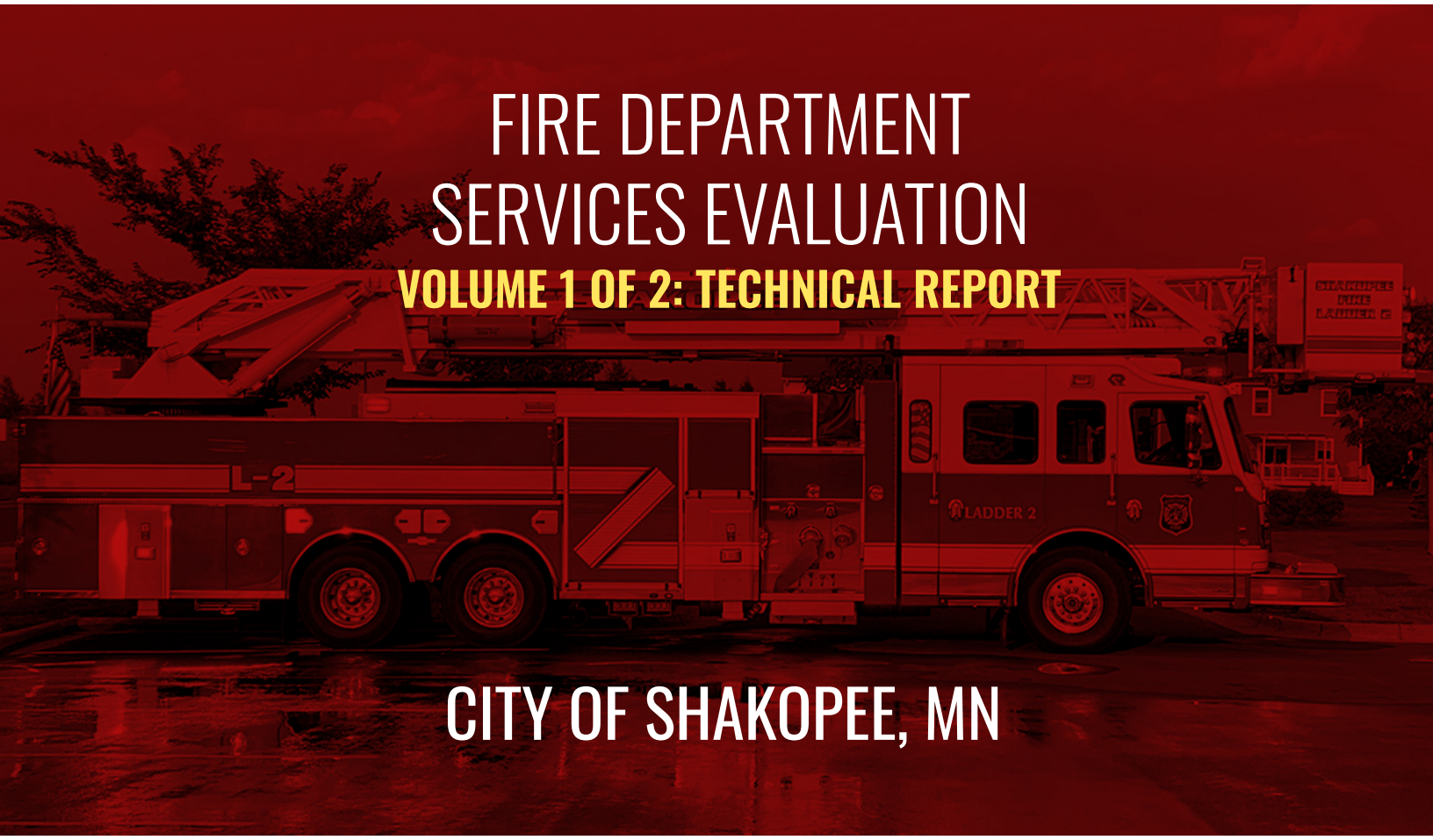
CITYGATE
FIRE & EMS

FIRE DEPARTMENT SERVICES EVALUATION

VOLUME 1 OF 2: TECHNICAL REPORT



CITY OF SHAKOPEE, MN

FEBRUARY 13, 2024

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SHAKOPEE

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EXECUTIVE SUMMARY

The City of Shakopee, Minnesota (City) Fire Department (Department) retained Citygate Associates, LLC (Citygate) to conduct a comprehensive Fire Department Services Evaluation to (1) establish recommended minimum requirements relative to the organization and deployment of fire suppression operations, emergency medical operations, and special operations for the Department to consider; and (2) to create a template for future deployment and performance analysis.

This report is presented in two volumes. The Technical Report (**Volume 1**) includes: this Executive Summary, which contains a summary of Citygate's analysis and all findings and recommendations; an introduction to the study and background information about the City and Department; a Standards of Cover study supported by maps and response statistics; and an administrative support staffing capacity review. A Map Atlas of deployment coverage measures is provided in **Volume 2**. Overall, Citygate makes 26 findings and 12 recommendations in this report.

POLICY CHOICES FRAMEWORK

There are no mandatory federal or state regulations directing the level of fire service staffing, response times, or outcomes related to fire services. The level of service provided, and any resultant cost, is a local policy choice. If services are provided at all, local, state, and federal regulations must be followed for the safety of the public and for the personnel providing the services.

Thus, the level of fire protection services provided is a *local policy decision*. Communities have the level of fire services they can afford and choose to purchase, which may not always be the level desired.

THREE CHALLENGES

For a community to achieve desired outcomes for fire and EMS events, adequate staffing, apparatus types, and response times are required. Citygate's review of the Department identified **three key challenges**—some with serious deficiencies—that overlap and prevent adherence to best practices and even regulatory compliance related to basic fire service operations.

Challenge #1: Management Culture – Accountability and Quality Control

Citygate observed and measured multiple failings of Department management, including many programs that were missing, weak, or not in compliance with state regulations. The overall management culture generally exemplified ad hoc decisions, favoritism, no quality assurance, no annual operations or training plan, was reactive, and (in many cases) was more reflective of a

department 20+ years ago. Inadequate leadership was most evidenced by very limited policy mandates for training attendance and safety practices not being ingrained or enforced. Many personnel interviewed by Citygate do, however, desire a more professional Department that is better led and better staffed.

Citygate further found the dual-role career and part-time program fragments job titles, responsibilities, and compensation, with several issues likely noncompliant with the federal Fair Labor Standards Act (FLSA). Overall, we identified a lack of understanding and compliance with City Hall policies, as well as broken relationships and trust with local, mutual aid partner agencies—who do not believe that quality training and safety programs exist within the Shakopee Department, which could endanger their personnel.

Challenge #2: Adherence to Safety and Standards

Citygate found the Department's training program to be not in conformance with recognized industry best practices and Minnesota and federal laws. The training that is conducted is not balanced per employee and, for most firefighters, does not meet the 11 core requirements for firefighter licensing in Minnesota. The Department places the entire burden of meeting and documenting training to state and federal laws on each individual employee with no accountability or oversight. There is no audit or enforcement by leadership. There is no annual training plan or schedule by subject; topics are ad hoc and repeated year to year. Department personnel only know the Shakopee way, which (to this point) has not had adequate leadership.

The current on-duty weekday fire engine crew completes fire inspections related to liquor/tobacco license renewal and building remodels. Currently, due to staffing, no one performs fire inspections on existing commercial buildings. For commercial building safety, the Fire Prevention section is at maximum workload capacity and is using the single on-duty fire engine crew for field inspections—which can be pulled away from a scheduled inspection or education appointment by an emergency response to the dismay of the customer whose project needed an inspection that day. Other significant administrative work is delegated to the part-time engine crews instead of tasking the crews to training, commercial building target hazard identification, and pre-incident tactical planning consistent with best operational practice.

Challenge #3: Adequate Staffing and Deployment

The current deployment model of four personnel on duty daily at Station 1 is *insufficient* to safely and effectively mitigate a moderate, single-family dwelling fire or other moderate incident type, with *no remaining on-duty personnel* or *very limited callback personnel* for a major or simultaneous incident. The present single-crew staffing and weak emergency callback is providing sluggish response times for positive outcomes in a suburban city that also has commercial building fire and technical rescue risks. There are 6 to 8 part-time firefighters (out of 46) performing much more than a "fair share" of the workload.

The current shift schedules for part-time personnel of 3:00 pm to 7:00 am, and 12-hour shifts on weekends, are unpopular and are family-time negative. When the Department changed from a paid-on-call model to working shifts, it eliminated a minimum callback response percentage requirement. This has resulted in an unpredictable and lower number of paid-on-call staff returning for emergency incident response, often resulting in an insufficient number of personnel to safely and effectively resolve serious incidents with desired positive outcomes.

Positives

Citygate found the Department's "silent majority" desires effective leadership and programs conforming with best practices. As this study was underway, and the City and as the Interim Fire Chief initiated reforms, many personnel stepped up and immediately helped create solutions without waiting for this report. Citygate is very impressed by these individuals and the work accomplished to date and believes there is strong DNA in the Department upon which to "reboot" the Department's culture and programs.

CURRENT DEPLOYMENT MEASURES

The Department serves an urban/suburban/rural population with a mixed residential and non-residential land-use pattern typical of other Twin Cities area cities of similar size and demographics.

> Simply summarized, **fire service deployment is about the *speed* and *weight* of response.** *Speed* refers to initial response (first-due) resources, typically engines, ladder trucks, and ambulances, strategically deployed across a jurisdiction for response to routine moderate emergencies within a specified time interval to achieve positive outcomes. *Weight* refers to multiple-unit responses for more serious emergencies, such as building fires, multiple-patient medical emergencies, vehicle collisions with extrication required, or technical rescue incidents where a sufficient number of firefighters must be assembled within a time interval to safely control the emergency and prevent it from escalating into a more serious event. Serious medical emergencies and building fires have the most severe time constraints.

As shown in following table, total response time performance in the City is significantly slower than best practice recommendations. For the most recent reporting year, this resulted in a first-unit call-to-arrival performance that was 4:21 minutes *slower* than Citygate's 7:30-minute recommended best practice to facilitate desired outcomes in suburban communities. The City does not have control over the County Dispatch center, but it can create positive fire unit response times with effective training and on-duty station staffing.

Table 1—Response Time Summary by Year

Station	Overall	RY 20/21	RY 21/22	RY 22/23
Department-Wide	11:27	10:59	11:16	11:51

Typical desired outcomes in *suburban*-density communities include preventing permanent impairment from medical emergencies where possible and confining building fires to the room or area of origin. To achieve this these desired outcomes:

- The initial (first-due) unit should arrive within **7:30 to 8:30** minutes, before brain death becomes permanent and an incipient building fire expands beyond the room of origin.
- The full, multiple-unit Effective Response Force (ERF) should arrive within **11:30 to 12:30** minutes, with a sufficient number of personnel to safely perform all of the critical tasks necessary to mitigate the emergency.

Given only one lightly staffed fire station, Citygate is concerned with the Department's ability to provide equitable "speed of response" to large sections of the City—as well as sufficient "weight of response" capacity for more serious emergencies *and* concurrent incident responses—to achieve commonly expected outcomes in urban/suburban communities like Shakopee, which has more than 47,000 residents plus employment and visitors.

Citygate understands that a cadre of part-time personnel provides great value to the City and Department, but it *does not meet* the City's *current risk exposure needs*. A combination of full-time and part-time personnel will be needed for the foreseeable future to ensure an adequate first-unit "speed of response" and ERF "weight of response."

The two current fire station locations can cover much of the City within adequate response travel times—*if they are staffed*. Best practice is to provide an equitable level of service to all areas of a jurisdiction with similar risk and population density. The far edges of the City are not yet densely populated or do not have a high enough incident demand to make a third fire station a priority. As infill growth occurs, however, a third station may be needed at some point in the future.

If desired outcomes include limiting building fire damage to only part of the inside of an affected building and/or minimizing permanent impairment resulting from a medical emergency, the urban/suburban population density areas of the City will need both first-due unit and multiple-unit ERF coverage from two fire stations and a part-time firefighter force to deliver Citygate's recommended *urban/suburban area* response performance goal.

Administrative Support Staffing Capacity Summary

Citygate's review and evaluation of the Department's administrative support organization finds that the management organization and most headquarters programs are inadequately staffed and not in conformance with Minnesota requirements and national best practices to provide a properly trained, equipped, and supported response force. Ensuring a prompt response with safe, competent service delivery requires management, planning, and compliance records. Compliance regulations for fire services operation have steadily increased over the last 20 plus years, mandating practices for the proper hiring, training, and supervision of operational personnel.

Findings and Recommendations

Following are Citygate's findings and recommendations as contained throughout this report.

Service Capacity

Findings

Finding #1: The Department's response unit types are appropriately configured to protect against the hazards likely to impact the City.

Finding #2: There is very little demand for Dive Team services despite the Dive Team representing an intensive program that creates substantial potential risk, training, and capital cost burdens for the City and Department.

Finding #3: Minnesota state law tasks county sheriff's departments with responsibility for underwater rescue and recovery.

Recommendations

Recommendation #1: The City should discuss with the County transferring underwater search and recovery services to the Scott County Sheriff's Office in conformance with state law responsibility while maintaining the City's programs for surface water and ice rescue capability.

Deployment

Findings

Finding #4: The City and Department have not yet established response performance goals consistent with best practice recommendations as published by the Commission on Fire Accreditation International and the National Fire Protection Association.

Doing so will guide future fire crew staffing, apparatus types, and deployment methods.

Finding #5: The Department's current deployment model provides only a single four-person crew at Station 1 daily to provide immediate response capacity for the 51.5-square mile service area. Additional response capacity is provided by automatic mutual aid from the Tribal Public Safety Department or callback of off-duty part-time personnel or mutual aid as needed and available.

Finding #6: The Department has a standard response plan that considers risk and establishes an appropriate initial response for each incident type; each type of call for service receives the combination of engines, trucks, specialty units, and command officers customarily needed to effectively control that type of incident based on Department experience.

Finding #7: The two fire station locations cover the sections of the City with the highest incident demand and a 5:00-minute travel time spacing of stations meets the City's needs.

Finding #8: Continued significant growth in Shakopee to the east, and township growth in the west and south, could drive the need for a third—or even a fourth—smaller neighborhood station with one staffed fire engine each.

Finding #9: Annual service demand has slightly increased post-Covid, but the Station 1 crew model also started within this period, and more EMS incidents have been responded to. However, the Department currently only responds to "high-priority" EMS calls as designated by Scott County Dispatch.

Finding #10: The rate of simultaneous incidents is growing, placing more pressure on a single on-duty unit.

Finding #11: The City provides little mutual aid to others and the contract townships do not materially affect the statistical demand for service.

Finding #12: The City should plan to transition EMS first response to the Fire Department. Police should also be utilized for the very infrequent life-threatening incidents along with Fire.

Finding #13: Call processing performance by Scott County's 9-1-1 Dispatch Center is substantially slower than any nationally recommended best practice goal.

Finding #14: Total response times from 9-1-1 answer to first-unit arrival are 4:21 minutes longer than best practice recommendations for positive outcomes in a suburban city. This is due to two reasons: (1) slow dispatch processing and (2) most responses only occurring from Station 1.

Finding #15: The City is not capable of fielding an effective multiple-unit response force to building fires, more so from only one fire station. To assemble the required number of total personnel, the City is also dependent on mutual aid also arriving quickly. The City needs to plan to staff both fire stations.

Finding #16: The burden on part-time firefighters is at its limit. After filling shifts for just one staffed unit, they are not keeping up with training when not on shift and emergency callbacks. It would take two or more times the number of part-time firefighters to staff a second unit and be available for training and callbacks. The costs to train, equip, and manage that large of a workforce would be significant.

Finding #17: Shakopee should follow federal wage and hour regulations and establish one pay rate for regular and overtime hours for career personnel. Firefighters should not be in unique "dual-role" functions.

Recommendations

Based on the technical analysis and findings contained in this section, Citygate makes the following deployment recommendations.

Recommendation #2: The City should obtain the appropriate legal opinions and enact changes to the Department to be that of a "combination" department of both career and part-time employees. Employees should have one clear set of positions and compensation and be in one pension system. One likely solution is to enact a set of processes like those already undertaken by other Twin Cities Metro Area cities:

2A: Create a new part-time firefighter/EMT position.

2B: Firefighters hired as paid-on-call personnel under the relief pension should be encouraged to reapply for a new, part-time firefighter/EMT position including new requirements for training compliance to state law and to be considered for staffing shifts.

2C: These new part-time firefighter/EMT positions should be included in the state's PERA-coordinated pension plan as opposed to a Fire Relief pension plan designed for volunteer and paid-on-call firefighters.

2D: Changing from relief to a state-based career employee PERA pension plan requires dissolving the relief association under Minnesota state statute. This allows those who transition to full-time work and those not wanting to reapply as part-time firefighter/EMTs to not be penalized in regards to losing their relief pension. In making this conversion, the City

must follow Minnesota State Statute 424B.22 for Relief Association Dissolution and Retirement Plan Termination.

Recommendation #3: **Adopt Deployment Policies:** The City Council should adopt complete performance measures to aid deployment planning and to monitor performance. The measures of time should be designed to deliver outcomes that will prevent death or more serious injury for EMS patients upon arrival when possible and keep small but serious fires from becoming more serious. With this is mind, Citygate recommends the following measures.

3.1 Distribution of Fire Stations: To treat pre-hospital medical emergencies and control small fires, the first-due unit should arrive within 8:30 minutes, 90 percent of the time, from receipt of the 9-1-1 call at the Scott County Dispatch Center from two staffed fire stations. This equates to a 1:30-minute call processing / dispatch time, a 2:00-minute crew turnout time, and a 5:00-minute travel time.

3.2 Multiple-Unit Effective Response Force for Serious Emergencies: To confine building fires near the room or rooms of origin, keep vegetation fires under one acre in size, and treat multiple medical patients at a single incident, a multiple-unit ERF of at least 12 personnel, plus at least one Chief Officer, should arrive within 12:30 minutes from the time of 9-1-1 call receipt, 90 percent of the time, within the suburban population density areas of the City. This equates to a 1:30-minute dispatch time, 2:00-minute crew turnout time, and a 9:00-minute travel time.

3.3 Hazardous Materials Response: To protect the City from the hazards associated with uncontrolled release of hazardous and toxic materials, the fundamental mission of the Department's response is to isolate the hazard, deny entry into the hazard zone, and minimize impacts on the community. This can be achieved with a first-due total response time of 8:30 minutes or less in the suburban population density areas of the City to provide initial hazard evaluation and/or mitigation actions. After the initial evaluation is completed, a determination can be made whether to request additional resources to mitigate the hazard.

3.4 Technical Rescue: To respond to technical rescue emergencies as efficiently and effectively as possible with enough trained personnel to facilitate a successful rescue, a first-due total response time of 8:30 minutes or less is required in the suburban population density areas of the City to evaluate the situation and initiate rescue actions. Additional

resources should assemble as needed, within a total response time of 12:30 minutes within the suburban population density areas of the City, to safely complete rescue/extrication and delivery of the victim to the appropriate emergency medical care facility.

Recommendation #4: Add career and part-time staffing at both stations to provide 4-person shift staffing 24 hours per day, 7 days per week.

Recommendation #5: As the career model expands, transition first responder EMS assistance from the Police to the Fire Department.

Recommendation #6: As soon as funds permit, remodel both fire stations to provide adequate spaces for 24-hour per day shift personnel.

Administrative Support Staffing Capacity

Findings

Finding #18: The Department's training program is informal, with no annual training needs assessment driving an annual training plan in conformance with Minnesota requirements. Since being made aware of training deficiencies in December, the Interim Fire Chief and administrative staff have made great progress in addressing these issues.

Finding #19: The training hours delivered are not close to being in balance to the Minnesota 11 Core Elements.

Finding #20: The Department lacks documentation of federally required annual hazardous material response training.

Finding #21: The Department is slightly understaffed to accomplish all of its administrative responsibilities and tasks.

Finding #22: The current interim administrative staff is at its limit and is working more hours (and managing more assignments) than it should be.

Finding #23: The Department is currently operating without a comprehensive set of administrative and operational policies and procedures but has contracted with a private company that specializes in policies for public safety and is currently working on creating new policies and procedures.

Finding #24: The fire prevention workload increased substantially over 2023 due to the additional building and development activity in the City, adversely impacting staff's ability to conduct all required annual fire and life safety inspections.

Finding #25: The full-time response personnel on the engine are also assigned to conduct field inspections under the direction of the Fire Marshal, often resulting in missed inspection appointments or interrupted inspections due to emergency responses by the engine crew.

Finding #26: The Fire Marshal intends to retire within the next few years; however, there is no succession plan in place for this highly technical position.

Recommendations

Recommendation #7: The City should consider funding an additional 1.0 FTE Administrative Assistant as soon as possible to resolve existing fire administrative workload capacity gaps, provide enhanced capacity, and minimize or eliminate any potential single points of administrative support failure.

Recommendation #8: The City should consider reorganizing the Department administrative staff to include a Deputy Chief to oversee field operations and training and ensure compliance with all federal and state mandates, and an Administrative Deputy Chief to supervise the administrative assistant and oversee the budget, apparatus, facilities, schedules, and grants to better fit the needs of a Department with both full-time and part-time response staff.

Recommendation #9: Complete the development and adoption of a comprehensive set of administrative and operational policies and procedures.

Recommendation #10: Consider focusing the inspection responsibilities of response personnel to existing businesses to minimize disruption to new building projects.

Recommendation #11: Develop and implement a succession plan for the Fire Marshal position to ensure continuity of services upon retirement of the current incumbent. This could include hiring a Fire Inspector for succession planning and additional life safety inspections should be a priority.

Recommendation #12: The City Administrator should consider transferring the Emergency Manager role and responsibilities to the Fire Chief.

COMPREHENSIVE STAFFING RECOMMENDATION AND PHASING

Based on Citygate's comprehensive review, the Department's current four-person crew model at Station 1 needs to be expanded to provide (1) a more equitable *speed of response* to all areas of the City and (2) an improved *weight of response* for more serious or concurrent incidents. To achieve this, Citygate recommends the City "reboot" the Department by converting the staffing system to that of a combination department, thus utilizing a modest number of full-time personnel

at both stations to provide a guaranteed minimum daily response staffing level under best practices and state regulations on fire services. The two-station staffing plan is then augmented by a part-time firefighter/EMT program, with the firefighters scheduled to work or called back under a singular hourly wage and state pension structure.

Citygate recommends the City consider funding additional personnel across a phasing period of a few fiscal years to eventually reach the master plan result of a ***minimum*** of eight personnel plus a chief officer on duty daily for supervision and incident command as summarized in the following table. The recommended staffing delivers a minimum, safe firefighting response for *speed of attack* and can enter burning structures under the two-in/two-out federal and state safety standard,[1] plus provide for incident command and a pump operator.

Table 2—Recommended Minimum Daily Response Staffing Model

Station	Career Personnel			Total On-Duty Staffing
	Battalion Chief	Captain	Firefighter	
1	1	1	3	**5**
2	0	1	3	**4**
Total	**1**	**2**	**6**	**9**

Citygate suggests that any full-time position vacancy be backfilled first with full-time personnel on overtime, and second with part-time personnel. Part-time personnel can be used for an additional staffing past four at each station, more so on busy community special event or bad weather days. As another option, with four or more firefighters at each station, a station could staff a fire engine *and* a quick response EMS unit.

The Department also needs to meet administrative and safety regulations, as an appropriately staffed headquarters team is needed to provide the leadership, training, and accountability necessary for the provision of safe and effective service delivery. This organization can be built in phases over a few fiscal years as summarized in the following table—ideally assisted by federal firefighter staffing grants. Once the Council provides policy direction, staff can provide the detailed expenses per fiscal year. Citygate recommends a four-year plan to recruit, train, and on-board the new and additional personnel that will be needed to achieve the recommended staffing model.

[1] https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134#1910.134(g)(4)

Phasing Plan

Gathering community input, designing and approving a funding plan for increased career staffing, and recruiting and hiring all take time. Given the cost and administrative burden on a small city to grow and gradually obtain the full funding needed, Citygate offers this phasing plan, which could be executed on a per-fiscal-year basis. The following are *career* personnel changes/additions:

Step 1: 2024 Budget Amendment

Increase career staff from 11 to 14. However, there were 3 new Battalion Chiefs in the approved 2024 budget. These positions are converted to 3 Fire Captains for line crew supervision. 2 firefighters and an Administrative Assistant are added. The budgeted Assistant Fire Chief and Administrative Captain positions are converted to 2 Deputy Chiefs. These moves improve headquarters capacity and add to the single fire engine shift staffing.

Step 2: 2025 Budget

Add 1 Fire Inspector, 3 Fire Captains, and 6 firefighters. Improve fire prevention and add a second staffed engine at Fire Station 2.

Step 3: 2026 Budget

Add 6 firefighters. Increase both engine crews to 4 career personnel each day, 1 Captain and 3 firefighters.

Step 4: 2027 Budget

Add 3 Battalion Chiefs, one per platoon, for 24/7/365 immediate response command and safety oversight.

The final career force will then be 18 career firefighters, 6 Fire Captains and 3 Battalion Chiefs. These personnel will staff two engines with a minimum of 6 personnel plus the Battalion Chief. One firefighter per shift will backfill for vacation and sick relief. The part-time staff will work scheduled assignments to add a fourth firefighter on each engine.

The following table shows these changes by year.

Table 3—Proposed Fire Department Staffing Summary

Step/Position	Total Career Personnel	Added Career Personnel	Annual Net Cost Increase[2]
Present	8		
Step 1 – 2024			
Headquarters		1	
Captains		3	
Firefighters		2	
Total Count and Costs	**14**	**6**	**$44,414**
Step 2 – 2025			
Headquarters		1	
Captains		3	
Firefighters		6	
Total Count and Costs	**24**	**10**	**$1,045,117**
Step 3 – 2026			
Firefighters		6	
Total Count and Costs	**30**	**6**	**$502,500**
Step 4 – 2027			
Battalion Chiefs		3	
Step 4 Net Costs	**33**	**3**	**$121,901**
		Total	**$1,713,932**

Note:

- The savings in Step 1 result from some of the added expenses being already budgeted, plus other savings in the part-time program and phasing of actual hiring.
- Step 1 does not reflect full 12 months of new position employment as hiring does not all occur on the first day of the new fiscal year.
- The added expenses in Steps 2 through 4 do reflect the full cost of the prior years' additions plus the new staff in the next step.
- The total added expense is in current employee costs; as such, the amount does not include inflation or future pay or benefit changes.

[2] City of Shakopee Fire and Finance Department estimates based on total compensation per position type.

NEXT STEPS

Citygate offers the following suggested sequential next steps.

Near-Term

- Review and absorb the content, findings, and recommendations of this report.
- Consider adopting revised response performance measures as recommended.
- Ask staff to return with the costs and phasing to implement the study's recommendations as desired by the City Council.
- Identify funding to begin phasing/implementation Step 1.

Longer-Term

- Consider applying for federal firefighter staffing (SAFER) grants.
- Identify funding for the repairs or modifications needed to provide 24/7 staffing from both fire stations.
- Work with other local fire departments and the Sheriff's Office to improve 9-1-1 center performance time for serious emergencies.
- Monitor response performance against adopted goals.

SECTION 1—INTRODUCTION AND BACKGROUND

The City of Shakopee, Minnesota (City) Fire Department (Department) retained Citygate Associates, LLC (Citygate) to conduct a comprehensive Fire Department Services Evaluation based on nationally recognized guidelines and best practices, federal and state mandates, and relevant local and regional operating procedures. The assessment is intended to establish recommended minimum requirements relative to the organization and deployment of fire suppression operations, emergency medical operations, and special operations for the Department to consider, and will create a template for future deployment and performance analysis.

Citygate's Work Plan reflects Citygate's Project Team members' experience in fire administration and deployment. Citygate utilizes various National Fire Protection Association (NFPA) and Insurance Services Office (ISO) publications as best practice guidelines, along with the self-assessment criteria of the Commission on Fire Accreditation International (CFAI).

1.1 REPORT ORGANIZATION

This report is organized into the following sections.

Executive Summary	A summary of current services and significant challenges, including all findings and recommendations.
Section 1	**Introduction and Background:** An introduction to the study and background information about the City and Department.
Section 2	**Standards of Cover Assessment:** An overview of the SOC process and detailed analysis of the Department's existing deployment model, risks to be protected, emergency outcome expectations, staffing needed at different emergencies (critical tasks), geographical distribution and concentration effectiveness of fire crew locations, reliability and historical response measures effectiveness, and a concluding overall deployment evaluation.
Section 3	**Administrative Support Staffing Capacity Review:** A high-level review and evaluation of the Department's administrative support staffing organization and workload capacity.
Section 4	**Comprehensive Recommendation and Phasing:** Citygate's phasing plan is based on extensive review and analysis and can be executed on a per-fiscal-year basis.
Appendix A	**Community Risk Assessment:** A comprehensive assessment of the values at risk to be protected within the community and

evaluation of the fire and non-fire hazards likely to impact the service area as they relate to services provided by the Department.

1.1.1 Goals of the Report

This report cites findings and makes recommendations, as appropriate, related to each finding. Findings and recommendations throughout this report are sequentially numbered.

This document provides technical information about how fire services are provided and legally regulated and how the Department is currently deployed and operating. This information is presented in the form of recommendations and policy choices for the City and Department to consider.

The result is a solid technical foundation upon which to understand the advantages and disadvantages of the choices City leadership faces regarding the best way to provide services and, more specifically, at what level of desired outcome and expense.

1.1.2 Limitations of the Report

There are no federal or state regulations mandating the level of fire service staffing, response performance, or outcomes. Through the public policy process, each community is expected to understand local fire and non-fire risks and its ability to pay for fire services, and then choose its level of services accordingly. *If* fire services are provided at all, federal and state regulations specify how to safely provide them, both for the public and the personnel providing services.

While this report and technical explanation can provide a framework for the discussion of Department services, neither this report nor the Citygate team can make the final decisions or cost out every possible alternative in detail. Once final policy choices receive City Council direction, City staff can conduct any final cost and fiscal analyses as typically completed in the City's normal operating and capital budget preparation cycle.

1.2 Project Approach and Scope of Work

1.2.1 Project Approach and Research Methods

Citygate utilized multiple sources to gather, understand, and model information about the City and Department. Citygate requested a large amount of relevant background data and information to better understand current costs, service levels, history of service level decisions, and other prior studies.

In virtual meetings, Citygate performed focused interviews of the Department's project team members and other project stakeholders. Citygate reviewed demographic information about the City and the potential for future growth and development. Citygate also obtained map and response data from which to model current and projected fire service deployment, with the goal to identify

the location(s) of stations and crew quantities required to best serve the City as it currently exists and to facilitate future deployment planning.

Once Citygate gained an understanding of the Department's service area and its fire and non-fire risks, Citygate developed a model of fire services that was tested against the prior response data to ensure an appropriate fit. Citygate also evaluated future City growth and service demand and evaluated potential alternative emergency service delivery models. Subsequently, Citygate developed an approach to address both current and longer-range needs. The result is a framework for enhancing Department services while meeting reasonable community expectations and fiscal realities.

1.2.2 Project Scope of Work

Citygate's approach to this assessment involved:

- Reviewing data and information provided by the Department and City and conducting stakeholder listening sessions with project stakeholders.
- Using StatsFD™, an incident response time analysis program, to review the statistics of prior incident performance and plot the results on graphs and geographic mapping exhibits.
- Identifying and evaluating future City population and related development growth.
- Recommending appropriate, risk-specific response performance goals.
- Utilizing the CFAI self-assessment criteria and *NFPA 1201 – Standard for Providing Emergency Services to the Public* as well as other NFPA standards as the basis for evaluating the Department's administrative support organization's workload capacity.

1.3 Service Area Overview

Located in the southwest corner of the Minneapolis-St. Paul metropolitan area along the south bank of the Minnesota River, the City of Shakopee encompasses 29.8 square miles with a 2023 population of 47,000. Incorporated in 1857, Shakopee is the county seat of Scott County—a thriving community known for its entertainment and quality of life—and was named as one of the top 50 places to live in the country by Money Magazine in 2020.

The City is governed by a five-member City Council elected at large to staggered four-year terms, with the Mayor serving as the City's chief executive officer. A City Administrator, appointed by the City Council, serves as the City's chief administrative officer and is responsible for day-to-day oversight of City operations. The City provides a full range of municipal services including

communications, finance, fire, human resources, parks and recreation, planning and development, police, and public work services.

The City has a diversified economy led by service-related businesses, followed by the retail trade and finance, insurance, and real estate sectors, with key employers including Amazon, Valleyfair, School District No. 720, and Emerson. The City's adopted 2024 budget is $37.06 million.

1.3.1 Future Growth and Development

While its population is projected to stabilize in coming years as growth continues to be concentrated in other areas of Scott County, the population of Shakopee is still projected to grow by as much as 25,000 additional residents to more than 62,500 in 9,000 new households by 2040, with employment expanding by as much as 13,000 new jobs.[3]

1.4 Fire Department Overview

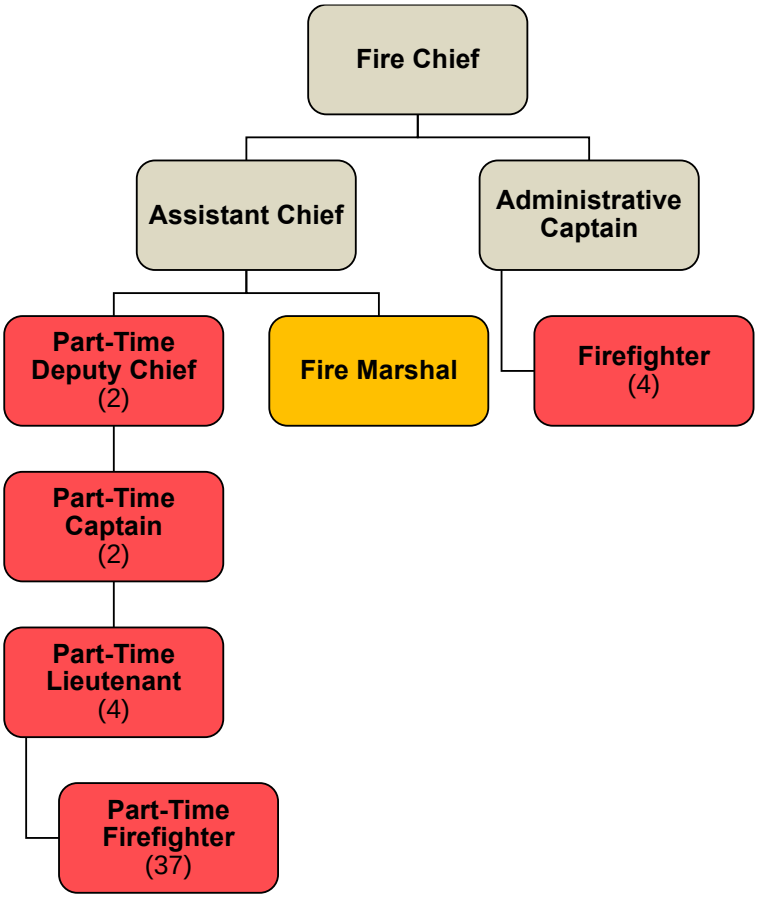
Operating under authority of the City Council and the Shakopee City Code, the Fire Department provides fire suppression, Basic Life Support (BLS) pre-hospital emergency medical, vehicle extrication, high-level rescue, open water and ice rescue, and initial hazardous materials response services for Shakopee and adjacent Jackson and Louisville Townships.

1.4.1 Organization

The Department provides services with a staff of 8 full-time and 46 part-time personnel organized as shown in the following figure. Unique to the City, some personnel hold "dual" roles, with 7 of the full-time staff also permitted to be on the part-time roster.

[3] City of Shakopee 2040 Comprehensive Plan (Envision Shakopee), page 47.

Figure 1—Organization Chart – Shakopee Fire Department



1.4.2 Facilities, Response Resources, and Staffing

The Department provides services from two fire stations with a combination of full-time and part-time personnel as summarized in the following table.

Table 4—Fire Department Facilities, Response Resources, and Daily Response Staffing

Station Number	Address	Year Built	Response Resources	Minimum On-Duty Staffing
1	2700 Vierling Drive East	1998	Engine 2 Engine 4 Ladder 2 Rescue 1 Air Boat Brush 1	4
2	1001 Vierling Drive West	2012	Engine 1 Engine 3 Brush 2 Kubota Zodiac	0[1]
			Total	**4**

[1] No on-duty staffing; part-time personnel respond as available when paged for response

1.4.3 Service Capacity

Service capacity refers to the Department's available response force; the size, type, and condition of its response fleet and any specialized equipment; core and specialized performance capabilities and competencies; resource distribution and concentration; availability of automatic or mutual aid; and any other agency-specific factors influencing its ability to meet current and prospective future service demand relative to the risks to be protected.

The Department's service capacity for fire and non-fire risks consists of four personnel on duty daily staffing one engine, with a part-time on-call officer available for callback after hours and additional part-time personnel paged as needed. The Department also has two brush engines; three additional engines (one with water tender capacity); one ladder truck; one heavy rescue squad; one airboat; one inflatable rescue boat; and one all-terrain vehicle (ATV)—all of which can be cross-staffed with on-duty or callback personnel as needed.

All response personnel are trained to either the Emergency Responder Level (EMR) or the Emergency Medical Technician (EMT) level, capable of providing Basic Life Support (BLS) pre-hospital emergency medical care. Ground paramedic ambulance service is provided by Allina Health Emergency Medical Service, a hospital-based ambulance provider operating under an exclusive operating area contract administered by the South Metro Region EMS System.

Response personnel are also trained to the U.S. Department of Transportation Hazardous Materials First Responder Operational (FRO) level to provide initial hazardous material incident assessment and hazard isolation, and can request a state Hazardous Materials Response Team from the State

Duty Officer. Demand for very serious hazardous material response is low and, when required, includes a regional response team from the state-sponsored City of Hopkins Hazardous Materials Team for technical support.

The Department delivers High-Angle and Dive Rescue service with two technical rescue teams coordinated by response personnel. The Dive Team includes 13 Technician-level Divers (11 of whom are Ice Diver certified) and 16 Attendants. The demand for Dive Team services is low and equipment costs are substantial, including an array of specialty apparatus. Over the three-year period studied by Citygate, some of the Dive Team responses were outside the Department's service area. There is no minimum level of staffing and callback is used to provide staffing as needed for this service.

The Dive team is an intensive program that creates substantial potential risk, training and capital cost burdens for the City and Department. Given the very low service demand, coupled with Minnesota state law tasking county sheriff's departments with responsibility for underwater rescue and recovery, Citygate recommends the City discuss with the County transferring underwater search and recovery services to the Scott County Sheriff's Office in conformance with state law while maintaining surface water and ice rescue capability. The Sheriff does not have a team at present, but should take the responsibility to do so, or should contract with a nearby metro agency with a larger team and incident experience per year. The County responsibility should not fall to one smaller city.

Similarly, the Rope Rescue Team has 15 members, with 10 trained to the Technician II level and five to the Technician III level. One of the two heavy rescue apparatus was recently sold, with the proceeds used to purchase standardized Self-Contained Breathing Apparatus (SCBA) for all remaining apparatus.

The Department has an automatic mutual aid agreement with the Shakopee Mdewakanton Tribe Public Safety Department and is a participating agency in the Minnesota Intrastate Mutual Aid Plan.

Finding #1:	The Department's response unit types are appropriately configured to protect against the hazards likely to impact the City.
Finding #2:	There is very little demand for Dive Team services despite the Dive Team representing an intensive program that creates substantial potential risk, training, and capital cost burdens for the City and Department.
Finding #3:	Minnesota state law tasks county sheriff's departments with responsibility for underwater rescue and recovery.

Recommendation #1:	The City should discuss with the County transferring underwater search and recovery services to the Scott County Sheriff's Office in conformance with state law responsibility while maintaining the City's programs for surface water and ice rescue capability.

SECTION 2—STANDARDS OF COVER ASSESSMENT

This section provides a detailed report of the Department's current ability to deploy and mitigate emergency hazards within its service area. The response analysis uses prior response statistics and geographic mapping to help the Department and the community visualize the capabilities and limitations of the current response system.

2.1 STANDARDS OF COVERAGE PROCESS OVERVIEW

The core methodology used by Citygate in the scope of its deployment analysis work is *Standards of Cover*, fifth and sixth editions, which is a systems-based approach to fire department deployment published by the CFAI. This approach uses local risk and demographics to determine the level of protection best fitting a community's needs.

> **The SOC method evaluates deployment as part of a fire agency's self-assessment process.** This approach uses risk and community expectations on outcomes to help elected officials make informed decisions on fire and emergency medical services deployment levels. Citygate has adopted this multiple-part systems approach as a comprehensive tool to evaluate fire station locations. Depending on the needs of the study, the depth of the components may vary.
>
> Such a systems approach to deployment, rather than a one-size-fits-all prescriptive formula, allows for local determination. In this comprehensive approach, each agency can match local needs (risks and expectations) with the costs of various levels of service. In an informed public policy debate, a governing board "purchases" the fire and emergency medical service levels the community needs and can afford.

While working with multiple components to conduct a deployment analysis is admittedly more work, it yields a much better result than using only a singular component. For instance, if only travel time is considered and frequency of multiple calls is not, the analysis could miss overworked companies. If a risk assessment for deployment is not considered and deployment is based only on travel time, a community could under-deploy to incidents.

The following table describes the eight elements of the SOC process.

Table 5—Standards of Coverage Process Elements

SOC Element		Description
1	**Existing Deployment**	Describing the current deployment model and response performance goals the agency has in place today.
2	**Community Outcome Expectations**	Reviewing the expectations of the community for responses to emergencies.
3	**Community Risk Assessment**	Identifying and quantifying the assets at risk to fire and non-fire hazards likely to impact the community. (For this report, see **Appendix A—Community Risk Assessment**.)
4	**Critical Task Analysis**	Reviewing the tasks that must be performed and the personnel required to deliver the stated outcome expectation.
5	**Distribution Analysis**	Reviewing the spacing of first-due response resources (typically engines) to control routine emergencies.
6	**Concentration Analysis**	Reviewing the spacing of fire stations so that more complex emergencies can receive sufficient resources and personnel in a timely manner (First Alarm Assignment or ERF).
7	**Reliability and Historical Response Effectiveness Analysis**	Using prior response statistics to determine the percent of compliance the existing system delivers.
8	**Overall Evaluation**	Proposing Standard of Coverage statements by risk type, as necessary.

Source: CFAI, *Standards of Cover*, Fifth Edition

Simply summarized, fire service deployment is about the ***speed*** and ***weight*** of the response. *Speed* refers to initial response (first-due), all-risk intervention resources (engines, ladder trucks, and ambulances) strategically deployed across a jurisdiction for response to emergencies within a specified time interval to control routine-to-moderate emergencies to achieve desired outcomes and prevent the incident from escalating to greater size or severity. *Weight* refers to multiple-unit responses for more serious emergencies, such as building fires, multiple-patient medical emergencies, vehicle collisions with extrication required, or technical rescue incidents where enough firefighters must be assembled within a reasonable time interval to safely control the emergency and prevent it from escalating into a more serious event.

The following table illustrates this deployment paradigm.

Table 6—Fire Service Deployment Paradigm

Element	Description	Purpose
Speed of Response	Travel time of initial response of all-risk intervention units strategically located across a jurisdiction.	Controlling routine to moderate emergencies without the incident escalating in size or complexity.
Weight of Response	Number of firefighters in a multiple-unit response for serious emergencies.	Assembling enough firefighters within a reasonable time frame to safely control a more complex emergency without escalation.

Thus, smaller fires and less complex emergencies require a single-unit or two-unit response (*fully staffed* engine or specialty resource) within a relatively short response time. Larger or more complex incidents require more units and personnel to control. In either case, if crews arrive too late or the total number of personnel is too few for the emergency, they are drawn into an escalating and more dangerous situation. The science of fire crew deployment is to spread crews out across a community or jurisdiction for quick response to keep emergencies small with positive outcomes without spreading resources so far apart that they cannot assemble quickly enough to effectively control more serious emergencies.

2.2 CURRENT DEPLOYMENT

SOC ELEMENT 1 OF 8
EXISTING DEPLOYMENT POLICIES

Nationally recognized standards and best practices suggest using several incremental measurements to define response time. Ideally, the clock starts when the Scott County Sheriff's Office 9-1-1 Dispatch Center receives the emergency call. In Shakopee, the response time clock starts with the initial time stamp in the Dispatch Center's computer-aided dispatch (CAD) record. Response time increments include 9-1-1 call processing / dispatch, crew response unit boarding (commonly referred to as crew turnout), and actual driving (travel) time. Response performance best practices include specific time goals for each of these three increments which, when combined, equal *total response time*, or call-to-arrival time, which is a fire agency's true customer service metric.

Goals should also address response performance to other risks within the City, such as hazardous materials and technical rescue, as recommended by the CFAI. While the Department has not adopted a response time goal to date, at the time of this study, it had developed a draft policy establishing the response standards reflected in the following table.

Table 7—Response Time Standards

Response Component	Performance Standard (minutes:seconds)	Reliability
Crew Turnout	**1:20**	90%
First-Unit Travel	**4:00**	90%
First-Unit Travel – First Responder or Higher EMS	**4:00**	90%
First Alarm Travel – Fire	**8:00**	90%

Draft Shakopee Fire Department Policy 305 – Response Time Standards

The Department also has a service-level history that can be documented in response times, number of response units, and incident staffing, which will be analyzed in this study.

Currently, NFPA Standard 1710—a recommended deployment standard for career fire departments in urban/suburban areas—recommends initial (first-due) intervention unit arrival within a 4:00-minute travel time and arrival of all resources comprising a multiple-unit First Alarm within an 8:00-minute travel time, all at 90 percent or better reliability.[4]

If the travel time measures recommended by the NFPA and Citygate are added to dispatch processing and crew turnout times recommended by Citygate and best practices, then a realistic 90 percent first-unit total response time goal for urban/suburban response zones is 7:30 minutes from the 9-1-1 Dispatch Center receiving the call. This includes 1:30 minutes for call processing/dispatch, 2:00 minutes for crew turnout, and 4:00 minutes for travel.

Finding #4: The City and Department have not yet established response performance goals consistent with best practice recommendations as published by the Commission on Fire Accreditation International and the National Fire Protection Association. Doing so will guide future fire crew staffing, apparatus types, and deployment methods.

2.2.1 Current Deployment Model

The Department's current deployment model consists of a single four-person crew at Station 1 daily—including the four full-time firefighters from 7:00 am to 3:00 pm Monday through Friday, and four part-time firefighters from 3:00 pm to 7:00 am Monday through Friday and 7:00 am to 7:00 pm on weekends. In addition, the part-time Deputy Chiefs and the Fire Marshal serve as on-

[4] Source: 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 (2020 Edition).

call supervisors Sunday through Thursday, and the part-time Deputy Chiefs, Fire Marshal, Captains, and Lieutenants rotate in serving as the on-call weekend supervisor. Additional response staffing, as needed, is provided by off-duty, part-time personnel as available when paged; however, according to Department staff, callbacks and all-calls typically receive a low response from part-time personnel.

Department policy requires part-time personnel to work a minimum of three shifts per month. Part-time firefighters are paid an hourly rate, while part-time officers are paid a monthly rate.

Finding #5: The Department's current deployment model provides only a single four-person crew at Station 1 daily to provide immediate response capacity for the 51.5-square mile service area. Additional response capacity is provided by automatic mutual aid from the Tribal Public Safety Department or callback of off-duty part-time personnel or mutual aid as needed and available.

Response Plan

The Department is an all-risk fire agency providing the community it protects with services that include fire suppression, pre-hospital BLS emergency medical, rescue, and initial hazardous material response. Given these risks, the Department utilizes a tiered response plan calling for different types and numbers of resources depending on incident/risk type. The Scott County 9-1-1 CAD system is not capable of selecting and dispatching the most appropriate resource types pursuant to the Department's response plan as shown in the following table. Other than the on-duty personnel at Station 1, the number of off-duty, part-time personnel responding to any given call for service is unpredictable and variable depending on availability.

Table 8—Response Plan by Incident Type

Incident Type	Resources Dispatched	Total Personnel[1]
EMS	1 Engine, 1 Allina Ambulance	6
Vehicle Collision	1 Engine, 1 Allina Ambulance	4–6
Vehicle Fire	1 Engine	4
Building Fire	1 Engine, 1 Ladder Truck, Supervisor	9
Vegetation Fire	1 Engine	4
Water Rescue	1 Engine/Boat	4
Hazardous Material Release	1 Engine, Supervisor	5

[1] Number of personnel above crew at Station 1 is variable and unpredictable

Finding #6:	The Department has a standard response plan that considers risk and establishes an appropriate initial response for each incident type; each type of call for service receives the combination of engines, trucks, specialty units, and command officers customarily needed to effectively control that type of incident based on Department experience.

2.3 OUTCOME EXPECTATIONS

SOC ELEMENT 2 OF 8
COMMUNITY OUTCOME EXPECTATIONS

The SOC process begins by reviewing existing emergency services outcome expectations. This includes determining for what purpose the response system exists and whether the governing body has adopted any response performance measures. If it has, the time measures used must be understood and sound data must be available to evaluate performance.

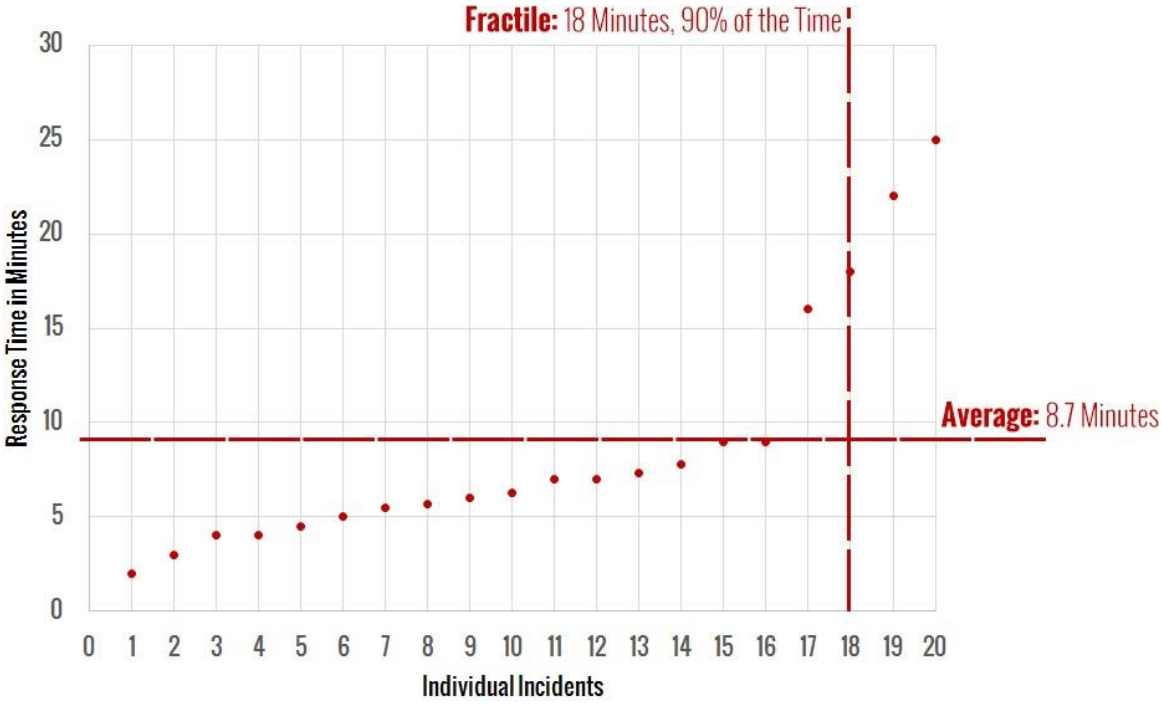
Current national best practice is to measure percent completion of a goal (e.g., 90 percent of responses) instead of an average measure. Mathematically, this is called a ***fractile*** measure.[5] Measuring the average only identifies the central or middle point of response time performance for all calls for service in the data set. Using an average makes it impossible to know how many incidents had response times that were far above or just above the average.

For example, the following figure shows response times for a fictitious fire department. This small agency receives 20 calls for service each month, and each response time has been plotted on the following graph from shortest response time to longest response time. The graph shows the average response time is 8.7 minutes. However, the average response time fails to properly account for four calls for service with response times far exceeding a threshold in which positive outcomes could be expected. In fact, it is evident in that 20 percent of responses are far too slow and that this jurisdiction has a potential life-threatening service delivery problem. Average response time as a measurement tool for fire services is simply not sufficient. This is a significant issue in larger cities if hundreds or thousands of calls are answered far beyond the average point.

By using the fractile measurement with 90 percent of responses in mind, this small example jurisdiction has a response time of 18:00 minutes, 90 percent of the time. This fractile measurement is far more accurate at reflecting the service delivery situation of this small fictitious agency.

[5] A *fractile* is that point below which a stated fraction of the values lie. The fraction is often given in percent; the term percentile may then be used.

Figure 2—Fractile versus Average Response Time Measurements



More importantly, within the SOC process, positive outcomes are the goal. From that, crew size and response time can be calculated to allow appropriate fire station spacing (distribution and concentration).

Emergency medical incidents include situations with the most severe time constraints. The human brain can only survive 4:00 to 6:00 minutes without oxygen. Cardiac arrest and other events can cause oxygen deprivation to the brain. While cardiac arrests make up a small percentage, drowning, choking, trauma constrictions, or other similar events have the same effect. **In a building fire, a small incipient fire can grow to involve the entire room in a 3:00 to 5:00-minute time frame**.

If fire service response is to achieve positive outcomes in severe emergency medical situations and incipient fire situations, all responding crews must arrive, assess the situation, and deploy effective measures before brain death occurs or the fire spreads beyond the room of origin.

Thus, from the time the 9-1-1 call is received by the dispatch center, an effective deployment system is *beginning* to manage the problem within a 7:00 to 8:00-minute total response time. This is right at the point that brain death is becoming irreversible, and the fire has grown to the point of leaving the room of origin and becoming very serious. Thus, the City needs a first-due response goal that is within a range to give hope for a positive outcome. It is important to note that the fire

or medical emergency continues to deteriorate from the time of inception, not from the time the fire engine starts to drive the response route. Ideally, the emergency is noticed immediately, and the 9-1-1 system is activated promptly. In the best of circumstances, this step of awareness—calling 9-1-1 and giving the dispatcher accurate information—takes 1:00 minute. Crew notification and travel time take additional minutes. Upon arrival, the crew must approach the injured party or emergency, assess the situation, and appropriately deploy its skills and tools. Even in easy-to-access situations, this step can take 2:00 minutes or more. This time frame may be increased considerably due to long driveways, apartment buildings with limited access, multiple-story apartments or office complexes, or shopping centers.

Unfortunately, there are times when the emergency has become too severe, even before the 9-1-1 notification or fire department response, for the responding crew to reverse; however, when an appropriate response time policy is combined with a well-designed deployment system, then only anomalies like bad weather, poor traffic conditions, or multiple emergencies slow down the response system. Consequently, a properly designed system will give the public hope of a positive outcome for their tax dollar expenditure.

For this report, total response time is the sum of 9-1-1 call processing / dispatch, crew turnout, and travel time, which is consistent with CFAI and NFPA best practice recommendations.

2.4 COMMUNITY RISK ASSESSMENT

SOC ELEMENT 3 OF 8
COMMUNITY RISK ASSESSMENT

The third element of the SOC process is a community risk assessment. Within the context of an SOC study, the objectives of a community risk assessment are to:

- Identify the values at risk to be protected within the community or service area.
- Identify the specific hazards with the potential to adversely impact the community or service area.
- Quantify the overall risk associated with each hazard.
- Establish a foundation for current/future deployment decisions and risk-reduction/hazard mitigation planning and evaluation.

A ***hazard*** is broadly defined as a situation or condition that can cause or contribute to harm. Examples include fire, medical emergency, vehicle collision, earthquake, flood, etc. ***Risk*** is broadly defined as the *probability of hazard occurrence* in combination with the *likely severity* of *resultant impacts* to people, property, and the community as a whole.

2.4.1 Risk Assessment Methodology

The methodology employed by Citygate to assess community risks as an integral element of an SOC study incorporates the following elements:

- Identification of geographic planning sub-zones (risk planning zones) appropriate to the community or jurisdiction.
- Identification and quantification, to the extent data is available, of the values at risk to various hazards within the community or service area.
- Identification of the fire and non-fire hazards to be evaluated.
- Determination of the probability of occurrence for each identified hazard.
- Determination of probable impact severity of a hazard occurrence by risk planning zone.
- Determination of overall risk by hazard and risk planning zone.

2.4.2 Values at Risk to Be Protected

Broadly defined, *values at risk* are those tangibles of significant importance or value to the community or jurisdiction that are potentially at risk of harm or damage from a hazard occurrence. Values at risk typically include people, critical facilities/infrastructure, buildings, and key economic, cultural, historic, and natural resources.

People

Residents, employees, visitors, and travelers through a community or jurisdiction are vulnerable to harm from a hazard occurrence. Particularly vulnerable are specific at-risk populations, including those unable to care for themselves or self-evacuate in the event of an emergency. Key demographic data for the City includes:

- Slightly more than 26 percent of the population is under 10 years or over 65 years of age.
- The service area population is predominantly White (64.5 percent), followed by Asian (12.0 percent), Hispanic/Latino (9.9 percent and also counted as White), Black / African American (9.1 percent) and other ethnicities (7.6 percent).
- Of the population over 24 years of age, more than 96 percent has completed high school or equivalency.
- Of the population over 24 years of age, nearly 41 percent has an undergraduate, graduate, or professional degree.

- Of the population 15 years of age or older, 96 percent is in the workforce; of those, less than 4 percent are unemployed.
- Median household income is slightly more than $93,000.
- The population below the federal poverty level is slightly more than 5 percent.
- Only 5 percent of the population does not have health insurance coverage.

Critical Facilities

The U.S. Department of Homeland Security defines critical infrastructure and key resources (CIKR) as those physical assets essential to the public health and safety, economic vitality, and resilience of a community, such as lifeline utilities infrastructure, telecommunications infrastructure, essential government services facilities, public safety facilities, schools, hospitals, airports, etc. For this assessment, the Department identified 41 critical facilities. A hazard occurrence with significant impact severity affecting one or more of these facilities would likely adversely impact critical public or community services.

Buildings

The service area includes nearly 17,000 residential housing units as well as more than 1,200 businesses, including offices, professional services, retail sales, restaurants/bars, motels, churches, schools, government facilities, healthcare facilities, and other business types as described in **Appendix A**.

2.4.3 Hazard Identification

Citygate utilized prior risk studies where available, fire and non-fire hazards as identified by the CFAI, and agency/jurisdiction-specific data and information to identify the hazards to be evaluated for this study.

Following an evaluation of the hazards identified in the 2021 Scott County Multi-Hazard Mitigation Plan[6] and the fire and non-fire hazards as identified by the CFAI as they relate to services provided by the Department.

Citygate evaluated the following six hazards for this risk assessment:

[6] Reference: Scott County 2021 Multi-Hazard Mitigation Plan, Table 10.

1	**Building Fire**
2	**Vegetation/Wildland Fire**
3	**Medical Emergency**
4	**Hazardous Material Release/Spill**
5	**Technical Rescue**
6	**Marine Incident**

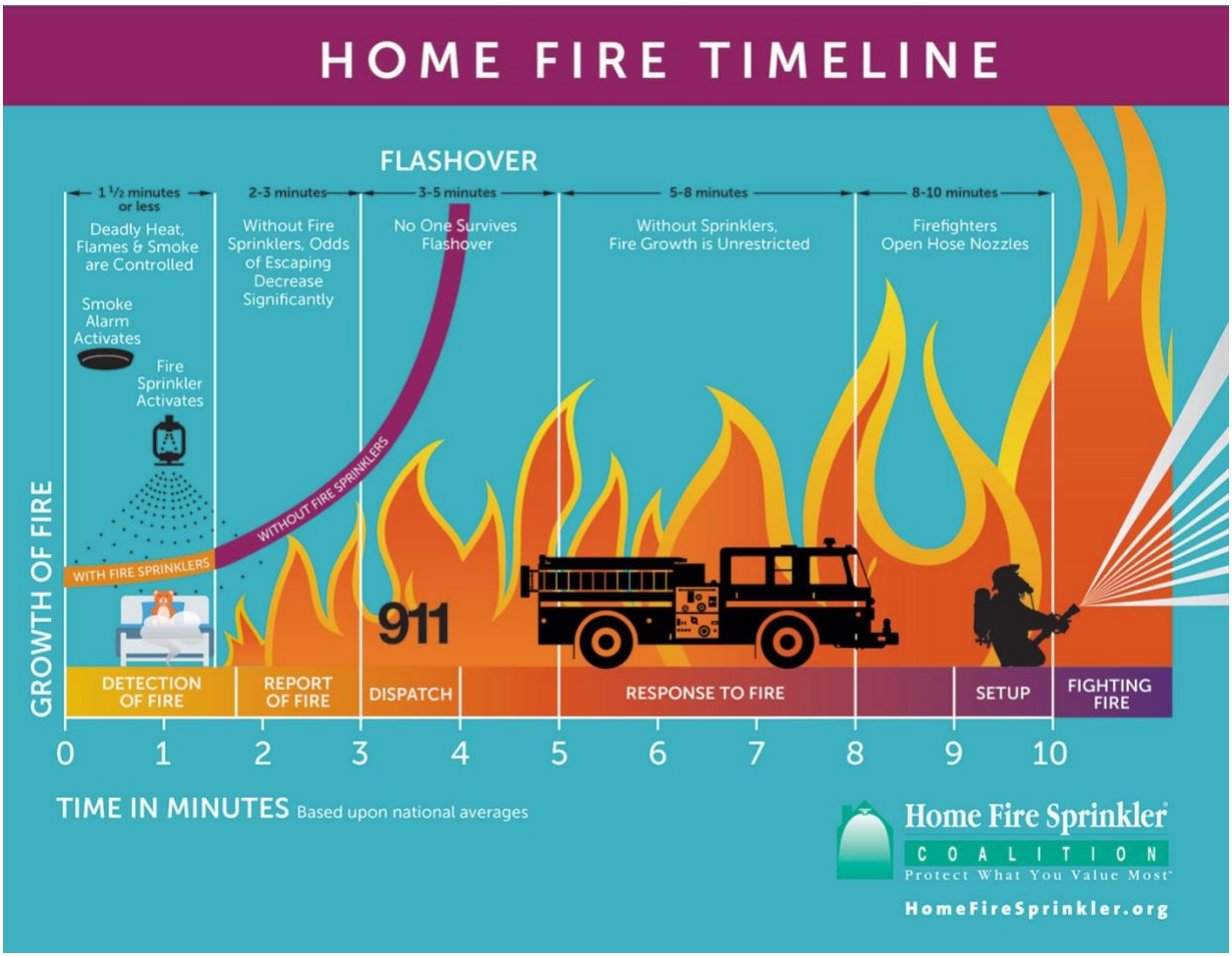
Because building fires and medical emergencies have the most severe time constraints if positive outcomes are to be achieved, the following is a brief overview of building fire and medical emergency risk. **Appendix A** contains the full risk assessment for all six hazards.

Building Fire Risk

One of the primary hazards in any community is building fire. Building fire risk factors include building density, size, age, occupancy, and construction materials and methods, as well as the number of stories, the required fire flow, the proximity to other buildings, built-in fire protection/alarm systems, an available fire suppression water supply, building fire service capacity, fire suppression resource deployment (distribution/concentration), staffing, and response time.

The following figure illustrates the building fire progression timeline and shows that flashover, which is the point at which the entire room erupts into fire after all the combustible objects in that room reach their ignition temperature, can occur as early as 3:00 to 5:00 minutes from the initial ignition. Human survival in a room after flashover is extremely improbable.

Figure 3—Building Fire Progression Timeline

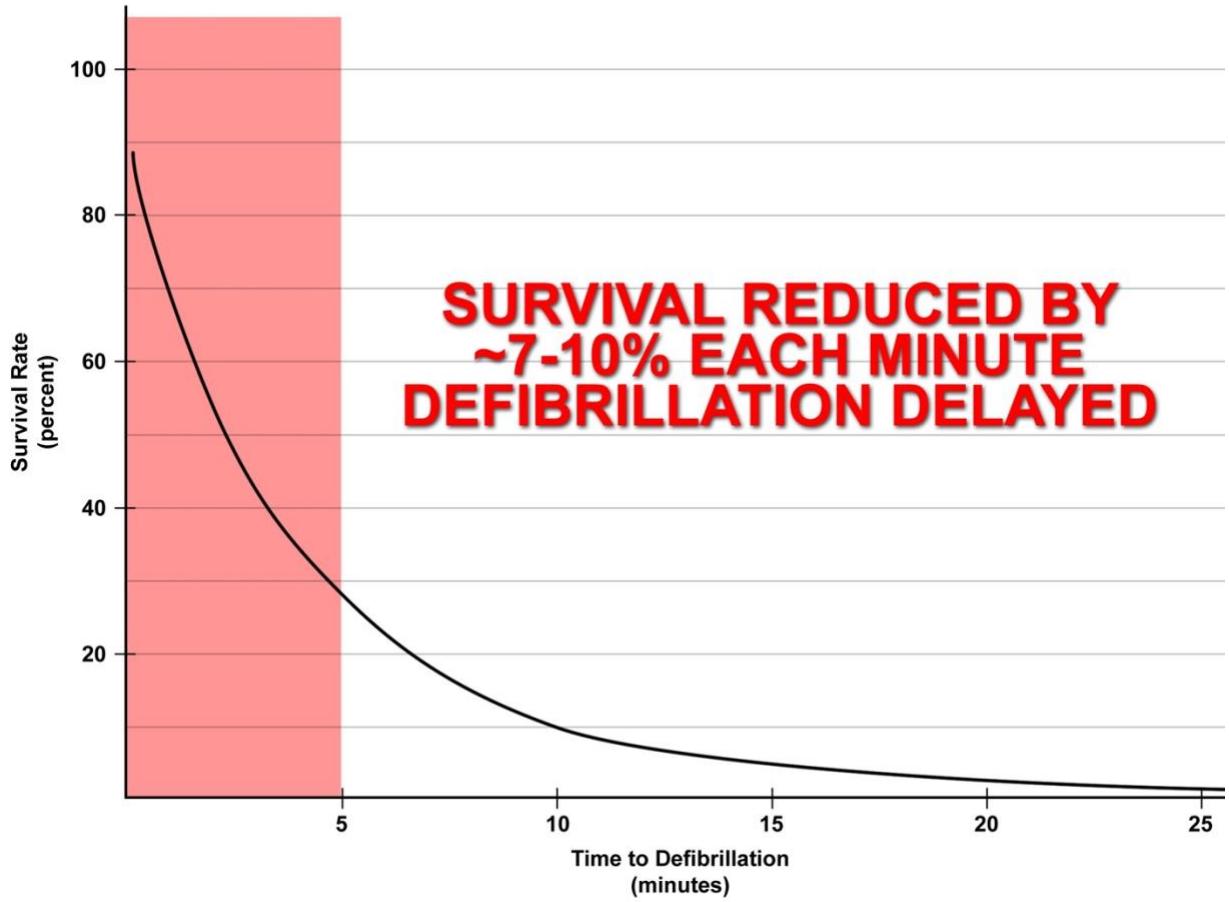


Source: http://www.firesprinklerassoc.org

Medical Emergency Risk

Fire agency service demand in most jurisdictions is predominantly for medical emergencies. The following figure illustrates the reduced survivability of a cardiac arrest victim as time to defibrillation increases.

Figure 4—Survival Rate versus Time of Defibrillation



The Department currently provides BLS pre-hospital emergency medical services, with operational personnel trained to the EMR or EMT-A level.

2.4.4 Risk Assessment Summary

The City's overall risk for six hazards related to emergency services provided by the Department range from **Low** to **High**, as summarized in the following table. See **Appendix A** for the full risk assessment.

Table 9—Overall Risk by Hazard

Hazard	Planning Zone	
	Station 1	Station 2
Building Fire	*Moderate*	*Moderate*
Vegetation/Wildland Fire	*Low*	*Low*
Medical Emergency	*High*	*High*
Hazardous Materials	*Moderate*	*Moderate*
Technical Rescue	*Moderate*	*Moderate*
Marine Incident	*Moderate*	*Moderate*

2.5 Critical Task Time Measures—What Must Be Done over What Time Frame to Achieve the Stated Outcome Expectation?

SOC Element 4 of 8
Critical Task Time Study

SOC studies use critical task information to determine the number of firefighters needed within a time frame to achieve desired objectives on fire and emergency medical incidents. Table 10 and Table 11 illustrate critical tasks typical of building fire and medical emergency incidents, including the minimum number of personnel required to complete each task. These tables are composites from Citygate clients in urban/suburban departments like Shakopee, with units staffed with three or four personnel per engine or ladder truck.

It is important to understand the following relative to these tables:

- It can take a considerable amount of time after a task is ordered by command to complete the task and achieve the desired outcome.
- Task completion time is usually a function of the number of personnel that are simultaneously available. The fewer firefighters available, the longer some tasks will take to complete. Conversely, with more firefighters available, some tasks are completed concurrently.
- Some tasks must be conducted by a minimum of two firefighters to comply with safety regulations. For example, two firefighters are required to search a smoke-filled room for a victim.

2.5.1 Critical Firefighting Tasks

The following table illustrates the critical tasks required to control a typical single-family dwelling fire with five response units (three engines, one ladder truck, and one Chief Officer) from the City

and mutual aid partners for a total Effective Response Force (ERF) of 10–17 personnel. These tasks are taken from typical fire departments' operational procedures, which are consistent with the customary findings of other agencies using the SOC process. No conditions exist to override the Occupational Safety and Health Administration (OSHA) two-in/two-out safety policy, which requires that firefighters enter atmospheres such as building fires that are immediately dangerous to life and health in teams of two while two more firefighters are outside and immediately ready to rescue them should trouble arise.

> ***Scenario:*** *Simulated approximately 2,000 square-foot, two-story, single-family residential fire with unknown rescue situation. Responding companies receive dispatch information typical for a witnessed fire. Upon arrival, they find approximately 50 percent of the second floor involved in fire.*

Table 10—First Alarm Residential Fire Critical Tasks – 10–17 Personnel

Critical Task Description		Personnel Required
First-Due Engine (4 Personnel)		
1	Conditions report	1
2	Establish supply line to hydrant	2
3	Deploy initial fire attack line to point of building access	1–2
4	Operate pump and charge attack line	1
5	Establish incident command	1
6	Conduct primary search	2
First-Due Truck (3–4 Personnel)		
1	Conduct initial search and rescue, if not already completed	2
2	Deploy ground ladders to roof	1–2
3	Establish horizontal or vertical building ventilation	1–2
4	Open concealed spaces as required	2
Second-Due Engine (3–4 Personnel)		
1	If necessary, establish supply line to hydrant	1–2
2	Deploy a backup attack line	1–2
3	Establish Initial Rapid Intervention Crew	2
Chief Officer		
1	Transfer of incident command	1
2	Establish exterior command and scene safety	1

Grouped together, the duties form an ERF, or First Alarm Assignment. These distinct tasks must be performed to effectively achieve the desired outcome; arriving on scene does not stop the emergency from escalating. While firefighters accomplish these tasks, the incident progression clock keeps running.

Many studies have shown that a small fire can spread to engulf an entire room in 3:00 to 5:00 minutes after free burning has started. Once the room is completely superheated and involved in fire (known as flashover), the fire will spread quickly both vertically and horizontally throughout the structure. For this reason, it is imperative that fire suppression and search/rescue operations commence before the flashover point occurs if the outcome goal is to keep the fire damage in or near the room of origin and to rescue persons unable to self-evacuate. In addition, flashover presents a life-threatening situation to both firefighters and any occupants of the building. Fire fatalities typically include persons under 10 and over 65 years of age and unable to self-evacuate, and more than 26 percent of the City's population falls within those age groups.

2.5.2 Critical Medical Emergency Tasks

The Department responds to more than 750 EMS incidents annually, including vehicle accidents, strokes, heart attacks, difficulty breathing, falls, childbirths, and other medical emergencies.

For comparison, the following table summarizes the critical tasks required for a cardiac arrest patient.

Table 11—Cardiac Arrest Critical Tasks – One Engine + Ambulance (6 Personnel)

Critical Task		Personnel Required	Critical Task Description
1	Chest compressions	1–2	Compression of chest to circulate blood
2	Ventilate/oxygenate	1–2	Mouth-to-mouth, bag-valve-mask, apply O_2
3	Airway control	1–2	Manual techniques/intubation/cricothyroidotomy
4	Defibrillate	1–2	Electrical defibrillation of dysrhythmia
5	Establish I.V.	1–2	Peripheral or central intravenous access
6	Control hemorrhage	1–2	Direct pressure, pressure bandage, tourniquet
7	Splint fractures	2–3	Manual, board splint, HARE traction, spine
8	Interpret ECG	2	Identify type and treat dysrhythmia
9	Administer drugs	2	Administer appropriate pharmacological agents
10	Spinal immobilization	2–5	Prevent or limit paralysis to extremities
11	Extricate patient	3–4	Remove patient from vehicle, entrapment
12	Patient charting	1–2	Record vitals, treatments administered, etc.
13	Hospital communication	1–2	Receive treatment orders from physician
14	Treat en route to hospital	2–3	Continue to treat/monitor/transport patient

2.5.3 Critical Task Analysis and Effective Response Force Size

What does a deployment study derive from a critical task analysis? The time required to complete the critical tasks necessary to stop the escalation of an emergency (as shown in Table 10 and Table 11) must be compared to outcomes. As stated, after approximately 3:00 to 5:00 minutes of free burning a room, fire will escalate to the point of flashover. At this point, the entire room is engulfed in fire, the entire building becomes threatened, and human survival near or in the room of fire origin becomes impossible. Additionally, brain death begins to occur within 4:00 to 6:00 minutes of the heart stopping. Thus, the ERF must arrive in time to prevent these emergency events from becoming worse.

The Department's daily on-duty staffing is *insufficient* to deliver a recommended ERF of 16–17 firefighters to a building fire,[7] which the statistical analysis of this report will discuss in detail. Mitigating an emergency event is a team effort once the units have arrived. This refers to the *weight* of response analogy: if too few personnel arrive too slowly, the emergency will escalate instead of improving. The outcome times, of course, will be longer and yield less-desirable results if the arriving force is later or smaller.

> The ***number of personnel*** and the ***arrival timeframe*** can be critical in a serious fire. Fires in older or multiple-story buildings could require the initial firefighters to rescue trapped or immobile occupants. If the ERF is too small, rescue and firefighting operations *cannot* be conducted simultaneously. Thus, achieving good performance requires *adequate staffing* (and training).
>
> Fires and complex medical incidents require additional units to arrive in time to complete an effective intervention. Time is one factor that comes from *proper station placement and the staffing model used*. When fire stations are spaced too far apart and one unit must cover another unit's area or multiple units are needed, the units may be too far away, and the emergency will escalate and result in a less-than-desirable outcome. When only one, or a subset of fire stations are staffed, response times are frequently inadequate to meet the speed or weight metrics outlined previously.

Previous critical task studies conducted by Citygate and NFPA Standard 1710 identify that all units need to arrive at a building fire with 16–17 firefighters within 11:30 minutes (from the time of 9-1-1 call) to *simultaneously and effectively* perform the tasks of rescue, fire suppression, and ventilation.

If fewer firefighters arrive, all tasks may not be completed. Most likely, the search team would be delayed, as would ventilation. The attack lines would only consist of two firefighters, which does not allow for rapid movement of the hose line above the first floor in a multiple-story building. Because rescue is conducted with at least two two-person teams, when rescue is essential, other tasks are not completed in a simultaneous, timely manner. Therefore, effective deployment is about the **speed** *(travel time)* and the **weight** *(number of firefighters)* of the response.

While 8–9 initial response personnel may begin to manage a moderate-risk, confined residential fire, even a full ERF of 16–17 personnel will be seriously slowed if the fire is above the first floor in a low-rise apartment building or commercial/industrial building. This is where the capability to add additional personnel and resources to the standard response becomes critical.

[7] Source: 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 (2020 Edition).

The fact that it takes the Department 20:00 to 24:00 minutes to (most of the time) deliver an ERF of not even 13–14 personnel to a moderate-risk building fire reflects a real-world difficulty as it relates to confining serious building fires to or near the room of origin and preventing the spread of fire to adjoining buildings. This is a typical desired outcome in urban/suburban areas and requires more firefighters, more quickly than the typical rural outcome of keeping the fire contained to the building, not room, of origin.

2.6 Distribution and Concentration Studies—How the Location of First-Due and First Alarm Resources Affects Emergency Incident Outcomes

SOC Element 5 of 8
Distribution Study

SOC Element 6 of 8
Concentration Study

The City is currently served by two fire stations designed to support a Department staffed by volunteers responding to the station as needed. Given the dispersion of where volunteers come from—and to provide a timely response—the City sited two fire stations. It is appropriate to understand, using geographic mapping tools, what the existing stations do and do not cover within travel time goals; if there are any coverage gaps needing one or more stations; and what, if anything, to do about them.

In brief, there are two geographic perspectives to fire station deployment:

- **Distribution** – the spacing of first-due fire units to control routine emergencies before they escalate and require additional resources.
- **Concentration** – the spacing of fire stations sufficiently close to each other so that more complex emergency incidents can quickly receive sufficient resources from multiple fire stations. As indicated, this is known as the Effective Response Force (ERF) or, more commonly, the First Alarm Assignment—the collection of a sufficient number of firefighters on scene, delivered within the concentration time goal to stop the escalation of the problem and achieve desired outcomes.

To analyze first-due fire unit travel time coverage, Citygate utilized incident statistic demand analysis mapping while the City's GIS mapping division assisted by providing travel distance and response time coverage maps.

Map #1 – Station Service Areas 1.5-Mile Distance Measure

Map #1 shows the street network coverage of the two fire stations using the Insurance Service Office (ISO) measure that a fire station be within 1.5-miles' distance of protected properties in urban areas. As can be seen, much of the City can be reached within this measure, but not all of the eastern City or the contracted townships.

Map #2 – Station One 2.5-Mile Service Distance Measure

This map displays the the 2.5-mile distance measure for a Ladder Truck from Station 1. Given the central location, one ladder truck within the ISO 2.5-mile measure can cover the core, most built-up areas of the City, but not the outer edge areas which mostly feature dwelling units.

Map #3 – 5:00-Minute Driving Time Measure

This map displays the the travel (driving) time measure of 5:00 minutes. To provide postive outcomes in a surburban area, 4:00 to 5:00-minutes' travel is required not including dispatch and crew turnout time. This map uses GIS to compute the travel time from both stations. As can be seen, the coverage is larger than the ISO 1.5-mile distance measure and two stations can cover all but the southern and eastern edges of the City and the contracted townships.

In Shakopee, a 4:00-minute travel time is too aggressive given the street design and topography of the City. A 5:00-minute travel time is sufficent for the placement of fire stations.

Map #4 – Incident Demand Locations

This map displays the locations of incidents in the most recent data year. The height of the cell represents volume, as does the color—with green indicating the least and red indicating the highest. While the total counts in a one-year period are modest, there is a clustering of demand in areas with the highest population and commercial density. The two current stations are well located to provide timely service to areas with the highest demand. Given the layout of the City limits and the adjoining townships, two stations cannot quickly serve the eastern and southern edge areas of the City, but service demand is much lower in these sections.

2.6.1 Mapping Coverage Findings

Finding #7:	The two fire station locations cover the sections of the City with the highest incident demand and a 5:00-minute travel time spacing of stations meets the City's needs.
Finding #8:	Continued significant growth in Shakopee to the east, and township growth in the west and south, could drive the need for a third—or even a fourth—smaller neighborhood station with one staffed fire engine each.

2.7 STATISTICAL ANALYSIS

SOC ELEMENT 7 OF 8
RELIABILITY AND HISTORICAL RESPONSE EFFECTIVENESS STUDIES

The maps described in **Section 2.6** and presented in **Volume 2** show the ideal situation for response times and response effectiveness given perfect conditions with no competing calls, units out of place, or simultaneous calls for service. Examination of the *actual* response time data provides a picture of actual response performance with simultaneous calls, rush hour traffic congestion, units out of position, and delayed travel time for events such as periods of severe weather. The following subsections provide summary statistical information regarding the Department and its services.

The Department provided both NFIRS 5 incident data and records management system (RMS) apparatus response data for the period 07/01/2020 – 06/30/2023. These two datasets were merged, providing 4,726 incidents and 12,048 apparatus response records.

The quantity of measures below is decreased to fewer measures as the current Department management of incident electronic records is weak and, in some cases, due to operating policy, flawed. **Citygate noted the following key issues**:

1. The Station ID number (1 or 2) in the incident record did not track the geographic station ID number for the station area of the incident, but rather, the station from which the apparatus responded, which is most always Station 1 where the single crew is located. Therefore, stations had to be assigned by Citygate to incidents based on the closest fire station.

2. There were improper procedures for tracking turnout and travel times accurately. The time to hear the alarm and don mandated protective clothing before the apparatus begins movement should be tracked from dispatch time to "wheel turning" time. However, prior Department management direction was to say "responding" well before the wheels were turning. This intentionally makes crew turnout time look artificially good. In addition to that mistake, it compounds as it transfers time (lengthening) to travel time. This distorts how far a unit can cover over varying street layouts.

3. Within the emergency incident reporting system, the Department is creating incident numbers to track administrative assignments as public assists such as all key box checks, car seat checks, and home safety visits. This process was not carried out with the prior incident software tool. These administrative duties make small additions to the counts of Incidents by Day of Week, Incidents by Hour of the Day, and possibly Incidents by Station, with all car seat checks occurring at Station 1. In the most recent data year, there were 77 such extra incidents.

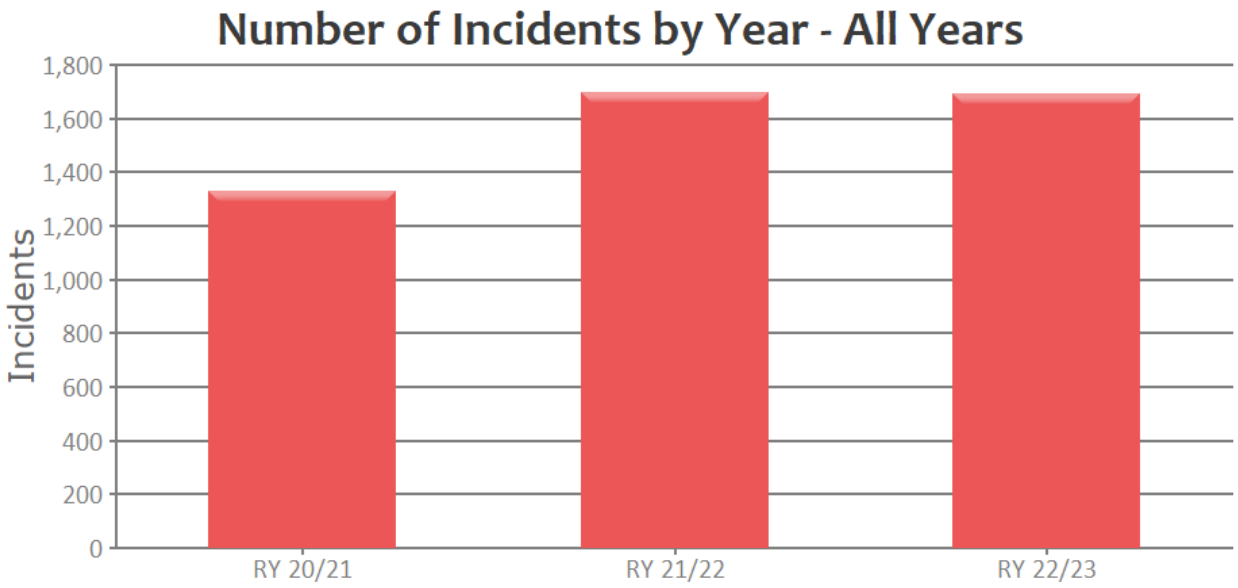
4. Currently, the Fire Department does not respond to all EMS incidents with the ambulance provider, Allina; the Police Department does. This study had to obtain a separate count of all EMS incidents between the City's Police Department and the Sheriff for the townships.

2.7.1 Demand for Service

In reporting year (RY) 22/23, the Department responded to 1,693 incidents. During this period, the City had a daily demand of 4.64 incidents, of which 4.37 percent were fire incidents, 46.37 percent were EMS incidents, and 49.26 percent were *Other* incident types. There were 3,885 apparatus responses. This means there was an average of 2.29 apparatus responses per incident. Also, at present, Fire only responds to high-priority EMS calls.

The following figure shows annual service demand for the three most recent reporting years.

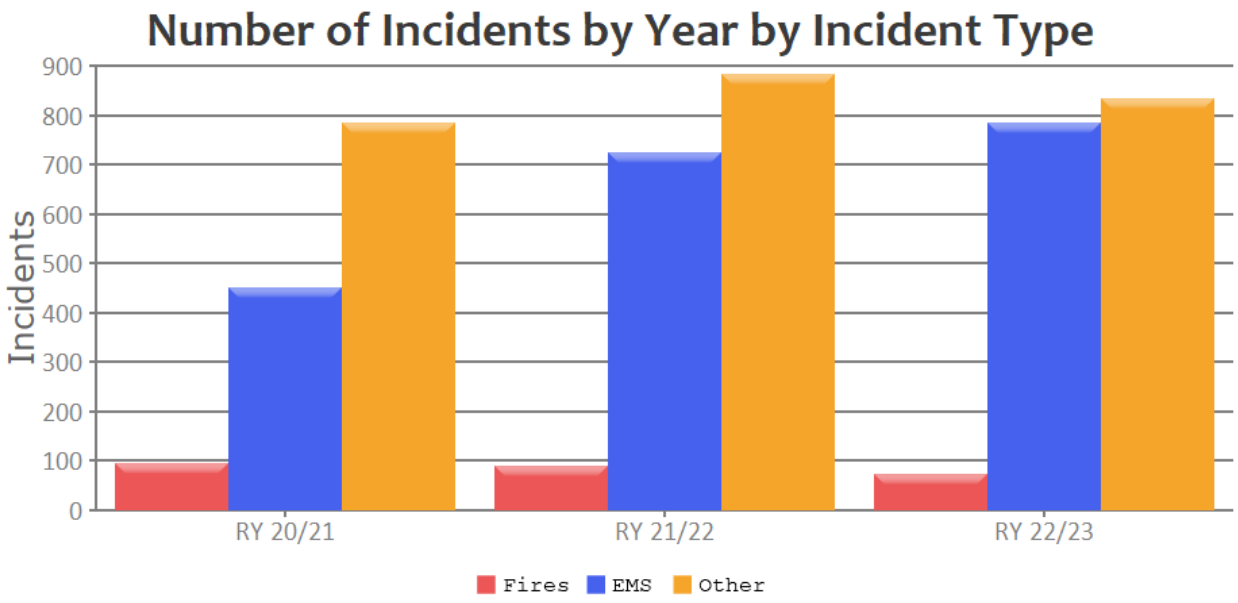
Figure 5—Annual Service Demand by Year



Finding #9: Annual service demand has slightly increased post-Covid, but the Station 1 crew model also started within this period, and more EMS incidents have been responded to. However, the Department currently only responds to "high-priority" EMS calls as designated by Scott County Dispatch.

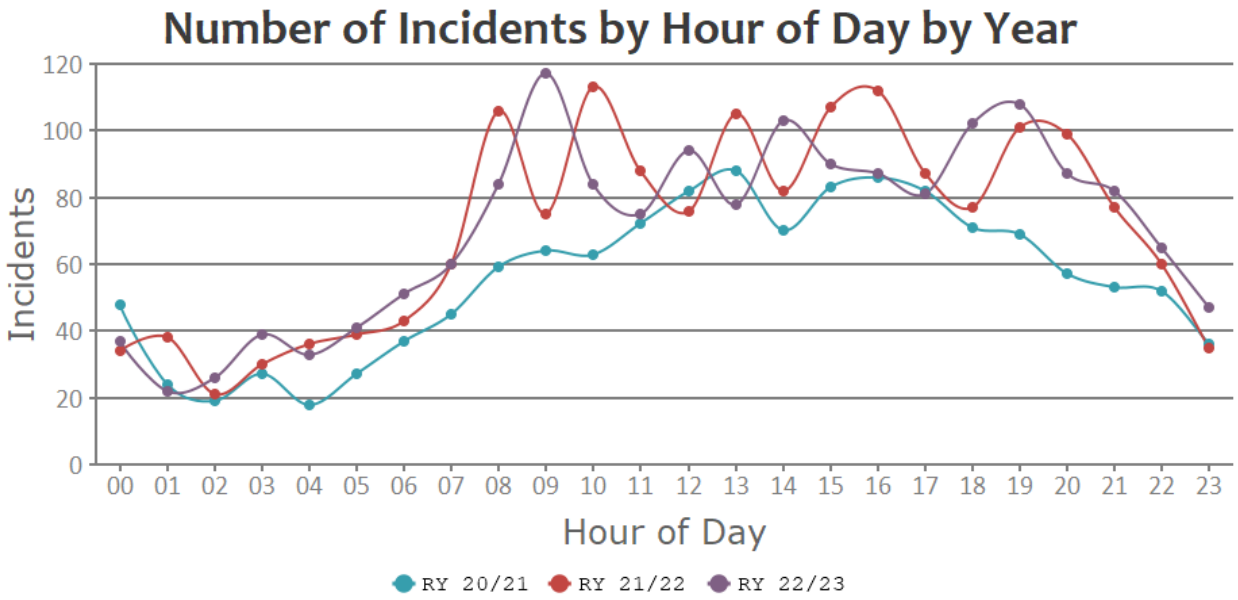
The following figure illustrates annual service demand by general incident type over the three-year period studied. While the number of *EMS* incidents continues to grow, the number of *Fires* incident types has been in slight decline.

Figure 6—Annual Service Demand by Incident Type



The following figure illustrates service demand by hour of day by year.

Figure 7—Service Demand by Hour of Day and Year



The following table ranks service demand by incident type for those with more than 20 occurrences in the last data year.

Table 12—Service Demand by Incident Type

Incident Type	RY 22/23
311 Medical assist, assist EMS crew	368
321 EMS call, excluding vehicle accident with injury	124
322 Vehicle accident with injuries	138
611 Dispatched & canceled en route	144
324 Motor vehicle accident no injuries	100
554 Assist invalid	65
553 Public service	80
733 Smoke detector activation due to malfunction	68
251 Excessive heat, scorch burns with no ignition	51
743 Smoke detector activation, no fire - unintentional	53
412 Gas leak (natural gas or LPG)	40
745 Alarm system sounded, no fire - unintentional	29
741 Sprinkler activation, no fire - unintentional	26
551 Assist police or another governmental agency	20
622 No incident found on arrival of incident address	18
111 Building fire	**20**

The following table ranks service demand by property use type for those with more than 25 occurrences over the three-year period studied by Citygate. Note the high rankings of residential dwellings, highways, and streets.

Table 13—Service Demand by Property Use

Property Use	RY 22/23
419 1- or 2-family dwelling	**447**
429 Multifamily dwellings	**391**
961 Highway or divided highway	**144**
963 Street or road in commercial area	**101**
962 Residential street, road or residential driveway	70
449 Hotel/motel, commercial	51
311 24-hour care Nursing homes, 4 or more persons	48
BLANK	53
700 Manufacturing, processing	46
965 Vehicle parking area	26
161 Restaurant or cafeteria	32
888 Fire station	28
891 Warehouse	29
571 Service station, gas station	**21**

2.7.2 Simultaneous Incident Activity

Simultaneous incidents occur when one or more incidents are underway when a new incident begins. During RY 22/23, 9.63 percent of the City's incidents occurred while one or more other incidents were underway.

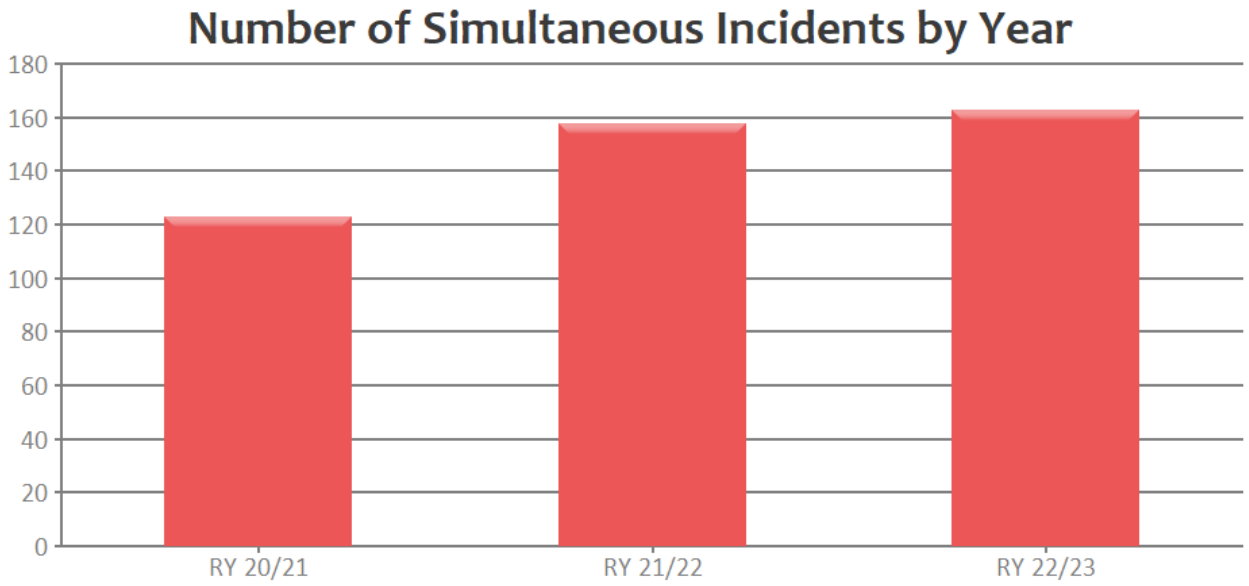
The following table summarizes simultaneous incident activity for RY 22/23.

Table 14—Simultaneous Incident Activity (RY 22/23)

Number of Simultaneous Incidents	Percent of Occurrence
1 or more	9.63%
2 or more	.83%

The following figure illustrates the number of simultaneous incidents by year.

Figure 8—Simultaneous Incident Activity by Year



Finding #10: The rate of simultaneous incidents is growing, placing more pressure on a single on-duty unit.

2.7.3 Aid Given to Other Communities

The following table shows the quantity of mutual aid given out to other communities and includes the contract townships.

Table 15—Incident Activity by City by Year

City / Community	RY 20/21	RY 21/22	RY 22/23	Total
Shakopee	1,218	1,663	1,658	**4,539**
Jackson Township	19	48	29	**42**
Louisville Township	26	35	37	**41**
Prior Lake	7	10	9	**26**
Savage	8	4	12	**24**
Chaska	15	3	5	**23**
Carver	2	1	3	**6**
Jordan	1	3	1	**5**
Chanhassen		**3**	**1**	**4**

Finding #11:	The City provides little mutual aid to others and the contract townships do not materially affect the statistical demand for service.

2.7.4 Total EMS Incident Demand

The historical EMS First Responder program in most of Minnesota is from police departments. This occurred as volunteer fire departments could not always achieve volunteer response from home or work quickly enough. Therefore, a police officer on a patrol beat was usually closer and more readily available to respond to EMS incidents. For years, police officers had either Emergency Medical Technician I (EMT-1) training or at least training at the Emergency Medical Responder (EMR) level. Ambulance service areas are managed by the state, and typically one private provider serves an area. For Shakopee, ambulance services are provided by Allina Health EMS.

During the data ranges of this study, the local EMS response policy had evolved to Shakopee Police or Scott County Sheriff and the Allina Health ambulance being dispatched to all EMS incidents. Fire is only dispatched to what Scott County Sheriff Dispatch considers "high-priority" medical incidents and/or when requested by law enforcement or Allina.

In 2022, police responses in the City totaled 1,651—an average rate of 4.5 per day. In this same period, the Sheriff had a total of 52 EMS responses in the township areas.

As the following table shows, Allina reported the following estimated number of ambulance responses (in 2023, 69 percent resulted in transport); however, these counts also include approximately 1,000 low-acuity responses per year that Police and/or Fire did not respond to.

Table 16—Total Estimated EMS Incident Response Summary For Law and Allina

City / Community	2022 Responses
Shakopee	3,147
Jackson Township	81
Louisville Township	72
Total	**3,300**

In 2022, the Department responded to a total of 785 EMS incidents along with the City Police or the Sheriff in the townships outside the City. While the Department responded to fewer EMS incidents, they cannot be subtracted from the City Police counts as, if a Police unit cannot respond, Fire does. Additionally, at times, Fire and Police both respond to the same incident due to the type of emergency. Thus, the best estimate of total EMS incidents in the City is the Allina number,

though that number could be overstated as it relates to incidents just outside the City limits. Either way, the Allina counts are higher than those of either Police or Fire. However, as a surrogate measure, if a City first responder travelled to 2,000 Allina incidents per year, that would equate to an average rate of 5.48 per day.

Based on this EMS workload, the following question is raised: Does the Police Department have time to continue EMS first response as well as maintain more than basic medical certifications? The City currently has one on-duty fire crew that can easily respond with certified EMTs six or more times per day. Many agencies in the Twin Cities area have transitioned EMS first response to fire units as fire departments staff more dedicated crews in fire stations. Doing so frees up proactive patrol time for police and lessens the need for EMT training for police officers.

If the City made this EMS first responder transition to Fire, it does not mean that police will not respond immediately on the occasional life or death EMS event or house fire. What the fire first responder shift does accomplish, however, is to ensure moderate-to-low-acuity EMS incidents are managed. These incidents represent at least 85 percent of total EMS incidents.

Finding #12: The City should plan to transition EMS first response to the Fire Department. Police should also be utilized for the very infrequent life-threatening incidents along with Fire.

2.7.5 Operational Performance

The following tables measure the performance for the first apparatus to arrive on the scene for NFIRS-coded fire and EMS emergency incidents only. These measures are the number of minutes and seconds necessary for 90 percent completion of the following components:

- **Call processing / dispatch**
- **Crew turnout**
- **Travel**
- **Dispatch to arrival**
- **Call to arrival**

In the measures to follow, only *Fire* and *EMS* incidents are used. This ensures an analysis of the most acute emergencies. Most component analyses include a year-to-year comparison, followed by a representation of 90 percent compliance by hour of day, and a graph showing performance by fractile time segment.

2.7.6 Call Processing / Dispatch

Call processing measures the time from the first incident timestamp until apparatus are notified of the request for assistance. Call processing performance depends on what is being measured. If the first incident timestamp takes place at the time the PSAP receives a 9-1-1 call, then call processing includes PSAP time as well as dispatch handling time. Otherwise, the performance represents only a portion of the entire processing operation.

In addition, not all requests for assistance are received via 9-1-1. Generally, there will be a mix of channels for receiving requests for assistance. Each channel will have a timestamp at a different point in the processing operation. This is not as much of a factor if many requests are received via 9-1-1 PSAP.

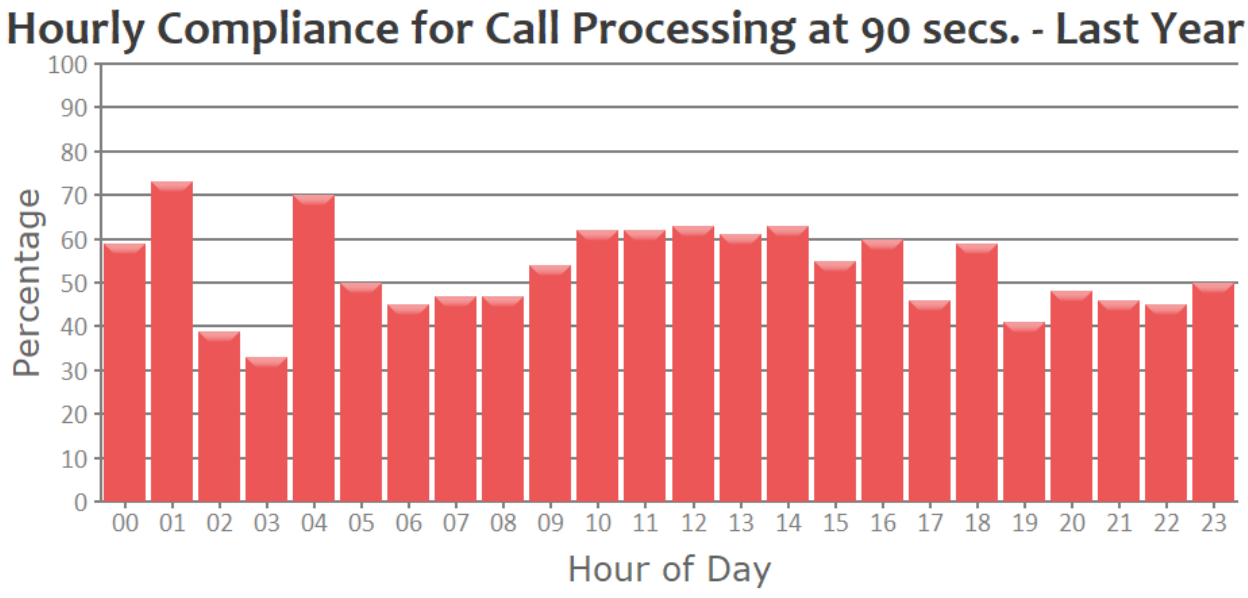
Call processing times degraded slightly in RY 22/23. In general, *times are much longer than the desired **90-second** goal for this phase of response.*

Table 17—Call Processing / Dispatch Performance by Year

Station	Overall	RY 20/21	RY 21/22	RY 22/23
Department-Wide	**02:54**	02:52	02:52	03:01

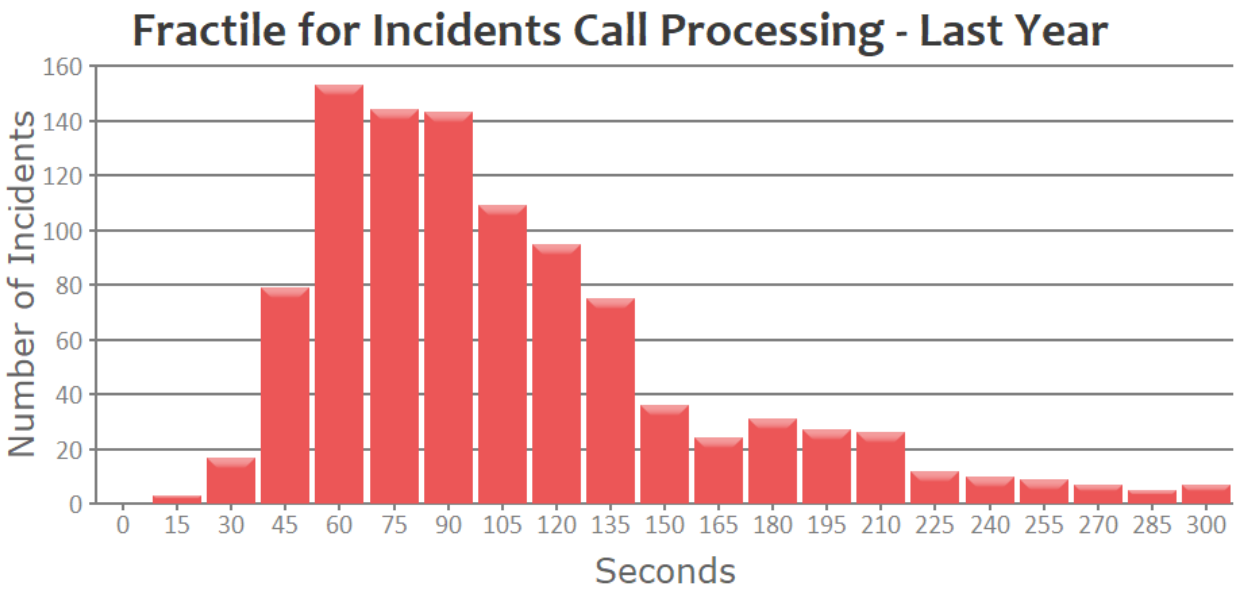
The following figure shows hourly compliance of approximately 50 percent, with performance decreasing to 30 percent in the early morning hours.

Figure 9—Call Processing / Dispatch Compliance (RY 22/23)



The following figure illustrates fractile call processing / dispatch time performance. The peak segment for call processing occurs at 60 seconds. However, there are many emergency incidents where call processing takes much longer than 60 seconds.

Figure 10—Call Processing / Dispatch Fractile Analysis (RY 22/23)



Finding #13: Call processing performance by Scott County's 9-1-1 Dispatch Center is substantially slower than any nationally recommended best practice goal.

2.7.7 Call to Arrival

Call to arrival measures the time interval from receipt of the 9-1-1 call until the first response apparatus arrives at the emergency incident and is a fire agency's true customer service measure. Best practice-based goals are 1:30 minutes for call processing, 2:00 minutes for crew turnout, and 4:00 minutes for travel for a total call-to-arrival time of 7:30 minutes.

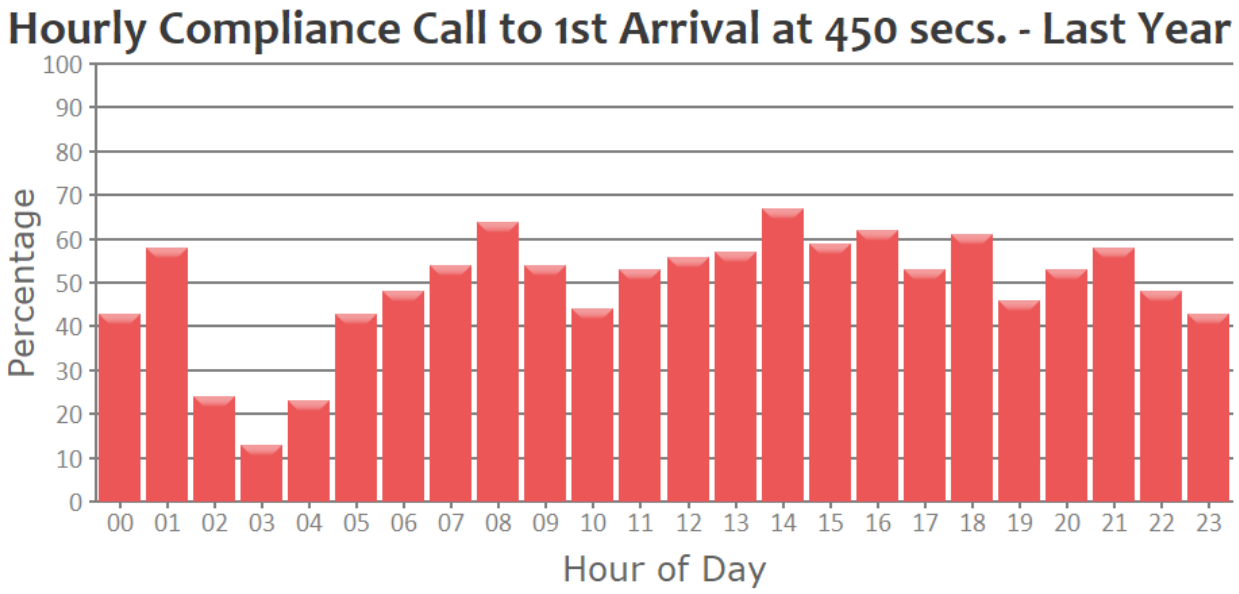
Table 18—Call-to-Arrival Performance by Year

Station	Overall	RY 20/21	RY 21/22	RY 22/23
Department-Wide	**11:27**	10:59	11:16	11:51

As the table shows, call-to-arrival performance has degraded slightly over the three-year period studied by Citygate, and was 4:21 minutes slower than a 7:30-minute best practice goal for urban/suburban areas in RY 22/23.

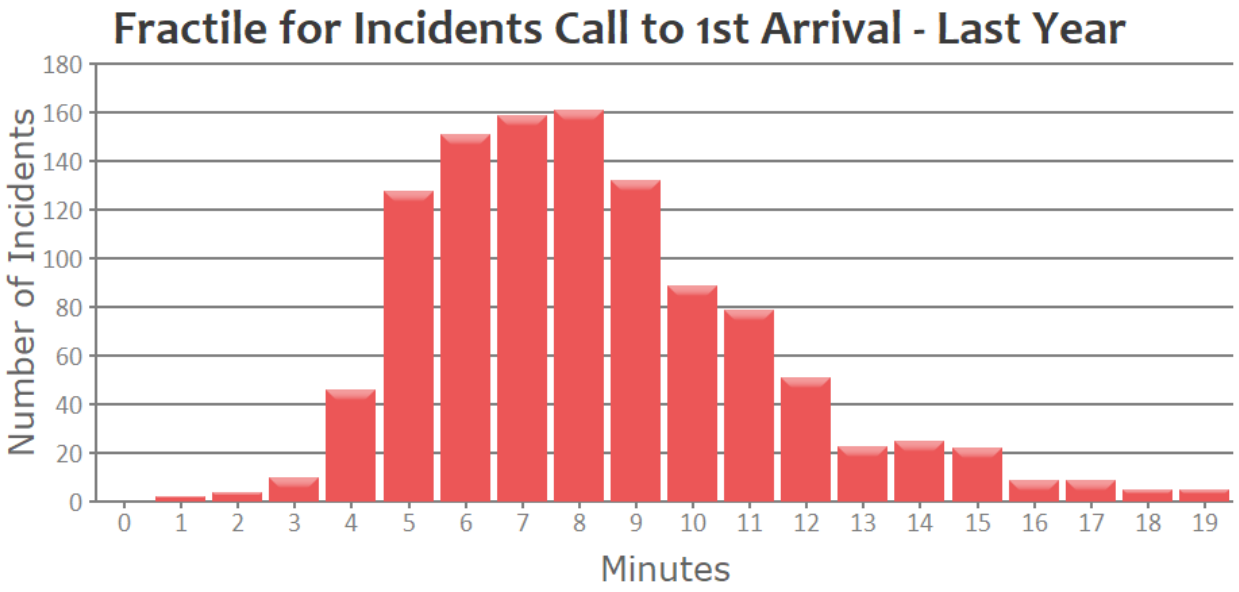
The following figure illustrates a roughly flat call-to-arrival compliance, with slightly poorer performance in the early morning hours.

Figure 11—Call-to-Arrival Compliance (RY 22/23)



The following figure illustrates fractile call-to-arrival performance. 8:00 minutes is the peak segment. The right-shifted graph indicates a high number of incidents with longer call-to-arrival times.

Figure 12—Call-to-Arrival Fractile Analysis (RY 22/23)



Finding #14: Total response times from 9-1-1 answer to first-unit arrival are 4:21 minutes longer than best practice recommendations for positive outcomes in a suburban city. This is due to two reasons: (1) slow dispatch processing and (2) most responses only occurring from Station 1.

2.7.8 Effective Response Force (ERF) Concentration Measurements

The Department's ERF for building fires is minimally two engines, one ladder truck. Across the three data years, there were only 25 such incidents where these units arrived at the scene. A best practice for a suburban house fire would be all needed units arriving within 11:30 minutes from 9-1-1 answer. In the Department's service area, the 90 percent call-to-arrival time for three units ranged from a low of 20:12 minutes (10 times) to a high of 24:10 minutes (once).

In Shakopee, the 8:00-minute travel time for the last-to-arrive unit is too aggressive given the street design and topography of the City. A 9:00-minute ERF travel time is suffucent for the placement of fire stations.

Finding #15: The City is not capable of fielding an effective multiple-unit response force to building fires, more so from only one fire station. To assemble the required number of total personnel, the City is also dependent on mutual aid also arriving quickly. The City needs to plan to staff both fire stations.

2.8 Paid-On-Call Firefighter Program Deployment Evaluation

2.8.1 Deployment Staffing

As is typical in Minnesota over decades, the City's fire services were staffed by paid-on-call firefighters. More recently, the City has used the term "part-time firefighter." At the time of this study's commencement, there were a total of 46 part-time firefighters. The overall issues with the part-time firefighter program will be covered more deeply in the headquarters programs assessment to follow in Section 3 of this report. For deployment, part-time firefighters must cover on-duty assignments, respond to emergencies from home (or elsewhere), and complete mandatory annual training.

Citygate received data related to three categories of how part-time firefighter hours were spent:

1. Crew shifts
2. Emergency callbacks
3. Training

In the most recent data year, emergency callback counts ranged from zero to 60. Only 13 personnel had more than 20 callbacks—less than twice a month—and only 7 had 35 or more.

To maintain the current, in-station crew staffing requires four personnel, 24/7/365. The City only has four career firefighters working 40 hours per week. Thus, all other hours fall to the part-time force.

There is a minimum requirement of three scheduled shifts per month for part-time personnel, with shifts ranging from 12 hours to 16 hours for an overnight shift. Per person, the shifts per year range from 34 to 101. The hours worked ranged from 456 (38 per month) to 1,358 (113 per month), with an annual average of 647 hours—not including the 8 firefighters who work more than 1,000 hours per year.

In summary, Citygate found that advanced practical (hands-on) training, tactical training, *and callbacks* are significant predictors of Worked Hours.

- Ladder Training – **164.20 Worked Hours** for every hour trained
- SCBA Training – **52.30 Worked Hours** for every hour trained
- Administrative/Command Training – **11.68 Worked Hours** for every hour trained
- Callbacks – **5.14 Worked Hours** for every callback

The low callback hours are of serious concern, as staff reports that most callback incidents do not see more than approximately five firefighters in less than 10:00 minutes. With four on duty, it would take another 11 callback firefighters *quickly* to make up an ERF attack on a modest house fire, much less a commercial building.

As shown in the following figure, this data can also be viewed as a matrix:

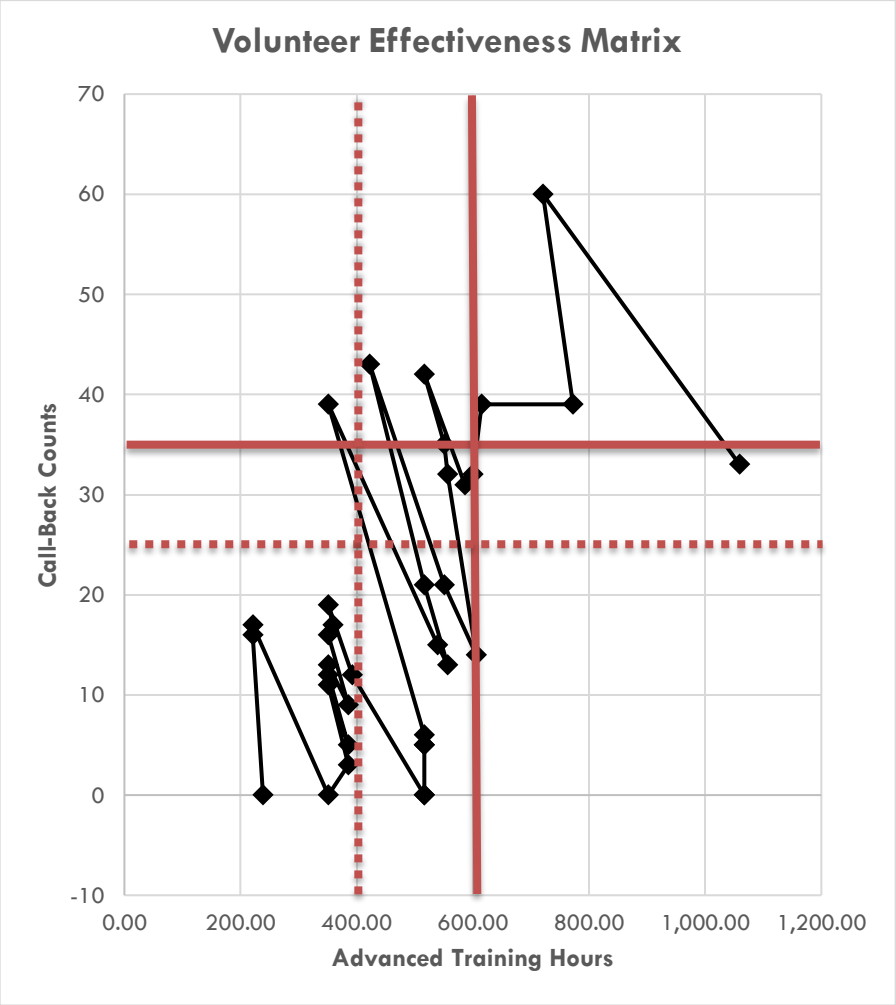
- The midpoints on the matrix are signified by the solid red lines.
- Perceived minimum effectiveness is signified by the dotted red lines.

In this matrix, volunteers with a score of at least 400 for advanced physical and tactical training[8] and at least 25 callbacks demonstrate more worked hours than their peers.[9]

[8] Training score = training hours * the predictive value for each training category, summed up for all three training focus areas.

[9] Volunteer tenure may be a factor in this analysis and, as such, one needs to consider these effects if a volunteer started mid-year.

Figure 13—Volunteer Effectiveness Matrix



As the figure shows, only 10 part-time personnel (22 percent) have a composite score above and to the right of the dotted red lines that are accomplishing all three core needs—staffing shifts, adequate training hours, and emergency callback. Department leadership finds that it is becoming more and more difficult to fill shift assignments and manage late cancellations, personnel arriving late or leaving early, etc.

Finding #16: The burden on part-time firefighters is at its limit. After filling shifts for just one staffed unit, they are not keeping up with training when not on shift and emergency callbacks. It would take two or more times the number of part-time firefighters to staff a second unit and be available for training and callbacks. The costs to train, equip, and manage that large of a workforce would be significant.

2.8.2 Minnesota Volunteer / Paid-On-Call Firefighter Pension and Compensation Issues

Over many decades in Minnesota, uncompensated volunteer firefighters were thanked for their service by being a member of a local "Relief Association" that received state payments to build very modest volunteer pension payments after decades of service. As pure volunteers were harder to maintain in a two-income, more commuter-based employment economy, departments like Shakopee started to pay part-time compensation for callback time and later to staff in-station units to ensure at least a minimal response.

In 2020, City firefighters began to work on-duty shifts. In doing so, they receive from the City a part-time payment of $16.88 per hour ($17.39 per hour in 2024). They must work three shifts per month. The shifts are either 16 hours—3:00 pm to 7:00 am weekdays—or 12-hour shifts on weekends. In addition, they were also paid-on-call firefighters to be recalled anytime, so they stayed in the Relief Association to continue their earnings towards a volunteer relief pension.

Most recently, the City hired its first career firefighters and chief officers, mostly from the part-time program personnel. When staff were hired full time, they were also allowed to remain part-time. This allowed them to remain in the Relief Association, continue to work towards receiving their relief pension, and be enrolled in the State of Minnesota Public Employees Retirement Association (PERA) Police & Fire Plan. It also served the needs of the Department to have those staff members in attendance for training and callbacks after their full-time shift ended. These positions are known as "dual roles" in the Department.

For dual role members, the Department uses their highest rank (career or part-time) when referring to someone. For example, a part-time Chief is called by that title when doing part-time or career work at a lower rank. The entire system creates confusion internally and externally and, according to staff, has caused conflict among ranks.

This confusion is made worse as differing pay rates are used for the same job description work. For example, when Joe Simon was promoted to full-time Administration Captain in 2018, his subordinate was a full-time firefighter but was his superior as a part-time Assistant Chief. Currently, all full-time firefighters hold an officer position within the Department's part-time designation, again creating confusion.

Table 19—Full-Time versus Part-Time Positions for Personnel

Name	Full-Time	Part-Time
Joe Simon	**Admin Captain**	**Deputy Chief**
Tom Pitschneider	**Fire Marshal**	**Fire Marshal**
Dave Giddings	**Firefighter**	**Deputy Chief**
Rob Indrebo	**Firefighter**	**Captain**
Corey Murray	**Firefighter**	**Lieutenant**
Brad Purrington	**Firefighter**	**Lieutenant**

Finally, the dual-role system must operate with two organization charts. One for full-time personnel on daytime shifts Monday through Friday, and another for part-time personnel during all other hours.

Observations

Citygate is concerned that the current use of pay, ranks, and dual roles is problematic and creates systemic, long-term issues. While perhaps necessary for a few "phase-in years," the ongoing use of dual roles and pay schedules is a practice that most other suburban cities would not undertake. Typically, job descriptions define one job, one line of authorities, including managers, and set forth equal pay for equal work.

While Citygate does not practice law, we are very experienced fire agency managers. All aspects of pay to firefighters—other than small stipends for volunteer time or supplies—are governed by the federal Fair Labor Standards Act (FLSA) of 1938, which was extended to the public sector in 1985. This federal law takes precedence over state law. FLSA is very clear that paid part-time or full-time staff cannot volunteer for the *same* City in the *same* position—nor can career personnel on overtime be paid a part-time wage instead of overtime based on their career hourly wage.

Further, under FLSA and state employment regulations for determining when an employee is to receive full benefits, part-time employees must limit their hours to less than full-time. In most states, per federal or state regulations, this is anywhere from 20–30 hours per week.

Finding #17: Shakopee should follow federal wage and hour regulations and establish one pay rate for regular and overtime hours for career personnel. Firefighters should not be in unique "dual-role" functions.

Recommendation #2: The City should obtain the appropriate legal opinions and enact changes to the Department to be that of a "combination" department of both career and part-time employees. Employees should have one clear set of positions and compensation and be in one pension system. One likely solution is to enact a set of processes like those already undertaken by other Twin Cities Metro Area cities:

2.1 Create a new part-time firefighter/EMT position.

2.2 Firefighters hired as paid-on-call personnel under the relief pension should be encouraged to reapply for a new, part-time firefighter/EMT position including new requirements for training compliance to state law and to be considered for staffing shifts.

2.3 These new part-time firefighter/EMT positions should be included in the state's PERA-coordinated pension plan as opposed to a Fire Relief pension plan designed for volunteer and paid-on-call firefighters.

2.4 Changing from relief to a state-based career employee PERA pension plan requires dissolving the relief association under Minnesota state statute. This allows those who transition to full-time work and those not wanting to reapply as part-time firefighter/EMTs to not be penalized in regards to losing their relief pension. In making this conversion, the City must follow Minnesota State Statute 424B.22 for Relief Association Dissolution and Retirement Plan Termination.

2.9 Overall Deployment Evaluation

SOC Element 8 of 8
Deployment Evaluation

The Department serves an urban/suburban/rural population with a mixed residential and non-residential land-use pattern typical of other Twin Cities area cities of similar size and demographics.

The current deployment model of four personnel on duty at Station 1 24/7/365 is *insufficient* to control even one moderate house fire and leaves no on-duty *or callback* staffing for a simultaneous incident. The current single crew unit and weak emergency callback is only providing sluggish response times for positive outcomes in a suburban City that also has commercial building fire and technical rescue risks.

Given only one lightly staffed fire station, Citygate is concerned with the Department's ability to provide equitable "speed of response" to large sections of the City—as well as sufficient "weight of response" capacity for more serious emergencies *and* concurrent incident responses—to achieve commonly expected outcomes in urban/suburban communities like Shakopee, which has more than 47,000 residents plus employment and visitors.

Citygate understands that a cadre of part-time personnel provides great value to the City and Department, but it *does not meet* the City's *current risk exposure needs*. A combination of full-time and part-time personnel will be needed for the foreseeable future to ensure an adequate first-unit "speed of response" and ERF "weight of response."

Total response time performance is significantly slower than best practice recommendations, resulting in first-unit call-to-arrival performance 4:21 minutes *slower* than Citygate's 7:30-minute recommended best practice to facilitate desired outcomes in suburban communities. The City does not have control over the County Dispatch center, but it can create positive fire unit response times with effective training and in-fire station staffing.

The two current fire station locations can cover much of the City within adequate response travel times—*if they are staffed*. Best practice is to provide an equitable level of service to all areas of a jurisdiction with similar risk and population density. The far edges of the City are not yet densely populated or do not have a high enough incident demand to make a third fire station a priority. As infill growth occurs, however, a third station may be needed at some point in the future.

If desired outcomes include limiting building fire damage to only part of the inside of an affected building and/or minimizing permanent impairment resulting from a medical emergency, the urban/suburban population density areas of the City will need both first-due unit and multiple-unit ERF coverage from two fire stations and a part-time firefighter force to deliver Citygate's recommended *urban/suburban area* response performance goal.

2.9.1 Deployment Recommendations

Based on the technical analysis and findings contained in this section, Citygate makes the following deployment recommendations.

Recommendation #3: **Adopt Deployment Policies:** The City Council should adopt complete performance measures to aid deployment planning and to monitor performance. The measures of time should be designed to deliver outcomes that will prevent death or more serious injury for EMS patients upon arrival when possible and keep small but serious fires from becoming more serious. With this is mind, Citygate recommends the following measures.

3.1 Distribution of Fire Stations: To treat pre-hospital medical emergencies and control small fires, the first-due unit should arrive within 8:30 minutes, 90 percent of the time, from receipt of the 9-1-1 call at the Scott County Dispatch Center from two staffed fire stations. This equates to a 1:30-minute call processing / dispatch time, a 2:00-minute crew turnout time, and a 5:00-minute travel time.

3.2 Multiple-Unit Effective Response Force for Serious Emergencies: To confine building fires near the room or rooms of origin, keep vegetation fires under one acre in size, and treat multiple medical patients at a single incident, a multiple-unit ERF of at least **12** personnel, plus at least one Chief Officer, should arrive within 12:30 minutes from the time of 9-1-1 call receipt, 90 percent of the time, within the suburban population density areas of the City. This equates to a 1:30-minute dispatch time, 2:00-minute crew turnout time, and a 9:00-minute travel time.

3.3 Hazardous Materials Response: To protect the City from the hazards associated with uncontrolled release of hazardous and toxic materials, the fundamental mission of the Department's response is to isolate the hazard, deny entry into the hazard zone, and minimize impacts on the community. This can be achieved with a first-due total response time of 8:30 minutes or less in the suburban population density areas of the City to provide initial hazard evaluation and/or mitigation actions. After the initial evaluation is completed, a determination can be made whether to request additional resources to mitigate the hazard.

3.4 Technical Rescue: To respond to technical rescue emergencies as efficiently and effectively as possible with enough trained personnel to facilitate a successful rescue, a first-due total response time of 8:30 minutes or less is required in the suburban population density areas of the City to evaluate the situation and initiate rescue actions. Additional resources should assemble as needed, within a total response time of 12:30 minutes within the suburban population density areas of the City, to safely complete rescue/extrication and delivery of the victim to the appropriate emergency medical care facility.

Recommendation #4: Add career and part-time staffing at both stations to provide 4-person shift staffing 24 hours per day, 7 days per week.

Recommendation #5: As the career model expands, transition first responder EMS assistance from the Police to the Fire Department.

Recommendation #6: As soon as funds permit, remodel both fire stations to provide adequate spaces for 24-hour per day shift personnel.

SECTION 3—ADMINISTRATIVE SUPPORT STAFFING CAPACITY REVIEW

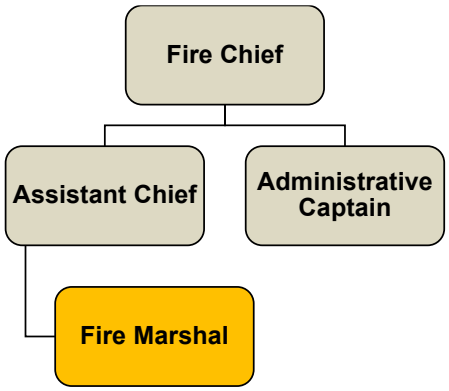
As an element of this SOC Assessment, the City requested a high-level review and evaluation of the Department's administrative support organization and workload capacity.

NFPA 1201 states, in part: *"…the [department] shall have a leader and organizational structure that facilitates efficient and effective management of its resources to carry out its mandate as required [in its mission statement]."*[10] Best practices call for a management organization and headquarters programs with adequate staffing to provide a properly trained, equipped, and supported response force to ensure prompt response and safe, competent service delivery. Compliance regulations for fire services operation are increasing; thus, the proper hiring, training, and supervision of operational personnel require a significant leadership and general management commitment.

3.1 ADMINISTRATIVE ORGANIZATION OVERVIEW

The City's Adopted 2021 Budget authorizes four full-time administrative support positions for the Department, organized as shown in the following figure.

Figure 14—Shakopee Fire Department Administrative Organization



As the figure shows, the Department's administrative staff consists of the Fire Chief (currently an Interim Fire Chief), an Assistant Chief, an Administrative Captain, and a Fire Marshal—all collocated at Station 1. This small staff is responsible for the overall administration and management of all Department programs and services, as well as administrative support for the four full-time and approximately 40 part-time operational response personnel. As the previous figure also shows, the Department has no clerical support staff.

[10] NFPA 1201 – Standard for Providing Emergency Services to the Public (2015 Edition).

Since the resignation of the previous Fire Chief in 2022, there have been a series of short-term leadership changes leading to the hiring of the current Interim Fire Chief. The Department is working diligently to (1) cultivate a more professional culture, (2) restore its working relationship with other City departments and Scott County fire agencies, and (3) expand its EMS mission.

The Department currently operates without a complete set of administrative and operational policies. While the Department has engaged a private sector vendor to provide best practice and compliance-based policies, the policies are currently incomplete, and also lack the local depth and breadth of information required to create a truly useful policy suite for Department personnel. Many training and staffing policies are pandemic-era countermeasures captured in Departmental memos of that period. The interim fire administrative staff has made great strides in correcting and updating these issues.

Citygate's review of the Department's administrative support organization's workload capacity found that the Interim Fire Chief is regularly working 55 to 65 hours per week to complete the most important responsibilities, with many other responsibilities not being completed at all. While due, in part, to the absence of the Assistant Chief, this is also partly due to the lack of any clerical support. In addition, the Police Chief currently serves as the City's Emergency Manager—a responsibility that, as he informed Citygate, he would prefer was reassigned to the Fire Department. Consideration should be given to having the new Fire Chief possess Emergency Management certification(s) and an appropriate bachelor's degree related to public sector management.

3.2 FIRE PREVENTION

The City's Municipal Code includes adoption of the state Fire Code with amendments approved by the City Council, including establishment of a Fire Prevention Bureau to implement, administer, and enforce the provisions of that code.[11] The Fire Marshal, appointed by the Fire Chief, serves as the Fire Code officer for the City.

In addition to enforcement of the Fire Code, the Fire Marshal's responsibilities include review of all proposed development, building, and fire/life safety system plans for conformance with applicable fire and life safety laws and regulations, and inspection of such occupancies and systems for proper installation and operation. The Fire Marshal is also responsible to ensure that all businesses selling alcohol and/or tobacco, schools, and healthcare facilities are inspected at least annually for compliance with applicable fire safety requirements. Field inspections are generally conducted by full-time response personnel under the direction of the Fire Marshal. Fire safety education is provided by administrative or response personnel as available and requested.

[11] Shakopee Municipal Code Section 130.07.

Citygate's review of the Fire Marshal's office workload identified the following changes in 2023 compared to the previous year:

- A 19 percent increase in plan review workload.
- A 43 percent increase in fire permits issued.
- A 24 percent increase in permit inspections completed.

According to the Fire Marshal, this increased workload is due to additional building/development activity within the City and is adversely impacting the Department's ability to conduct all required annual fire and life safety inspections. In addition, the current practice of utilizing full-time response personnel for field inspections and fire and life safety system acceptance tests creates costly disruptions when they are redirected to an emergency or do not show up for a scheduled inspection due to an emergency incident.

The Fire Marshal also advised Citygate of his intent to retire within the next few years, with no succession plan for this highly technical position currently in place. Priority should be given to hiring a full-time fire Inspector.

3.3 TRAINING

The State of Minnesota has separate but similar training requirements for full-time and part-time firefighters. The Assistant Chief has the responsibility to ensure all Department personnel meet mandated training requirements. New personnel are required to be certified structural firefighters prior to employment and are then oriented to Department-specific procedures in a ride-along program at Station 1.

The Minnesota Board of Firefighter Training and Education (MBFTE) requires firefighters to be licensed and have 72 continuing education hours in the previous three-year period for license renewal across a mandatory 11 Core Elements.[12] For part-time firefighters, best practice is 24 hours annually in any combination of the 11 Core Elements, plus live fire training at least annually.

The state of Minnesota OSHA requirements are department-dependent, based upon the department's level of service provided within their communities. The MBFTE's desire is that fire departments use their "Best Practices Training Plan" around the 11 Core Elements as a resource to develop a training plan to provide balanced training across all elements for all personnel in each three-year period.

[12] https://www.mbfte.org/Forms/WebsiteMenu/ElevenCoreElements.pdf

The Department currently delivers continuing education training curriculum on Monday evenings to accommodate all personnel, with no changes to the structural firefighting curriculum from year-to-year. This approach was created during the pandemic and is memorialized in a Department memorandum. Lesson plans are informal, and attendance is tracked in the Department's record management system (ESO); however, no records were found documenting federally required hazardous material response training. In addition, the Department does not conduct an annual training needs assessment, *nor does it have any training plan, much less one consistent with Minnesota requirements.* Live training burns are conducted annually at a remote site.

For emergency medical care, most City firefighters are certified as Emergency Medical Responders (EMRs) who—in addition to the above—are required to have 8 hours of annual EMS training. Higher-trained Emergency Medical Technicians (EMTs) must have 20 hours of annual training. EMS continuing education is provided monthly by Allina Healthcare, including information on local medical directives.

As the Department offers each training subject twice, most personnel obtain their training hours while on a part-time duty shift. Depending on scheduling, personnel could receive training in the same subject twice while completing in training in none of the other subjects at all. The Department has only been tracking *total hours* in attendance rather than a balance across all subjects. As a result, when Citygate reviewed the training hours by person, by subject, we found significant, lopsided swings between too little or too much training on some subjects and, for some personnel, no hours at all on some subjects and live burns. Despite this, the Assistant Chief was certifying everyone as being eligible for re-licensure. Most of the hours for the last two years were logged as EMS or administrative time, leaving very low hours on actual firefighting.

Finding #18:	The Department's training program is informal, with no annual training needs assessment driving an annual training plan in conformance with Minnesota requirements. Since being made aware of training deficiencies in December, the Interim Fire Chief and administrative staff have made great progress in addressing these issues.
Finding #19:	The training hours delivered are not close to being in balance to the Minnesota 11 Core Elements.
Finding #20:	The Department lacks documentation of federally required annual hazardous material response training.

3.4 ADMINISTRATIVE ORGANIZATION REVIEW SUMMARY

From this review and assessment of the Department's administrative support organization, Citygate makes the following findings and recommendations.

3.4.1 Findings

Finding #21: The Department is slightly understaffed to accomplish all of its administrative responsibilities and tasks.

Finding #22: The current interim administrative staff is at its limit and is working more hours (and managing more assignments) than it should be.

Finding #23: The Department is currently operating without a comprehensive set of administrative and operational policies and procedures but has contracted with a private company that specializes in policies for public safety and is currently working on creating new policies and procedures.

Finding #24: The fire prevention workload increased substantially over 2023 due to the additional building and development activity in the City, adversely impacting staff's ability to conduct all required annual fire and life safety inspections.

Finding #25: The full-time response personnel on the engine are also assigned to conduct field inspections under the direction of the Fire Marshal, often resulting in missed inspection appointments or interrupted inspections due to emergency responses by the engine crew.

Finding #26: The Fire Marshal intends to retire within the next few years; however, there is no succession plan in place for this highly technical position.

3.4.2 Recommendations

Recommendation #7:	The City should consider funding an additional 1.0 FTE Administrative Assistant as soon as possible to resolve existing fire administrative workload capacity gaps, provide enhanced capacity, and minimize or eliminate any potential single points of administrative support failure.
Recommendation #8:	The City should consider reorganizing the Department administrative staff to include a Deputy Chief to oversee field operations and training and ensure compliance with all federal and state mandates, and an Administrative Deputy Chief to supervise the administrative assistant and oversee the budget, apparatus, facilities, schedules, and grants to better fit the needs of a Department with both full-time and part-time response staff.
Recommendation #9:	Complete the development and adoption of a comprehensive set of administrative and operational policies and procedures.
Recommendation #10:	Consider focusing the inspection responsibilities of response personnel to existing businesses to minimize disruption to new building projects.
Recommendation #11:	Develop and implement a succession plan for the Fire Marshal position to ensure continuity of services upon retirement of the current incumbent. This could include hiring a Fire Inspector for succession planning and additional life safety inspections should be a priority.
Recommendation #12:	The City Administrator should consider transferring the Emergency Manager role and responsibilities to the Fire Chief.

SECTION 4—COMPREHENSIVE RECOMMENDATION AND PHASING

Based on Citygate's comprehensive review, the Department's current four-person crew model at Station 1 needs to be expanded to provide (1) a more equitable *speed of response* to all areas of the City and (2) an improved *weight of response* for more serious or concurrent incidents. To achieve this, Citygate recommends the City "reboot" the Department by converting the staffing system to that of a combination department, thus utilizing a modest number of full-time personnel at both stations to provide a guaranteed minimum daily response staffing level under best practices and state regulations on fire services. The two-station staffing plan is then augmented by a part-time firefighter/EMT program, with the firefighters scheduled to work or called back under a singular hourly wage and state pension structure.

Citygate recommends the City consider funding additional personnel across a phasing period of a few fiscal years to eventually reach the master plan result of a ***minimum*** of eight personnel plus a chief officer on duty daily for supervision and incident command as summarized in the following table. The recommended staffing delivers a minimum, safe firefighting response for *speed of attack* and can enter burning structures under the two-in/two-out federal and state safety standard,[13] plus provide for incident command and a pump operator.

Table 20—Recommended Minimum Daily Response Staffing Model

Station	Career Personnel			Total On-Duty Staffing
	Battalion Chief	Captain	Firefighter	
1	1	1	3	**5**
2	0	1	3	**4**
Total	**1**	**2**	**6**	**9**

Citygate suggests that any full-time position vacancy be backfilled first with full-time personnel on overtime, and second with part-time personnel. Part-time personnel can be used for an additional staffing past four at each station, more so on busy community special event or bad weather days. As another option, with four or more firefighters at each station, a station could staff a fire engine *and* a quick response EMS unit.

The Department also needs to meet administrative and safety regulations, as an appropriately staffed headquarters team is needed to provide the leadership, training, and accountability necessary for the provision of safe and effective service delivery. This organization can be built in phases over a few fiscal years as summarized in the following table—ideally assisted by federal

[13] https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134#1910.134(g)(4)

firefighter staffing grants. Once the Council provides policy direction, staff can provide the detailed expenses per fiscal year. Citygate recommends a four-year plan to recruit, train, and on-board the new and additional personnel that will be needed to achieve the recommended staffing model.

4.1 Phasing Plan

Gathering community input, designing and approving a funding plan for increased career staffing, and recruiting and hiring all take time. Given the cost and administrative burden on a small city to grow and gradually obtain the full funding needed, Citygate offers this phasing plan, which could be executed on a per-fiscal-year basis. The following are *career* personnel changes/additions:

Step 1: 2024 Budget Amendment

Increase career staff from 11 to 14. However, there were 3 new Battalion Chiefs in the approved 2024 budget. These positions are converted to 3 Fire Captains for line crew supervision. 2 firefighters and an Administrative Assistant are added. The budgeted Assistant Fire Chief and Administrative Captain positions are converted to 2 Deputy Chiefs. These moves improve headquarters capacity and add to the single fire engine shift staffing.

Step 2: 2025 Budget

Add 1 Fire Inspector, 3 Fire Captains, and 6 firefighters. Improve fire prevention and add a second staffed engine at Fire Station 2.

Step 3: 2026 Budget

Add 6 firefighters. Increase both engine crews to 4 career personnel each day, 1 Captain and 3 firefighters.

Step 4: 2027 Budget

Add 3 Battalion Chiefs, one per platoon, for 24/7/365 immediate response command and safety oversight.

The final career force will then be 18 career firefighters, 6 Fire Captains and 3 Battalion Chiefs. These personnel will staff two engines with a minimum of 6 personnel plus the Battalion Chief. One firefighter per shift will backfill for vacation and sick relief. The part-time staff will work scheduled assignments to add a fourth firefighter on each engine.

The following table shows these changes by year.

Table 21—Proposed Fire Department Staffing Summary

Step/Position	Total Career Personnel	Added Career Personnel	Annual Net Cost Increase[14]
Present	8		
Step 1 – 2024			
Headquarters		1	
Captains		3	
Firefighters		2	
Total Count and Costs	**14**	**6**	**$44,414**
Step 2 – 2025			
Headquarters		1	
Captains		3	
Firefighters		6	
Total Count and Costs	**24**	**10**	**$1,045,117**
Step 3 – 2026			
Firefighters		6	
Total Count and Costs	**30**	**6**	**$502,500**
Step 4 – 2027			
Battalion Chiefs		3	
Step 4 Net Costs	**33**	**3**	**$121,901**
		Total	**$1,713,932**

Note:

- The savings in Step 1 result from some of the added expenses being already budgeted, plus other savings in the part-time program and phasing of actual hiring.
- Step 1 does not reflect full 12 months of new position employment as hiring does not all occur on the first day of the new fiscal year.
- The added expenses in Steps 2 through 4 do reflect the full cost of the prior years' additions plus the new staff in the next step.
- The total added expense is in current employee costs; as such, the amount does not include inflation or future pay or benefit changes.

[14] City of Shakopee Fire and Finance Department estimates based on total compensation per position type.

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APPENDIX A—COMMUNITY RISK ASSESSMENT

A.1 COMMUNITY RISK ASSESSMENT

SOC ELEMENT 3 OF 8
COMMUNITY RISK ASSESSMENT

The third element of the Standards of Coverage (SOC) process is a community risk assessment. Within the context of an SOC study, the objectives of a community risk assessment are to:

- Identify the values at risk to be protected within the community or service area.
- Identify the specific hazards with the potential to adversely impact the community or service area.
- Quantify the overall risk associated with each hazard.
- Establish a foundation for current/future deployment decisions and risk-reduction/hazard mitigation planning and evaluation.

A ***hazard*** is broadly defined as a situation or condition that can cause or contribute to harm. Examples include fire, medical emergency, vehicle collision, earthquake, flood, etc. ***Risk*** is broadly defined as the *probability of hazard occurrence* in combination with the *likely severity* of *resultant impacts* to people, property, and the community as a whole.

2.4.1 Risk Assessment Methodology

The methodology employed by Citygate to assess community risks as an integral element of an SOC study incorporates the following elements:

- Identification of geographic planning sub-zones (risk planning zones) appropriate to the community or jurisdiction.
- Identification and quantification, to the extent data is available, of the values at risk to various hazards within the community or service area.
- Identification of the fire and non-fire hazards to be evaluated.
- Determination of the probability of occurrence for each identified hazard.
- Determination of probable impact severity of a hazard occurrence by risk planning zone.
- Determination of overall risk by hazard and risk planning zone.

- Determination of overall risk by hazard considering probability of occurrence and likely impact severity according to the following table.

Table 22—Overall Risk

Probability of Occurrence	Probable Impact Severity				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	*Low*	*Low*	*Low*	*Moderate*	*High*
Unlikely	*Low*	*Low*	*Low*	*Moderate*	*High*
Possible	*Low*	*Low*	*Moderate*	*High*	*Extreme*
Probable	*Low*	*Low*	*Moderate*	*High*	*Extreme*
Frequent	*Low*	*Moderate*	*High*	*Extreme*	*Extreme*

For this assessment, Citygate used the following data sources to understand the hazards and values to be protected in the Shakopee Minnesota.

- Esri and U. S. Census Bureau population and demographic data
- City Geographical Information Systems (GIS) data
- Shakopee City General Plan and Zoning information
- Scott County Comprehensive and Hazard Mitigation Plans
- Shakopee Fire Department and other City data and information.

A.1.2 Risk Assessment Summary

Citygate's evaluation of the values at risk and hazards likely to impact the service area yields the following:

- The Department serves a diverse urban population over a varied urban land-use pattern.
- The Department's service area population is projected to grow approximately 11 percent by 2040.
- The service area has a diverse inventory of residential and non-residential buildings to protect.
- The service area has significant economic and other resource values to be protected, as identified in this assessment.

- The Department has multiple mass emergency notification options available, including 20 outdoor warning sirens located within the City and a reverse 9-1-1 system via Scott County CodeRED. Other options include City/County social media and local news media to effectively communicate emergency information to the public in a timely manner.
- The service area's risk for six hazards related to emergency services provided by the Department range from Low to High as summarized in the following table.

Table 23—Overall Risk by Incident Type

Hazard	Planning Zone	
	Station 1	Station 2
Building Fire	*Moderate*	*Moderate*
Vegetation/Wildland Fire	*Low*	*Low*
Medical Emergency	*High*	*High*
Hazardous Materials	*Moderate*	*Moderate*
Technical Rescue	*Moderate*	*Moderate*
Marine Incident	*Moderate*	*Moderate*

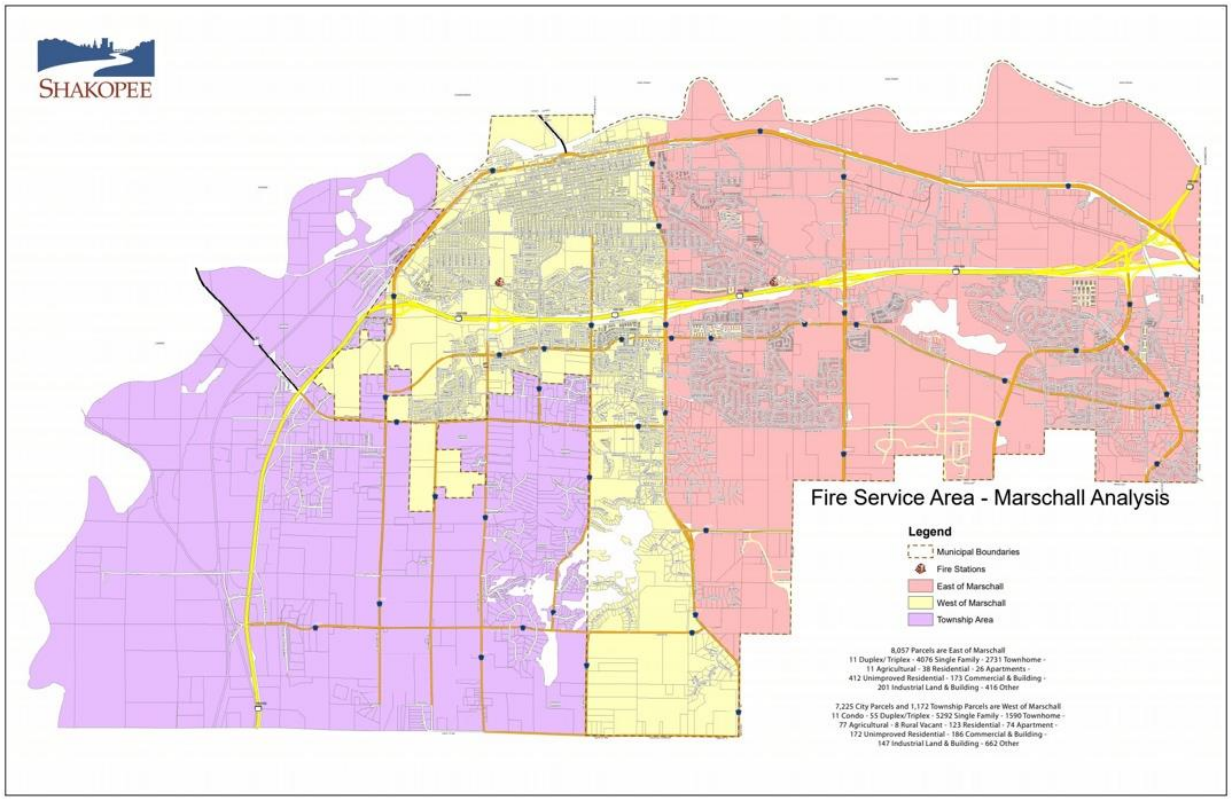
A.1.3 Planning Zones

The Commission on Fire Accreditation International (CFAI) recommends jurisdictions establish geographic planning zones to better understand risk at a sub-jurisdictional level. For example, portions of a jurisdiction may contain predominantly moderate risk building occupancies, such as detached single-family residences, while other areas contain high-risk or maximum-risk occupancies, such as commercial and industrial buildings with a high hazard fire load.

If risk were to be evaluated on a jurisdiction-wide basis, the predominant moderate risk could outweigh the high or maximum risk and may not be a significant factor in an overall assessment of risk. If, however, high-risk or maximum-risk occupancies are a larger percentage of the risk in a smaller planning zone, then they become a more significant risk factor.

Another consideration in establishing planning zones is that the jurisdiction's record management system must also track the specific zone for each incident to appropriately evaluate service demand and response performance relative to each specific zone. For this assessment, Citygate utilized two planning zones corresponding with established City Fire Management Areas (FMAs) and fire station first-due response areas as shown on the following map.

Figure 15—Risk Planning Zones



A.1.4 Values at Risk to Be Protected

Values at risk, broadly defined, are tangibles of significant importance or value to the community or jurisdiction potentially at risk of harm or damage from a hazard occurrence. Values at risk typically include people, critical facilities/infrastructure, buildings, and key economic, cultural, historic, or natural resources.

People

Residents, employees, visitors, and travelers in a community or jurisdiction are vulnerable to harm from a hazard occurrence. Particularly vulnerable are specific at-risk populations, including those unable to care for themselves or self-evacuate in the event of an emergency. At-risk populations typically include children under the age of 10, the elderly, people housed in institutional settings, and households below the federal poverty level. The following table summarizes key demographic data for the City of Shakopee service area.

Table 24—Key Demographic Data – Shakopee

Demographic	2023
Population	**47,008**
Under 10 Years	16.8%
10–14 Years	8.9%
15–64 Years	65.0%
65–74 Years	5.8%
75 Years and Older	3.6%
Median Age	35.0
Daytime Population	44.673
Housing Units	**16,812**
Owner-Occupied	70.6%
Renter-Occupied	24.3%
Vacant	5.1%
Median Household Size	2.9
Median Home Value	$340,958
Ethnicity	
White Alone	64.5%
Black / African American Alone	9.1%
Asian Alone	12.0%
Other / Two or More Races	14.3%
Hispanic / Latino Origin	9.9%
Diversity Index	63.3
Education (Population over 24 Years of Age)	**29,272**
High School Graduate or Equivalent	93.9%
Undergraduate Degree	40.6%
Graduate/Professional Degree	11.1%
Employment (Population over 15 Years of Age)	**25,819**
In Labor Force	96.2%
Unemployed	3.8%
Median Household Income	$93,367
Population Below Poverty Level	6.8%
Population with Disabilities	6.4%
Population without Health Insurance Coverage	5.0%

Source: Esri and U.S. Census Bureau

Of note from the previous table is the following:

- Slightly more than 26 percent of the population is under 10 years or over 65 years of age.
- The service area population is predominantly White (64.5 percent), followed by Asian (12.0 percent), Hispanic/Latino (9.9 percent and counted as White), Black / African American (9.1 percent) and other ethnicities (7.6 percent),
- Of the population over 24 years of age, more than 96 percent has completed high school or equivalency.
- Of the population over 24 years of age, nearly 41 percent has an undergraduate, graduate, or professional degree.
- Of the population 15 years of age or older, 96 percent is in the workforce; of those, less than 4 percent are unemployed.
- Median household income is slightly more than $93,000.
- The population below the federal poverty level is nearly 7 percent.
- 5 percent of the population does not have health insurance coverage.

The service area's Comprehensive Plan projects slightly less than 2,000 new households by 2040.[15]

Buildings

The service area has nearly 17,000 residential housing units and 2,600 other buildings housing manufacturing, research, technology, office, professional services, retail sales, restaurants/bars, motels, churches, schools, storage, government facilities, healthcare facilities, and other occupancy types.[16]

Building Occupancy Risk Categories

The CFAI identifies the following four risk categories that relate to building occupancy:

Low Risk – includes detached garages, storage sheds, outbuildings, and similar building occupancies that pose a relatively low risk of harm to humans or the community if damaged or destroyed by fire.

Moderate Risk – includes detached single-family or two-family dwellings; mobile homes; commercial and industrial buildings smaller than 10,000 square feet without a high hazard fire

[15] Source: Scott County 2040 Comprehensive Plan.
[16] Source: Esri Community Analyst – Community Profile (2023).

load; aircraft; railroad facilities; and similar building occupancies where loss of life or property damage is limited to the single building.

High Risk – includes apartment/condominium buildings; commercial and industrial buildings larger than 10,000 square feet without a high hazard fire load; low-occupant load buildings with high fuel loading or hazardous materials; and similar occupancies with potential for substantial loss of life or unusual property damage or financial impact.

Maximum Risk – includes buildings or facilities with unusually high risk requiring an Effective Response Force (ERF) involving a significant augmentation of resources and personnel and where a fire would pose the potential for a catastrophic event involving large loss of life or significant economic impact to the community.

Critical Facilities

The U.S. Department of Homeland Security defines critical infrastructure and key resources as those physical assets essential to the public health and safety, economic vitality, and resilience of a community, such as lifeline utilities infrastructure, telecommunications infrastructure, essential government services facilities, public safety facilities, schools, hospitals, airports, etc. The Department has identified 41 critical facilities and infrastructure, as shown in the following table. A hazard occurrence with significant impact severity affecting one or more of these facilities would likely adversely impact critical public or community services.

Table 25—Critical Facilities

Critical Facility Category	Quantity
Communications	4
Community Services	2
Education	12
Energy	1
Government Services	2
Hazardous Materials	2
Healthcare & Medical	6
Infrastructure	2
Public Safety	5
Transportation	-
Utility	2
Heavy Industrial	3
Total	**41**

Source: Shakopee Fire Department Prevention Division Community Risk Classifications List 2023

Economic Resources

The service area has over 1,200 businesses employing nearly 26,000 people. Key economic industries include manufacturing, retail, government, and services.[17]

- Anchor Glass
- Rahr Malting
- Scott County Government
- CertainTeed
- Univar

Natural Resources

Key natural resources within the service area include:[18]

- Abundant lakes among rolling topography
- 2,228 acres of wetlands
- 920 acres of parks, including the Bluff Park archery range
- 60 miles of trails interconnecting with Scott County trail systems
- 4,254 acres of riparian resources

Cultural/Historic Resources

Key cultural/historic resources within the service area include:

- Downtown historic district
- The Landing
- Shakopee Public Library

Special/Unique Resources

The following facilities are special or unique resources to be protected:

- Canterbury Park
- Valleyfair Amusement Park

[17] Source: ESRI Business Summary September 2023 and Scott County 2040 Comprehensive Plan.
[18] Source: City of Shakopee Parks, Trails & Recreation Master Plan, 2019 and City of Shakopee Engineering Department 2023.

A.1.5 Hazard Identification

Citygate utilizes prior risk studies where available, fire and non-fire hazards as identified by the CFAI, and agency/jurisdiction-specific data and information to identify the hazards to be evaluated for this study. The 2021 Scott County Multi-Hazard Mitigation Plan identifies the following 14 hazards within two broad categories that are likely to impact the service area:

Natural Hazards

1. **Severe weather (High wind, hail, and lightning)**
2. **Land Subsidence**
3. **Landslide/Mudslide**
4. **Wildfire**
5. **Flooding**
6. **Ice/Snowstorm**
7. **Extreme Temperatures**
8. **Drought**

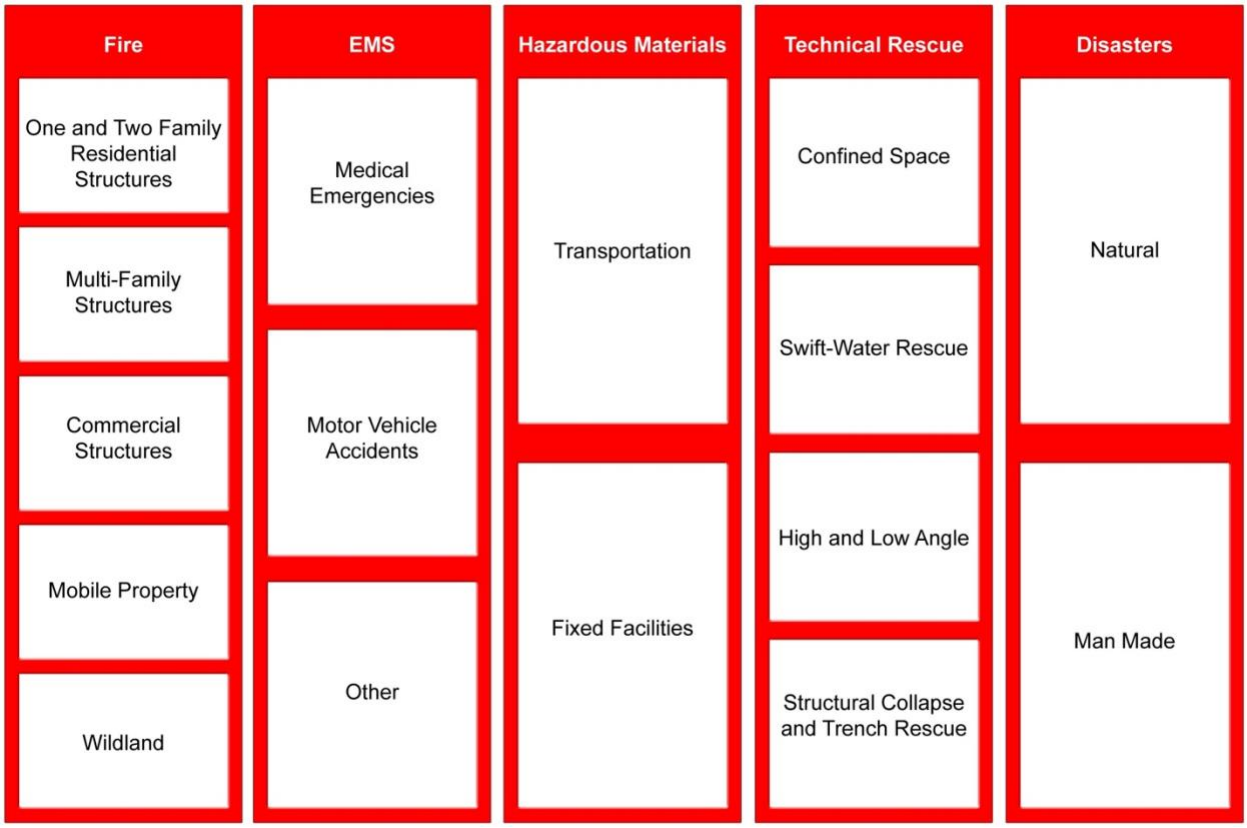
Manmade Hazards

9. **Hazardous Materials**
10. **Illegal Methamphetamine labs**
11. **Pandemic/Epidemic**
12. **Terrorism**
13. **Structure Fire**
14. **Civil Unrest**

Although the Department has no legal authority or responsibility to mitigate any hazards other than fire code violations and possibly for wildfire, it does provide services related to many hazards, including fire suppression, emergency medical services, technical rescue, and hazardous materials response.

The CFAI groups hazards into fire and non-fire categories, as shown in the following figure. Identification, qualification, and quantification of the various fire and non-fire hazards are important factors in evaluating how resources are or can be deployed to mitigate those risks.

Figure 16—Commission on Fire Accreditation International Hazard Categories



Source: CFAI *Standards of Cover* (Fifth Edition)

After review and evaluation of the hazards identified in the Scott County Multi-Hazard Mitigation Plan, the 2020 internal Department Community Risk Assessment, and the fire and non-fire hazards as identified by the CFAI as they relate to services provided by the Department, Citygate evaluated the following six hazards for this risk assessment:

1	**Building Fire**
2	**Vegetation/Wildland Fire**
3	**Medical Emergency**
4	**Hazardous Material Release/Spill**
5	**Technical Rescue**
6	**Marine Incident**

A.1.6 Service Capacity

Service capacity refers to an agency's available response force; the size, types, and condition of its response fleet and any specialized equipment; core and specialized performance capabilities and competencies; resource distribution and concentration; availability of automatic or mutual aid; and any other agency-specific factors influencing its ability to meet current and prospective future service demand and response performance relative to the risks to be protected.

The Department's service capacity for fire and non-fire risks consists of four personnel on duty daily staffing one engine, with a part-time on-call officer available for callback after hours and additional part-time personnel paged as needed. The Department also has two brush engines; three additional engines (one with water tender capacity); one ladder truck; one heavy rescue squad; one airboat; one inflatable rescue boat; and one all-terrain vehicle (ATV)—all of which can be cross-staffed with on-duty or callback personnel as needed.

All response personnel are trained to either the Emergency Medical Technician (EMT) level, capable of providing Basic Life Support (BLS) pre-hospital emergency medical care, or EMT-Paramedic (Paramedic) level, capable of providing Advanced Life Support (ALS) pre-hospital emergency medical care. Ground paramedic ambulance service is provided by Allina Health Emergency Medical Service, a hospital-based ambulance provider operating under an exclusive operating area contract administered by the South Metro Region EMS System. St. Francis Regional Medical center is a Level III trauma center.

Response personnel are also trained to the U.S. Department of Transportation Hazardous Materials First Responder Operational (FRO) level to provide initial hazardous material incident assessment and hazard isolation, and can request a state Hazardous Materials Response Team from the State Duty Officer. Demand for very serious hazardous material response is low and, when required, includes a regional response team from the state-sponsored Hazardous Materials Team for technical support.

The Department also maintains a Dive Rescue Team with 13 Technician-level Divers (11 of which are Ice Diver certified) and 16 Attendants. There is no minimum level of staffing and callback is used to ensure staffing. Similarly, the Rope Rescue Team has 15 members trained to the Technician II (10) and Technician III (5) levels.

A.1.7 Probability of Occurrence

Probability of occurrence refers to the probability of a future hazard occurrence during a specific period. Because the CFAI agency accreditation process requires annual review of an agency's risk assessment and baseline performance measures, Citygate recommends using the 12 months following the completion of an SOC study as an appropriate period for the probability of occurrence evaluation. The following table describes the five probability of occurrence categories and related characteristics used for this analysis.

Table 26—Probability of Occurrence Categories

Category	General Characteristics	Anticipated Frequency of Occurrence
Rare	• Hazard ***may occur*** under exceptional circumstances.	> 10 years
Unlikely	• Hazard ***could occur*** at some time. • No recorded or anecdotal evidence of occurrence. • Little opportunity, reason, or means for hazard to occur.	2–10 years
Possible	• Hazard ***should occur*** at some time. • Infrequent, random recorded or anecdotal evidence of occurrence. • Some opportunity, reason, or means for hazard to occur.	1–23 months
Probable	• Hazard will ***probably occur*** occasionally. • Regular recorded or strong anecdotal evidence of occurrence. • Considerable opportunity, reason, or means for hazard to occur.	1–4 weeks
Frequent	• Hazard is ***expected to occur*** regularly. • High level of recorded or anecdotal evidence of regular occurrence. • Strong opportunity, reason, or means for hazard to occur. • Frequent hazard recurrence.	Daily to weekly

Citygate's SOC assessments use recent multiple-year hazard response data to determine the probability of hazard occurrence for the ensuing 12-month period.

A.1.8 Impact Severity

Impact severity refers to the *probable* extent a hazard occurrence has on people, buildings, lifeline services, the environment, and the community. The following table describes the five impact severity categories and general characteristics used for this analysis.

Table 27—Impact Severity Categories

Category	General Characteristics
Insignificant	• No injuries or fatalities • None to few persons displaced for short duration • Little or no personal support required • None to inconsequential damage • None to minimal community disruption • No measurable environmental impacts • None to minimal financial loss • No wildland Fire Hazard Severity Zones
Minor	• Few injuries; no fatalities; minor medical treatment only • Some displacement of persons for less than 24 hours • Some personal support required • Some minor damage • Minor community disruption of short duration • Small environmental impacts with no lasting effects • Minor financial loss • No wildland Fire Hazard Severity Zones
Moderate	• Medical treatment required; some hospitalizations; few fatalities • Localized displaced of persons for less than 24 hours • Personal support satisfied with local resources • Localized damage • Normal community functioning with some inconvenience • No measurable environmental impacts with no long-term effects, or small impacts with long-term effect • Moderate financial loss • Less than 25% of area in *Moderate* or *High* wildland FHSZ
Major	• Extensive injuries; significant hospitalizations; many fatalities • Large number of persons displaced for more than 24 hours • External resources required for personal support • Significant damage • Significant community disruption; some services not available • Some impact to environment with long-term effects • Major financial loss with some financial assistance required • More than 25% of area in *Moderate* or *High* wildland FHSZ; less than 25% in *Very High* wildland FHSZ
Extreme	• Large number of severe injuries requiring hospitalization; significant fatalities • General displacement for extended duration • Extensive personal support required • Extensive damage • Community unable to function without significant external support • Significant impact to environment and/or permanent damage • Catastrophic financial loss; unable to function without significant support • More than 50% of area in *High* wildland FHSZ; more than 25% of area in *Very High* wildland FHSZ

A.1.9 Overall Risk

As a reminder to the reader, overall risk was determined by considering the probability of occurrence and reasonably expected impact severity according to the following table.

Table 28—Overall Risk

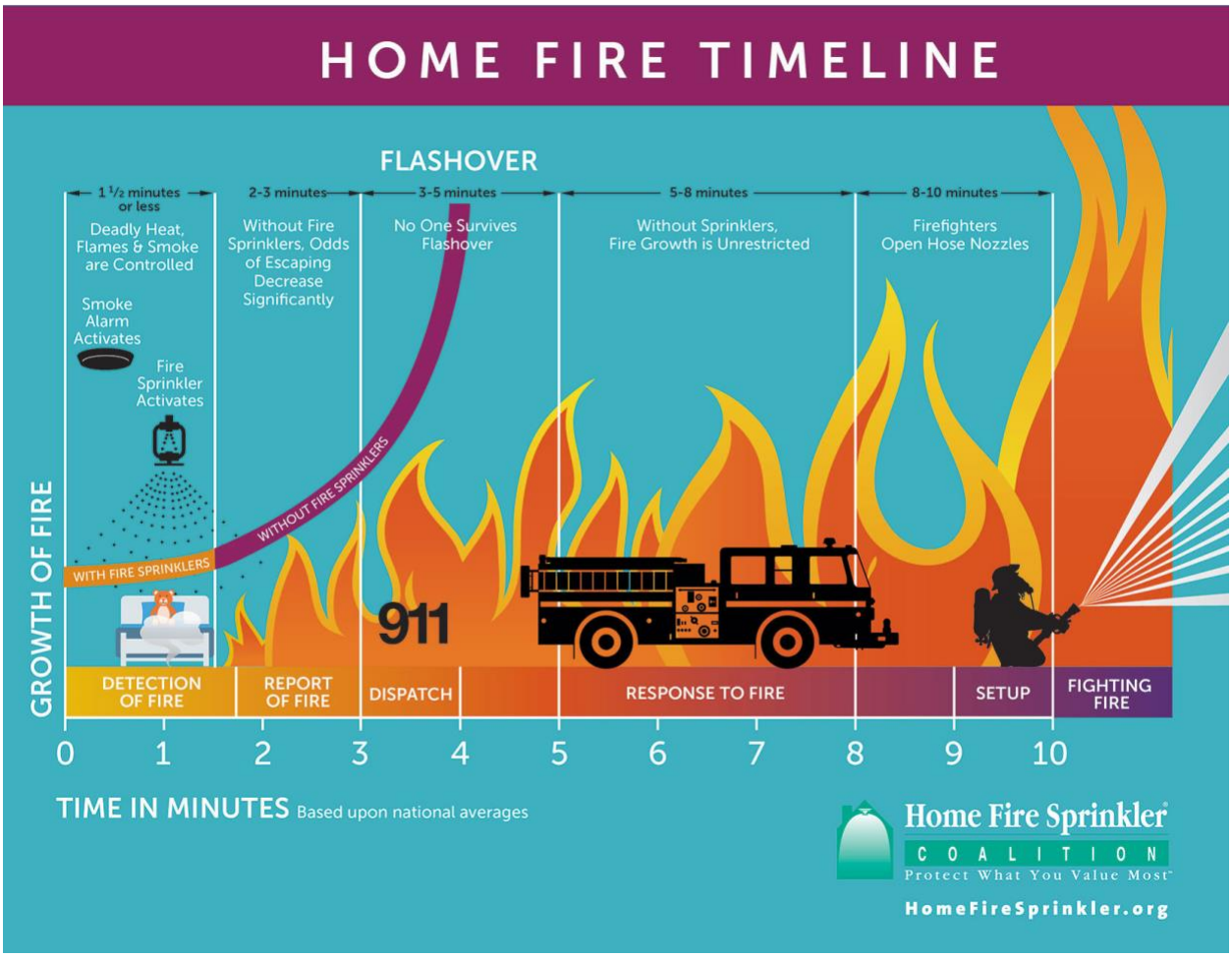
Probability of Occurrence	Probable Impact Severity				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	*Low*	*Low*	*Low*	*Moderate*	*High*
Unlikely	*Low*	*Low*	*Low*	*Moderate*	*High*
Possible	*Low*	*Low*	*Moderate*	*High*	*Extreme*
Probable	*Low*	*Low*	*Moderate*	*High*	*Extreme*
Frequent	*Low*	*Moderate*	*High*	*Extreme*	*Extreme*

A.1.10 Building Fire Risk

One of the primary hazards in any community is building fire. Building fire risk factors include building size, age, construction type, density, occupancy, and height above ground level; required fire flow; proximity to other buildings; built-in fire protection/alarm systems; available fire suppression water supply; building fire service capacity; and fire suppression resource deployment (distribution/concentration), staffing, and response time. Citygate used available data from the Department and the U.S. Census Bureau to assist in determining the service area's building fire risk.

The following figure illustrates the building fire progression timeline and shows that flashover, which is the point at which the entire room erupts into fire after all the combustible objects in that room reach their ignition temperature, can occur as early as 3:00 to 5:00 minutes from the initial ignition. Human survival in a room after flashover is extremely improbable.

Figure 17—Building Fire Progression Timeline



Source: http://www.firesprinklerassoc.org

Population Density

Although risk analysis across a wide spectrum of other Citygate clients shows no direct correlation between population density and building fire *occurrence*, it is reasonable to conclude that building fire *risk* relative to potential impact on human life is greater as population density increases, particularly in areas with high density, multiple-story buildings.

Water Supply

A reliable public water system providing adequate volume, pressure, and flow duration in close proximity to all buildings is a critical factor in mitigating the potential impact severity of a community's building fire risk. Potable water is provided by Shakopee Public Utilities and, according to Department staff, available fire flow volume and pressure are adequate in most of the service area except for areas without fire hydrants.

Building Fire Service Demand

For the three-year period from July 1, 2020, through June 31, 2023, the service area experienced 93 building fire incidents comprising 1.97 percent of total service demand over the same period, as summarized in the following tables.

Table 29—Building Fire Service Demand

Hazard	Year	Planning Zone			Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Other		
Building Fire	RY 20/21	24	14	1	**39**	2.93%
	RY 21/22	16	13	0	**29**	1.70%
	RY 22/23	13	12	0	**25**	1.48%
	Total	**53**	**39**	**1**	**93**	**1.97%**
Percent Total Station Demand		1.99%	2.19%	0.36%		

As the table shows, annual building fire service demand fluctuated downward by nearly 50 percent over the three-year period studied by Citygate. Overall, building fire service demand is low at only 1.97 percent of total service demand.

Building Fire Risk Assessment

The following table summarizes Citygate's assessment of the service area's building fire risk by planning zone.

Table 30—Building Fire Risk Assessment

Building Fire Risk	Planning Zone	
	Station 1	Station 2
Probability of Occurrence	*Probable*	*Probable*
Probable Impact Severity	*Moderate-*	*Moderate-*
Overall Risk	***Moderate***	***Moderate***

A.1.11 Vegetation/Wildland Fire Risk[19]

Some areas within and adjacent to the service area are susceptible to a vegetation/wildland fire. Vegetation/wildland fire risk factors include vegetative fuel types and configuration, weather,

[19] Source: Minnesota Department of Natural Resources and Scott County Hazard Mitigation Plan of 2021.

topography, prior fires, water supply, mitigation measures, and vegetation/wildland fire service capacity.

Vegetative Fuels

Vegetative fuel factors influencing fire intensity and spread include fuel type (vegetation species), height, arrangement, density, and moisture. In addition to decorative landscape species, vegetative fuels within the service area consist of a mix of annual grasses and weeds, invasive species, and mixed deciduous and conifer tree species. Once ignited, vegetation fires can burn intensely and contribute to rapid fire spread under the right fuel, weather, and topographic conditions.

Weather

Weather elements, including temperature, relative humidity, wind, and lightning, also affect vegetation/wildland fire potential and behavior. High temperatures and low relative humidity dry out vegetative fuels, creating a situation where fuels will more readily ignite and burn more intensely. Wind is the most significant weather factor influencing vegetation/wildland fire behavior, with higher wind speeds increasing fire spread and intensity. Fuel and weather conditions most conducive to vegetation/wildfires generally occur from late June through October; however, above-normal temperatures and drought can increase that period on either end.

Water Supply

Another significant vegetation fire impact severity factor is water supply immediately available for fire suppression. According to Fire Department staff, available fire flow and hydrant spacing is adequate throughout most of the developed service area.

Vegetation/Wildland Fire Service Demand

Over the three-year period studied by Citygate, the Department responded to 62 vegetation/wildfires comprising 1.31 percent of total service demand over the same period, as summarized in the following tables.

Table 31—Vegetation/Wildland Fire Service Demand

Hazard	Year	Planning Zone			Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Other		
Vegetation/Wildland Fire	RY 20/21	5	11	5	**21**	1.58%
	RY 21/22	12	10	5	**27**	1.59%
	RY 22/23	7	6	1	**14**	0.83%
	Total	**24**	**27**	**11**	**62**	**1.31%**
Percent Total Station Demand		0.90%	1.52%	3.96%		

As the table shows, annual vegetation/wildland fire service demand varied over the three-year period studied by Citygate, with low overall demand.

Vegetation/Wildland Fire Risk Assessment

The following table summarizes Citygate's assessment of the service area's vegetation/wildland fire risk by planning zone.

Table 32—Vegetation/Wildland Fire Risk Assessment

Vegetation/Wildland Fire Risk	Planning Zone	
	Station 1	Station 2
Probability of Occurrence	*Possible*	*Possible*
Probable Impact Severity	*Minor*	*Minor*
Overall Risk	***Low***	***Low***

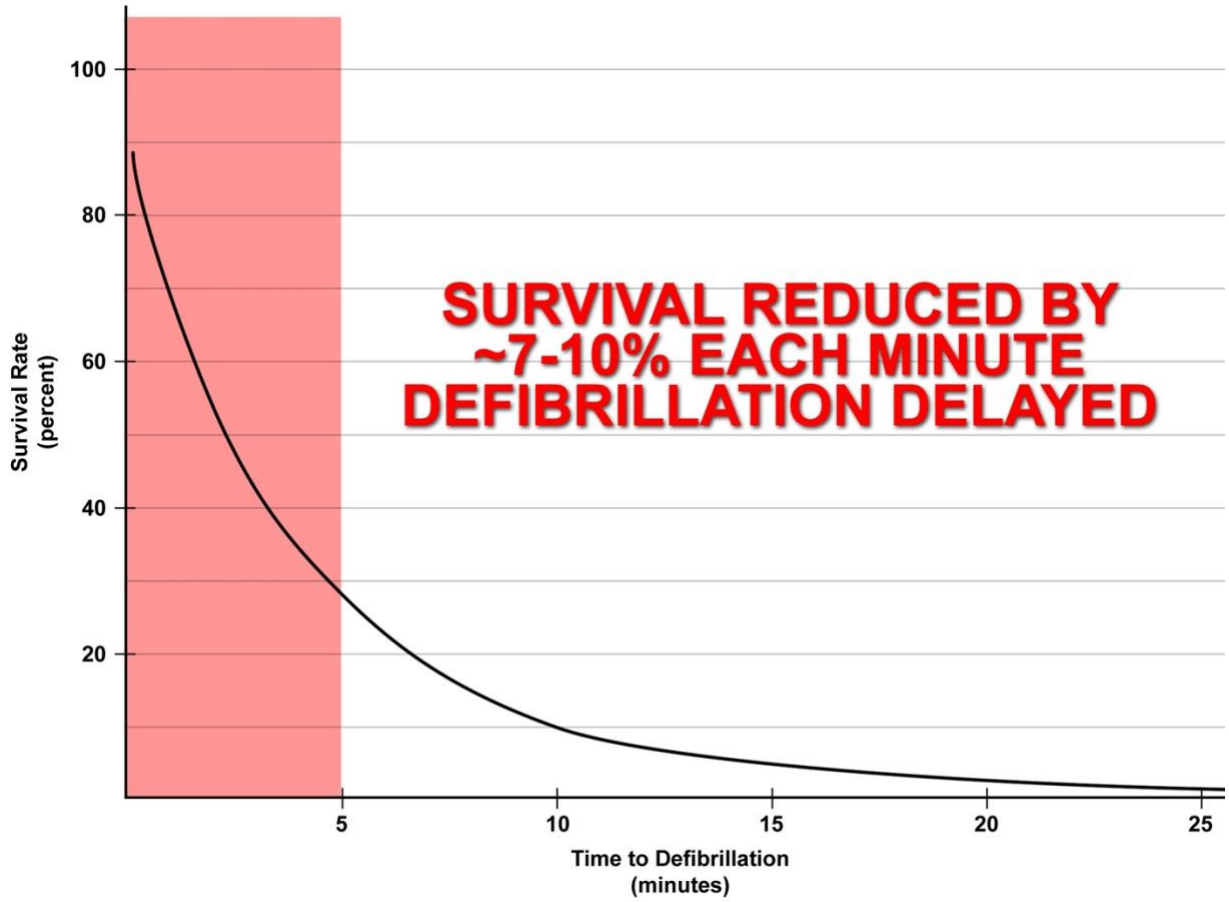
A.1.12 Medical Emergency Risk

Medical emergency risk in most communities is predominantly a function of population density, demographics, violence, health insurance coverage, and vehicle traffic.

Medical emergency risk can also be categorized as either a medical emergency resulting from a traumatic injury or a health-related condition or event. Cardiac arrest is one serious medical emergency among many where there is an interruption or blockage of oxygen to the brain.

The following figure illustrates the reduced survivability of a cardiac arrest victim as time to defibrillation increases. While early defibrillation is one factor in cardiac arrest survivability, other factors can influence survivability as well, such as early CPR and pre-hospital advanced life support interventions.

Figure 18—Survival Rate versus Time to Defibrillation



Population Density

Risk analysis across a wide spectrum of other Citygate clients shows a direct correlation between population density and the *occurrence* of medical emergencies, particularly in high urban population density zones.

Demographics

Medical emergency risk tends to be higher among older, poorer, less educated, and uninsured populations. As shown in Table 24, 9.4 percent of the service area population is 65 and older; 3 percent of the population over 24 years of age has less than a high school education or equivalent; nearly 7 percent of the population is at or below poverty level; and 5 percent of the population does not have health insurance coverage.[20]

[20] Source: ESRI and US Census Bureau.

Vehicle Traffic

Medical emergency risk tends to be higher in areas of a community with high daily vehicle traffic volume, particularly areas with high traffic volume traveling at high speeds. The service area's transportation network includes Highways 101 and 169 carrying an aggregate annual average daily traffic volume of more than 41,000 vehicles.[21]

Medical Emergency Service Demand

Medical emergency service demand over the three-year period studied by Citygate includes more than 1,874 calls for service comprising nearly 40 percent of total service demand over the same period, as summarized in the following tables.

Table 33—Medical Emergency Service Demand

Hazard	Year	Planning Zone			Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Other		
Medical Emergency	RY 20/21	206	157	62	**425**	31.91%
	RY 21/22	394	233	69	**696**	40.92%
	RY 22/23	405	289	59	**753**	44.50%
	Total	**1,005**	**679**	**190**	**1,874**	**39.66%**
Percent Total Station Demand		37.70%	38.12%	68.35%		

As the table shows, medical emergency service demand varies significantly by planning zone but has increased overall each year over the three-year period studied by Citygate.

Medical Emergency Risk Assessment

The following table summarizes Citygate's assessment of the service area's medical emergency risk by planning zone.

[21] Source: Minnesota Department of Transportation Traffic Mapping Application 2023.

Table 34—Medical Emergency Risk Assessment

Medical Emergency Risk	Planning Zone	
	Station 1	Station 2
Probability of Occurrence	*Frequent*	*Frequent*
Probable Impact Severity	*Moderate*	*Moderate*
Overall Risk	***High***	***High***

A.1.13 Hazardous Material Risk

Hazardous material risk factors include fixed facilities that store, use, or produce hazardous chemicals or waste; underground pipelines conveying hazardous materials; aviation, railroad, maritime, and vehicle transportation of hazardous commodities into or through a jurisdiction; vulnerable populations; emergency evacuation planning and related training; and specialized hazardous material service capacity.

Transportation-Related Hazardous Materials

The service area also has transportation-related hazardous material risk because of its road transportation network—including Highways 101 and 169, which carry an aggregate annual average daily truck traffic volume of more than 41,000 vehicles, some of which are transporting hazardous materials, as summarized in the following table.[22]

Table 35—Average Annual Daily Traffic Volume

Highway	Crossing	AADT[1]
101	383	30,382
169	42507	11,240
	Total	**41,622**

The service area also has transportation-related hazardous material risk due to numerous train movements into and through the service area daily, many of which are transporting hazardous commodities.

Vulnerable Populations

Persons vulnerable to a hazardous material release/spill include individuals or groups unable to self-evacuate, generally including children under the age of 10, the elderly, and persons confined

[22] Source: Minnesota Department of Transportation Traffic Mapping Application 2023.

to an institution or other setting where they are unable to leave voluntarily. As shown in Table 24, nearly 26 percent of the population is under age 10 or is 65 years and older.

Emergency Evacuation Planning, Training, Implementation, and Effectiveness

Another significant hazardous material impact severity factor is a jurisdiction's shelter-in-place / emergency evacuation planning and training. In the event of a hazardous material release or spill, time can be a critical factor in notifying potentially affected persons, particularly at-risk populations, to either shelter-in-place or evacuate to a safe location. Essential to this process is an effective emergency plan that incorporates one or more mass emergency notification capabilities, as well as pre-established evacuation procedures. It is also essential to conduct regular, periodic exercises involving these two emergency plan elements to evaluate readiness and to identify and remediate any planning or training gaps to ensure ongoing emergency incident readiness and effectiveness.

The service area has a subscription and reverse 9-1-1-based mass emergency notification system (CodeRED) that is used to provide emergency alerts, notifications, and other emergency information to email accounts, cell phones, smartphones, tablets, and landline telephones. Outdoor sirens and social media (Facebook, Twitter) are also used to provide emergency notifications and information to the public.

Hazardous Material Service Demand

The service area experienced 240 hazardous material incidents over the three-year period studied by Citygate, comprising 5.08 percent of total service demand over the same period, as summarized in the following tables.

Table 36—Hazardous Material Service Demand

Hazard	Year	Planning Zone			Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Other		
Hazardous Material	RY 20/21	33	25	1	**59**	4.43%
	RY 21/22	72	34	1	**107**	6.29%
	RY 22/23	41	33	0	**74**	4.37%
	Total	**146**	**92**	**2**	**240**	**5.08%**
Percent Total Station Demand		5.48%	5.17%	0.72%		

As the table shows, hazardous material service demand was generally consistent over the three-year period studied by Citygate.

Hazardous Material Risk Assessment

The following table summarizes Citygate's assessment of hazardous material risk by planning zone.

Table 37—Hazardous Material Risk Assessment

Hazardous Materials Risk	Planning Zone	
	Station 1	Station 2
Probability of Occurrence	*Probable*	*Probable*
Probable Impact Severity	*Moderate*	*Moderate*
Overall Risk	***Moderate***	***Moderate***

A.1.14 Technical Rescue Risk

Technical rescue risk factors include active construction projects; structural collapse potential; confined spaces, such as tanks and underground vaults; bodies of water, including rivers and streams; industrial machinery use; transportation volume; and earthquake, flood, and landslide potential.

Construction Activity

There is ongoing residential, commercial, industrial, and infrastructure construction activity within the service area.

Confined Spaces

There are multiple confined spaces within the service area, including tanks, vaults, and open trenches.

Bodies of Water

The service area has numerous lakes, ponds, and open stream channels (including Shakopee Creek) that comprise part of the Minnesota River drainage system.

Transportation Volume

Another technical rescue risk factor is transportation-related incidents requiring technical rescue. This risk factor is primarily a function of vehicle, railway, maritime, and aviation traffic. Vehicle traffic volume is the greatest of these factors within the service area, with Highways 101 and 169 carrying an aggregate annual average daily traffic volume of more than 41,000.[23]

[23] Source: Minnesota Department of Transportation Traffic Mapping Application.

Flood Risk

Many areas of the service area are subject to flooding from various causes.

Technical Rescue Service Demand

The Department responded to 39 technical rescue incidents over the three-year period studied by Citygate, comprising 0.83 percent of total service demand for the same period, as summarized in the following tables.

Table 38—Technical Rescue Service Demand

Hazard	Year	Planning Zone			Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Other		
Technical Rescue	RY 20/21	6	4	1	**11**	0.83%
	RY 21/22	6	5	1	**12**	0.71%
	RY 22/23	12	4	0	**16**	0.95%
	Total	**24**	**13**	**2**	**39**	**0.83%**
Percent Total Station Demand		0.90%	0.73%	0.72%		

As the table shows, overall technical rescue service demand is very low and was relatively constant over the three-year period studied by Citygate.

Technical Rescue Risk Assessment

The following table summarizes Citygate's assessment of technical rescue risk by planning zone.

Table 39—Technical Rescue Risk Assessment

Technical Rescue Risk	Planning Zone	
	Station 1	Station 2
Probability of Occurrence	*Possible*	*Possible*
Probable Impact Severity	*Moderate-*	*Moderate*
Overall Risk	***Moderate***	***Moderate***

A.1.15 Marine Incident Risk

Marine incident risk factors include waterway and near-shore recreational activities and watercraft storage and use in or on waterways within the service area.

Waterways

Bodies of water and waterways within the service area include Shakopee Creek, 9.4 miles of the Minnesota River, and numerous ponds and lakes.

Recreational Activity

The service area's waterways are popular for water recreation activities, including swimming, fishing, paddle boarding, kayaking, etc.

Marine Incident Service Capacity

The Department's marine safety service capacity includes 13 certified divers and a cadre of attendants to support ice and cold-water operations.

Marine Incident Service Demand

Over three-year period studied by Citygate, the Department responded to 9 marine incidents, comprising 0.19 percent of total service demand for the same period, as summarized in the following tables.

Table 40—Marine Incident Service Demand

Hazard	Year	Planning Zone			Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Other		
Marine Incident	RY 20/21	1	1	0	**2**	0.15%
	RY 21/22	4	1	1	**6**	0.35%
	RY 22/23	0	1	0	**1**	0.06%
	Total	**5**	**3**	**1**	**9**	**0.19%**
Percent Total Station Demand		0.19%	0.17%	0.36%		

As the table shows, overall marine incident service demand is very low, but varies considerably over the three-year period studied by Citygate.

Marine Risk Assessment

The following table summarizes Citygate's assessment of marine incident risk by planning zone.

Table 41—Marine Incident Risk Analysis

Marine Incident Risk	Planning Zone	
	Station 1	Station 2
Probability of Occurrence	*Possible*	*Possible*
Probable Impact Severity	*Moderate-*	*Moderate*
Overall Risk	***Moderate***	***Moderate***