1212, 1213

Planning Zone DG5 Profile

This zone is best described as rural in nature. This zone is directly south of Lawrence. Roads in this area generally are located one mile apart and follow a common grid pattern. US-59 Highway and a few county roads allow faster travel throughout the zone. US-59 is the primary entrance and exit for the south side of the city of Lawrence and thus heavily traveled. US-59 is a major interstate route out of south Lawrence connecting to I-35. The bulk of county roads are gravel, with a few being identified as minimum maintenance and commonly identified as dirt roads and impassable except in the best conditions.

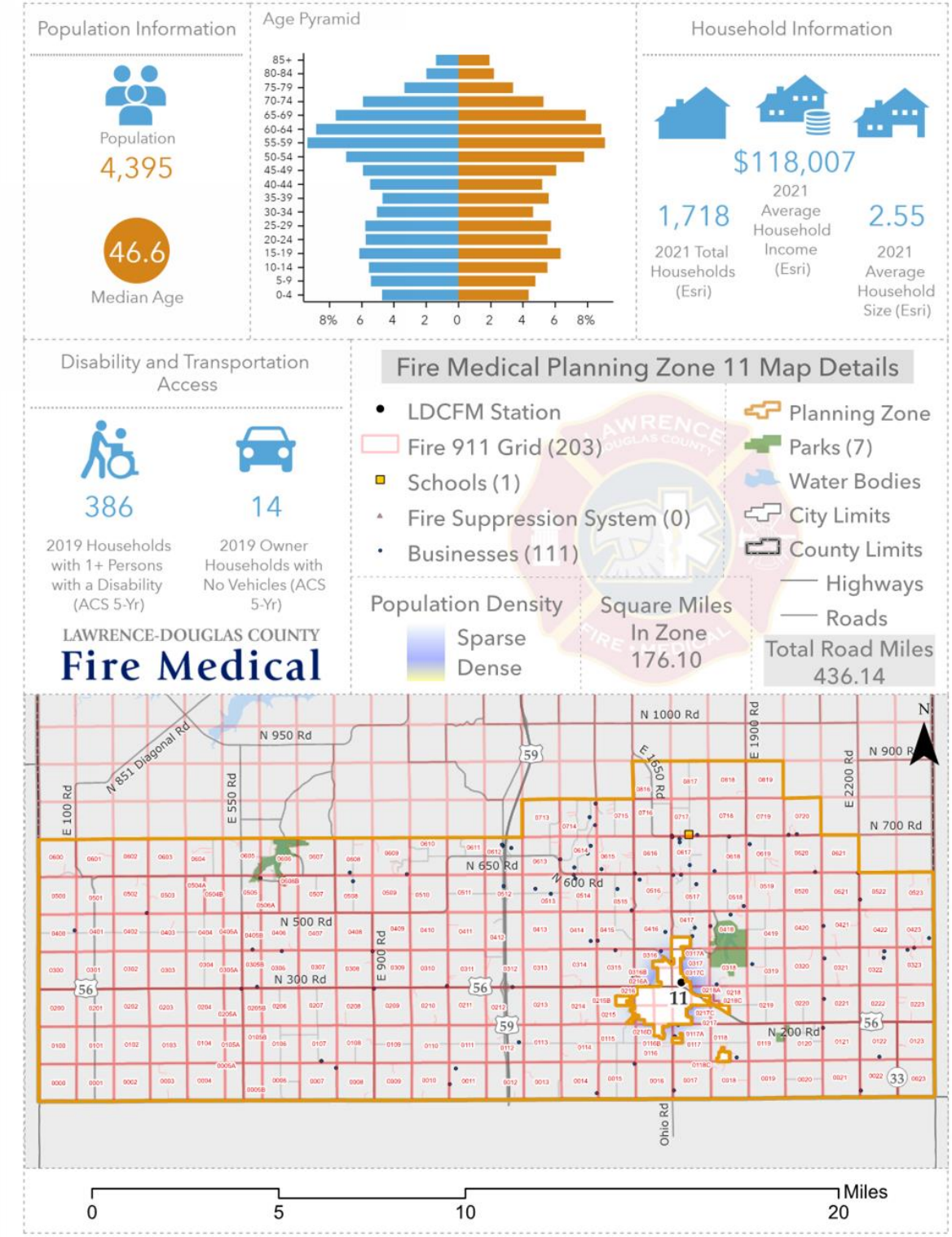


Figure 18: Planning Zone 11

Planning Zone 11 Map Reference(s): 0001, 0002, 0003, 0004, 0006, 0007, 0008, 0009, 0010, 0011, 0012, 0013, 0014, 0015, 0016, 0017, 0018, 0019, 0020, 0021, 0022, 0023, 0100, 0101, 0102, 0103, 0104, 0106, 0107, 0108, 0109, 0111, 0112, 0113, 0114, 0115, 0116, 0117, 0118, 0119, 0120, 0121, 0123, 0200, 0201, 0202, 0203, 0204, 0204, 0206, 0207, 0208, 0209, 0210, 0211, 0212, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0220, 0221, 0222, 0223, 0300, 0301, 0302, 0304, 0305, 0306, 0307, 0308, 0309, 0310, 0311, 0312, 0313, 0314, 0315, 0316, 0317, 0318, 0319, 0320, 0321, 0322, 0323, 0400, 0401, 0402, 0403, 0404, 0406, 0407, 0408, 0409, 0410, 0411, 0412, 0413, 0415, 0416, 0417, 0418, 0419, 0420, 0421, 0422, 0423, 0500, 0501, 0502, 0503, 0505, 0507, 0508, 0509, 0510, 0511, 0512, 0513, 0514, 0515, 0516, 0517, 0518, 0519, 0520, 0521, 0522, 0523, 0600, 0601, 0602, 0603, 0604, 0605, 0606, 0607, 0608, 0609, 0610, 0611, 0612, 0613, 0614, 0615, 0616, 0617, 0618, 0619, 0620, 0621, 0713, 0714, 0715, 0716, 0717, 0718, 0719, 0720, 0816, 0817, 0818, 0819, 0105A, 0205A, 0105B, 0205B, 0305A, 0405A, 0405B, 0504A, 0504B, 0506A, 0506B, 005A, 005B, 0506B, 0005A, 0005B

Planning Zone 11 Profile

This zone is best described as rural in nature. This zone is in the southernmost area of the county, bordered to the east by Johnson County, to the west by Osage, and to the south by Franklin. Roads in this area generally are located one mile apart and follow a common grid pattern. US Highway 56 and US Highway 59, as well as a few county roads, allow faster travel throughout the zone. The bulk of the roads are gravel, with a few being identified as minimum maintenance and commonly identified as dirt roads and impassable except in the best conditions. US 59 was recently re-built as a limited access highway to the east of the existing US 59 and was opened to traffic in October 2012.

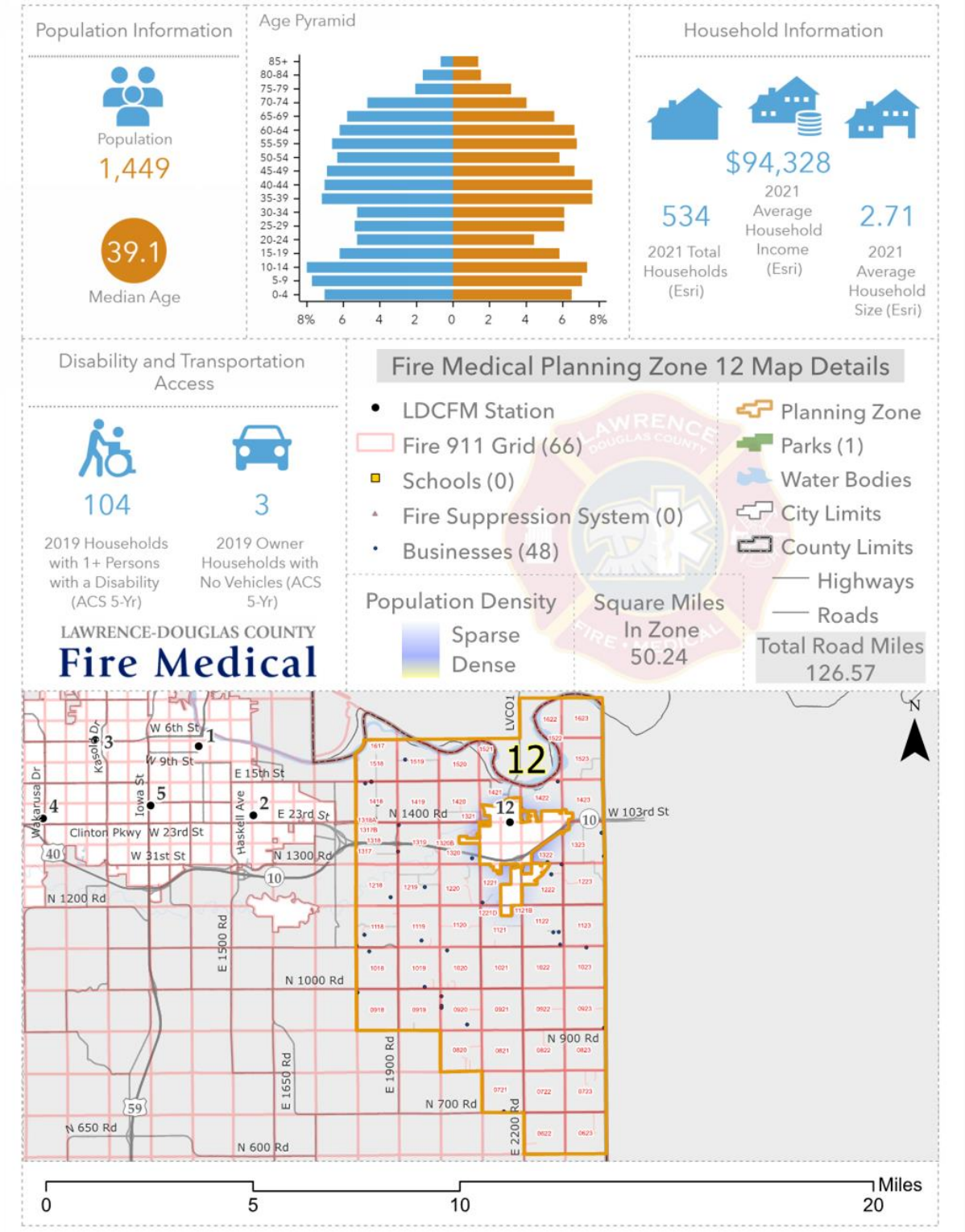


Figure 19: Planning Zone 12

Planning Zone 12 Map References: 0622, 0623, 0721, 0722, 0723, 0820, 0821, 0822, 0823, 0918, 0919, 0920, 0921, 0922, 0923, 1018, 1019, 1020, 1021, 1022, 1023, 1118, 1119, 1120, 1121, 1122, 1123, 1218, 1219, 1220, 1221, 1222, 1223, 1318, 1319, 1320, 1321, 1322, 1323, 1418, 1419, 1420, 1421, 1422, 1423, 1518, 1519, 1520, 1521, 1522, 1523, 1622, 1623

Planning Zone 12 Profile

This area surrounds the city of Eudora, located in eastern Douglas County, with a 2020 population of approximately 6,551. Some industry is located in the Intech Business Park on the east side of the city, with access off the Old K-10 Highway. The city is primarily residential, with most being one- and two-family dwellings. The city is located along the Kansas and Wakarusa Rivers. The city is steadily growing, with the current growth area located north of US Highway 56. Roads in this zone are residential and generally pose no issues for emergency response. Principal Roads: Kansas Highway 10, County Road 2200.

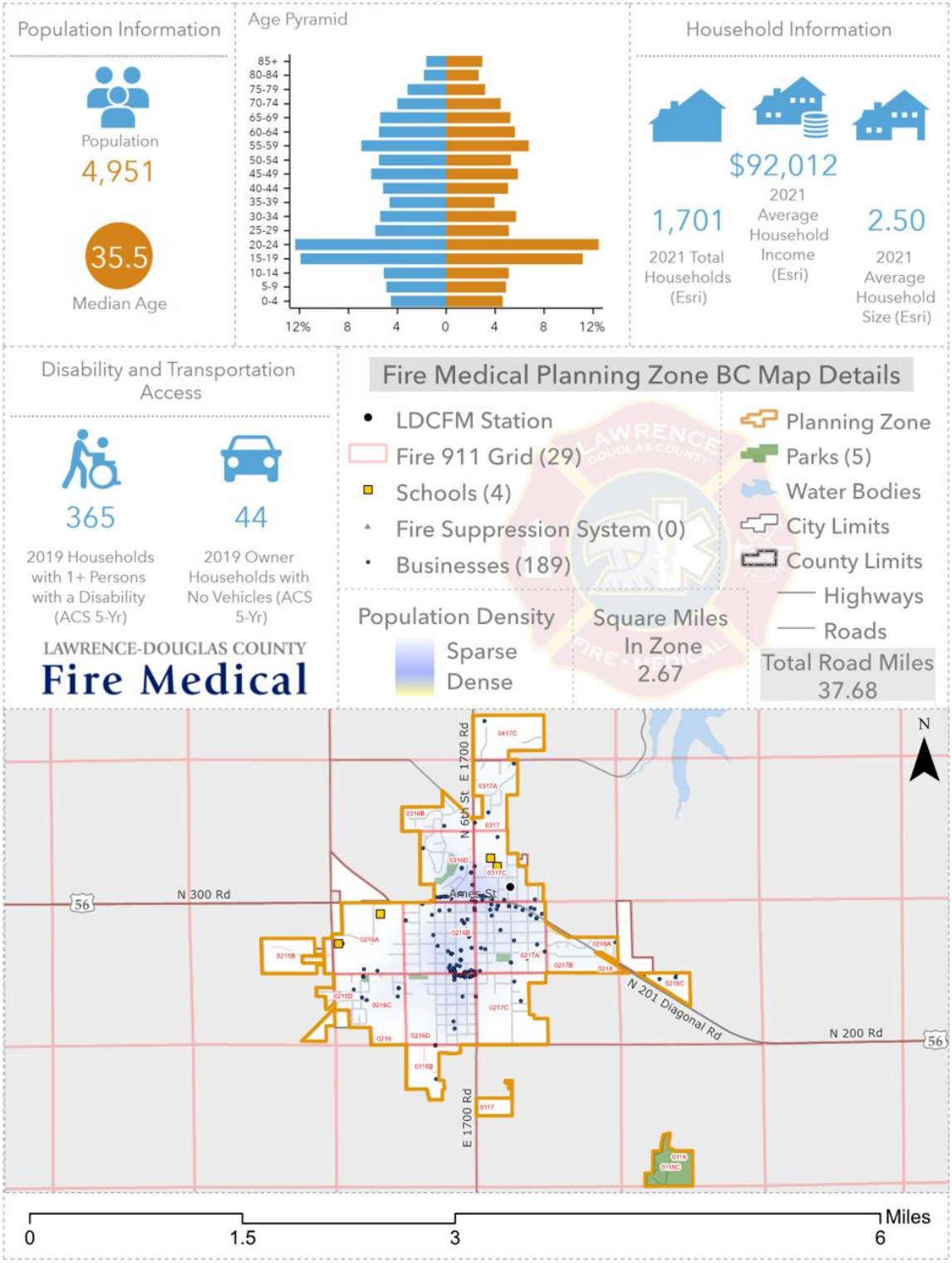


Figure 20: Planning Zone BC

Planning Zone BC Map References: 0116B, 0117A, 0118C, 0215B, 0215D, 0216A, 0216B, 0216C, 0216D, 0217A, 0217B, 0217C, 0218A, 0218C, 0316B, 0316D, 0317A, 0317C, 0417C

Planning Zone BC Profile

This area comprises Baldwin City, located in southern Douglas County, with a 2020 population of approximately 4,684. There is some industry scattered throughout the community with no central hub. US Highway 56 is the most heavily traveled road and generally divides Baldwin north and south; commercial properties continue to grow on both sides of this highway. The city is primarily residential, with most being one- and two-family dwellings. Baldwin City is home to Baker University, a private college with a student population of over 900. The city is steadily growing, with the current growth area located north of US Highway 56. Roads in this zone are residential and generally pose no issues for emergency response. Principal Roads: US Highway 56, County Road 1055.

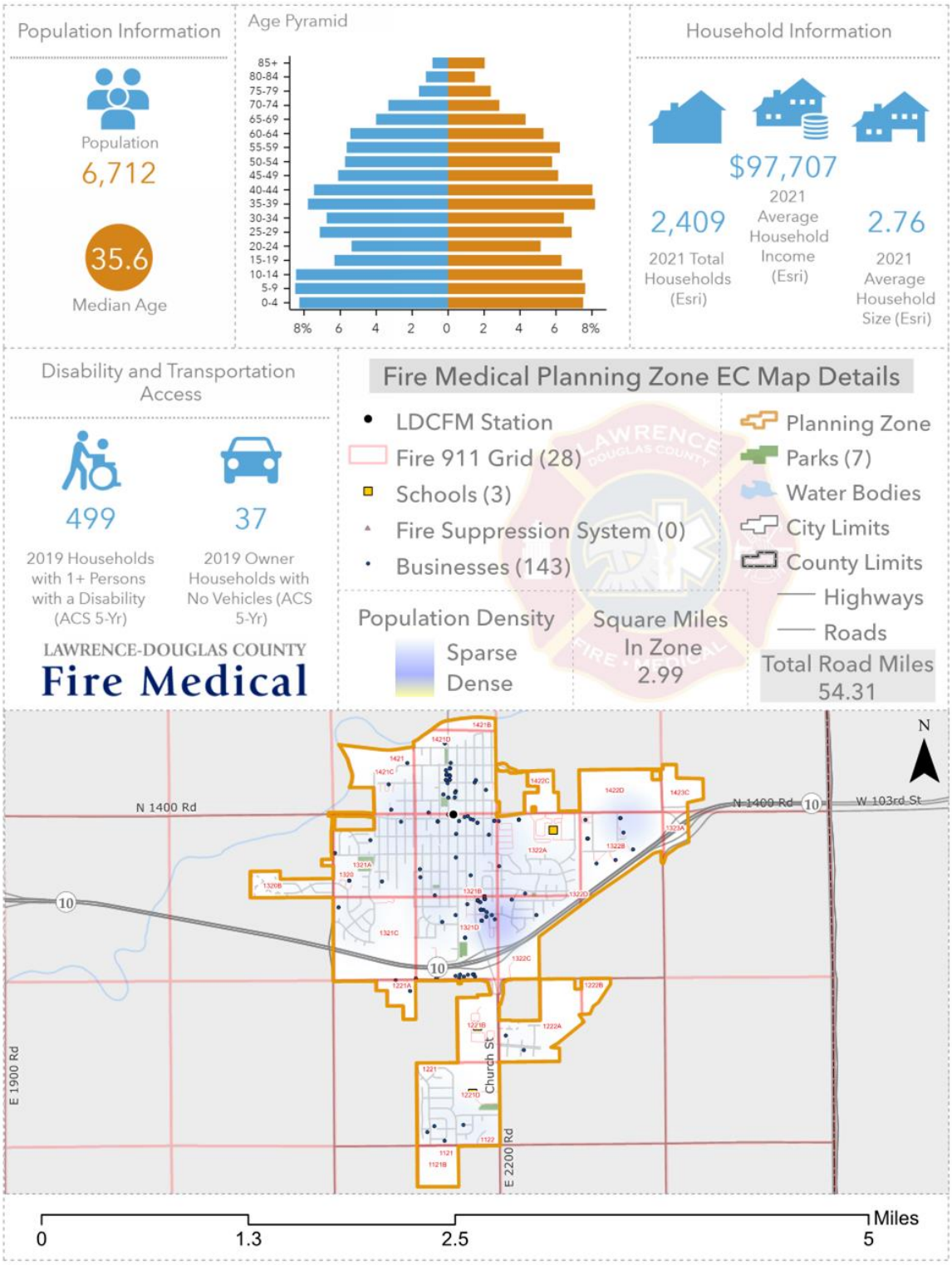


Figure 21: Planning Zone EC

Planning Zone EC Map References: 1121B, 1221A, 1221B, 1221D, 1222A, 1222B, 1230B, 1321A, 1321B, 1321C, 1321D, 1322A, 1322B, 1322C, 1322D, 1323A, 1421B, 1421C, 1421D, 1422C, 1422D, 1423C

Planning Zone EC Profile

This area comprises the city of Eudora, located in eastern Douglas County, with a 2020 population of approximately 6,551. There is some industry located primarily along Kansas Highway 10. There are two commercial areas. The central business district is comprised of businesses located along Main Street. Church Street, the main access point from Kansas Highway 10, also has a cluster of businesses located near the intersection of the highway. The remainder of the city is residential, with most being one- and two-family dwellings. The city is experiencing good growth and is primarily expanding on both sides of the K-10 Corridor and south of the highway. Roads in this zone are residential and generally pose no issues for emergency response. The Kansas River is at the north, and the Wakarusa River at the west edge of the city. Eudora Medicalodges is a professional therapy and skilled nursing facility. Additional risks present with high-risk populations in assisted living and nursing home occupancies.

Risk Classification and Categories

Critical Task Analysis

To affect positive change in an incident, department personnel must be properly assigned, resources must be properly placed and equipped, and each individual must be assigned a critical task(s) to complete. Consequently, those individuals must arrive within a time frame which allows them a chance to use their skills to mitigate the incident at hand. This section illustrates the critical tasks for each risk class and category.

Critical tasks are those tasks that must be conducted in a timely manner by personnel at the scene. The department has evaluated the critical tasks needed for a variety of incidents. When identifying critical tasks, the safety of department personnel is paramount. A command structure must also be in place to ensure that critical tasks are being met.

Fire - Critical Tasks

Critical tasks must be conducted in a timely manner by firefighters at structure fires if firefighters are expected to control the fire. There are several other tasks that must be performed prior to termination of the scene, such as salvage and overhaul. In creating standards of cover, an assessment must be conducted to determine the capabilities of the arriving companies and individual firefighters to achieve those tasks. The department has evaluated the critical tasks needed for a structural fire. When identifying critical tasks, firefighter safety must be emphasized. Whenever interior fire operations are to be accomplished, which require the use of protective clothing (including turnout gear, SCBA, and a minimum 1-3/4" hose line), additional personnel must be staged to perform rescue functions for interior firefighters. A command structure should also be in place. The following key critical tasks must be accomplished by the ERF for the department to meet its mission, goals, and objectives.

Table 35: Critical Tasks - Low Risk Fire

Critical Tasks for Low-Risk Fire	
Task	**Firefighters**
Command/Safety/Attack Line	2
Apparatus Operator	1
Hose Line Support	1
Total	**4**

Table 36: Critical Tasks - Moderate Risk Fire

Critical Tasks for Moderate-Risk Fire	
Task	**Firefighters**
Attack Line	2
Backup Line	2
Search and Rescue	2
Water Supply	2
Apparatus Operator	1
Command/Safety	1
Total	**10**

Table 37: Critical Tasks - High Risk Fire

Critical Tasks for High-Risk (Structure) Fire	
Task	**Firefighters**
Attack Line	2
Backup Line	2

Search and Rescue	2
Water Supply	1-2
Ventilation	2
RIT Team	4
Engineer	1
Command/Safety	1-2
Total	**16**

Emergency Medical Services - Critical Tasks

These calls include cardiac arrests, heart attacks, difficulty breathing, childbirths, and strokes. For the majority of advanced life support (ALS) level EMS calls, the low-risk response is one medic unit staffed with a paramedic and AEMT.

Emergency communications dispatchers have the responsibility of screening calls utilizing the Emergency Medical Dispatch (EMD) system to establish the correct effective response and to provide pre-arrival instructions for callers. Upon arrival of the first officer on the scene, the initial response may be adjusted once actual conditions/patient have been assessed. Standard operating procedures (SOP) are utilized to request adequate personnel for these types of calls needing additional resources.

Higher-risk EMS incidents correlate with incidents with a risk of serious outcome or potential life loss. Cardiac arrest event types fall within the high-risk classification. A single acute coronary syndrome patient with difficulty breathing and shock-like symptoms would necessitate the following tasks by responding personnel.

Table 38: Critical Tasks - EMS

Critical Tasks for an EMS Incident	
Paramedic Critical Task	**AEMT Critical Task**
Primary and secondary assessment	Oxygen set up and administration
Triage decision and direct all patient care	ECG application
ECG interpretation	IV-line placement and monitoring
Medication administration	Vital signs and oxygen saturation monitoring
Bio-com communications with medical control	Radio communications with dispatch
Application of standing and physician orders	Patient and equipment packaging for transport
Report to medical staff on arrival	Vehicle operations to/from scene
Written report documentation	Vehicle readiness and restocking
	Assist with all EMT-level care

Table 39: Critical Tasks - Low Risk EMS

Critical Tasks for Low-Risk EMS	
Task	**Firefighters**
ALS Patient Care	1
Command	1
Total	**2**

Table 40: Critical Tasks - Moderate Risk EMS

Critical Tasks for Moderate-Risk EMS	
Task	**Firefighters**
ALS Treatment/Transport	1
Command	1
Total	**2**

Table 41: Critical Tasks - High Risk EMS

Critical Tasks for High-Risk EMS	
Task	**Firefighters**
ALS Treatment / Transport	2
Command	1
Total	**3**

Table 42: Critical Tasks - Maximum Risk EMS

Critical Tasks for Maximum-Risk EMS	
Task	**Firefighters**
ALS Treatment / Transport	3
Command	1
Total	**4**

Technical Rescue - Critical Tasks

The often complex and dangerous nature of a technical rescue requires that responders are both highly trained and rapidly deployable. The common tasks associated with mitigating a rope rescue, trench collapse, building collapse, water or ice rescue are identified as follows.

Table 43: Critical Tasks - Low Risk Rescue

Critical Tasks for Low-Risk Rescue	
Task	**Firefighters**
Rescue	1
Command	1
Total	**2**

Table 44: Critical Tasks - Moderate Risk Rescue

Critical Tasks for Moderate-Risk Rescue	
Task	**Firefighters**
ALS Patient Care/Transport	2
Extrication/Additional Patient Care Providers/ Hazard Mitigation	3
Command/ Safety	1
Total	**6**

Table 45: Critical Tasks - High Risk Rescue

Critical Tasks for High-Risk Rescue	
Task	**Firefighters**
Rescue Group (primary and secondary teams and Rescue Group Officer)	6
Medical	2
Rescue Safety	1
Command	1
Total	**10**

Table 46: Critical Tasks - Maximum Risk Rescue

Critical Tasks for a Maximum Risk Rescue	
Task	**Firefighters**
Rescue Group (primary and secondary teams)	6
Rigging	5
Medical	2
Rescue Safety (upstream and downstream)	2
Command/Safety	1
Total	**16**

Hazardous Materials - Critical Tasks

The department currently maintains a hazardous materials unit and hazardous materials support trailer at Fire Medical Station 4. Approximately 40 personnel are trained to NFPA 472 competencies for hazardous material technician. The remainder of the department is trained to the operations level. Guidelines for response and critical tasks are set forth in the hazmat response SOP. A hazardous materials response would necessitate the following tasks by responding personnel.

Table 47: Critical Tasks - Low Risk Hazardous Materials

Critical Tasks for Low-Risk Hazardous Materials	
Task	**Firefighters**
Investigation/Monitoring	3
Command/ Safety	1
Total	**4**

Table 48: Critical Tasks - Moderate Risk Hazardous Materials

Critical Tasks for Moderate-Risk Hazardous Materials	
Task	**Firefighters**
Pump Operation	1
Fire Suppression Standby	2
Air monitoring	2
Command/Safety	1
Total	**6**

Table 49: Critical Tasks - High Risk Hazardous Materials

Critical Tasks for High-Risk Hazardous Materials	
Task	**Firefighters**
Haz-Mat Safety (1-HM)	1
Decontamination	4
Site Access Control	1
Technical Specialist (HM) (Research)	1
Safe Refuge	1
Medical monitoring	1
Entry Team (1 HM)	2
Entry Team Leader	1
Hazmat Group Supervisor	1
Back-up Team (1-HM), (RIT)	2
Command	1
Total	**16**

Incident scenes are unpredictable in many ways. While it is possible to state what critical tasks must be accomplished for each incident to be mitigated, it is not always possible to predict how many firefighters it will take to accomplish a specific task. On larger incidents, it is expected that chief officers not assigned to the initial response will arrive on scene to provide command support. This supports the on-duty response by adding personnel for command functions such as planning, logistics, and administrative positions.

The department has utilized its risk assessment, experience, knowledge, and call history to determine what the effective minimum response force should be for the identified incident types. These numbers represent an accurate number of firefighters to develop an effective response force for each incident type. The need for more or less personnel may arise on any incident at any time. Incident conditions or complexity must dictate the response available for any given incident, even if that response is above what is outlined in this document.

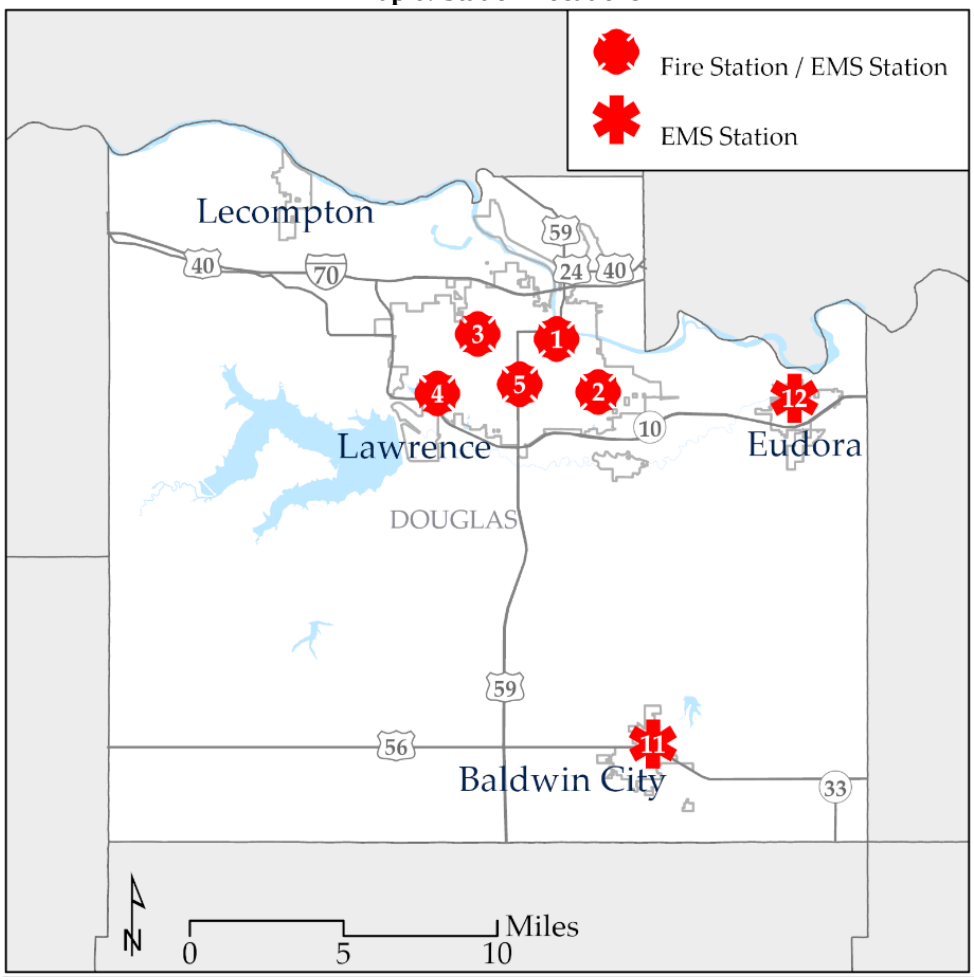
H. Historical Perspective and Summary of System Performance

Distribution Factors

Distribution: Geographic location of all first-due resources for initial intervention. Generally measured from fixed response points, such as fire medical stations, and expressed as a measure of time. Distribution of response resources defines the specific geographical location for each resource. Resources can change locations at any one point in time, depending on demand. These estimates are based upon what is considered first due or closest resources under normal response situations.

Specific station and unit assignments:
Fire Medical Station 1: Chief Officer (1), Fire Apparatus (1), Medic Unit (1)
Fire Medical Station 2: Fire Apparatus (1), Medic Unit (1)
Fire Medical Station 3: Fire Apparatus (1), Medic Unit (1)
Fire Medical Station 4: Fire Apparatus (1), Medic Unit (1)
Fire Medical Station 5: Chief Officer (1), Fire Apparatus (1), Medic Unit (1)
Fire Medical Station 11: Medic Unit (1)
Fire Medical Station 12: Medic Unit (1)

Map 6: Station Locations

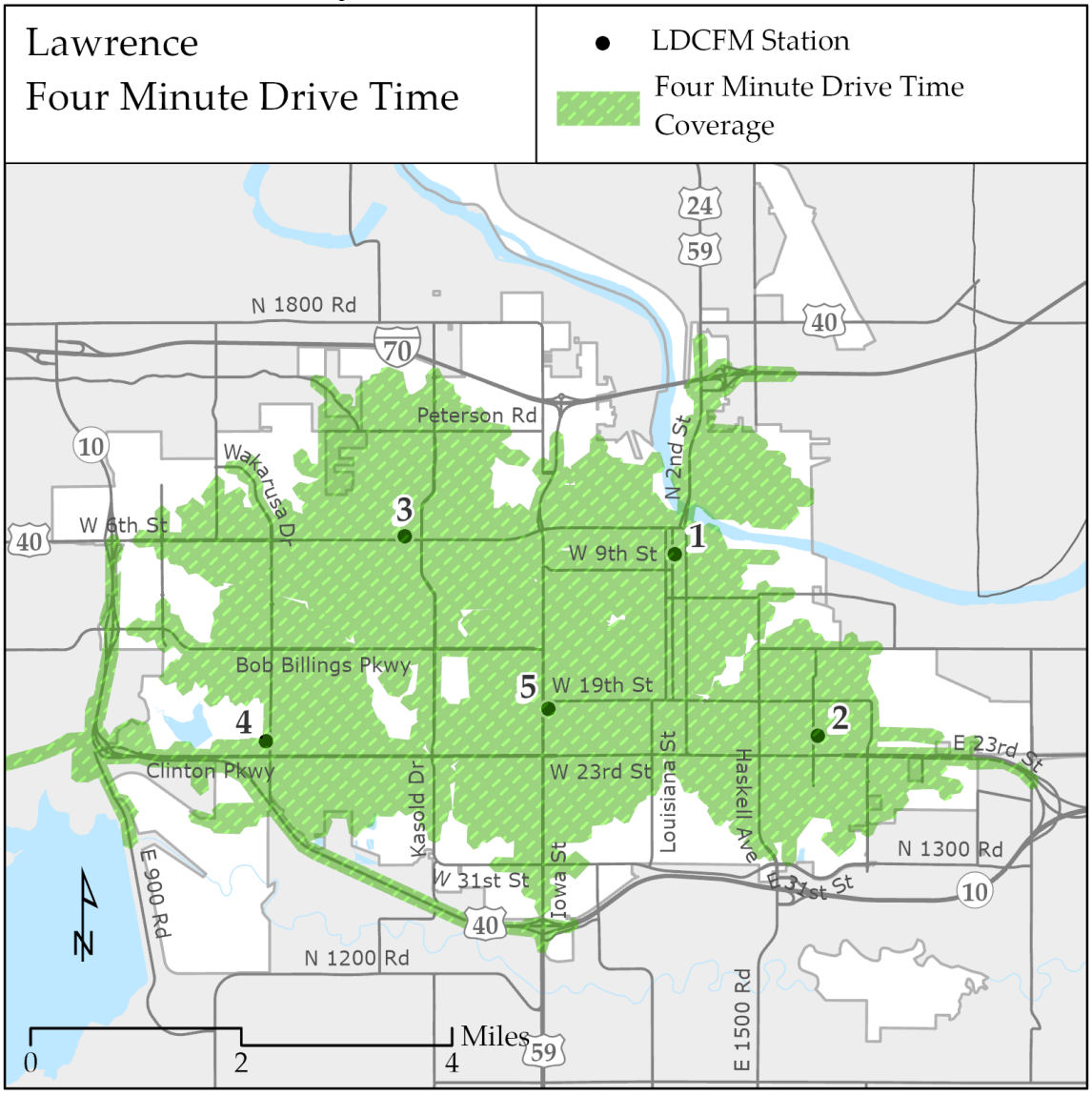


Station location is driven by a number of factors, the least of which is the delivery of quality service. Stations are usually located where they are most tolerated by the residents and where the city owns or can obtain land inexpensively. Extraordinary requirements are needed for a department to locate a service facility exactly

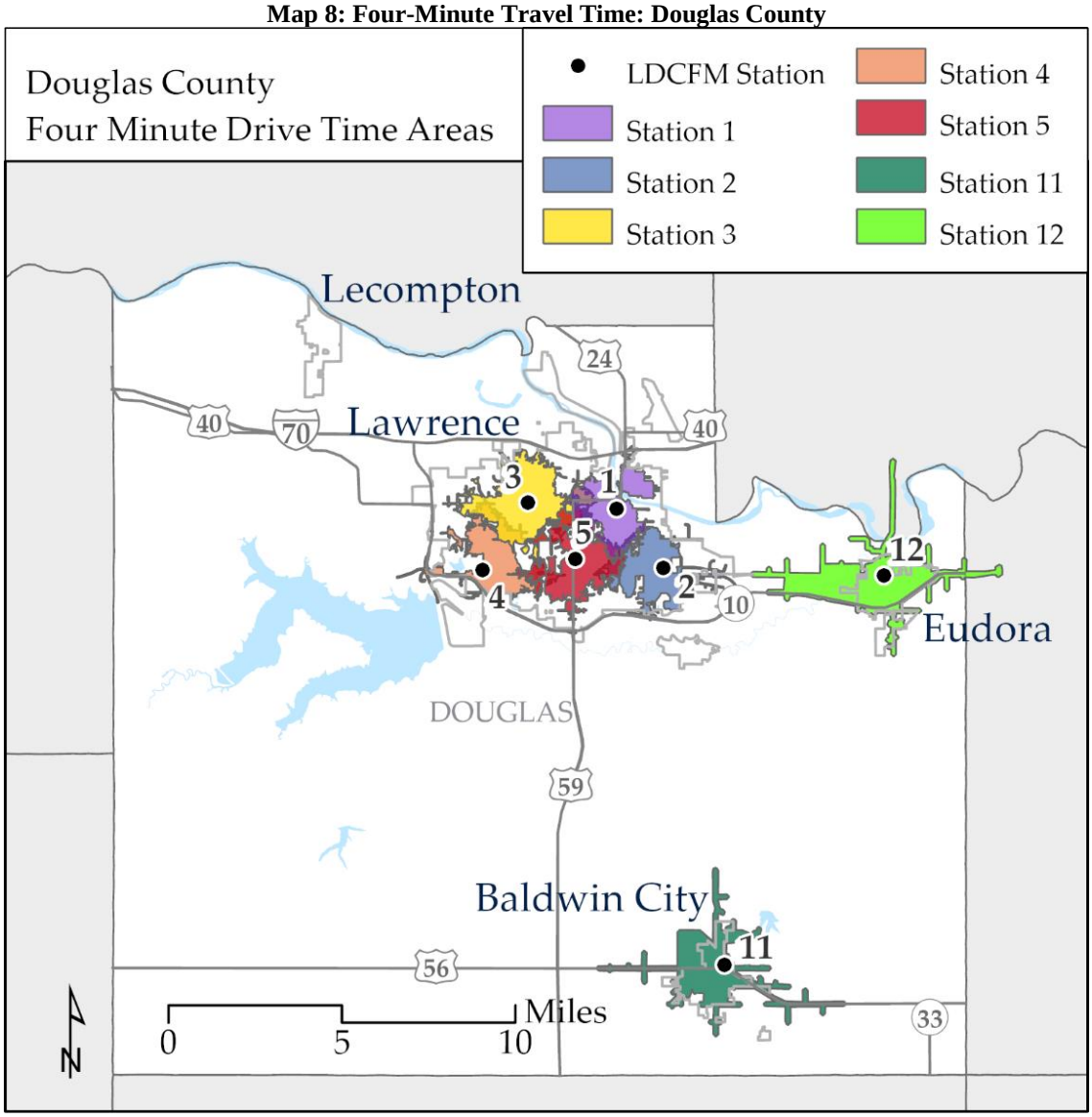
where it is needed. Rarely considered is that several blocks in either direction sometimes make a serious change in regular response patterns and the ability to meet the SOC total response time objectives. In the case of Lawrence, the city currently operates five response facilities from which fire and emergency medical services are dispatched.

Distribution of station and resource locations is needed to ensure rapid first due response deployment to mitigate emergencies. Distribution is measured by the percent of the jurisdiction covered by the first due units. Currently, the department operates out of five stations in the city of Lawrence, each containing an engine/quint/truck company staffed with four personnel and a medic unit staffed with two personnel. The department also operates medic units out of Baldwin City and Eudora.

Map 7: Four-Minute Travel Time: Lawrence



Map 8: Four-Minute Travel Time: Douglas County



For each type of category and classification, distribution is based on whether a qualifying unit arrives on scene to make progress on mitigating the incident.

Table 50: Qualifying Units by Risk Category

Risk Category	Qualifying Unit
Fire	Engine, Quint, or Truck
Emergency Medical Services	Vehicle with an AED and an Advanced Emergency Medical Technician
Hazardous Materials	Engine, Quint, or Truck
Technical Rescue	Engine, Quint, Truck, Ladder, or Rescue

Concentration Factors

Concentration: Spacing of multiple resources arranged so that an initial "effective response force" (ERF) can arrive on scene within the time frames outlined in the on-scene performance expectations. Concentration addresses the spacing of multiple resources arranged close enough together so that the ERF can be assembled on-scene, targeting total response time benchmark objectives. The ERF is determined for each incident type based on critical tasking to mitigate the incident and stop loss.

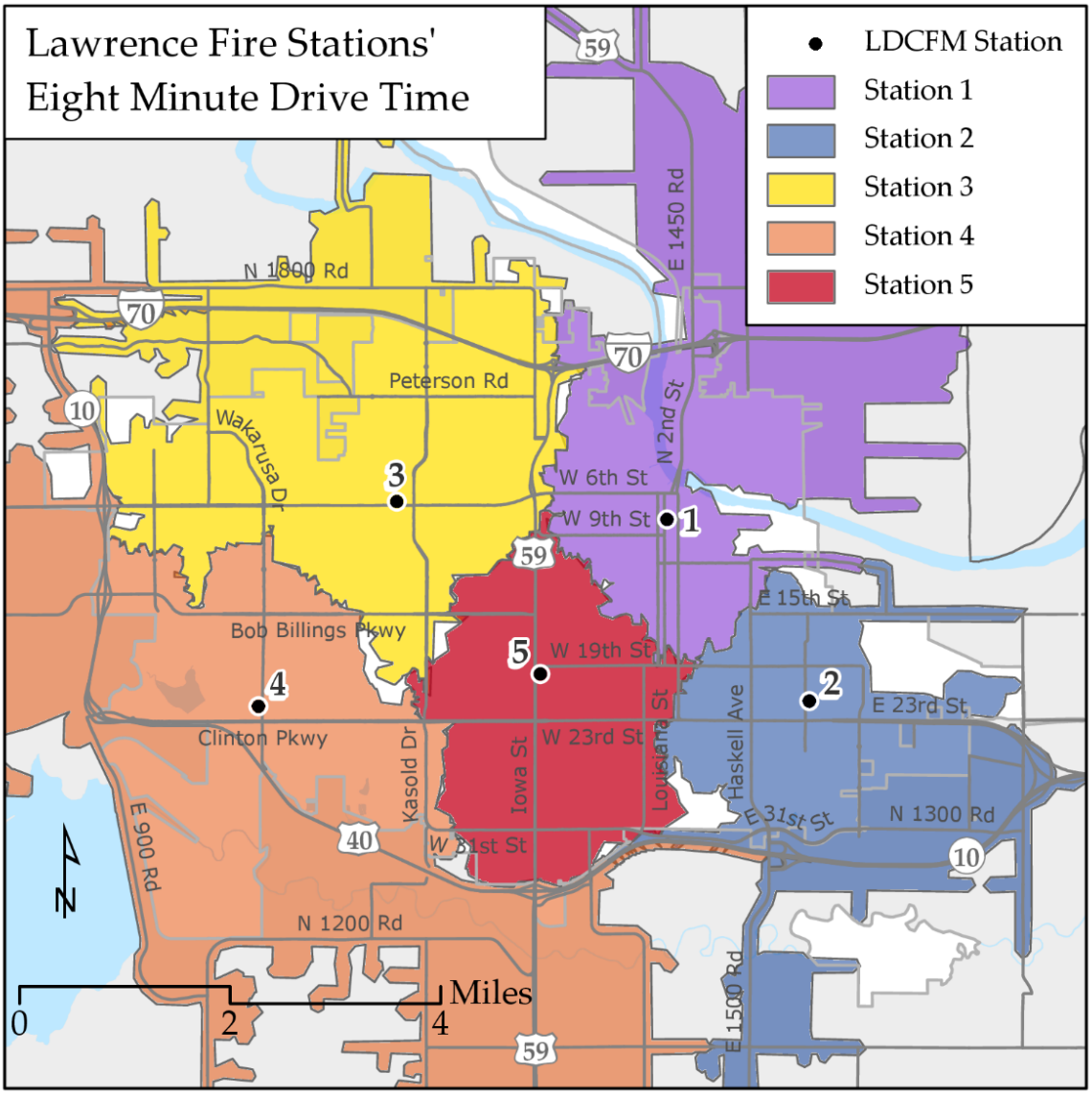
An initial ERF is that which will most likely stop the escalation of an emergency in a specific risk type. Such an initial response may stop the escalation of the emergency, even in maximum risk areas; however, an initial ERF is not necessarily the total number of units or personnel needed if the emergency escalates to the maximum potential. Additional resources can be requested through mutual aid to assist in incident mitigation and/or response coverage.

The concentration of emergency response units in the city of Lawrence and Douglas County reflects the demand for service. Fire and emergency medical services are delivered from all five locations. Emergency medical services are delivered from Fire Medical Station 11 (Baldwin City) and 12 (City of Eudora).

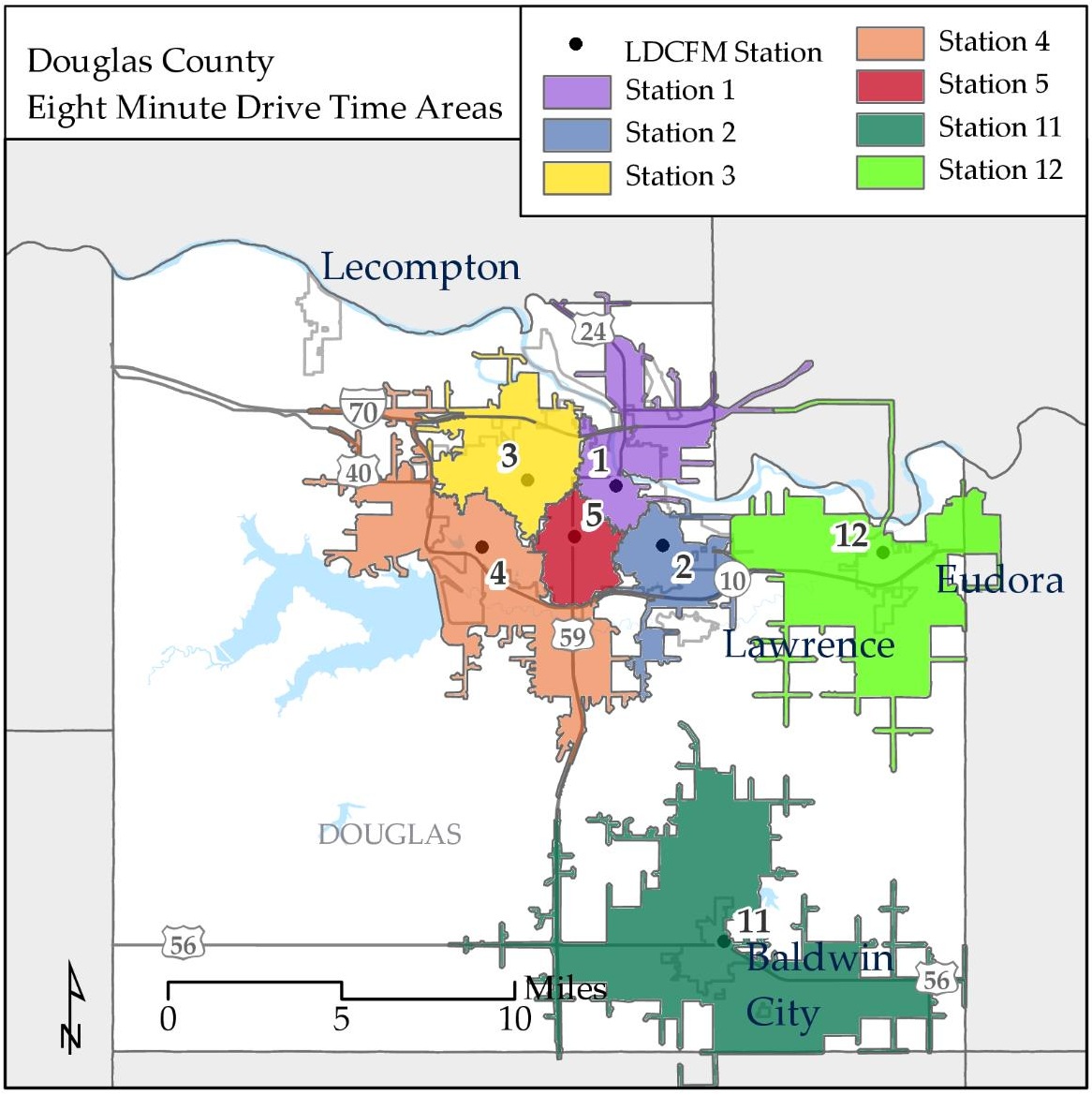
The focus of providing an initial ERF is that it will most likely stop the escalation of the emergency, be it fire or increased illness. Concentration of service delivery is best measured by risk/category type, where higher-risk areas would require second and third-due units in shorter time frames than typical or low risk areas. The department handles responses to all hazards in a similar manner. Services concentration measures are considered in:

- Percent of square miles
- Percent of equally sized analysis areas
- Percent of total road miles in jurisdiction for the number of total units in the initial effective response force
- Resource types and staffing

Map 9: Eight-Minute Travel Time: Lawrence



Map 10: Eight-Minute Travel Time: Douglas County

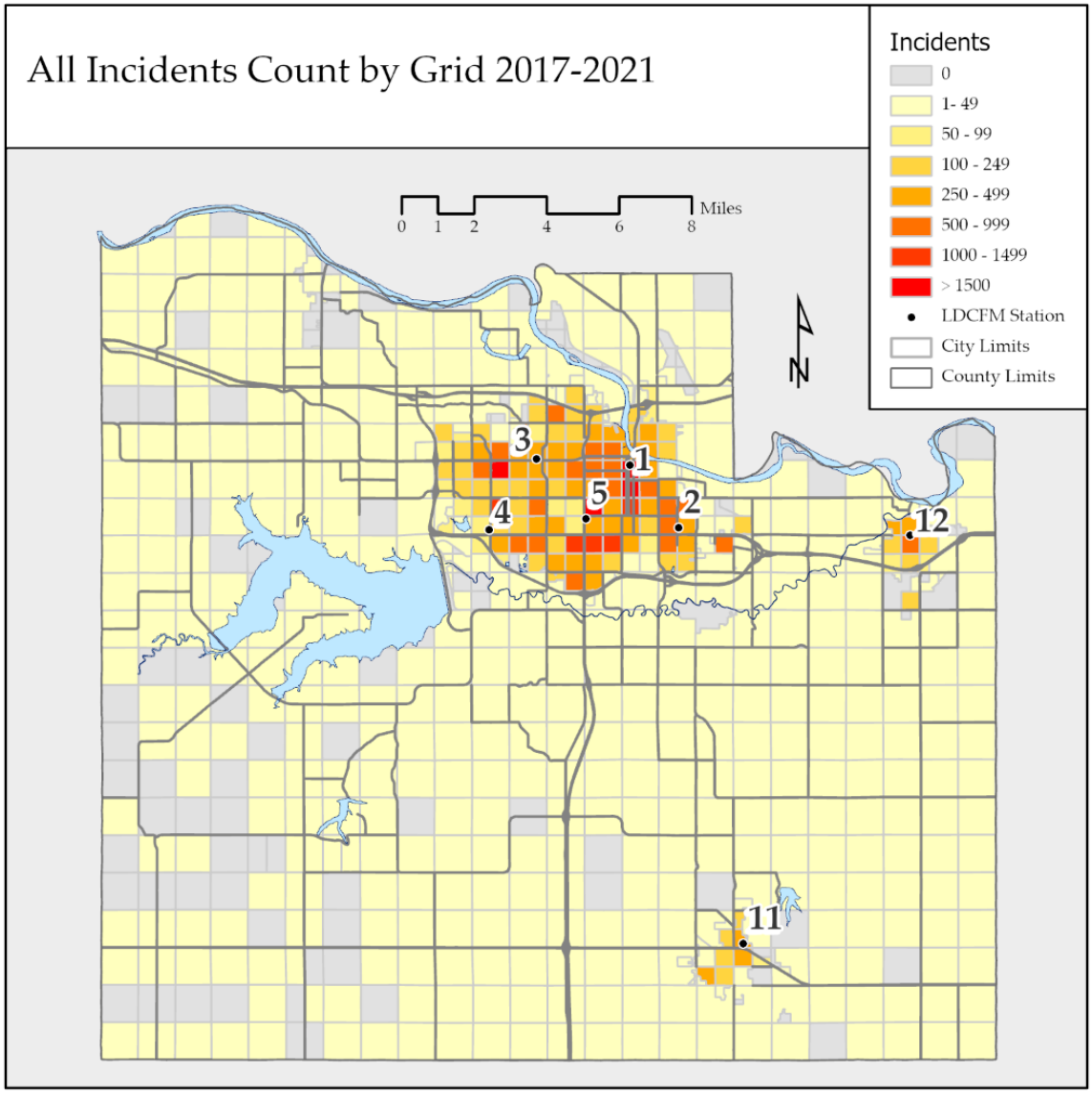


Reliability Factors

Response reliability is the frequency of resource response time performance within some geographical regions or planning zones. Travel time response quality is affected by several factors, including resource availability, weather, road conditions, and traffic. Theoretically, if all units were available and always in their stations, then the reliability of performance within a shaded area would be near one hundred percent. Except, units are not always available. They are utilized for a myriad of tasks daily beyond responding to emergency calls. If the closest unit to an incident is unavailable, the next closest unit will be assigned to the incident. Reliability is reduced when companies are unavailable for a multitude of reasons, including:

- Fire Prevention/Inspection
- Public Education
- Coroner Scene Investigation (CSI)
- Fire Investigations
- Out-of-town ambulance transfers (Hospital to hospital)
- High call volume
- Out-of-station or out-of-district training (Fire/EMS)
- Fueling apparatus
- Administrative duties (re-stocking ambulance, etc.)

Map 11: All Incidents Count by Grid (2017-2021)



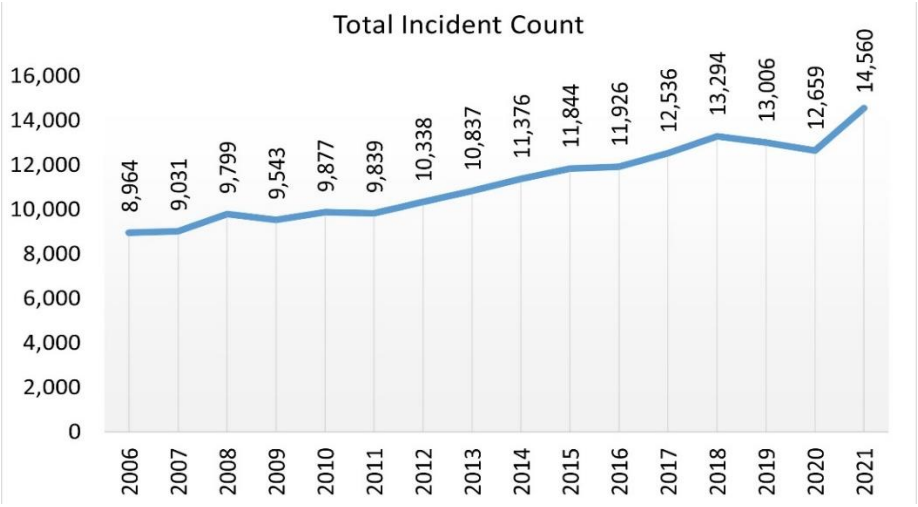


Figure 22: Total Incident Count (2006-2021)

In 2016, the department began utilizing automatic vehicle location (AVL) in conjunction with the identification and deployment of department resources. It is the department's realization that this deployment-enhancing technology has assisted in ensuring the closest resources are mobilized for the best outcome for the community. The department believes this technology has assisted in maintaining a consistent travel time measurement with an increasing number of demands for service.

The table below illustrates the reliability of benchmark travel response time (4 minutes/urban standard) of a fire apparatus on structure fires by planning zone within the city of Lawrence.

Table 51: Benchmark Travel Time Reliability - Structure Fires, by Planning Zone in Lawrence

Structure Fires	Planning Zone 1	Planning Zone 2	Planning Zone 3	Planning Zone 4	Planning Zone 5	City-wide
Reliability 2017-2021	63%	72%	50%	42%	44%	54%
	n=79	n=43	n=64	n=24	n=97	n=307

The table below illustrates the reliability of benchmark travel response time (4 minutes/urban standard) of any unit to a high-risk medical call by planning zone within the city of Lawrence. High risk medical calls include cardiac arrest, electrocution, drowning/diving accident, shootings, and stabbings.

Table 52: Benchmark Travel Time Reliability - EMS, by Planning Zone in Lawrence

High Risk Medical	Planning Zone 1	Planning Zone 2	Planning Zone 3	Planning Zone 4	Planning Zone 5	City-wide
Reliability 2017-2021	83%	84%	78%	78%	76%	80%
	n=195	n=132	n=199	n=88	n=192	n=806

Table 53: Benchmark Travel Time Reliability - EMS, Eudora and Baldwin City

High Risk Medical	Eudora	Baldwin City
Reliability 2017-2021	79%	70%
	n=63	n=40

The following table illustrates the reliability of benchmark travel response time (10 minutes/rural standard) of any unit to a high-risk medical call by planning zone within Douglas County. High-risk medical calls include cardiac arrest, electrocution, drowning/diving, motor vehicle accident level 3 (county only), shootings, and stabbings.

Table 54: Benchmark Travel Time Reliability - Douglas County

Cardiac Arrest	County Zone 1	County Zone 2	County Zone 3	County Zone 4	County Zone 5	County Zone 11	County Zone 12	Rural
Reliability 2017-2021	100%	69%	54%	45%	73%	57%	86%	65%
	n=12	n=16	n=50	n=20	n=22	n=37	n=28	n=185

Exhaustion of Resources

The exhaustion deployment level triggers the chief officers and all company officers to notify recoverable members and immediately cease all activities which might cause response delays. The department has set a minimum resource exhaustion level of two engines/quints and two medic units as the point where off-duty personnel will be called back to duty. Monitoring exhaustion is the responsibility of the chief officers, who may request assistance to manage this task at any time from another chief officer or company officer. In the event that the initial emergency response proves to be inadequate, the department also has the capability to request additional resources from the Kansas City Metro Area fire departments. These additional units are available upon request through the normal communications channels. With the existing systems in place, it is possible to immediately deplete all the available resources to respond to an incident within the jurisdiction. When the cache of local resources is depleted, the department can call upon regional resources.

Standards, Goals, and Objectives

To perform a complete assessment of a department's ability to respond to specific emergencies, it must establish standards. These standards must be made based on an educated understanding of the risk faced, both from the source and the community.

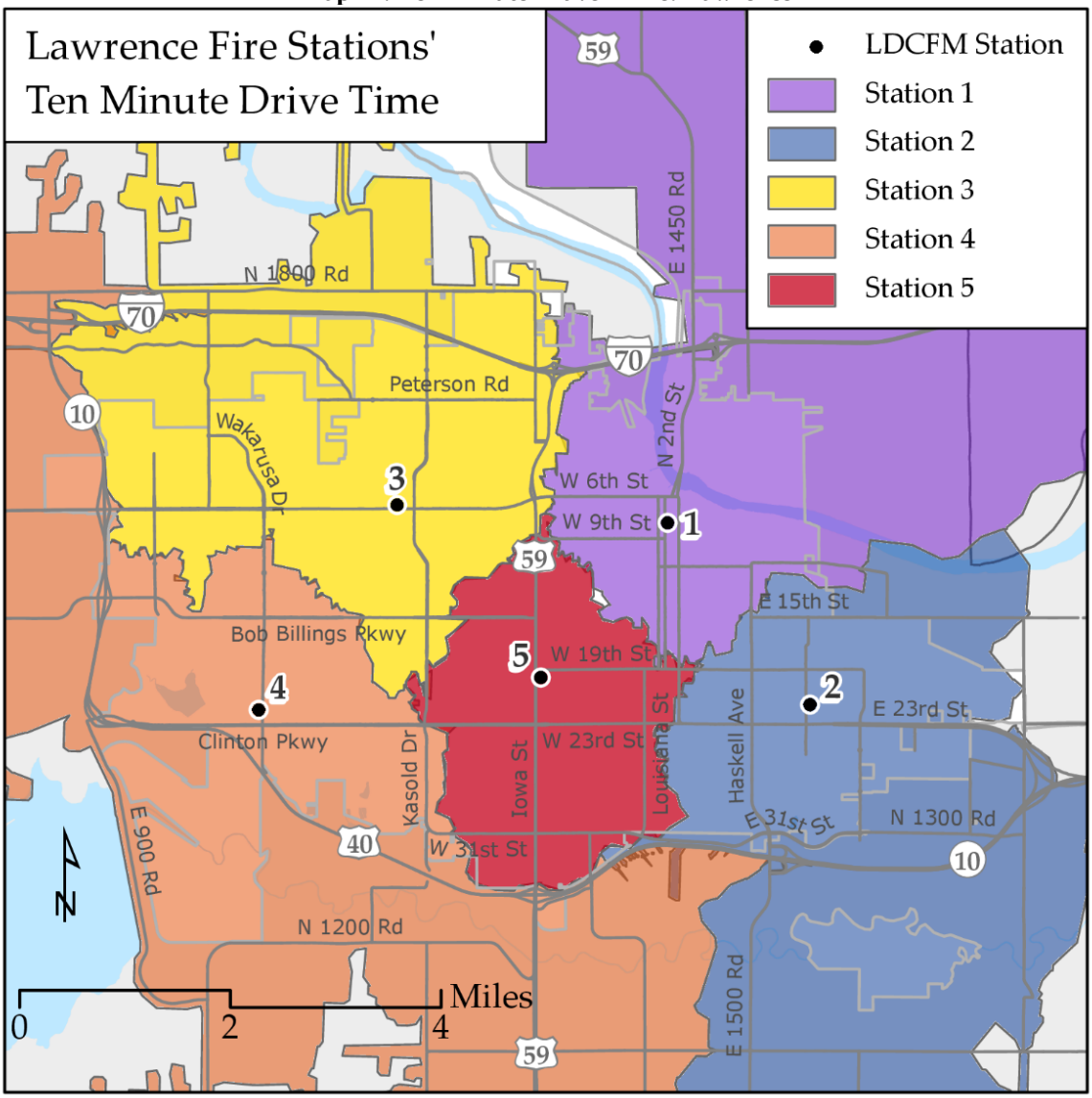
For a community's emergency resources to make a positive impact on the event, they must arrive in time to affect change. In this section, the department will assess and establish a total response time measurement for the service while taking into consideration the factors involved in creating effective change in both structural fires and life-threatening emergency medical calls.

Total Response Time

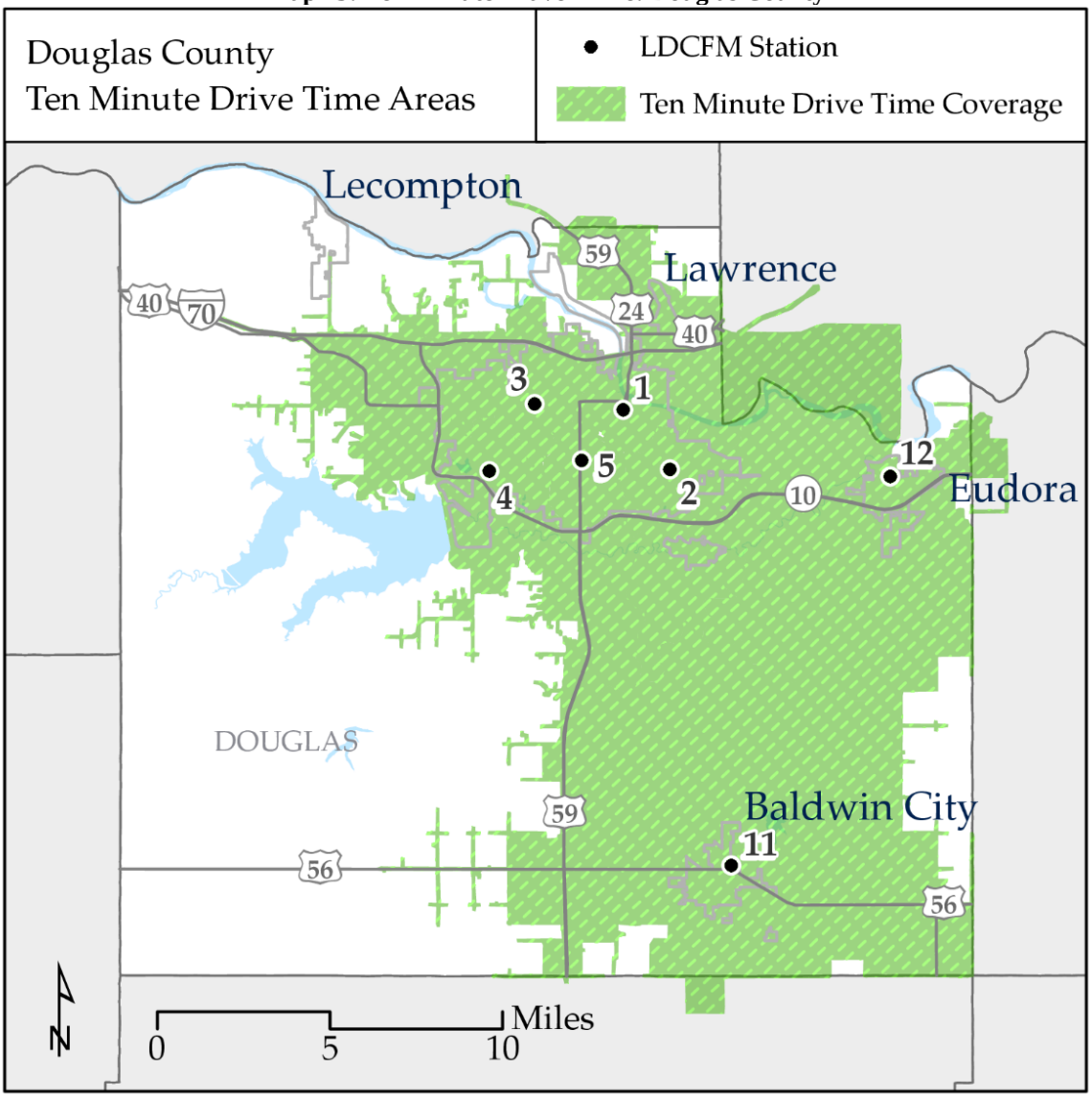
Total response time is a compilation of the elements beginning with alarm handling time, turnout time, and travel time. The total response time concept is simple but has been extremely hard for fire departments and fire chiefs nationwide to accept. Fire departments nationwide typically have different descriptions for the term "Response Time." Generally, it describes travel time only or turnout and travel time combined. Total response time includes the alarm handling time component often overlooked by most departments. The simple fact is when a person calls for service, they generally are not interested in all the pieces that make up these differing response times. They know they called, and it took longer than the department has traditionally said it takes to arrive.

The concept of a total response time continuum has evolved from standards set by the National Fire Protection Association (NFPA). This theory of a total time assessment and standard was foreign to the fire service before the mid-1980s.

Map 12: Ten-Minute Travel Time: Lawrence



Map 13: Ten-Minute Travel Time: Douglas County



Total Response Time Objectives

The department operates around two basic cycles. The first is the cycle of fire: heat, fuel, and oxygen cycle continuously while a fire burns. Firefighters train to break this cycle at any of these three points. The second cycle is the cycle of life: the heart, lungs, and brain work continuously to sustain life. When that cycle is broken due to illness or injury, firefighters train to keep this cycle going to save a life, like performing CPR. One cycle disconnected; one cycle reconnected – both to save lives within a critical few minutes.

If emergency system designers plan effective responses around the benchmark times of flashover and brain death, the measure of time needs to be defined and understood. In an emergency, there are many benchmarks such as ignition point, heart cessation, calling 911, dispatch, travel time, and set-up times. The department must plan a system that places effective resources on-scene at department benchmark targets, considering all the necessary tasks.

Outcomes

The department measures success using outputs and outcomes of services provided to the community.

Two key performance indicators the department uses to measure its success are:

1) Percent of Fires Contained to Their Room of Origin (Safe & Secure Outcome SaS-3)
2) Percent of Cardiac Arrest Patients with Pulsatile Rhythms Upon Arrival to a Hospital (Safe & Secure Outcome SaS-4)

The Cycle of Fire

A fire within a structure can be classified into three defined growth stages. The first is the incipient phase which occurs from ignition to open flame. The second phase of fire is the free-burning stage which is characterized by rapid growth and heat production. During this phase of fire growth, the fire can reach the point of flashover. Flashover is the point when the fire dramatically grows from burning the initial contents to all the contents in the space. Flashover is likely to occur if the temperature of the upper gas layer in an enclosure reaches approximately 1,100 degrees Fahrenheit. The final phase of the fire growth is the smoldering phase, which occurs when the available oxygen is consumed by the fire. At this stage, a rapid introduction of oxygen into the room can lead to a sudden backdraft.

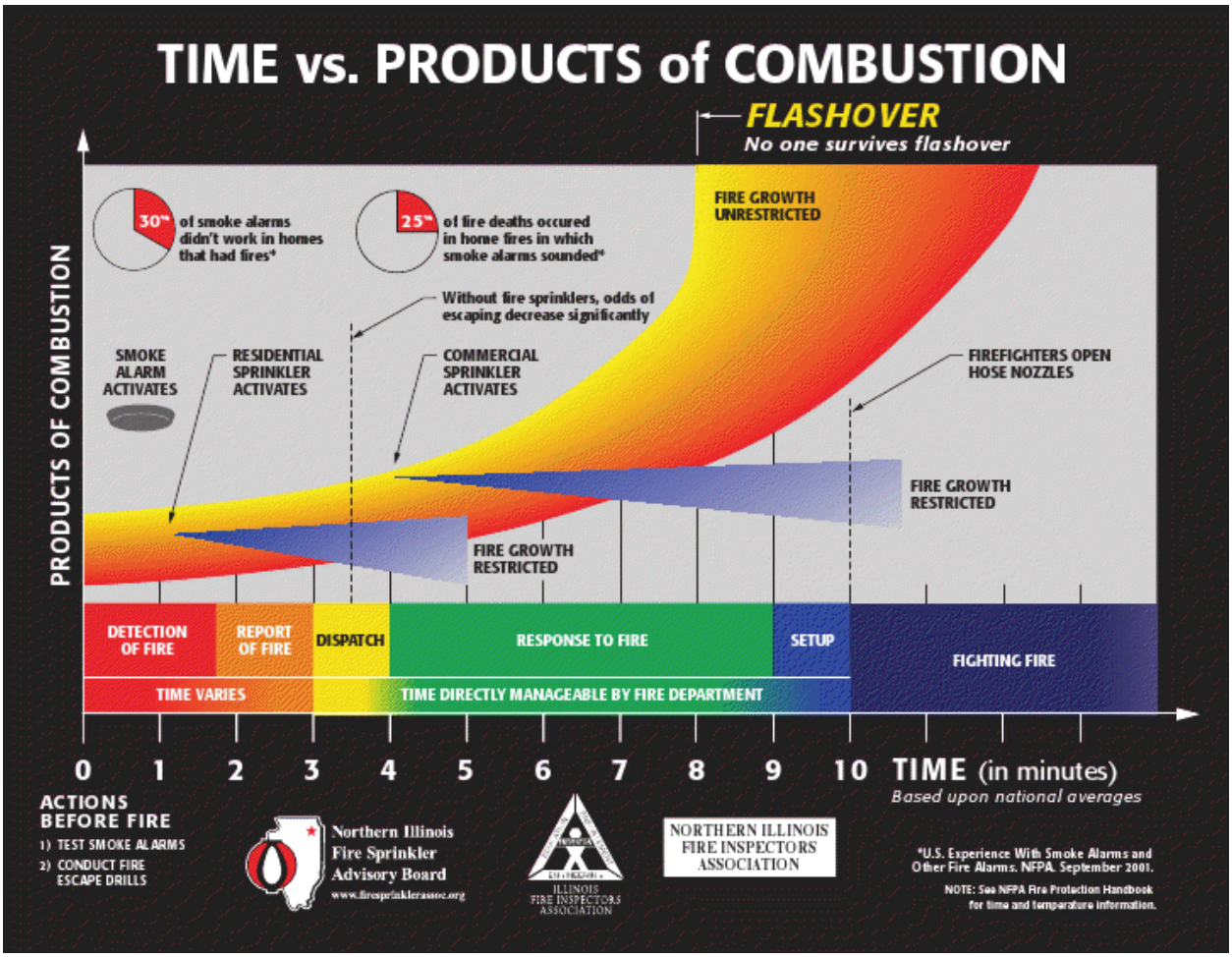


Figure 23: Time vs Products of Combustion

The Cycle of Life

EMS-related incidents have benchmarks measured in the time in which critically ill or injured patients need to be stabilized and transported to a medical facility. A key component must be in place for this stabilization to take place. Spontaneous circulation can cease in almost every type of medical emergency, whether it is an injury or illness-related problem. Physiologically, brain death begins four to six minutes after the cessation of circulation, or cardiac arrest. After ten minutes, based on research, the survivability outcome of a patient who suffers from the loss of spontaneous circulation is considered unlikely, even with advanced life support interventions.

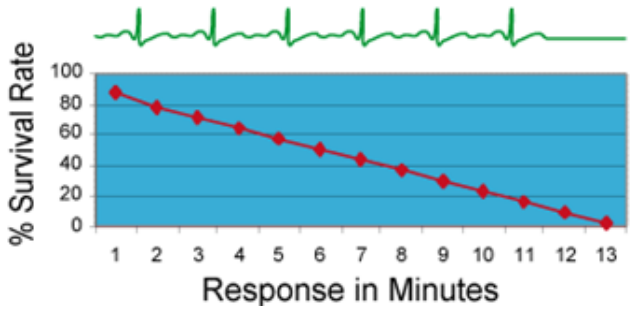


Figure 24: Cardiac Survival vs Response Time

Given these response objectives, how does a community evaluate and measure the department's progress or efficiency? The elected officials annually adopt a fiscal budget which helps to dictate the department's standard of cover (SOC). The community, in essence, buys a level of protection for itself. The purpose of defining the factors that determine the SOC allows the community to be informed about the decisions it makes for the provision of emergency services. Before making a decision or establishing a SOC, the following information was examined:

Table 55: Emergency Operations Cascade of Response Elements

Event Initiation	**Pre-Response Elements**
Emergency Event	
Alarm	
Notification – Alarm is Reported/Received	**Total Response Time**
Alarm Handling	
Turnout Time – Unit Notification/En Route	
Travel Time – Unit is Responding to Alarm	
On-Scene Time – Unit Arrives On-Scene	
Initiation of Action – Unit Begins Operations	**Post Response Elements**
Termination of Incident	

Event Initiation

Event initiation is the point at which factors occur that ultimately will result in the activation of the emergency response system. Factors that may contribute to the event initiation may occur from seconds to a day or more before leading to the actual emergency event.

Alarm

Alarm is the time it takes for someone to discover that an emergency exists and start the process to get the emergency response system activated. This process may mean dialing a personal cellular phone, driving to a location with a fixed phone, or simply hiking out of the wilderness to find someone with a radio to make the notification.

Notification

Notification is the time at which the alarm is received by the communications center and could include walk-in citizens, phone calls, or radio reports. The department, along with many other departments, enhances the notification process through the use and requirements of automatic alarm notification. Additionally, over the past decade, the community has experienced a perceived decrease in the reporting time on most alarms due to the proliferation of cellular phones. Previously, reporting an emergency may have been delayed because of a lack of communication options. Although cellular phones make reporting an emergency-faster, the greatest time killer is trying to verify the caller's location. In cases where the caller is unsure of their location, the communications center can attempt to ping the phone for the general location with escalating alarm processing times. This factor greatly affects the city of Lawrence in late summer when the new college students move in, all with cellular phones and many in an unfamiliar location.

Alarm Answering

Alarm answering is the process of answering a call for assistance or service. Alarm answering time is the amount of time from when the call is made until the call is answered by the communications center.

Alarm Handling

Alarm handling is the time interval from when the first notification was received and the completion of dispatching the recommended units. The computer-aided dispatch (CAD) system utilized by the ECC assists in recommending and assigning units to an incident.

Emergency Medical Dispatching (EMD) protocols help to target the correct effective response force and provide instructions for callers of EMS. They contain a specific set of questions based on the nature of the call that dispatchers must ask the caller. This can result in delaying the first unit dispatched to the incident. Many accredited agencies have discovered that there are competing interests when evaluating the usefulness of an EMD system. The department implemented the priority dispatch EMD system in 2004 and was confident it was making a difference in the overall response efforts.

In 2018, the department received a strategic recommendation from the Commission on Fire Accreditation International to continue working collaboratively with Douglas County Emergency Communications Center (DGECC) to establish time-based performance objectives for alarm answering and alarm processing. Through several meetings between the department and DGECC, process enhancements were identified. The process changes were focused on facilitating faster processing times within the Primary Public Safety Answering Points (PSAP). In June 2021, DGECC implemented the new call-handling process. The new process fundamentally changed how calls are answered by 911 call takers and at which point the fire medical dispatcher will need to act as a call taker. The primary 911 call taker will now answer 911 calls through the following process: “Douglas County 911, is this a police, fire, or medical emergency?” As the primary call taker is inputting the call notes from the caller, the fire medical dispatcher is simultaneously assigning the closest appropriate unit type for the fire or medical emergency. As the primary call taker continues to process the call, the call type will be adjusted by the fire medical dispatcher and the appropriate balance of units added and dispatched. The fire medical dispatcher has been moved to the last call-taker position to help free up their responsibilities and concentrate on Fire Medical calls for service. The initial data shared from DGECC shows a significant decrease in the overall call process. This new data set identified some elongation of turnout times initially attributed to being dispatched to an unknown call type. This has been addressed by empowering the fire medical dispatcher to share information related to the potential call types, facilitating crews to turnout in the most appropriate PPE and/or units.

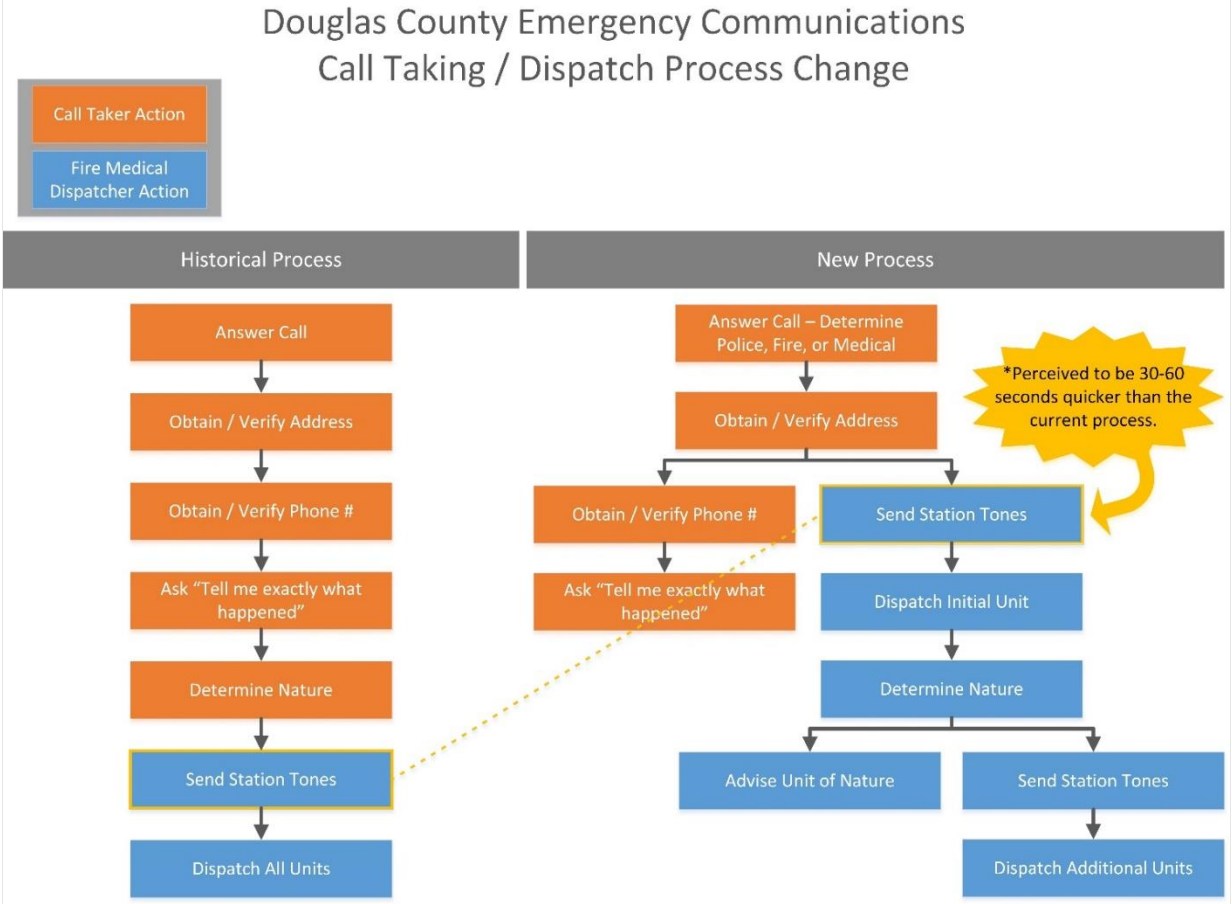
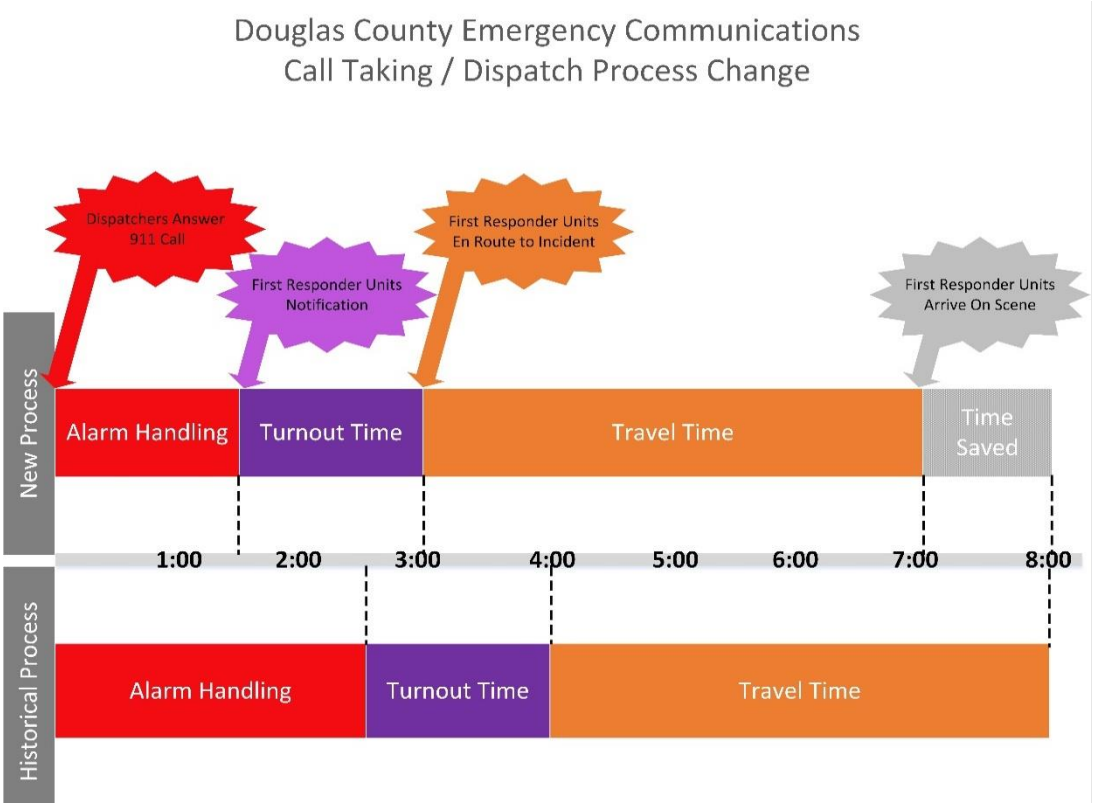


Figure 25: Douglas County Emergency Communications Call Taking/Dispatch Process Change



Turnout

Turnout time is the time interval from notification of a station or unit to the assigned unit responding. Station facilities are equipped with radio tone-alert activation. Turnout time is measured from the time of completion of alerting by dispatch to the vehicles clearing the stations and announcing "en route" on the radio or utilizing their mobile data computers.

Newer station designs have not specifically focused on the time to get from any part of the facility to the apparatus and subsequently have impacted turnout times. Increased emphasis on never removing a seatbelt while responding has raised levels of safety but has also impacted turnout times when responding to calls.

The department turnout time is consistently above the 60 to 80-second recommendations of NFPA 1710. A study was conducted on turnout time in 2011 and is still relevant due to the lack of updates or changes in station design. The department ran a series of turnout time scenarios to better understand what benchmark and baseline turnout times should be. Three scenarios were developed, and the chief officers on each shift conducted the testing in every station. Crews were aware the testing would be occurring, but there was no schedule, and the first test was unannounced to capture the protective clothing layout at the apparatus in a normal daily configuration. The individual and overall results are reflected in the following tables:

Table 56: 2011 Turnout Time Study - Structure Fire from Dorm

Station & Shift	Structure Fire from Dorm				
	First FF at Rig	First FF On	Last FF On	En Route	Elapsed
1X	19	45	75	86	**01:26**
1Y	12	40	53	67	**01:07**
1Z	14	42	53	56	**00:56**
2X	41	57	105	108	**01:48**
2Y	29	60	79	92	**01:32**
2Z	27	56	91	105	**01:45**
3X	40	49	92	106	**01:46**
3Y	25	46	53	78	**01:18**
3Z	40	80	86	100	**01:40**
4X	45	83	111	114	**01:54**
4Y	35	60	83	90	**01:30**
4Z	35	63	90	96	**01:36**
5X	49	86	97	109	**01:49**
5Y	40	72	79	88	**01:28**
5Z	29	55	69	80	**01:20**
MAX	49	86	111	114	**01:54**
MIN	12	40	53	56	**00:56**
90th %					**01:49**
All times are in seconds except elapsed show as minutes and seconds					

Table 57: 2011 Turnout Time Study - MVA from Fitness Room

Station & Shift	MVA from Fitness Room				
	First FF at Rig	First FF On	Last FF On	En Route	Elapsed
1X	26	64	72	86	01:26
1Y	38	52	70	85	01:25
1Z	31	62	69	79	01:19
2X	19	51	83	94	01:34
2Y	16	50	61	70	01:10
2Z	23	54	75	85	01:25
3X	25	45	72	80	01:20
3Y	12	40	52	69	01:09
3Z	22	53	69	75	01:15
4X	26	69	84	94	01:34
4Y	18	49	59	69	01:09
4Z	29	62	86	91	01:31
5X	28	62	70	80	01:20
5Y	22	48	65	76	01:16
5Z	21	48	76	84	01:24
MAX	38	69	86	94	01:34
MIN	12	40	52	69	01:09
90th %					01:34
All times are in seconds except elapsed show as minutes and seconds					

Table 58: 2011 Turnout Time Study - Structure Fire from Dayroom

Station & Shift	Structure Fire from Dayroom				
	First FF at Rig	First FF On	Last FF On	En Route	Elapsed
1X	10	37	59	68	01:08
1Y	18	44	57	69	01:09
1Z	18	37	50	78	01:18
2X	32	66	101	109	01:49
2Y	19	56	62	76	01:16
2Z	17	52	74	83	01:23
3X	21	37	61	69	01:09
3Y	11	30	53	61	01:01
3Z	15	65	78	95	01:35
4X	27	70	94	108	01:48
4Y	18	54	72	81	01:21
4Z	26	63	84	84	01:24
5X	37	73	88	104	01:44
5Y	26	61	70	78	01:18
5Z	19	45	78	91	01:31
MAX	37	73	101	109	01:49
MIN	10	30	50	61	01:01
90th %					01:48
All times are in seconds except elapsed show as minutes and seconds					

The results and analysis of these turnout times have led the department to believe a benchmark of 60-80 seconds at the 90th percentile may be difficult to achieve. The results of the test indicated that a 90th percentile mark would be closer to 1:45. The department will continue to look at ways to reduce these times without encouraging unsafe practices of running to the apparatus or not donning the proper protective clothing before being seated, to reduce the chance of removing the seatbelt.

The station alerting system utilizes countdown timers to better increase awareness of the time since the station was alerted of the incident. Mobile data computers are in place to receive alarm information to do unit status changes, such as us en route, on-scene, and available.

Travel

Travel time is the time interval from when the assigned unit indicates going en route to an emergency until that unit arrives at the emergency and goes "on-scene." Travel time and safety have been impacted through traffic calming measures and traffic control preemption devices. Traffic preemption devices were installed on all traffic signals in the city of Lawrence in the first quarter of 2018. Preemption is utilized on each emergency response to reduce the delay at traffic signal-controlled intersections. Traffic calming devices, road design standards, and gated areas of the community have the opposite effect of slowing travel time to emergencies.

On-Scene

On-scene time is the point at which units have arrived "on-scene" and is done in conjunction with a brief initial radio report to dispatch describing the incident as viewed from the apparatus. Officers use their mobile data computers to change the unit status to on-scene.

Initiation of Action

Initiation of action begins with the conclusion of the initial report, which will include the action to be taken by the reporting unit as it deploys from the apparatus. Initial actions may include, but are not limited to: investigation, advancing an attack line, and patient assessment. The initiation of action taken may last from moments to days and will result in the mitigation of the incident.

Termination of Incident

This is the time at which units have completed their incident task and are available to respond to another emergency incident.

NFPA 1710 Impact

The department has evaluated the feasibility of meeting NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. This standard is often quoted as a nationwide standard and outlines an organized approach to defining levels of service, deployment capabilities, and staffing for "substantial" career fire departments. Specifically, NFPA 1710 provides standard definitions for fire apparatus, personnel assigned, procedural guidelines within which they operate, and staffing levels needed to accomplish specific tasks on arrival at an incident.

NFPA 1710 states that fire departments shall establish a performance objective of no less than 90% for each of the following response time objectives:

- Alarm answering time not more than (15 seconds) for at least 95% of the alarms received and not more than (40 seconds) for at least 99% of the alarms received, as specified by NFPA 1221.
- Alarm processing time shall not be more than (64 seconds) for at least 90% of the alarms and not more than (106 seconds) 95% of the time.
- One minute twenty seconds (80 seconds) turnout time for fires and one minute (60 seconds) turnout time for EMS calls.
- Four minutes (240 seconds) or less for the arrival of the first-arriving engine company at a fire suppression incident and/or eight minutes (480 seconds) or less for the arrival of a full first alarm assignment at a fire suppression incident (including one individual for incident command outside of the hazard area).
- Four minutes (240 seconds) or less for the arrival of a unit with first responder, or higher, level capability at an emergency medical incident.
- Eight minutes (480 seconds) or less for the arrival of an advanced life support unit at an emergency medical incident, where this service is provided by the fire department.

The department evaluates emergency response data in various categories and believes that response time goals can be adjusted for the safety of its members without compromising service to the community. The department has not formally adopted this standard.

Dataset Qualification

The department utilizes the following standard operating procedures (SOP) to guide data processing:

SOP 103.20 *Response Performance and Outcomes*

SOP 103.21 *Response Performance and Outcomes Baseline*

SOP 103.22 *Response Performance and Outcomes Benchmark*

The department gathers emergency response data from the current records management system (RMS) for 2021, *ESO*, and the legacy RMS system, *FIREHOUSE*. Risk category (NFIRS code), Planning Zone, Risk / Call Class (Call Type – Dispatched as), Risk / Call Category (Call Type – Dispatched as) information is pulled from both systems and analyzed for the baseline performance tables.

Components Calculations of Response Time

- Alarm Handling Time = minimum notification time – minimum dispatch time
- Turnout Time = Minimum Roll Time – Minimum Notification Time
- Total Response Time 1st Unit = minimum arrival time of 1st qualifying – minimum roll time
- Travel Time ERF = arrival of last unit to complete ERF – 1st Unit En Route
- Travel Time = minimum arrival time – minimum roll time
- Total Response Time 1st Unit = alarm handling time + turn out time + travel time
- Total Response Time ERF = alarm handling time + turnout time + travel time

The 90th percentile is then calculated for the above items for emergent incidents (both within the city of Lawrence and Douglas County) in 2017-2021, plus the aggregate total for the time range.

Outliers

Outliers identified in the Alarm Handling Time (<=00:00:10 and >=00:05:00) and Turnout Time (<=00:00:05) data sets are eliminated during this process to help interpret a more accurate representation of the performance data.

Planning Zones

The department uses 14 planning zones covering Douglas County to analyze risk. Seven are currently associated with urban population risk (five in Lawrence, one in Eudora, and one in Baldwin City). The other seven are in rural areas of the county:

- Urban Zones: 1-5, Baldwin City (BC), the City of Eudora (EC).
- Rural Zones: DG1-5, 11, and 12

Baseline Performance Tables

Table 59: Baseline Performance - Fire Suppression Low Risk

(Risk Level Low) Fire Suppression 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:13	1:32	2:00	2:11	2:18	2:31	1:00
		Rural	2:47	2:26	2:26	2:51	2:16	3:37	1:00
Turnout Time	Turnout Time 1st Unit	Urban	2:35	2:53	2:34	2:46	2:22	2:12	1:30
		Rural	2:36	5:43	2:47	1:44	2:02	1:30	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	6:12	5:53	5:42	6:01	6:23	6:42	4:00
		Rural	13:20	25:44	14:12	6:26	12:04	11:58	10:00
	Travel Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	8:00
		Rural	NA	NA	NA	NA	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:35	9:11	8:56	10:58	9:28	10:27	6:30
			n=2663	n=425	n=475	n=540	n=590	n=635	NA
		Rural	17:16	33:10	17:19	11:01	15:17	15:47	12:30
			n=36	n=5	n=12	n=2	n=8	n=9	NA
	Total Response Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	10:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
		Rural	NA	NA	NA	NA	NA	NA	18:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA

Table 60: Baseline Performance - Fire Suppression Moderate Risk

(Risk Level Mod) Fire Suppression 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:52	3:17	2:36	1:58	2:26	2:50	1:00
		Rural	2:56	NA	3:18	NA	NA	1:26	1:00
Turnout Time	Turnout Time 1st Unit	Urban	1:47	1:26	1:26	1:37	1:09	1:51	1:30
		Rural	1:18	NA	0:48	NA	NA	1:19	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	6:06	6:13	5:28	5:07	12:54	4:41	4:00
		Rural	12:16	NA	13:19	NA	NA	7:58	10:00
	Travel Time ERF **Concentration**	Urban	10:24	NA	14:17	7:48	NA	5:15	8:00
		Rural	11:26	NA	NA	NA	NA	11:26	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:36	10:56	9:18	10:57	16:21	8:35	6:30
			n=32	n=1	n=2	n=2	n=3	n=24	NA
		Rural	16:03	NA	17:25	NA	NA	10:31	12:30
			n=3	n=0	n=1	n=0	n=0	n=2	NA
	Total Response Time ERF **Concentration**	Urban	13:14	NA	16:00	11:23	NA	8:23	10:30
			n=7	n=0	n=1	n=1	n=0	n=5	NA
		Rural	13:59	NA	NA	NA	NA	13:59	18:30
			n=2	n=0	n=0	n=0	n=0	n=2	NA

Table 61: Baseline Performance - Fire Suppression High Risk

(Risk Level High) Fire Suppression 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:28	1:18	2:12	2:30	2:06	2:37	1:00
		Rural	3:32	1:50	NA	2:04	3:31	3:15	1:00
Turnout Time	Turnout Time 1st Unit	Urban	2:04	2:25	1:40	1:47	1:11	1:37	1:30
		Rural	1:53	1:09	NA	2:22	0:56	1:27	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:56	5:14	6:21	6:02	6:16	5:59	4:00
		Rural	10:13	10:28	NA	8:48	4:18	NA	10:00
	Travel Time ERF **Concentration**	Urban	11:01	11:55	9:45	11:55	11:12	10:52	8:00
		Rural	18:21	NA	NA	18:21	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	8:45	8:05	9:29	8:53	8:18	8:58	6:30
			n=308	n=44	n=50	n=35	n=48	n=131	NA
		Rural	13:46	13:27	NA	13:13	13:41	NA	12:30
			n=5	n=1	n=0	n=2	n=2	n=0	NA
	Total Response Time ERF **Concentration**	Urban	14:08	14:06	12:45	15:45	13:24	14:21	10:30
			n=179	n=31	n=30	n=23	n=37	n=58	NA
		Rural	22:46	NA	NA	22:46	NA	NA	18:30
			n=2	n=0	n=0	n=2	n=0	n=0	NA

Table 62: Baseline Performance - EMS Low Risk

(Risk Level Low) EMS 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:14	1:52	2:05	2:18	2:31	3:52	1:00
		Rural	2:24	1:25	3:08	2:49	2:42	3:11	1:00
Turnout Time	Turnout Time 1st Unit	Urban	2:08	2:15	2:01	1:36	2:00	1:33	1:30
		Rural	2:07	2:09	2:57	1:33	1:24	1:26	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	8:05	9:12	7:16	6:32	6:54	15:44	4:00
		Rural	19:23	20:02	17:46	17:11	18:58	26:33	10:00
	Travel Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	8:00
		Rural	NA	NA	NA	NA	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	11:00	12:05	9:48	9:15	9:56	21:56	6:30
			n=1329	n=637	n=192	n=218	n=246	n=36	NA
		Rural	22:22	22:08	22:10	19:28	22:19	31:10	12:30
			n=84	n=49	n=7	n=11	n=16	n=1	NA
	Total Response Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	10:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
		Rural	NA	NA	NA	NA	NA	NA	18:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA

Table 63: Baseline Performance - EMS Moderate Risk

(Risk Level Moderate) EMS 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:20	1:44	1:59	2:08	2:27	2:46	1:00
		Rural	2:36	1:48	2:11	2:32	2:43	3:03	1:00
Turnout Time	Turnout Time 1st Unit	Urban	1:55	2:15	1:52	1:46	1:50	1:30	1:30
		Rural	2:18	2:45	2:18	2:10	2:18	1:51	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:45	6:17	5:34	5:28	5:31	5:49	4:00
		Rural	17:07	17:56	15:52	16:20	17:04	17:03	10:00
	Travel Time ERF **Concentration**	Urban	6:45	7:13	6:36	6:29	6:36	6:52	8:00
		Rural	17:12	17:50	16:06	16:48	17:04	17:05	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	8:50	9:07	8:19	8:19	8:33	9:39	6:30
			n=15159	n=3386	n=2221	n=2743	n=3227	n=3582	NA
		Rural	20:30	21:03	19:21	20:05	20:34	20:44	12:30
			n=1219	n=298	n=149	n=209	n=240	n=323	NA
	Total Response Time ERF **Concentration**	Urban	9:45	9:59	9:12	9:10	9:36	10:30	10:30
			n=14047	n=3297	n=2080	n=2413	n=2991	n=3265	NA
		Rural	20:34	20:58	19:23	20:05	20:34	20:44	18:30
			n=1192	n=297	n=149	n=205	n=240	n=301	NA

Table 64: Baseline Performance - EMS High Risk

(Risk Level High) EMS 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:12	1:33	1:48	2:08	2:24	2:28	1:00
		Rural	2:59	1:45	2:22	3:03	3:06	3:25	1:00
Turnout Time	Turnout Time 1st Unit	Urban	1:49	2:15	1:47	1:34	1:26	1:28	1:30
		Rural	2:18	3:18	2:16	2:01	1:37	1:33	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:48	4:50	4:50	4:29	4:34	4:53	4:00
		Rural	14:42	15:51	13:48	15:07	14:42	14:03	10:00
	Travel Time ERF **Concentration**	Urban	10:09	11:06	10:12	8:20	12:02	7:42	8:00
		Rural	21:21	24:49	18:50	24:38	23:14	19:25	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:34	7:34	7:32	7:09	7:32	7:52	6:30
			n=905	n=199	n=193	n=152	n=190	n=171	NA
		Rural	18:51	17:54	17:46	17:28	16:50	20:20	12:30
			n=182	n=35	n=35	n=26	n=51	n=35	NA
	Total Response Time ERF **Concentration**	Urban	13:09	14:30	12:29	11:02	14:23	10:51	10:30
			n=539	n=109	n=126	n=81	n=76	n=147	NA
		Rural	25:24	27:09	22:08	27:17	26:21	24:13	18:30
			n=83	n=14	n=13	n=6	n=18	n=32	NA

Table 65: Baseline Performance - EMS Maximum Risk

(Risk Level Max) EMS 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:41	NA	NA	0:51	2:50	NA	1:00
		Rural	3:02	2:27	1:54	2:16	3:11	4:16	1:00
Turnout Time	Turnout Time 1st Unit	Urban	1:29	NA	NA	2:03	0:59	NA	1:30
		Rural	2:29	2:34	3:19	1:54	1:31	1:16	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:30	NA	NA	7:51	4:27	NA	4:00
		Rural	13:21	11:16	13:53	14:02	14:01	8:53	10:00
	Travel Time ERF **Concentration**	Urban	12:36	NA	NA	NA	12:36	NA	8:00
		Rural	16:54	NA	NA	9:49	19:40	14:40	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:32	NA	NA	9:22	7:06	NA	6:30
			n=11	n=0	n=0	n=2	n=9	n=0	NA
		Rural	16:23	16:00	16:26	17:10	17:45	13:03	12:30
			n=74	n=19	n=11	n=13	n=23	n=8	NA
	Total Response Time ERF **Concentration**	Urban	15:43	NA	NA	NA	15:43	NA	10:30
			n=3	n=0	n=0	n=0	n=3	n=0	NA
		Rural	20:58	NA	NA	11:11	22:20	18:31	18:30
			n=12	n=0	n=0	n=1	n=3	n=8	NA

Table 66: Baseline Performance - Technical Rescue Low Risk

(Risk Level Low) Technical Rescue 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	3:48	3:41	0:54	NA	0:45	2:09	1:00
		Rural	NA	NA	NA	NA	NA	NA	1:00
Turnout Time	Turnout Time 1st Unit	Urban	2:00	2:09	1:55	NA	1:36	1:27	1:30
		Rural	NA	NA	NA	NA	NA	NA	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	6:54	6:50	4:17	NA	4:38	7:40	4:00
		Rural	NA	NA	NA	NA	NA	NA	10:00
	Travel Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	8:00
		Rural	NA	NA	NA	NA	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	10:24	9:59	6:44	NA	6:59	10:51	6:30
			n=11	n=1	n=4	n=0	n=1	n=5	NA
		Rural	NA	NA	NA	NA	NA	NA	12:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
	Total Response Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	10:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
		Rural	NA	NA	NA	NA	NA	NA	18:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA

Table 67: Baseline Performance - Technical Rescue Moderate Risk

(Risk Level Moderate) Technical Rescue 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:33	2:00	1:18	2:54	2:49	2:29	1:00
		Rural	NA	NA	NA	NA	NA	NA	1:00
Turnout Time	Turnout Time 1st Unit	Urban	2:04	2:15	2:31	1:59	0:25	1:44	1:30
		Rural	NA	NA	NA	NA	NA	NA	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:22	5:03	5:36	4:06	5:54	5:21	4:00
		Rural	NA	NA	NA	NA	NA	NA	10:00
	Travel Time ERF **Concentration**	Urban	5:38	4:39	6:37	6:59	6:19	5:30	8:00
		Rural	NA	NA	NA	NA	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	8:33	7:55	8:25	9:29	9:02	7:49	6:30
			n=159	n=34	n=16	n=21	n=28	n=60	NA
		Rural	NA	NA	NA	NA	NA	NA	12:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
	Total Response Time ERF **Concentration**	Urban	9:03	7:28	8:28	11:41	10:41	9:08	10:30
			n=140	n=31	n=15	n=19	n=28	n=47	NA
		Rural	NA	NA	NA	NA	NA	NA	18:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA

Table 68: Baseline Performance - Technical Rescue High Risk

(Risk Level High) Technical Rescue 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:52	NA	NA	NA	2:52	NA	1:00
		Rural	NA	NA	NA	NA	NA	NA	1:00
Turnout Time	Turnout Time 1st Unit	Urban	1:04	NA	NA	NA	1:04	NA	1:30
		Rural	NA	NA	NA	NA	NA	NA	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	3:40	NA	NA	NA	3:40	NA	4:00
		Rural	NA	NA	NA	NA	NA	NA	10:00
	Travel Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	8:00
		Rural	NA	NA	NA	NA	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:36	NA	NA	NA	7:36	NA	6:30
			n=1	n=0	n=0	n=0	n=1	n=0	NA
		Rural	NA	NA	NA	NA	NA	NA	12:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
	Total Response Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	10:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
		Rural	NA	NA	NA	NA	NA	NA	18:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA

Table 69: Baseline Performance - Technical Rescue Maximum Risk

(Risk Level Max) Technical Rescue 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:45	1:54	2:27	3:36	2:02	2:45	1:00
		Rural	1:40	1:40	NA	NA	NA	NA	1:00
Turnout Time	Turnout Time 1st Unit	Urban	2:33	3:18	1:40	1:59	0:52	1:37	1:30
		Rural	2:00	2:00	NA	NA	NA	NA	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	6:38	6:30	5:18	5:20	6:07	11:40	4:00
		Rural	17:23	17:23	NA	NA	NA	NA	10:00
	Travel Time ERF **Concentration**	Urban	20:07	21:39	10:42	9:42	22:38	16:46	8:00
		Rural	NA	NA	NA	NA	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	13:02	9:18	7:55	8:22	11:31	21:18	6:30
			n=79	n=22	n=13	n=14	n=1	n=29	NA
		Rural	19:56	19:56	NA	NA	NA	NA	12:30
			n=3	n=3	n=0	n=0	n=0	n=0	NA
	Total Response Time ERF **Concentration**	Urban	23:06	23:07	13:01	12:47	25:09	20:27	10:30
			n=16	n=5	n=2	n=5	n=1	n=3	NA
		Rural	NA	NA	NA	NA	NA	NA	18:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA

Table 70: Baseline Performance - Hazardous Materials Low Risk

(Risk Level Low) Hazmat 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:34	2:10	1:34	2:34	2:56	2:38	1:00
		Rural	NA	NA	NA	NA	NA	NA	1:00
Turnout Time	Turnout Time 1st Unit	Urban	2:24	2:25	2:18	2:26	2:34	2:01	1:30
		Rural	NA	NA	NA	NA	NA	NA	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	6:47	4:59	8:32	7:08	6:33	5:58	4:00
		Rural	NA	NA	NA	NA	NA	NA	10:00
	Travel Time ERF **Concentration**	Urban	5:26	NA	NA	NA	NA	5:26	8:00
		Rural	NA	NA	NA	NA	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	10:22	7:42	11:07	10:09	11:53	9:39	6:30
			n=157	n=16	n=32	n=37	n=25	n=48	NA
		Rural	NA	NA	NA	NA	NA	NA	12:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
	Total Response Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	10:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
		Rural	NA	NA	NA	NA	NA	NA	18:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA

Table 71: Baseline Performance - Hazardous Materials Moderate Risk

(Risk Level Moderate) Hazmat 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:14	0:57	1:36	1:58	2:22	2:33	1:00
		Rural	1:13	NA	NA	NA	1:13	NA	1:00
Turnout Time	Turnout Time 1st Unit	Urban	2:20	2:49	2:28	2:04	2:08	1:55	1:30
		Rural	2:01	NA	NA	NA	2:01	NA	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	6:56	7:39	6:40	10:13	6:38	6:04	4:00
		Rural	7:26	NA	NA	NA	7:26	NA	10:00
	Travel Time ERF **Concentration**	Urban	8:01	8:59	6:48	8:08	8:10	7:50	8:00
		Rural	8:45	NA	NA	NA	8:45	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	10:49	10:53	10:31	13:40	10:38	9:31	6:30
			n=187	n=39	n=36	n=36	n=41	n=35	NA
		Rural	10:40	NA	NA	NA	10:40	NA	12:30
			n=1	n=0	n=0	n=0	n=1	n=0	NA
	Total Response Time ERF **Concentration**	Urban	11:29	12:20	10:43	12:20	10:51	10:42	10:30
			n=144	n=27	n=29	n=28	n=32	n=28	NA
		Rural	32:18	NA	NA	NA	32:18	NA	18:30
			n=1	n=0	n=0	n=0	n=1	n=0	NA

Table 72: Baseline Performance - Hazardous Materials High Risk

(Risk Level High) Hazmat 90th Percentile Times Baseline Performance			2017-2021	2021	2020	2019	2018	2017	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	3:40	2:00	1:12	3:31	NA	3:39	1:00
		Rural	NA	NA	NA	NA	NA	NA	1:00
Turnout Time	Turnout Time 1st Unit	Urban	1:41	2:04	1:39	1:01	NA	1:22	1:30
		Rural	NA	NA	NA	NA	NA	NA	1:30
Travel Time	Travel Time 1st Unit **Distribution**	Urban	7:03	3:30	2:30	6:25	NA	2:14	4:00
		Rural	NA	NA	NA	NA	NA	NA	10:00
	Travel Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	8:00
		Rural	NA	NA	NA	NA	NA	NA	16:00
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	10:30	6:41	5:21	9:55	NA	6:24	6:30
			n=17	n=2	n=1	n=3	n=0	n=11	NA
		Rural	NA	NA	NA	NA	NA	NA	12:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
	Total Response Time ERF **Concentration**	Urban	NA	NA	NA	NA	NA	NA	10:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA
		Rural	NA	NA	NA	NA	NA	NA	18:30
			n=0	n=0	n=0	n=0	n=0	n=0	NA

I. Evaluation of Service Delivery

Performance Objectives – Benchmarks

The following statements are descriptors of performance goals relative to time. The statements include the mobilization of assets, both human and physical, incorporating time towards a quality outcome relative to a risk category and classification. A benchmark is defined as a quality standard or target from which something can be judged. Pursuing the benchmark or target will help define superior performance of the product, service, or process. The department will be pursuing the benchmark or target with the goal of providing better outcomes to the community.

Fire Suppression Services Program

Fire Suppression Distribution / First unit to stop loss

For 90 percent of all low risk fire responses, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer; (4) total, shall be: 6 minutes and 30 seconds within urban areas and 12 minutes and 30 seconds in rural areas. The first arriving unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all moderate risk fire responses, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer; (4) total, shall be: 6 minutes and 30 seconds within urban areas and 12 minutes and 30 seconds in rural areas. The first arriving unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all high risk fire responses, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer; (4) total, shall be: 6 minutes and 30 seconds within urban areas and 12 minutes and 30 seconds in rural areas. The first arriving unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations shall be performed utilizing safe operational procedures.

Fire Suppression Concentration / Effective Response Force

For 90 percent of all low risk fire responses, the total response time for the arrival of the effective response unit (ERF), with a minimum of 3 firefighters and 1 officer; (4) total, shall be: 6 minutes and 30 seconds within urban areas and 12 minutes and 30 seconds in rural areas. The first arriving unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all moderate risk fire responses, the total response time for the arrival of the effective response force (ERF), with a minimum of 7 firefighters and 3 officers; (10) total, shall be: 10 minutes and 30 seconds within urban areas and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; providing a water supply; advancing an attack line and a backup line for fire control; complying with the requirements of two in-two out; searching and rescuing at-risk victims. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all high risk fire responses, the total response time for the arrival of the effective response force (ERF), with a minimum of 10 firefighters and 6 officers; (16) total, shall be: 10 minutes and 30 seconds

within urban areas and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; safety; providing an uninterrupted water supply or rural water operation; advancing an attack line and a backup line for fire control; complying with the requirements of two in-two out; establishing a rapid intervention team; completing forcible entry; searching and rescuing at-risk victims; evacuation; ventilating; exposure protection; controlling utilities; and performing salvage and overhaul. These operations shall be performed utilizing safe operational procedures.

Emergency Medical Services Program

Emergency Medical Services Distribution / First unit to initiate care

For 90 percent of low risk emergency medical incidents, the total response time for the arrival of the first-due unit, with a minimum of 1 Emergency Medical Technician (EMT) or higher level of care provider; (1) total, shall be: 6 minutes and 30 seconds in urban areas, and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations shall be performed utilizing safe operational procedures.

For 90 percent of moderate risk emergency medical incidents, the total response time for the arrival of the first-due unit, with a minimum of 1 EMT or higher level of care provider; (1) total, shall be: 6 minutes and 30 seconds in urban areas, and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations shall be performed utilizing safe operational procedures.

For 90 percent of high risk emergency medical incidents, the total response time for the arrival of the first-due unit, with a minimum of 1 EMT or higher level of care provider; (1) total, shall be: 6 minutes and 30 seconds in urban areas, and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations shall be performed utilizing safe operational procedures.

For 90 percent of maximum risk emergency medical incidents, the total response time for the arrival of the first-due unit, with a minimum of 1 EMT or higher level of care provider; (1) total, shall be: 6 minutes and 30 seconds in urban areas, and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations shall be performed utilizing safe operational procedures.

Emergency Medical Services Concentration / Effective Response Force

For 90 percent of low risk emergency medical incidents, the total response time for the arrival of the effective response force, with a minimum of 1 paramedic and 1 Emergency Medical Technician (EMT); (2) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; conducting initial patient assessment; obtaining vitals and patient's medical history; performing cardiopulmonary resuscitation; and utilizing an automatic external defibrillator. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all moderate risk emergency medical incidents, the total response time for the arrival of the ERF (ALS unit), with a minimum of 1 paramedic and 1 EMT; (2) total, shall be: 10 minutes and 30 seconds in urban areas, and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and equipment packaging for transport; and transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all high risk emergency medical incidents, the total response time for the arrival of the ERF (ALS unit), with a minimum of 1 paramedic and 2 EMTs, (3) total, shall be: 10 minutes and 30 seconds in urban areas, and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; communicating with family or other witnesses; scene documentation; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and

equipment packaging for transport; and transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all maximum risk emergency medical incidents, the total response time for the arrival of the ERF (ALS unit), with a minimum of 2 paramedics and 2 EMTs, (4) total, shall be: 10 minutes and 30 seconds in urban areas, and 18 minutes and 30 seconds in rural areas. The ERF shall be capable of: establishing command; communicating with family or other witnesses; scene documentation; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and equipment packaging for transport; and transportation of multiple patients to the hospital. These operations shall be performed utilizing safe operational procedures.

Technical Rescue Services Program

Technical Rescue Distribution

For 90 percent of all low risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all moderate risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all high risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all maximum risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighter and 1 officer; (3) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations shall be performed utilizing safe operational procedures.

Technical Rescue Concentration / Effective Response Force

For 90 percent of all low risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first due shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all moderate risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 4 firefighters and 2 officers; (6) total, shall be: 10 minutes and 30 seconds in urban areas and 18 minutes and 30 seconds in rural areas. The effective response force shall be capable of:

establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; providing patient care; providing transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all high risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 6 firefighters and 4 officers; (10) total, shall be: 10 minutes and 30 seconds in urban areas and 18 minutes and 30 seconds in rural areas. The effective response force shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; performing mechanical extrication; providing patient care; providing transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all maximum risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 10 firefighters and 6 officers; 4 being technician level rescuers; (16) total, shall be: 10 minutes and 30 seconds in urban areas and 18 minutes and 30 seconds in rural areas. The effective response force shall be capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; performing mechanical extrication; performing air-quality analysis; performing a confined space rescue; performing a trench rescue; performing a water/ice rescue; performing a high angle rescue; providing patient care; providing transportation to the hospital. These operations shall be performed utilizing safe operational procedures.

Hazardous Materials Services Program

Hazardous Materials Distribution

For 90 percent of all low risk hazardous materials response incidents, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer; (4) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all moderate risk hazardous materials response incidents, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer; (4) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all high risk hazardous materials response incidents, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer; (4) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The first-due unit shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

Hazardous Materials Concentration / Effective Response Force

For 90 percent of all low risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 3 firefighters and 1 officer; (4) total, shall be: 6 minutes and 30 seconds in urban areas and 12 minutes and 30 seconds in rural areas. The effective response

force shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all moderate risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 4 firefighters and 2 officers; (6) total, shall be: 6 minutes and 30 seconds in urban areas and 18 minutes and 30 seconds in rural areas. The effective response force shall be capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; providing a hose line for protection; providing advanced medical care; transporting the patient to the hospital; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

For 90 percent of all high risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 10 firefighters and 6 officers; (16) total, 4 being hazardous materials technicians; shall be: 6 minutes and 30 seconds in urban areas and 18 minutes and 30 seconds in rural areas. The effective response force shall be capable of: establishing command; performing an initial scene assessment; establishing a hazard zone; establishing a hazmat group; performing research; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; performing technical decontamination; providing a hose line for fire protection; providing advanced medical care; transporting the patient to the hospital; and requesting additional resources. These operations shall be performed utilizing safe operational procedures.

Performance Objectives – Baselines

The following statements are descriptors of historical response time performance relative to risk category and class representing qualifying responses between 2017 and 2021. The statements include the mobilization of assets, both human and physical, incorporating time towards a quality outcome relative to a risk category and classification. A baseline is the measurement of actual performance in an organizational context. Pursuing the benchmark or target from the baseline will help define superior performance of the product, service, or process. The department will be pursuing the benchmark or target with the goal of providing better outcomes to the community.

Fire Suppression Services Program

Fire Suppression Distribution / First unit to stop loss

For 90 percent of all low risk fire responses, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total, is: 9 minutes and 35 seconds within urban areas, 17 minutes and 16 seconds in rural areas. The first arriving unit is capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations are performed utilizing safe operational procedures.

For 90 percent of all moderate risk fire responses, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total, is: 9 minutes and 36 seconds within urban areas and 16 minutes and 3 seconds in rural areas. The first arriving unit is capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations are performed utilizing safe operational procedures.

For 90 percent of all high risk fire responses, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total, is: 8 minutes and 45 seconds within urban areas and 13 minutes and 46 seconds in rural areas. The first arriving unit is capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations are performed utilizing safe operational procedures.

Fire Suppression Concentration / Effective Response Force

For 90 percent of all low risk fire responses, the total response time for the arrival of the effective response unit (ERF), with a minimum of 3 firefighters and 1 officer, (4) total, is: 9 minutes and 35 seconds within urban areas, 17 minutes and 16 seconds in rural areas. The ERF is capable of: establishing command; completing an initial size up; establishing water supply; and initiating fire attack and/or rescue. These operations are performed utilizing safe operational procedures.

For 90 percent of all moderate risk fire responses, the total response time for the arrival of the effective response force (ERF), with a minimum of 7 firefighters and 3 officers; (10) total, is: 13 minutes and 14 seconds within urban areas and 13 minutes and 59 seconds in rural areas. The ERF is capable of: establishing command; providing a water supply; advancing an attack line and a backup line for fire control; complying with the requirements of two in-two out; searching and rescuing at-risk victims. These operations are performed utilizing safe operational procedures.

For 90 percent of all high risk fire responses, the total response time for the arrival of the effective response force (ERF), with a minimum of 10 firefighters and 6 officers; (16) total, is: 14 minutes and 8 seconds within urban areas and 22 minutes and 46 seconds in rural areas. The ERF shall be capable of: establishing command; safety; providing an uninterrupted water supply; advancing an attack line and a backup line for fire control;

complying with the requirements of two in-two out; establishing a rapid intervention team; completing forcible entry; searching and rescuing at-risk victims; evacuation; ventilating; exposure protection; controlling utilities; and performing salvage and overhaul. These operations are performed utilizing safe operational procedures.

Emergency Medical Services Program

Emergency Medical Services Distribution

For 90 percent of low risk emergency medical incidents, the total response time for the arrival of the first-due unit, with a minimum of 1 Emergency Medical Technician (EMT) or higher level of care provider; (1) total, is: 11 minutes in urban areas, 22 minutes and 22 seconds in rural areas. The first-due unit is capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations are performed utilizing safe operational procedures.

For 90 percent of moderate risk emergency medical incidents, the total response time for the arrival of the first-due unit, with a minimum of 1 EMT or higher level of care provider; (1) total, is: 8 minutes and 50 seconds in urban areas, 20 minutes and 30 seconds in rural areas. The first-due unit is capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations are performed utilizing safe operational procedures.

For 90 percent of high risk emergency medical incidents, the total response time for the arrival of the first-due unit, with a minimum of 1 EMT or higher level of care provider; (1) total, is: 7 minutes and 34 seconds in urban areas, 18 minutes and 51 seconds in rural areas. The first-due unit is capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations are performed utilizing safe operational procedures.

For 90 percent of maximum risk emergency medical incidents, the total response time for the arrival of the first-due unit, with a minimum of 1 EMT or higher level of care provider; (1) total, is: 7 minutes and 32 seconds in urban areas, 16 minutes and 23 seconds in rural areas. The first-due unit is capable of establishing command; performing cardiopulmonary resuscitation; and utilizing an automated external defibrillator. These operations are performed utilizing safe operational procedures.

Emergency Medical Services Concentration / Effective Response Force

For 90 percent of low risk emergency medical incidents, the total response time for the arrival of the effective response force, with a minimum of 1 paramedic and 1 Emergency Medical Technician (EMT); (2) total, is: 11 minutes in urban areas, 22 minutes and 22 seconds in rural areas. The ERF is capable of: establishing command; conducting initial patient assessment; obtaining vitals and patient's medical history; performing cardiopulmonary resuscitation; and utilizing an automatic external defibrillator. These operations are performed utilizing safe operational procedures.

For 90 percent of all moderate risk emergency medical incidents, the total response time for the arrival of the ERF (ALS unit), with a minimum of 1 paramedic and 1 EMT; (2) total, is: 9 minutes and 45 seconds in urban areas, 20 minutes and 34 seconds in rural areas. The ERF is capable of: establishing command; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and equipment packaging for transport; and transportation to the hospital. These operations are performed utilizing safe operational procedures.

For 90 percent of all high risk emergency medical incidents, the total response time for the arrival of the ERF (ALS unit), with a minimum of 1 paramedic and 2 EMTs; (3) total, is: 13 minutes and 9 seconds in urban areas, 25 minutes and 24 seconds in rural areas. The ERF is capable of: establishing command; communicating with family or other witnesses; scene documentation; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and equipment packaging for transport; and transportation to the hospital. These operations are performed utilizing safe operational procedures.

For 90 percent of all maximum risk emergency medical incidents, the total response time for the arrival of the ERF (ALS unit), with a minimum of 2 paramedics and 2 EMTs; (4) total, is: 15 minutes and 34 seconds in urban areas, 20 minutes and 58 seconds in rural areas. The ERF shall be capable of: establishing command; communicating with family or other witnesses; scene documentation; conducting primary and secondary patient assessment; triaging the patient; electrocardiogram interpretation; medication administration; bio-com communications with medical control; application of standing and physician orders; patient and equipment packaging for transport; and transportation of multiple patients to the hospital. These operations shall be performed utilizing safe operational procedures.

Technical Rescue Services Program

Technical Rescue Distribution

For 90 percent of all low risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, is: 10 minutes and 24 seconds in urban areas and there is no qualifying data in rural areas. The first due is capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations are performed utilizing safe operational procedures.

For 90 percent of all moderate risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, is: 8 minutes and 33 seconds in urban areas and there is no qualifying data in rural areas. The first due is capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations are performed utilizing safe operational procedures.

For 90 percent of all high risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, is: 7 minutes and 36 seconds in urban areas and there is no qualifying data in rural areas. The first due is capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations are performed utilizing safe operational procedures.

For 90 percent of all maximum risk technical rescue incidents, the total response time for the arrival of the first due unit, with a minimum of 2 firefighters and 1 officer; (3) total, is: 13 minutes and 2 seconds in urban areas and there is no qualifying data in rural areas. The first due is capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources. These operations are performed utilizing safe operational procedures.

Technical Rescue Concentration / Effective Response Force

For 90 percent of all low risk technical rescue incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 2 firefighters and 1 officer; (3) total, is: 10 minutes and 22 seconds in urban areas and there is no qualifying data in rural areas. The first due is capable of: establishing command;

assessing scene safety; performing a scene assessment; requesting additional resources. These operations are performed utilizing safe operational procedures.

For 90 percent of all moderate risk technical rescue incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 4 firefighters and 2 officers; (6) total, is: 9 minutes and 3 seconds in urban areas and there is no qualifying data in rural areas. The effective response force is capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; providing patient care; providing transportation to the hospital. These operations are performed utilizing safe operational procedures.

For 90 percent of all high risk technical rescue incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 6 firefighters and 4 officers; (10) total, is: 7 minutes and 36 seconds in urban areas and there is no qualifying data in rural areas. The effective response force is capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; performing mechanical extrication; providing patient care; providing transportation to the hospital. These operations are performed utilizing safe operational procedures.

For 90 percent of all maximum risk technical rescue incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 10 firefighters and 6 officers; 3 being technician level rescuers; (16) total, is: 13 minutes and 2 seconds in urban areas, 19 minutes and 56 seconds in rural areas. The effective response force is capable of: establishing command; assessing scene safety; performing a scene assessment; requesting additional resources; hazard mitigation; performing mechanical extrication; performing air-quality analysis; performing a confined space rescue; performing a trench rescue; performing a water/ice rescue; performing a high angle rescue; providing patient care; providing transportation to the hospital. These operations are performed utilizing safe operational procedures.

Hazardous Materials Services Program

Hazardous Materials Distribution

For 90 percent of all low risk hazardous materials response incidents, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total; is: 10 minutes and 22 seconds in urban areas and there is no qualifying data in rural areas. The first-due unit is capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations are performed utilizing safe operational procedures.

For 90 percent of all moderate risk hazardous materials response incidents, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total; is: 10 minutes and 49 seconds in urban areas, 10 minutes and 40 seconds in rural areas. The first-due unit is capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations are performed utilizing safe operational procedures.

For 90 percent of all high risk hazardous materials response incidents, the total response time for the arrival of the first-due unit, with a minimum of 3 firefighters and 1 officer, (4) total; is: 10 minutes and 30 seconds in urban areas and there is no qualifying data in rural areas. The first-due unit is capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations are performed utilizing safe operational procedures.

Hazardous Materials Concentration / Effective Response Force

For 90 percent of all low risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 3 firefighters and 1 officer, (4) total; is: 10 minutes and 24 seconds in urban areas and there is no qualifying data in rural areas. The effective response force is capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; and requesting additional resources. These operations are performed utilizing safe operational procedures.

For 90 percent of all moderate risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 4 firefighters and 2 officers, (6) total; is: 11 minutes and 29 seconds in urban areas, 32 minutes and 18 seconds in rural areas. The effective response force is capable of: establishing command; performing an initial scene assessment; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; providing a hose line for protection; providing advanced medical care; transporting the patient to the hospital; and requesting additional resources. These operations are performed utilizing safe operational procedures.

For 90 percent of all high risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 10 firefighters and 6 officers, (16) total, 4 being hazardous materials technicians; is: not applicable because there were no qualifying incidents in urban areas or rural areas. The effective response force is capable of: establishing command; performing an initial scene assessment; establishing a hazard zone; establishing a hazmat group; performing research; performing air quality analysis; assisting with an evacuation; ventilating a structure; performing gross decontamination; performing technical decontamination; providing a hose line for fire protection; providing advanced medical

care; transporting the patient to the hospital; and requesting additional resources. These operations are performed utilizing safe operational procedures.

Performance Gaps – Baseline to Benchmark Time Gap

Fire Suppression Services Program

The department provides a broad range of responses to structure fires involving single-family dwellings, multi-family dwellings, and high-rise, commercial, and industrial occupancies. Additionally, high-hazard structures such as institutional facilities, schools, nursing homes, assisted living facilities, and congregate housing (sororities/fraternities). Other fire-related responses involve mobile property such as passenger vehicles, road freight, rail freight, watercraft, recreational vehicles, aircraft, dumpster or rubbish fires, and heavy equipment fires. The department provides contractual services for Grant Township, comprised of agricultural, residential, and some commercial structures.

Map 14: Fire Incident Heat Map: Lawrence

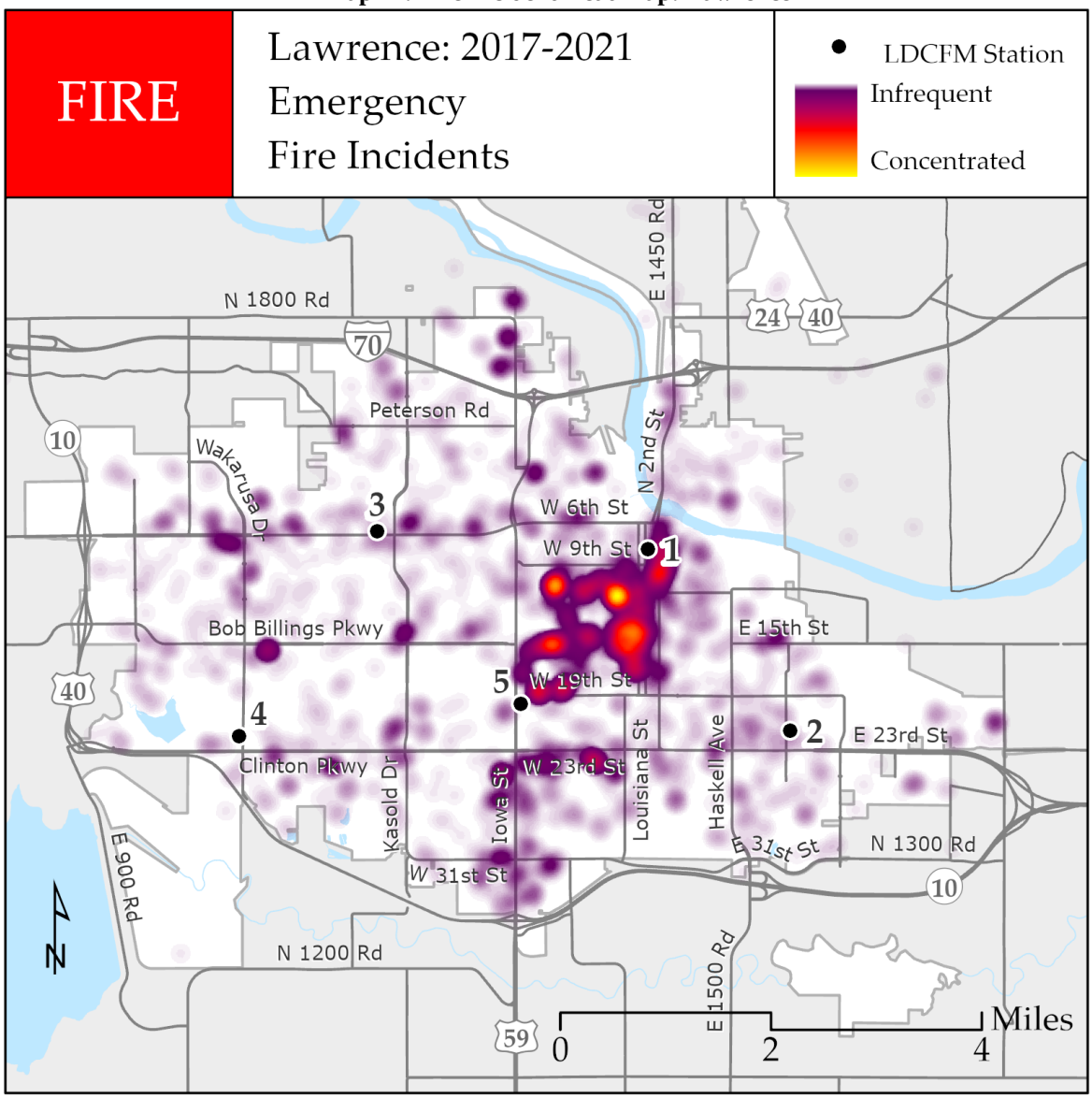


Table 73: Baseline to Benchmark Time Gap - Fire Suppression Low Risk

2017-2021 Low Risk Fire Suppression Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	9:35	6:30	03:05
		n=2,663		
1st Due	Rural	17:16	12:30	04:46
		n=36		
ERF	Urban	9:35	6:30	03:05
		n=2,663		
ERF	Rural	17:16	12:30	04:46
		n=36		

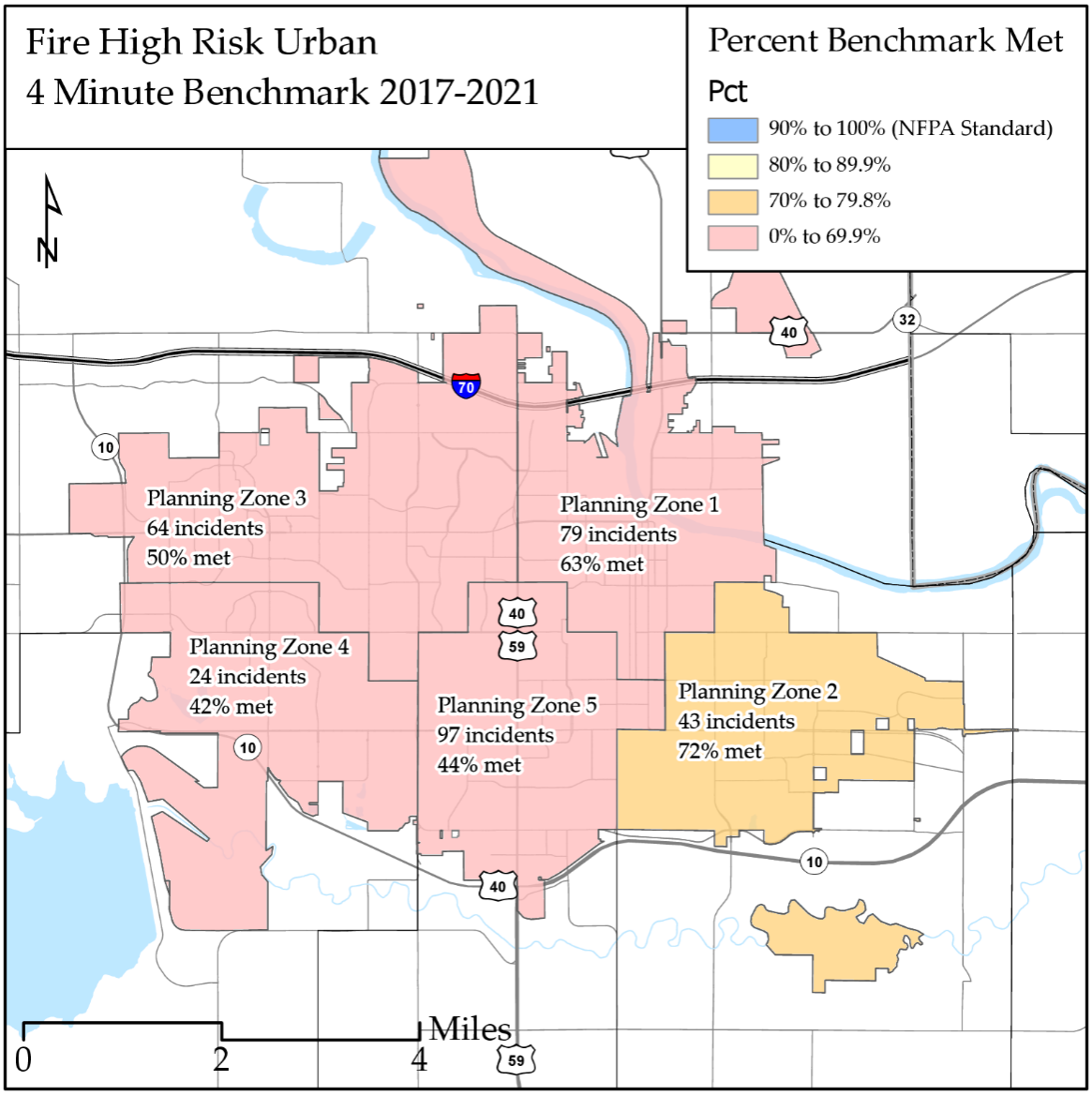
Table 74: Baseline to Benchmark Time Gap - Fire Suppression Moderate Risk

2017-2021 Moderate Risk Fire Suppression Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	9:36	6:30	03:06
		n=32		
1st Due	Rural	16:03	12:30	03:33
		n=32		
ERF	Urban	13:14	10:30	02:44
		n=7		
ERF	Rural	13:59	18:30	04:31
		n=2		

Table 75: Baseline to Benchmark Time Gap - Fire Suppression High Risk

2017-2021 High Risk Fire Suppression Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	8:45	6:30	02:15
		n=308		
1st Due	Rural	13:46	12:30	01:16
		n=5		
ERF	Urban	14:08	10:30	03:38
		n=179		
ERF	Rural	22:46	18:30	04:16
		n=2		

Map 15: Four-Minute Benchmark - Fire High Risk Urban (2017-2021): Lawrence



Emergency Medical Services Program

The department provides first responder medical care at the basic life support (BLS) and advanced life support (ALS) service levels. Calls for EMS continue to be the dominant emergency type within the city and county. To better serve the citizens within Douglas County, the department now requires all new operations hires to acquire their paramedic certification within the first three years of employment. Medical responses continue to account for approximately 64% of all annual emergency responses managed by the department. All sworn department members are, at a minimum, certified emergency medical technicians (EMTs), while approximately 76 are Advanced Emergency Medical Technicians (AEMTs), and 58 are state and/or nationally certified paramedics. The department provides ALS services utilizing paramedics countywide.

The department provides the best available service within Douglas County due to the overlapping needs of fire, rescue, EMS, member staffing, certifications, and equipment deployment. The department provides seven primary and five secondary ALS ambulances. Each primary unit is staffed by one officer and one firefighter/paramedic. The department's five primary fire apparatus and rescue trucks are full-time ALS units. Primary fire apparatus and the rescue truck are equipped with a full complement of ALS equipment, including

cardiac monitors, advanced respiratory equipment, as well as cardiac medications, and intravenous therapy supplies.

EMS includes first response, rescue, treatment, transportation, and reporting for medical emergencies to approximately 9,380 calls per year out of the 14,560 within the city of Lawrence and Douglas County in 2021. Responses to these calls include but are not limited to, cardiac and respiratory emergencies, difficulty breathing, childbirths, cardiac arrests, strokes, and trauma. Medical supervision is provided on shift by an operations chief officer and medical direction provided by the department's medical director. For the majority of ALS-level EMS calls, the basic response is one medic unit staffed with a paramedic and AEMT.

Map 16: EMS Incident Heat Map: Lawrence

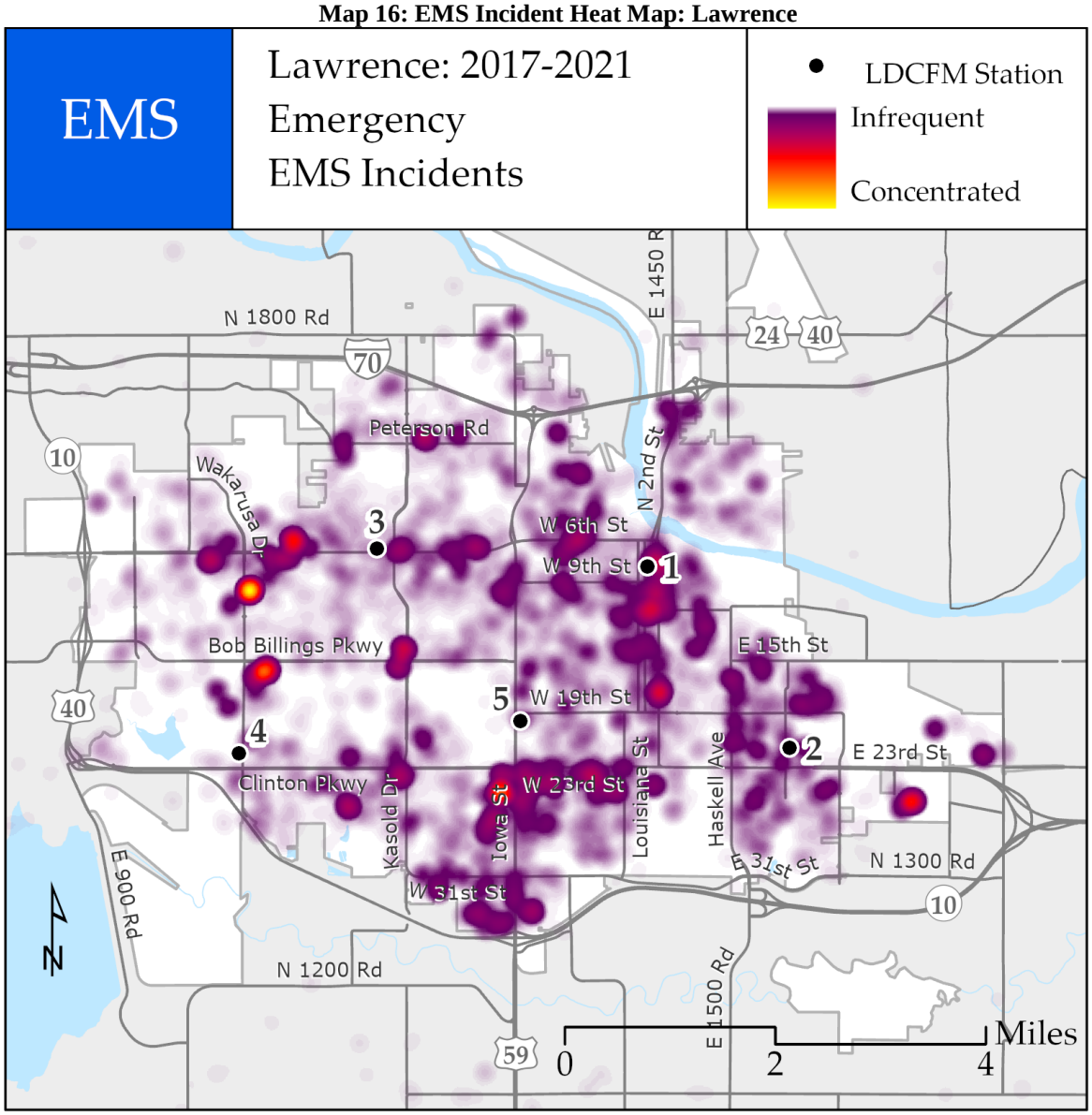


Table 76: Baseline to Benchmark Time Gap - EMS Low Risk

2017-2021 Low Risk EMS Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	11:00	6:30	04:30
		n=1,329		
1st Due	Rural	22:22	12:30	09:52
		n=84		
ERF	Urban	11:00	6:30	04:30
		n=1,329		
ERF	Rural	22:22	12:30	09:52
		n=84		

Table 77: Baseline to Benchmark Time Gap - EMS Moderate Risk

2017-2021 Moderate Risk EMS Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	8:50	6:30	02:20
		n=15,159		
1st Due	Rural	20:30	12:30	08:00
		n=1,219		
ERF	Urban	9:45	10:30	00:45
		14,047		
ERF	Rural	20:34	18:30	02:04
		n=1,192		

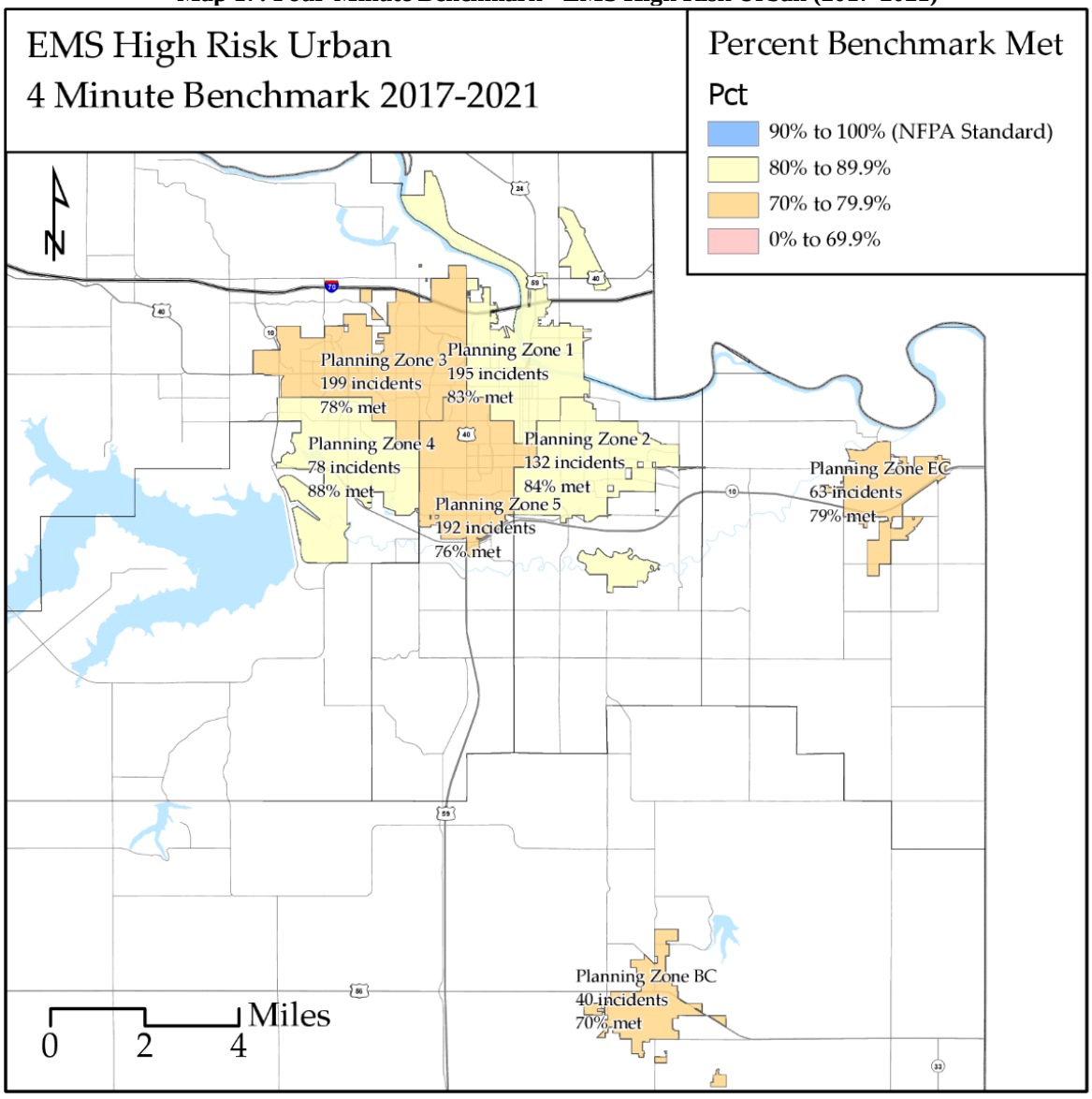
Table 78: Baseline to Benchmark Time Gap - EMS High Risk

2017-2021 High Risk EMS Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	7:34	6:30	01:04
		n=905		
1st Due	Rural	18:51	12:30	06:21
		n=182		
ERF	Urban	13:09	10:30	02:39
		n=539		
ERF	Rural	25:24	18:30	06:54
		n=83		

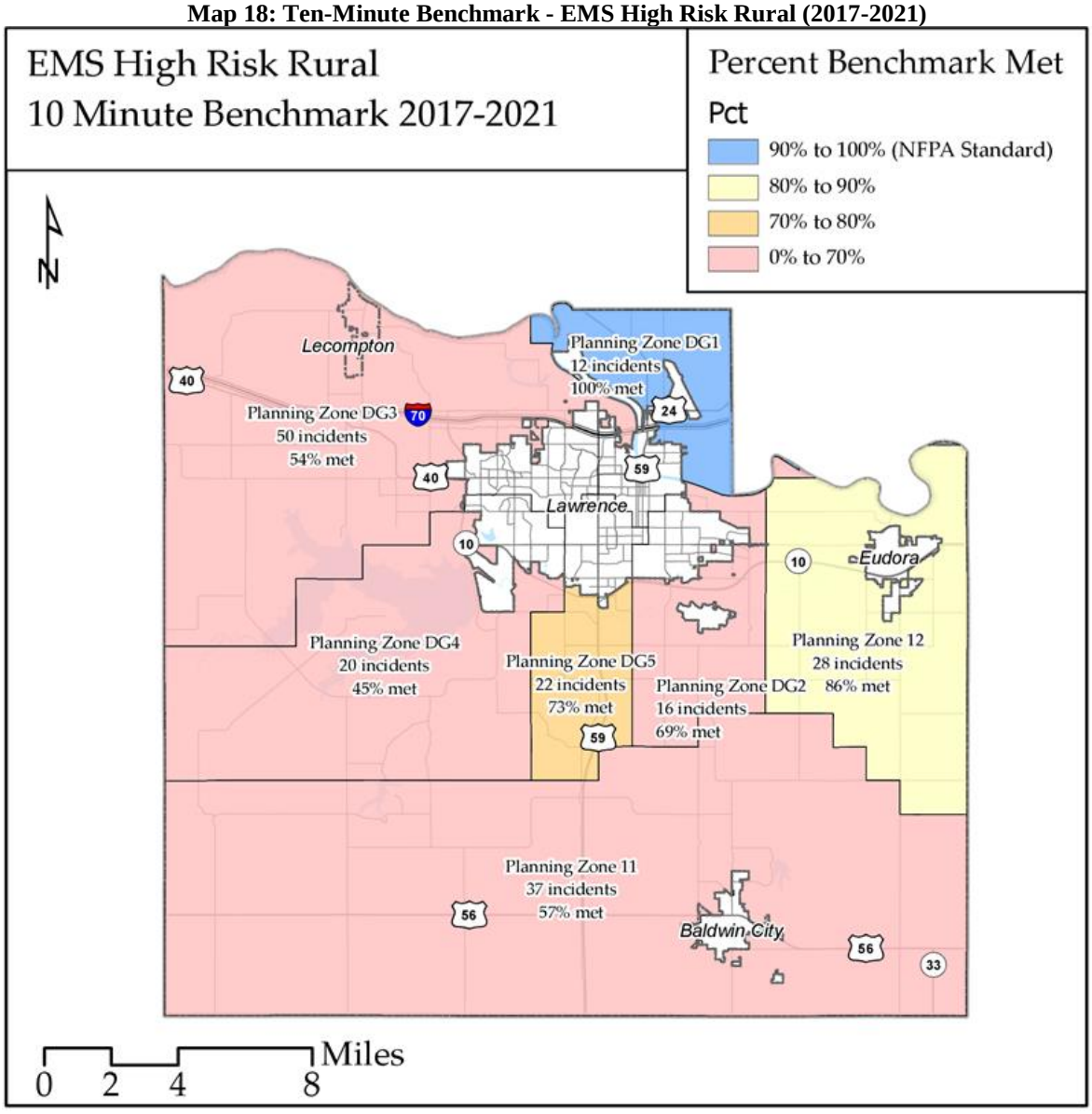
Table 79: Baseline to Benchmark Time Gap - EMS Maximum Risk

2017-2021 Maximum Risk EMS Response Times				
1st/ERF	**Urban/Rural**	**Baseline**	**Benchmark**	**Gap**
1st Due	Urban	7:32	6:30	**01:02**
		n=11		
1st Due	Rural	16:23	12:30	**03:53**
		n=74		
ERF	Urban	15:43	10:30	**05:13**
		n=3		
ERF	Rural	20:58	18:30	**02:28**
		n=12		

Map 17: Four-Minute Benchmark - EMS High Risk Urban (2017-2021)



Map 18: Ten-Minute Benchmark - EMS High Risk Rural (2017-2021)



Technical Rescue Services Program

The department provides technical rescue services within the city, supports the EMS mission in the county, and provides mutual aid as needed to surrounding areas. The department provides firefighters trained in various aspects of technical rescue to respond to emergencies for confined space, vehicle extrication, trench rescue, structural collapse, high-angle rope rescue, and water/ice rescue. The technical rescue team is based out of Fire Medical Station 5. The department has identified major highways, water towers, utility services, new construction, remodeling of structures, and water/sewer pipe maintenance as potential sites for technical rescue. The department continually performs ongoing evaluations to identify new potential technical rescue hazards or sites.

Technical rescue operations generally require specialized training and equipment. Providing sufficient resources to mitigate a protracted or complicated rescue would be difficult for the department. The department, in many instances, would need the support of regional technical rescue teams for complex and time-demanding operations. The technical rescue component of the department is part of Kansas Task Force 2. Kansas Task Force 2 is a regional response team for the northeast region of Kansas, managed by the Kansas

Department of Emergency Management (KDEM). The often complex and dangerous nature of a technical rescue requires that responders be both highly trained and rapidly deployable.

Map 19: Technical Rescue Incident Heat Map: Lawrence

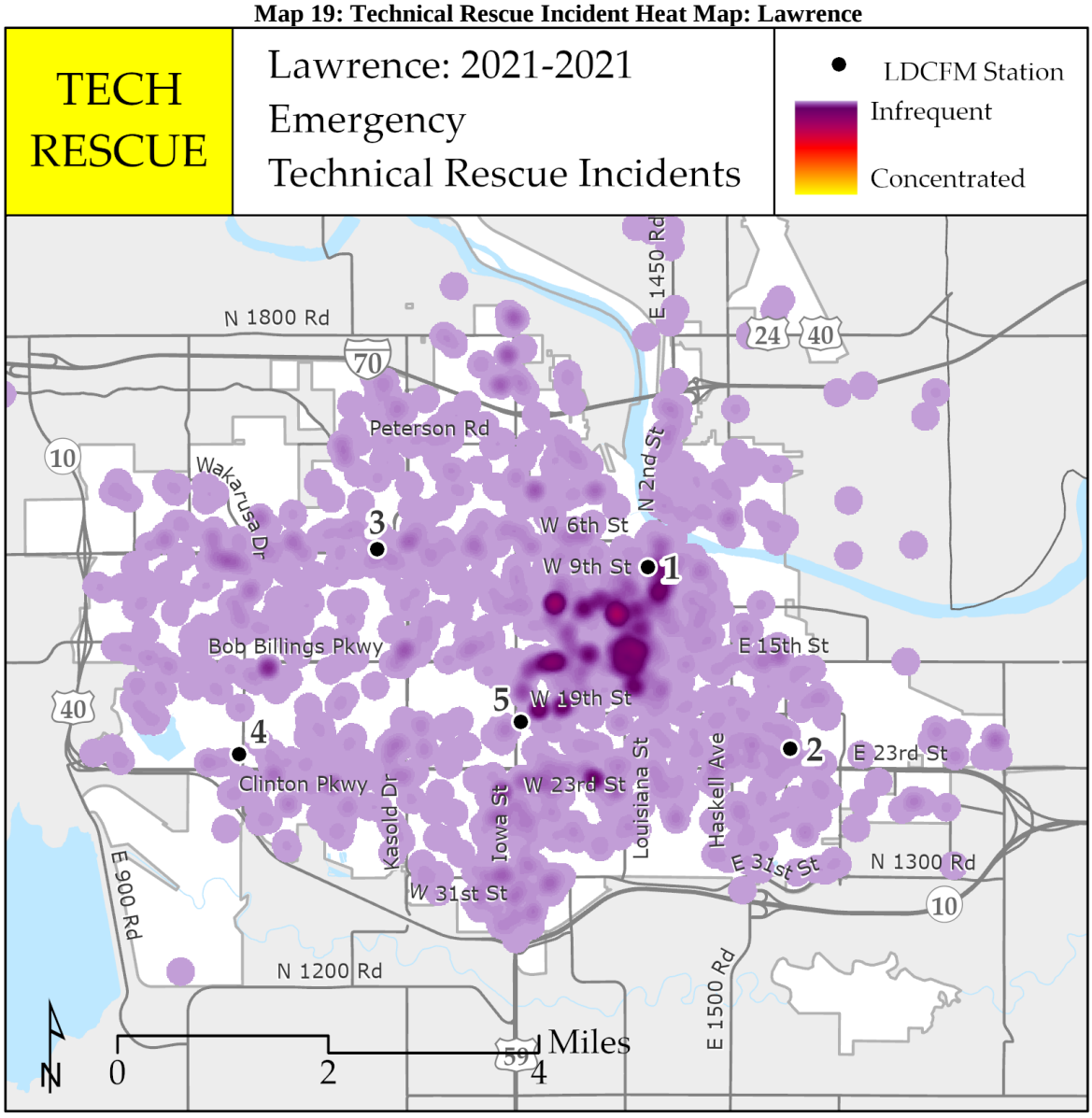


Table 80: Baseline to Benchmark Time Gap - Technical Rescue Low Risk

2017-2021 Low Risk Tech Rescue Response Times				
1st/ERF	**Urban/Rural**	**Baseline**	**Benchmark**	**Gap**
1st Due	Urban	10:24	6:30	**03:54**
		n=11		
1st Due	Rural	NA	12:30	**#VALUE!**
		n=0		
ERF	Urban	10:24	6:30	**03:54**
		n=11		
ERF	Rural	NA	18:30	**#VALUE!**
		n=0		

Table 81: Baseline to Benchmark Time Gap - Technical Rescue Moderate Risk

2017-2021 Moderate Risk Tech Rescue Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	8:33	6:30	02:03
		n=159		
1st Due	Rural	NA	12:30	#VALUE!
		n=0		
ERF	Urban	9:03	10:30	01:27
		n=140		
ERF	Rural	NA	18:30	#VALUE!
		n=0		

Table 82: Baseline to Benchmark Time Gap - Technical Rescue High Risk

2017-2021 High Risk Tech Rescue Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	7:36	6:30	01:06
		n=1		
1st Due	Rural	NA	12:30	#VALUE!
		n=0		
ERF	Urban	NA	10:30	#VALUE!
		n=0		
ERF	Rural	NA	18:30	#VALUE!
		n=0		

Table 83: Baseline to Benchmark Time Gap - Technical Rescue Maximum Risk

2017-2021 Maximum Risk Tech Rescue Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	13:02	6:30	06:32
		n=79		
1st Due	Rural	19:56	12:30	07:26
		n=3		
ERF	Urban	23:06	10:30	12:36
		n=16		
ERF	Rural	NA	18:30	#VALUE!
		n=0		

Hazardous Materials Services Program

The department is staffed and equipped to respond to hazardous materials (hazmat) incidents county-wide. Hazmat operations are based out of Fire Medical Station 4. Engine 4 is staffed with an officer, an engineer, and two firefighters. Engine 4 is a dual-purpose unit with specialized hazardous materials response equipment and fire suppression capabilities. Medic 4 is staffed with one officer and one paramedic/firefighter. Fire Medical Station 4 also houses a hazmat trailer that responds in tandem to incidents that require more resources which enhances capabilities. The department currently maintains approximately 43 members trained to National Fire Protection Association 472 (NFPA 472) standard: competence of responders to hazardous materials/weapons of mass destruction incidents. The remaining members are trained to the

hazardous materials operations level. Hazmat technicians are dispersed throughout the department to offer a higher-level initial response to hazmat incidents.

The department is the primary agency within Douglas County to respond to hazmat incidents and receives mutual aid from Johnson County, approximately 35 miles to the east. The agency is responsible for offensive and defensive operations; however, the department does not collect or dispose of any hazardous materials.

Map 20: Hazardous Materials Incident Heat Map: Lawrence

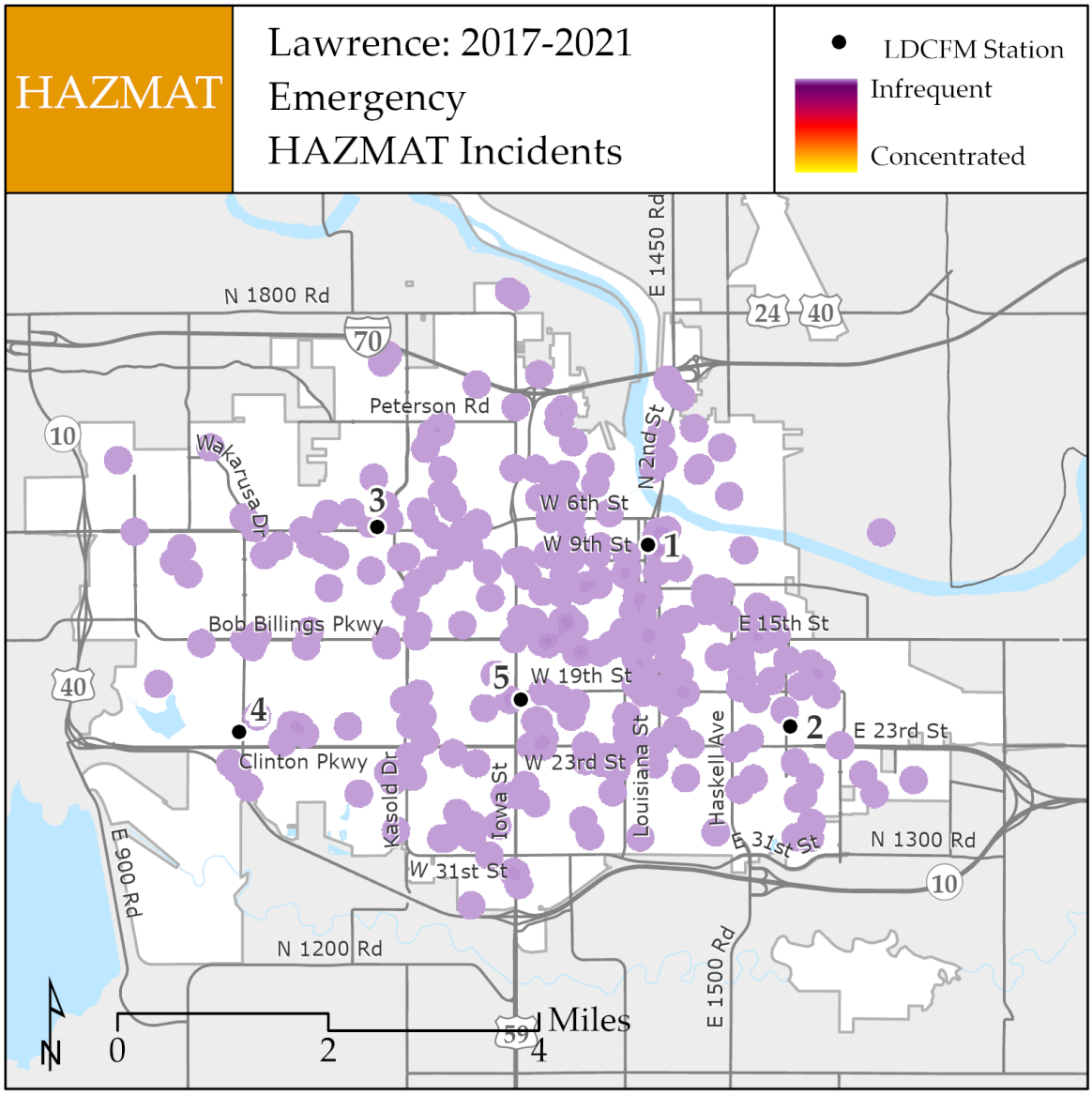


Table 84: Baseline to Benchmark Time Gap - Hazardous Materials Low Risk

2017-2021 Low Risk Hazmat Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	10:22	6:30	03:52
		n=157		
1st Due	Rural	NA	12:30	#VALUE!
		n=0		
ERF	Urban	9:33	10:30	00:57
		n=38		
ERF	Rural	NA	18:30	#VALUE!
		n=0		

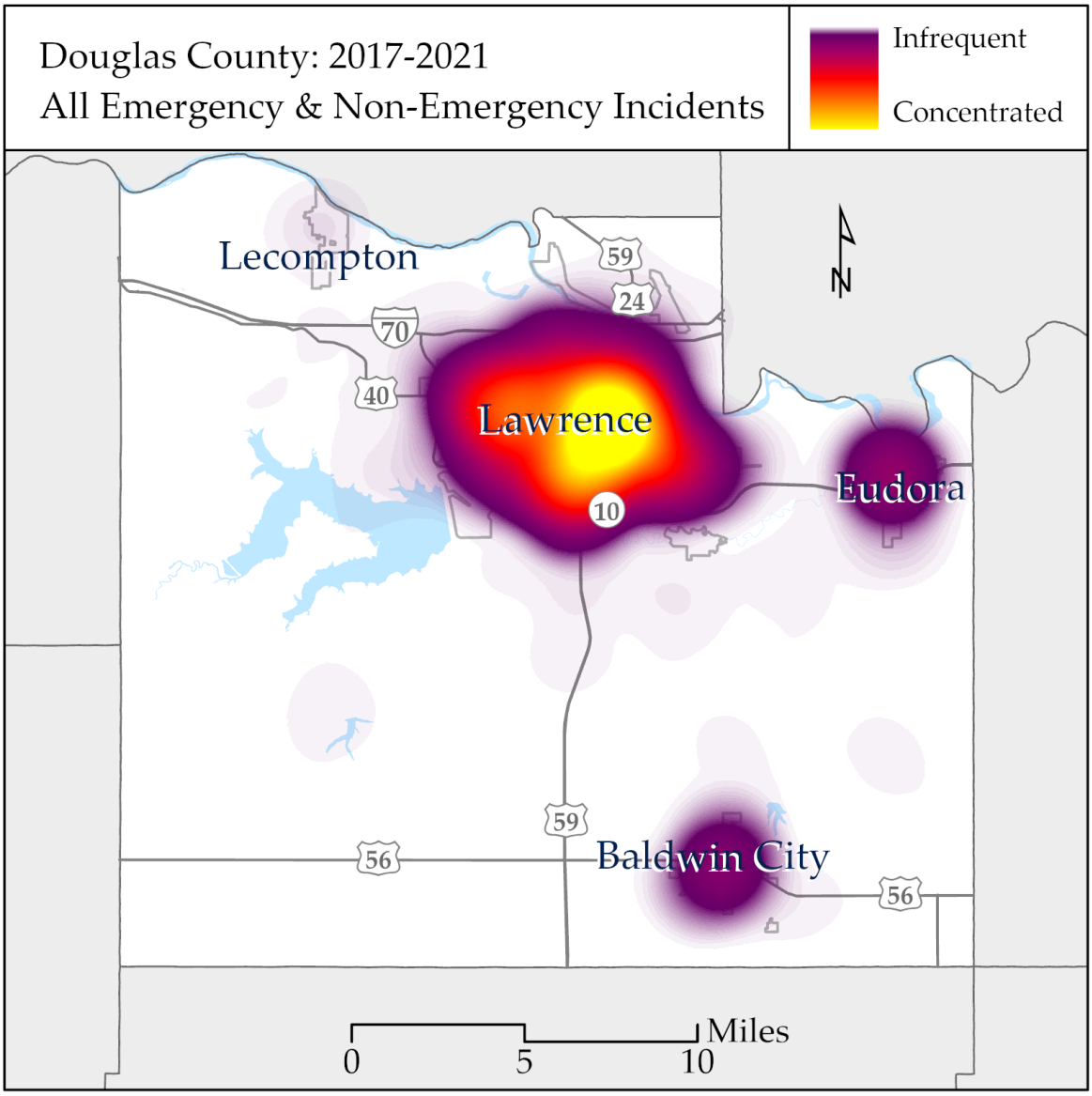
Table 85: Baseline to Benchmark Time Gap - Hazardous Materials Moderate Risk

2017-2021 Moderate Risk Hazmat Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	10:49	6:30	04:19
		n=187		
1st Due	Rural	10:40	12:30	01:50
		n=1		
ERF	Urban	11:29	10:30	00:59
		n=144		
ERF	Rural	32:18	18:30	13:48
		n=1		

Table 86: Baseline to Benchmark Time Gap - Hazardous Materials High Risk

2017-2021 High Risk Hazmat Response Times				
1st/ERF	Urban/Rural	Baseline	Benchmark	Gap
1st Due	Urban	10:30	6:30	04:00
		n=17		
1st Due	Rural	NA	12:30	#VALUE!
		n=0		
ERF	Urban	NA	10:30	#VALUE!
		n=0		
ERF	Rural	NA	18:30	#VALUE!
		n=0		

Map 21: Douglas County Incident Frequency (2017-2021)



J. Performance Maintenance and Improvement Plans

Compliance Team / Responsibility

The department is dedicated to maintaining and improving service on a continuous cycle. To accomplish this task, the Compliance Team consisting of administrative staff, operations personnel, and chief officers will review service baselines on a quarterly and annual basis. The review will cover response time baselines, compared to benchmarks, as well as demand counts. The data will be presented during the quarterly Governance Committee meeting between the department, the City of Lawrence, and Douglas County.

The fire chief and accreditation manager will share with the Authority Having Jurisdiction the capabilities and capacities of the department relative to maintaining the adopted level of service annually. The review process may result in recommendations to improve the level of service. This data-driven recommendation(s) will be presented to the executive staff as appropriate.

Performance Evaluation and Compliance Strategy

The department is committed to the self-evaluation process and continuous improvement. The Standards of Coverage is the department's effort to evaluate current levels of performance and establish levels for the future. These standards will be continuously evaluated and updated as needed, as this SOC is considered a living document. The SOC will be part of the department's budget development and the Community-Driven Strategic Plan.

Performance evaluation includes all components of total response time for all risk categories and classifications. Compliance reports and performance indicators are evaluated and communicated to the fire chief annually.

Through the City of Lawrence Strategic Plan Commitment – Safe and Secure (SaS), the City dedicates time quarterly for the Commitment Team to present information relative to the performance indicators. Through the SaS presentations, the department reports on the following performance indicators:

SaS-1: Percent of residents who perceive Lawrence as safe or very safe

SaS-3: Percent of fires contained to their room of origin

SaS-4: Percent of cardiac arrest patients with pulsatile rhythms upon arrival to a hospital

SaS-5: Number of responses to a mental health crisis per 1,000 residents

SaS-8: Percent of residents rating trust in emergency services departments as satisfied or very satisfied (Fire)

SaS-10: Expenditure per 1,000 residents for Fire

SaS-12: Employee Engagement Index for Fire Medical

SaS-14: Percent of Firefighters meeting or exceeding 228 hours of firefighter training

Compliance strategies will be developed to improve and maintain SOC response capabilities. The Compliance Team will be assigned the responsibility of managing compliance in services provided and the level of service. Some performance areas being evaluated are any changes in the types of services being delivered by the department, new laws or regulations requiring a change in service, and any time the AHJ or fire chief determines if adjustment to the service delivery model is required.

Compliance Verification Reporting

The command staff and operations division are responsible for verifying and validating compliance in the department's incident reports.

The department utilizes a quality control (QC) review process to ensure incident reports contain accurate data. The quality control process has three workflows: 1) EMS incidents, 2) Structure / Building Fire incidents, and 3) all other incident types. Each workflow has its designated levels of QC responsibility, incorporating report writers, officers, chief officers, and administration.

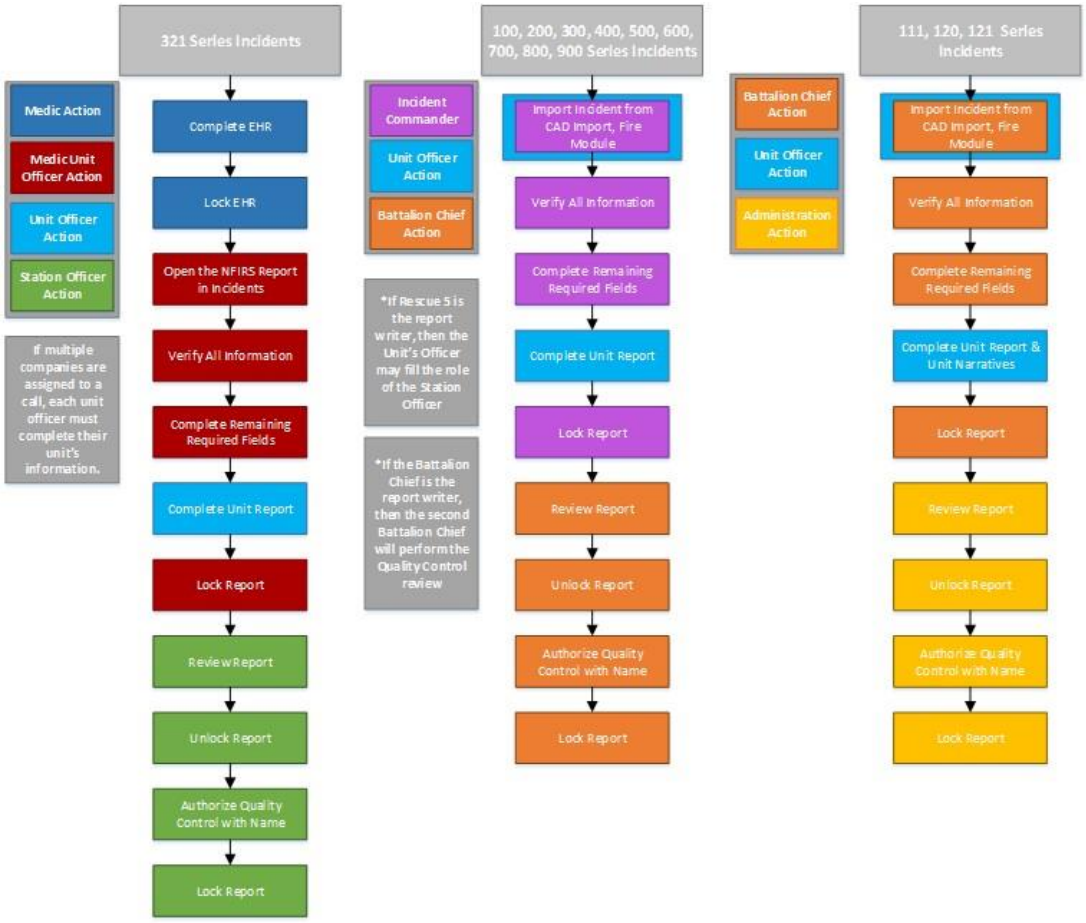


Figure 26: RMS Workflows

Compliance with the National Fire Incident Reporting System (NFIRS) will be maintained and verified through monthly compliance reports from the NFIRS state manager in the Kansas State Fire Marshall's Office. Critical errors are addressed monthly and resubmitted automatically through the department's RMS.

Chief officers monitor real-time data from response performance for each shift. Validating compliance is performed through monthly performance reports that include shift, station, and unit response data. This data is shared through the chain of command to all employees.

Continuous Improvement Strategy

The department is committed to providing modern equipment and apparatus and well-maintained stations. It takes an all-hazard approach to provide emergency services, with an overall positive reputation in the

community. In addition to the CFAI accredited status, the department maintains an ISO public protection classification rating of Class 1; the highest rating possible.

To ensure the department is meeting or nearing the expected level of service (benchmarks), continuous monitoring of service level baselines is conducted by reviewing current benchmarks and comparing those results to previous results. Trending the data is used to identify positive and negative trends. The compliance team recommends actions or options to address any recognized deficiencies, changes, or other external factors affecting response capabilities.

The fire chief determines the most appropriate course of action based on the recommendations and the Mission, Vision, and Values of the department and the City of Lawrence. If, or when, the recommended actions may significantly alter the level of service, the fire chief provides this data and information through management channels for consideration. The overall goal of the recommendations is to improve the ability to provide quality service to the community.

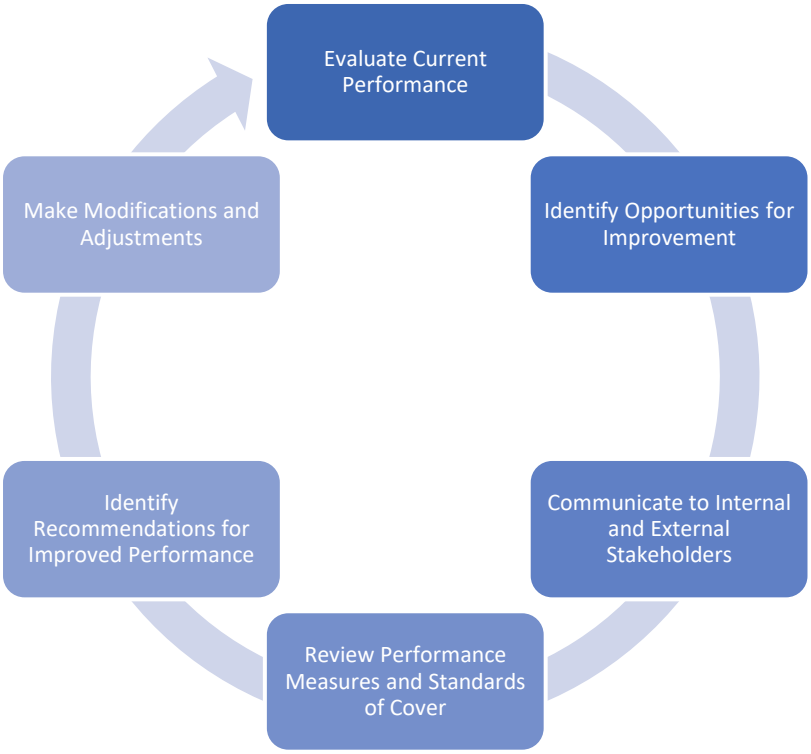


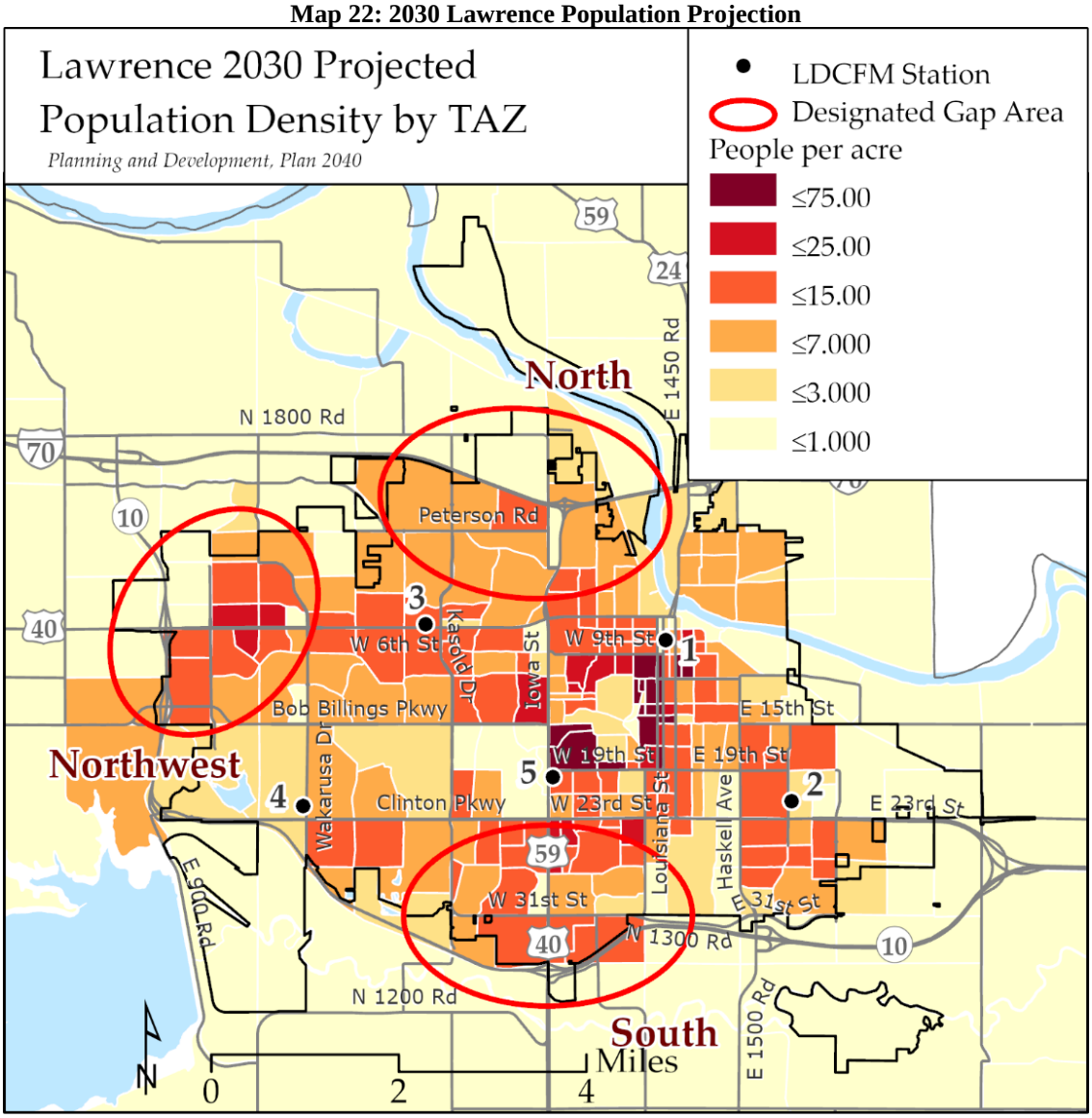
Figure 27: Continuous Improvement Cycle

Community Areas for Program Delivery and Coverage Improvement

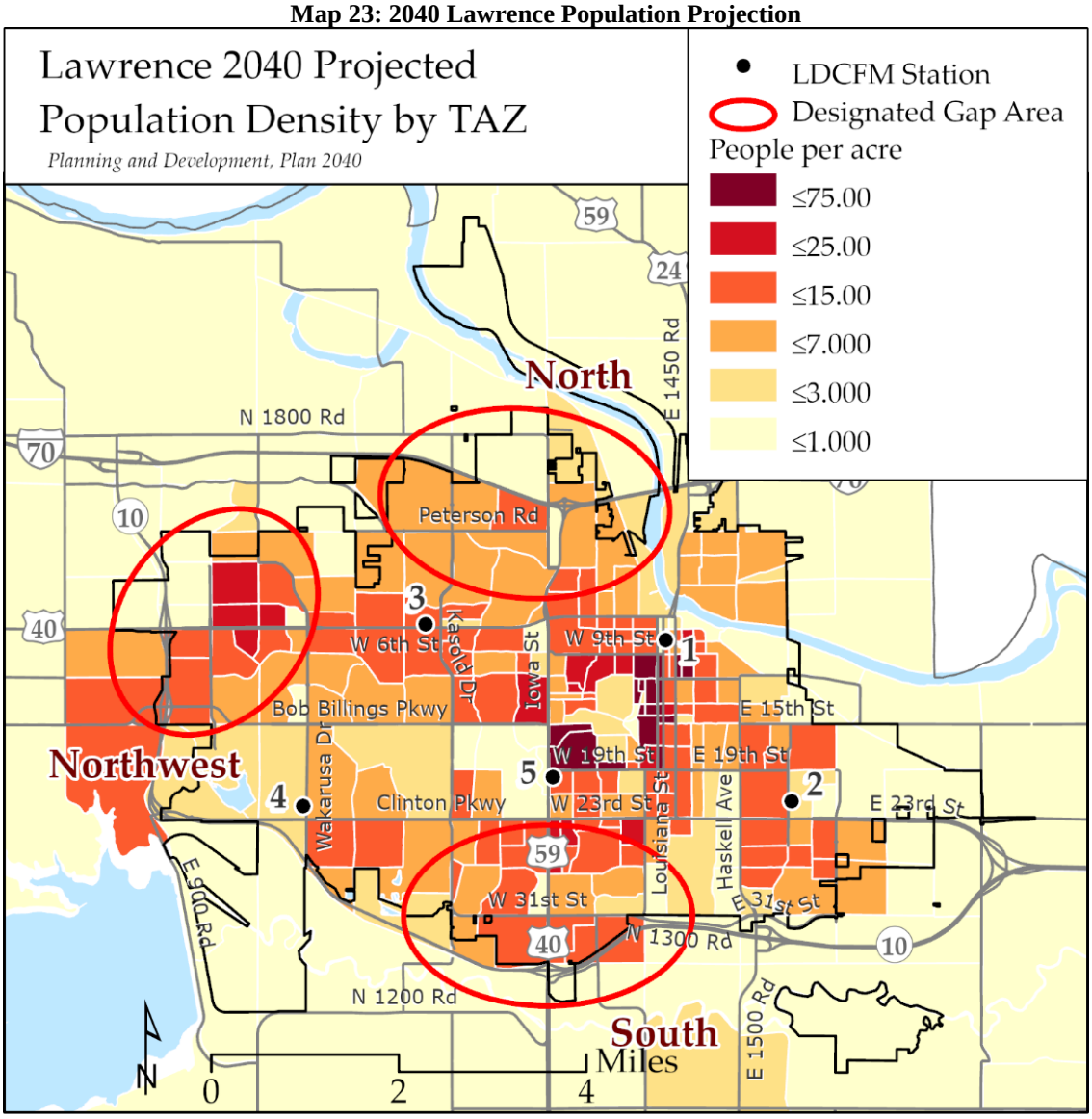
In 2020, the department published the *2020 Station Optimization Analysis,* which identifies three regional areas of suboptimal response coverage in the northwest, north, and south regions of the city of Lawrence. The analysis identifies solutions to improve performance toward National Fire Protection Association (NFPA) standards for fire/medical response times.

The analysis provides a multi-year reconfiguration of the department's response model and recommends solutions for the relocation of existing Fire Medical Station 3 and the development of new Fire Medical Stations 6 and 7. These recommendations will improve fire medical performance and outcomes and balance emergency resource deployment to a more broad population, resulting in a more safe and secure community.

Map 22: 2030 Lawrence Population Projection



Map 23: 2040 Lawrence Population Projection




LAWRENCE
STREET DEPT

K. Appendices

Appendix A: SOP 202.10 Alarms and Responses

Lawrence-Douglas County Fire Medical Procedure	202.10
Title: **Alarms and Responses**	**Effective Date: 8/17/2017** **Page 1 of 7**
	Supersedes - SOP(s)/Date(s): **SOP II-250 ALARMS AND RESPONSE revised 09/21/07**

1 PURPOSE

The purpose of this procedure is to define the department's unit assignments that will be dispatched to a particular call type. This procedure will aid in the departments goal of efficiently assigning available resources at the time of an alarm.

2 SCOPE

The scope of this procedure applies to all operations members.

3 ACCREDITATION REFERENCE

5E, 5F, 5G, 5H

4 PROCEDURE

The response matrix for City of Lawrence and Grant township incidents are listed in Table 1.

The response matrix for Douglas County incidents are listed in Table 2.

A "Call Start Dictionary" is found in Appendix 1.

The Douglas County Emergency Communications Center "Dispatch" will utilize the response matrix to dispatch the most appropriate available resources. As additional information is received, the call type may be changed or the levels "BALANCED" to the next appropriate level.

BALANCING of alarm.

The highest level within the response matrix is Level 1.

The BALANCING of an alarm based upon the best available information will be done by, (a) Dispatch, as they receive additional information from the caller or additional callers. (b) Highest ranking officer assigned to the call. This will be the responsibility of the Captain or Lieutenant assigned to the Engine/Quint/Truck when they are dispatched with a medic unit.

When the highest level of a given response is reached, additional or specialized resources will need to be requested through dispatch.

5 TURNPIKE RESPONSES

The City limit is within mile markers 201-206

County Fire Districts are responsible for fire responses within mile markers 188.5-201

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6 MUTUAL AID REQUEST OR GIVEN

Fire apparatus will not respond outside the city limits except for the following reasons; Technical Rescue, Hazardous Materials, Immediate life threatening emergencies, Request from another Fire and or EMS agency, Request from the Douglas County Sheriff, Request from the NE Region Homeland Security.

The response assignment will be determined by expressed need as assigned by the Division Chief/Shift Commander or Chief of the department.

When mutual aid is given, the Division Chief/Shift Commander will also be assigned to the Incident to act as liaison with the incident commander for the safety of our crew(s).

7 PHONE CALLS OR WALK-INS AT STATIONS REQUESTING HELP

If a station is notified of a fire or medical emergency by phone, the person taking the call, when safe for the caller, will record the address location of the emergency, type of incident, a call back number and caller's name to be forwarded to dispatch.

If the caller is in immediate danger, direct the caller to move to a safe location and call 911.

If a station is notified of a fire or medical emergency by walk-in, the station officer will radio dispatch to initiate an alarm. The station officer will advise of the address and nature of the alarm.

8 RELOCATING

When the department is on-scene of working structure fire "Structure Fire LVL 1", and Station 5 is assigned, an available Quint/Engine that is still in quarters, will relocate to station 5. Once at station 5, the need for Emergency Call Back will be evaluated, following (SOP 109.30).

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Table 1

Call Nature	E/Q/T5	M	R	SC	E40	B	T5	M5	E4	M4	Total
Abdominal Pain		1									2
Aircraft Emergency	1	2	1	1	1						16
Alarm/Fire LVL 1	2	1	1	1							14
Alarm/Fire LVL 2	1										4
Alarm/Medical		1									2
Alcohol Poisoning		1									2
Allergic Reaction	1	1									6
Animal Attack	1	1									6
Arcing Line	1										4
Assault		1									2
Assist Police	1										4
Assist Public	1										4
Back Pain		1									2
Breathing Problem	1	1									6
Building Collapse	2	1	1	1			1	1			20
Burns	1	1									6
Car Fire	1										4
Cardiac Arrest	1	1		1							7
Chest Pain	1	1									6
Choking	1	1									6
CO Alarm	1										4
CO Alarm/Sickness	1	1									6
Confined Space Rescue	1	1	1	1			1	1	1		20
Convulsions/Seizures	1	1									6
Diabetic	1	1									6
Drowning	1	1		1							7
Dumpster Fire	1										4
Electrocution	1	1		1							7
Elevator Rescue	1										4
Explosive Investigation	1										4
Eye Problems		1									2
Lift Assist	1										4
Fall	1	1									6
Fire Standby	1										4
FOTHER	1										4
Fuel Spill	1										4
Gas Leak	1	1									6
Gas Odor	1										4
Grass Fire	1										4
Grass Fire Grant Township	1					1					6
Hazardous Materials LVL 1	2	2	1	1					1	1	22
Hazardous Materials LVL 2	1	1		1					1	1	13
Hazardous Materials LVL 3	1										4
Headache		1									2
Heart Problems	1	1									6

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Call Nature	E/Q/T5	M	R	SC	E40	B	T5	M5	E4	M4	Total
Helicopter Standby	1										4
Hemorrhage		1									2
High Angle Rescue	1	1	1	1			1	1			16
Industrial Accident	1	1	1	1							10
Long Fall	1	1									6
Med Transfer from care facility (Will Be Dispatched By Nature)											
Med Transfer from LMH		1									2
Medical Standby		1									2
Move Up Alarm		1									2
MVA LVL 1	1	2	1	1							12
MVA LVL 2	1	1									6
MVA LVL 3		1									2
Odor	1										4
Overdose	1	1									6
Power line Down	1										4
Pregnancy	1	1									6
Psychiatric		1									2
Semi Fire	2	1		1							11
Semi Fire (un-incorporated)	1	1		1	1						11
Shooting LVL 1	2	2		1							13
Shooting LVL 2	1	1		1							6
Sick Person		1									2
Stabbing LVL 1	2	2		1							13
Stabbing LVL 2	1	1		1							7
Stroke	1	1									6
Structure Fire LVL 1	3	2	1	1							20
Structure Fire LVL 2	2	1	1	1							14
Structure Fire LVL 3	1	1									6
Grant Township Structure Fire LVL 1	2	2	1	1	1						20
Grant Township Structure Fire LVL 2	1	1	1	1	1						14
Grant Township Structure Fire LVL 3	1	1									6
Suicide Attempt	1	1									6
Traumatic Injury		1									2
Trench Rescue	1	1	1	1			1	1			16
Unconscious	1	1									6
Unknown Medical		1									2
Water/Ice Rescue	1	1	1	1		1	1	1			16

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Appendix 1

Aircraft Emergency	*Any situation, not necessarily a crash that forces an aircraft to make an unscheduled or emergency landing.*
Alarm/Fire LVL 1	*Multiple devices activated, pull station, Full building*
Alarm/Fire LVL 2	*Single device*
Arcing Line	*An elevated power line, transformer, or other unidentified line that is arcing and/or on fire and does not endanger any structure(s). Also includes a power line that remains elevated and out of reach after falling from its original position.*
Assist Police	*Any request for assistance by law enforcement, not related to a fire or medical emergency, and approved by a person of authority within the department, i.e. Ladders, Lights, etc.*
Assist Public	*Any request for assistance by a citizen or non-law enforcement organization, not related to a fire or medical emergency, and approved by a person of authority within the department.*
Building Collapse	*A structure or part of a structure, which has collapsed. This includes a car into a building where there is potential for further building collapse.*
Car Fire	*A vehicle fire in an open area that does not endanger any structure(s), Vehicles grouped under this category include, but not limited to passenger cars, small to full-sized pickup trucks, small to medium-sized trailers, small to medium-sized moving trucks, and small to medium-sized farm/garden/yard apparatuses.*
CO Alarm	*Activated Carbon Monoxide alarm with no reported symptoms.*
CO Alarm/Sickness	*Activated Carbon Monoxide alarm with symptoms of CO poisoning.*
Confined Space Rescue	*Report of a person trapped in a constrictive space, excluding Building Collapses and Trench Rescue. This type of rescue also generally has a hazardous atmosphere.*
Dumpster Fire	*A dumpster, waste receptacle, or recycling bin fire that does not endanger any structures.*
Fire Standby	*Any request for a fire unit to standby where a potential, short-term fire hazard exists.*
FOTHER	*Any request for a fire unit, not classified under any other call type.*
Fuel Spill	*Any small to moderate amount of petroleum product that has leaked or spilled and cannot safely be cleaned up by conventional "on hand" methods, and which the amount is not significant enough to constitute a HAZMAT.*
Gas Leak	*A natural or propane gas line not considered a major flow line, which is leaking and not significant enough to constitute a HAZMAT.*
Gas Oder	*An odor of natural or propane gas, either indoors or outdoors, from an unknown source.*
Grass Fire	*Any lawn, field or tree line fire that does not endanger any structure(s).*
Hazardous Materials LVL 1	*Chemical reaction, rupture of vessel, munitions or bomb explosion (no fire), Blasting agent explosion (No Fire), Explosion (no fire), Toxic Condition, Chemical hazard, spill or leak, Refrigeration leak, Radioactive condition, leak or material, Biologic hazard confirmed or suspected,*

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	Explosive or bomb removal, Bomb Scare (no Bomb)
Hazardous Materials LVL 2	*Overpressure or rupture from air or gas pipe or pipeline, Overpressure or rupture from boiler from air or gas, Air or gas rupture of pressure or process vessel, Gas leak Natural or LPG.*
Hazardous Materials LVL 3	*Gasoline or other flammable liquid spilled, Oil or other combustible liquid spilled, Carbon Monoxide incident, Vehicle accident general cleanup, Smoke or odor removal, Hazmat release investigation with no Hazmat, Biological hazard investigation.*
Helicopter Standby	*Additional fire unit(s) needed at an incident to establish a landing zone. Should not create a separate call.*
High Angle Rescue	*A person trapped or stranded at a high elevation, requiring rescue using aerial fire apparatus, or rescue rope and rigging.*
Industrial Accident	*A person trapped or entangled in machinery.*
Medical Standby	*Any request for a medic unit to standby where a potential, short-term medical hazard exists.*
Move-Up Alarm	*Relocation of a medic unit (M12, M11) from assigned quarters to a location as designated by the Division Chief/Shift Commander during times of high call volume.*
MVA LVL 1	*Motor vehicle accident with 1 patient complaining of major injury or with multiple patients complaining of significant injuries, with or without extrication needs.*
MVA LVL 2	*Motor vehicle accident with 1 patient complaining of significant injury or with multiple patients complaining of minor injury or requesting evaluation.*
MVA LVL 3	*Motor vehicle accident with 1 patient complaining of minor injury or requesting evaluation.*
Powerline Down	*A power line or other unidentified line that has fallen to the ground and/or within reach, not arcing or on fire, and does not endanger any structures.*
Semi Fire	*A tractor-trailer or transport vehicle fire in an open area that does not endanger any structure(s). Vehicles grouped under this category include, but are not limited to semi-trucks, large trailers, large moving trucks, large farm/garden/yard apparatuses, motorized recreational vehicles, and railroad apparatuses.*
Shooting LVL 1	*A report of more than one patient injured by shooting.*
Shooting LVL 2	*A report of one patient injured by shooting.*
Stabbing LVL 1	*A report of more than one patient injured by stabbing.*
Stabbing LVL 2	*A report of one patient injured by stabbing.*
Structure Fire LVL 1	*Working fire, Smoke with victims inside the structure, report of active fire not been verified by the caller.*
Structure Fire LVL 2	*Fire that reported out, vehicle on fire near a structure, fence on fire connected to a structure, smoke present no flames seen.*
Structure Fire LVL 3	*Contained oven fire, electrical outlet/fixture sparking not fire, smoke outside the residence unknown source, second hand report of smoke inside the building not verified by caller.*
Trench Rescue	*A trench, or part of a trench that has collapsed, trapping patient(s).*
Water/Ice Rescue	*Any rescue involving a body of water other than a swimming pool.*

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COMMUNITY RISK ASSESSMENT/STANDARDS OF COVER