



SUMMARY & FINDINGS REPORT

2023 Community Risk Assessment & Standards of Cover

Executive Summary | Facilities | Apparatus | Findings | Recommendations

Oshkosh Fire Department

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Emergency Services Consulting International
Helping Change the World, One Community at a Time

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Executive Summary

Emergency Services Consulting International (ESCI) is pleased to present the findings and recommendations from our comprehensive Community Risk Assessment (CRA) and Standards of Cover (SOC) project conducted for the Oshkosh Fire Department (OFD). This project aimed to enhance the effectiveness and readiness of OFD by addressing key aspects of their emergency response services and community risk assessment. Below is a summary of the key project components and outcomes.

The project began with the development of an innovative Community Risk Assessment Hub. This innovative tool centralizes critical data on community risk, demographics, incident response, department deployment, and emergency response system performance. The Hub provides OFD with insights into evolving risks, enabling them to allocate resources more efficiently and respond effectively to emerging challenges.

ESCI has crafted a comprehensive SOC document for OFD. This document establishes benchmark performance standards categorized by risk and classification. It covers a wide range of emergency response services, including fire suppression, emergency medical response, hazardous materials response, dive and water rescue, and technical rescue. These standards serve as a foundation for optimizing OFD's operational strategies and resource allocation.

In addition to the SOC, ESCI consultants prepared a detailed Summary and Findings document. This document offers a holistic assessment of OFD's facilities, apparatus, and a deeper exploration into performance measurement, administrative staffing, and EMS unit staffing and deployment. It provides actionable recommendations to enhance OFD's operational efficiency and service delivery.

Throughout this project, ESCI has worked collaboratively with OFD to gain a deep understanding of their unique challenges and needs. Our recommendations are tailored to align with OFD's mission to safeguard the Oshkosh community through skillful emergency services and risk reduction.

ESCI is proud to have partnered with the Oshkosh Fire Department in this endeavor, and we believe that this project's outcomes will empower OFD to continue providing the highest level of service to the community.



Acknowledgments

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Administrative Considerations

Mission Statement Performance Measurement

The City of Oshkosh Fire Department's commitment to its mission is commendable, and their proactive use of Key Performance Indicators (KPIs) to measure their progress in achieving it demonstrates their dedication to the community's safety and well-being. Their mission statement, which emphasizes being a highly trained team that adds value through emergency services, risk reduction, and leadership during crisis, serves as a guide for their operations.

The City of Oshkosh Fire Department is a highly trained team that adds value to our community by providing a wide range of emergency services with skill and compassion. We advocate risk reduction through prevention and education, and we provide leadership in times of crisis.

The department's choice of KPIs is both strategic and purposeful. By conducting monthly standardized Company Performance Drills, they are not only ensuring their team's continuous improvement, but, also, setting a baseline for measuring their readiness for fire suppression operations. Furthermore, their focus on reviewing EMS incidents, customer satisfaction surveys, and fire inspections highlights a comprehensive approach to serving the community. These KPIs align with their mission, reflecting their commitment to being highly trained, adding value to the community, demonstrating skill and compassion, and actively promoting risk reduction and prevention.



Table 1: Key Performance Indicators for the OFD Mission (OFD Table)

Mission Statement	Indicator	Measurement
Highly Trained	Monthly standardized Company Performance Drills will be conducted in 2023 to create a baseline measurement of the time needed for performing tasks required to support an effective fire suppression operation.	Type of Drill 90% completion time
Adds value to our community	Review EMS incidents where CVA was the primary impression to determine the number of times the patient was not transported to a stroke center within 15 minutes of the first OFD unit's arrival.	Total # of CVA calls Measure scene time % under 15 minutes
Skill & Compassion	Survey a valid sample size of Oshkosh residents who have received service from the fire department in the previous month to establish a baseline for customer satisfaction in 2023.	Total # of calls # of Surveys sent out # of Surveys returned Score on questions 3–6
Community Risk Reduction	Fire inspections conducted in 2023 will be reviewed to identify commercial occupancies with fire code violations to create a baseline measurement of the number of re-inspections that should be completed to achieve fire code compliance.	Total # of fire inspections How many require re-inspections? How many did we re-inspect?

Fire Code Enforcement & Risk Reduction

Within the Oshkosh Fire Department (OFD), the Fire Prevention Bureau plays a pivotal role in safeguarding the community by enforcing fire codes, conducting inspections, and promoting fire safety education. However, a series of interviews and reviews have revealed significant staffing challenges that hinder the bureau's ability to effectively carry out its responsibilities.



The Fire Prevention Bureau is presently staffed by an Assistant Chief (Fire Marshal), a Fire Captain (Deputy Fire Marshal), and a civilian public educator/PIO. The Assistant Chief and Captain are mainly tasked with conducting fire inspections and code enforcement. However, the challenges emerge when we delve into the additional responsibilities placed upon these two key positions.

In addition to fire inspections, the Assistant Chief and the Captain shoulder supplementary duties. These responsibilities include assisting with fire training academies, managing OFD facilities, community outreach initiatives, new construction inspections, fire investigations, third-party system testing, monitoring controlled burns, and other duties as assigned. This diverse array of tasks, while important, often diverts their attention and resources away from core fire prevention activities.

Operations crews within OFD also conduct fire code inspections, conducting approximately 2,300 inspections annually. However, the Fire Prevention Bureau's Captain alone conducted around 900 inspections last year. The sheer volume of inspections, coupled with the myriad of other responsibilities, creates an immense administrative burden, limiting the Bureau's ability to follow up effectively on inspections.

One notable challenge faced by the Fire Prevention Bureau is the time commitment required for re-inspections. Fire code compliance mandates re-inspections for properties with violations, which are labor-intensive processes that consume substantial time and resources. Unfortunately, due to the competing demands on the Assistant Chief and the Captain's schedules, re-inspections often go unaddressed, potentially compromising community safety.

The state of Wisconsin imposes stringent requirements on OFD, mandating fire code inspections for nearly every multi-family and commercial occupancy in the city. While this is a crucial aspect of fire prevention, the existing staffing constraints have made it increasingly difficult for the Fire Prevention Bureau to comprehensively meet these legal obligations.

To assist with code compliance in the City of Oshkosh, specifically third-party inspection follow-up, the Bureau has implemented Brycer's "The Compliance Engine" (TCE). Third-party inspections include fire alarm, commercial cooking hood, and fire sprinkler inspections conducted by non-city inspectors, typically a trained contractor. OFD partnered with TCE to allow third-party inspectors to submit violations directly to



TCE for initial follow-up. If initial follow-up, usually through form letters, does not achieve the intended result, the TCE process pushes the follow-up to OFD. However, the utilization of TCE has brought forth an additional administrative workload that further strains the Captain's capacity to manage inspections effectively. Coordinating TCE data with other responsibilities has proven challenging and time-consuming.

The Fire Prevention Bureau of the Oshkosh Fire Department faces substantial staffing challenges that hinder its ability to fulfill its mission of ensuring fire safety within the community. Addressing these challenges will be crucial to meeting state requirements, reducing fire risks, and enhancing the overall safety and well-being of Oshkosh residents. Immediate attention and solutions are required to better allocate resources and streamline processes within the Fire Prevention Bureau to improve its efficiency and effectiveness.



Operational Response Considerations

EMS Unit Cross Staffing

Under the current deployment model, OFD provides three ambulances that are staffed full-time to the total response area population. Four additional ambulances are available for deployment; however, OFD utilizes a cross-staffing model. Cross-staffing in the fire service means that to provide trained personnel to deploy a cross-staffed unit, another in-service unit must provide the staffing. When cross-staffing occurs, the donor unit is marked out of service and is no longer available to provide emergency services and resources to an area.

As an example, if Medics 15, 16, and 17 are committed to medical calls, OFD may opt to deploy one of the additional four transport ambulances. In this case, the staff from Engine 14 could move to Medic 214 and responds to the call for service. Engine 14 provides first-response paramedic and fire suppression services to a population of 7,215, and to 3,516 households across approximately eight square miles. Once Medic 214 is deployed, Station 14's area will experience a decrease in response performance because Engine 14 is no longer in-service.

The table below shows the current ambulance staffing models.



Table 2: Available EMS Transport Resources

Unit	Type	Station	Daily Staffing
Medic 15	ALS Ambulance	Station 15	2
Medic 16	ALS Ambulance	Station 16	2
Medic 17	ALS Ambulance	Station 17	2
Medic 214	Crossed Staffed by Engine 14	Station 14	0
Medic 216	Crossed Staffed by Engine 16	Station 16	0
Medic 218	Crossed Staffed by Engine 18	Station 18	0
Medic 219	Crossed Staffed by Engine 19	Station 19	0

The table below shows the cumulative number of hours a cross-staffed ambulance was used which subsequently placed the affected fire engine out of service.

Table 3: Cumulative Hours of Cross-Staffed Ambulance Use by Calendar Year

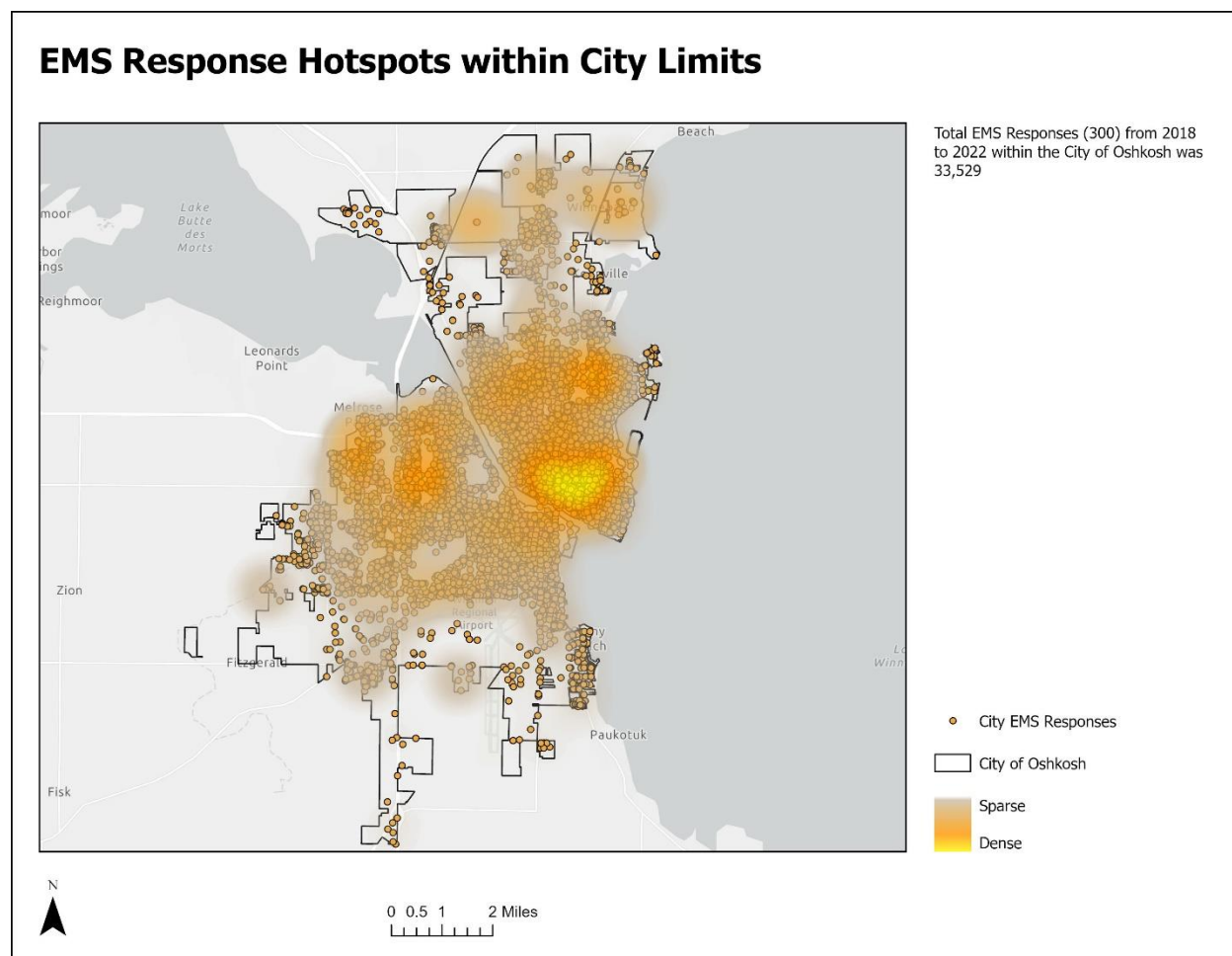
Calendar Year	Medic 214 (Engine 14)	Medic 215 (Engine 15)	Medic 216 (Engine 16)	Medic 217 (Engine 17)	Medic 218 (Engine 18)	Medic 219 (Engine 19)
2018	N/A	57.9	51.8	N/A	33.4	28.9
2019	N/A	61.1	44.0	13.8	45.3	47.3
2020	N/A	54.8	53.6	N/A	56.1	47.9
2021	N/A	51.1	55.7	N/A	46.3	39.6
2022	N/A	73.6	72.2	N/A	66.9	62.8

EMS Utilization & Response Area

The Oshkosh Fire Department responded to 40,295 medical calls for services (300-series NFIRS) between 2018 and 2022. Predictably, the majority of those incident responses (83.2%) occurred within the city limits of Oshkosh. The figure below shows that of the city responses, the highest concentration occurs in the downtown corridor and is aligned with the concentration of the population and commerce.



Figure 1: In-City EMS Response Map



Also, the City of Oshkosh Fire Department responds to all emergency and non-emergency medical calls within communities that are part of an Inter-Governmental Agreement. These communities include the following cities, townships, and villages:

- City of Omro
- Town of Algoma
- Town of Black Wolf
- Town of Nekimi
- Town of Omro
- Town of Poygan
- Town of Rushford
- Town of Van Dyne
- Town of Winneconne
- Village of Winneconne
- Town of Utica

The following table, based on the 2023 projected population, shows that OFD is responsible for providing emergency medical transport services to more than 90,000 people, 38,190 households, over a 233 square mile area. For context, Winnebago County is 434 square miles.

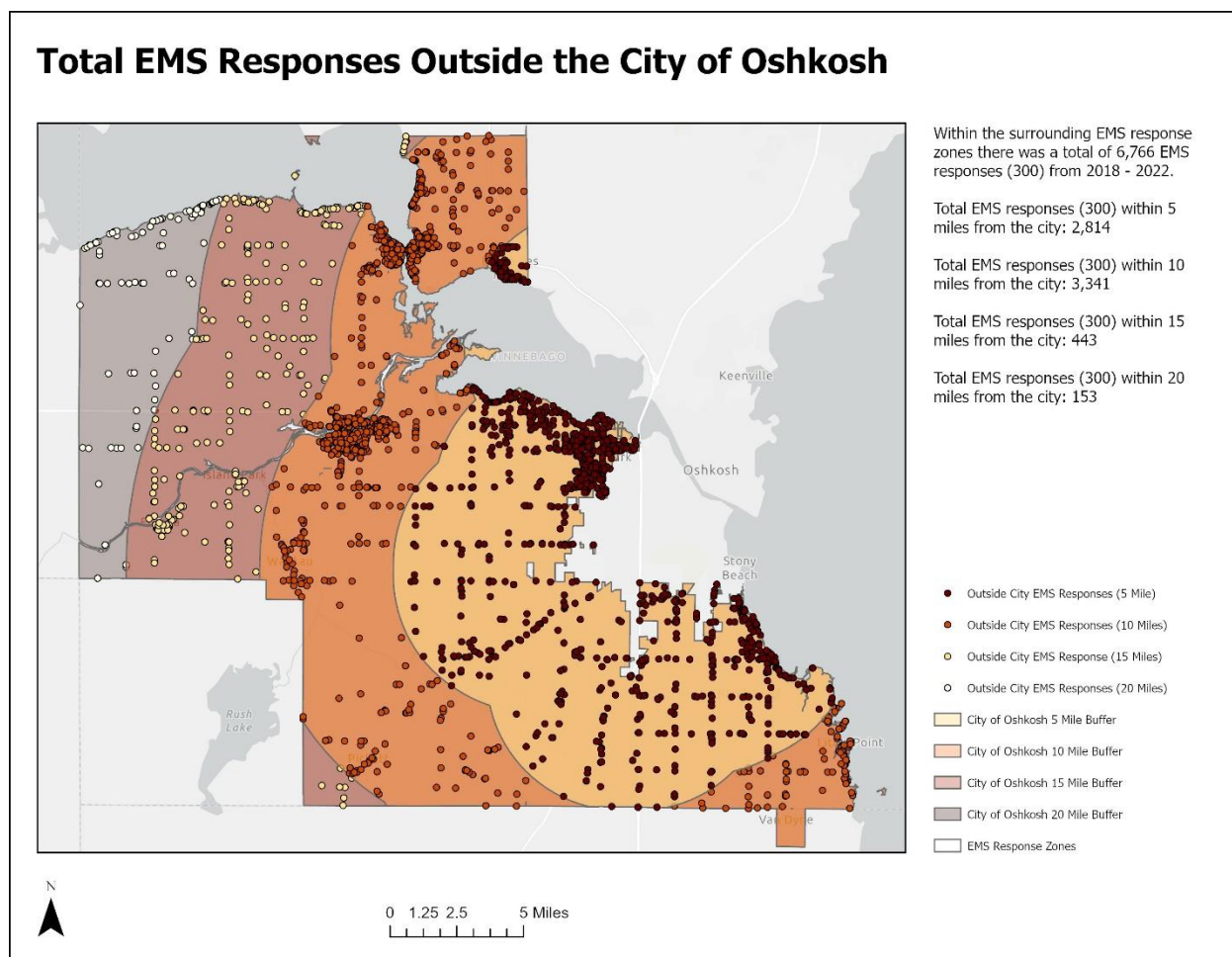
Table 4: Population & Households by EMS Area

Area	Population	Daytime Population	Households	Area (in Sq. Miles)
EMS Area - Outside of City	26,507	19,171	10,590	205.87
EMS Area - Inside City	65,351	74,167	27,600	27.67
Total	91,858	93,338	38,190	233.54

OFD's response outside of the city limits is important to discuss. As visualized in the figure below, responses into the Inter-Governmental Agreement are not evenly distributed. The call volume density is in three different areas. Additionally, more than half of all EMS responses outside the city occur more than ten miles from the city's boundary.



Figure 2: Outside-City EMS Response Points & Distance

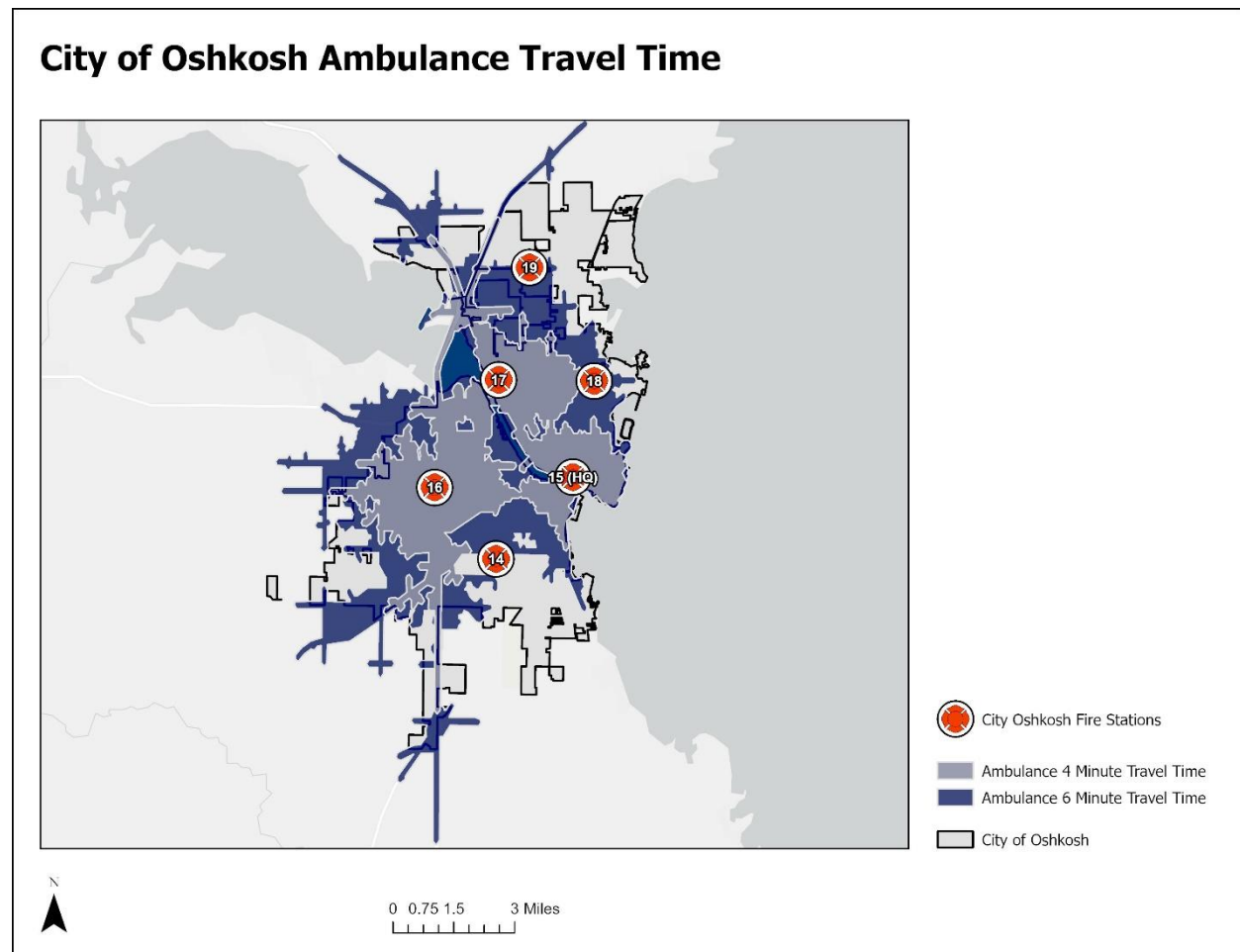


Although EMS responses in this area account for 16.8% of all EMS responses, the travel distance and reflex time back to the city should be considered. On average, OFD ambulances travel more than 10 miles away from the city's nearest boundary 2.15 times per day.

To clarify the figure above, the shaded area labeled "City of Oshkosh 10 Mile Buffer" represents the collection of incident responses between five and ten miles from the city boundary. Furthermore, the communities of Omro and Winneconne are within this catchment. Although the areas are 5–10 miles, the typical travel time to both these communities are 18–19 minutes.

Based on the figure below, the fire department's ambulance coverage provides baseline coverage to the city response area using 4-minute and 6-minute travel-time performance benchmarks. However, when ambulances leave the primary service area, they become unavailable for city responses as they are committed to other communities.

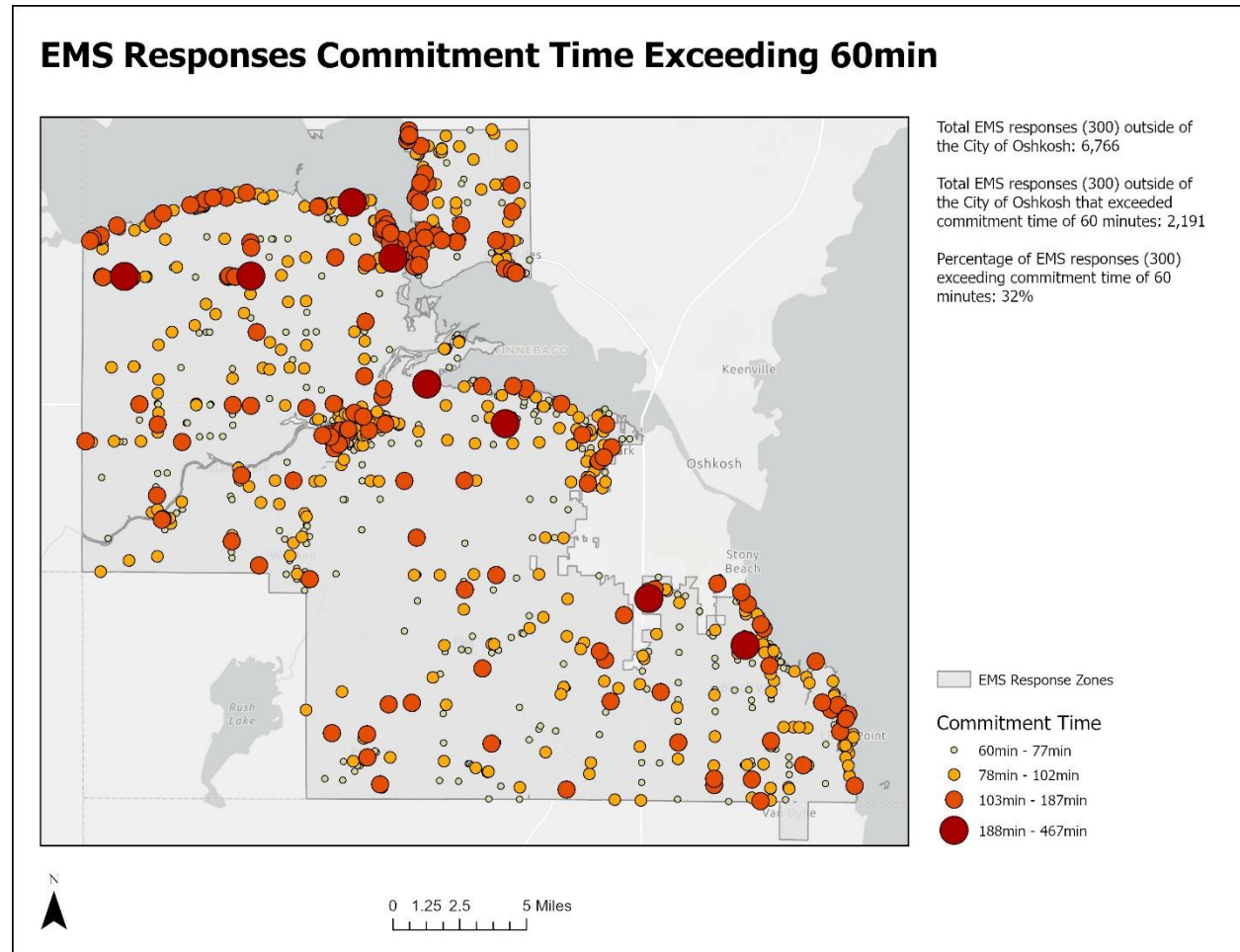
Figure 3: OFD Ambulance Travel Time Capacity



Additionally, responses outside of the city have a greater commitment time (time between dispatch and return-to-service) than the city incidents. Responses outside of the city have longer travel times and without the OFD resources to assist ambulance crews in patient mobilization and care, ambulances are less efficient in routine transports. Medical calls in the city, in many cases, also have three OFD fire engine personnel available to assist in moving the patient from the incident location to the ambulance and assisting with patient care prior to transport. The two figures below

visualize commitment times. Interestingly, the data shows that 32% of outside-city EMS calls and 15% of in-city calls show unit commitment exceeding sixty minutes.

Figure 4: Ambulance Commitment Outside the City



career fire departments. This standard includes guidelines for the minimum number of personnel and types of apparatus that should respond to different types of incidents.

The concept of an Effective Response Force is crucial for ensuring that fire departments are adequately prepared and equipped to handle emergencies, thereby protecting both the public and firefighters. It also serves as a benchmark for evaluating the performance and capabilities of fire departments.

The following two figures illustrate the current limitations by the specific number of firefighters available to respond in four and eight minutes respectively. In the map showing the ERF by four-minute travel time, 25% of the city is limited to no-more than three firefighter arriving within four minutes. In the map showing ERF by eight-minute travel time, 18% of the city is limited to no-more than sixteen firefighters arriving within eight minutes.

Figure 6: ERF, 4-Minute Travel Time

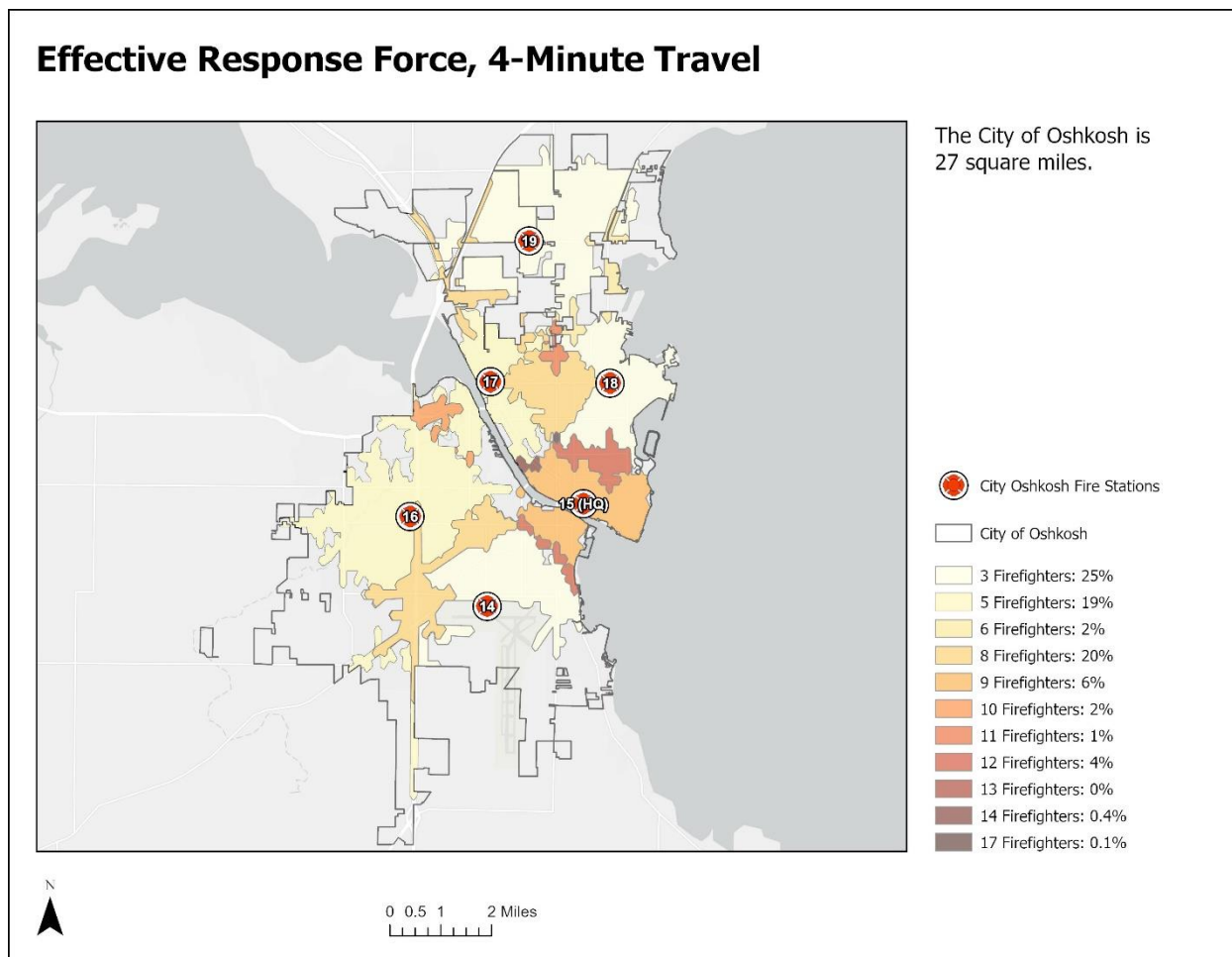
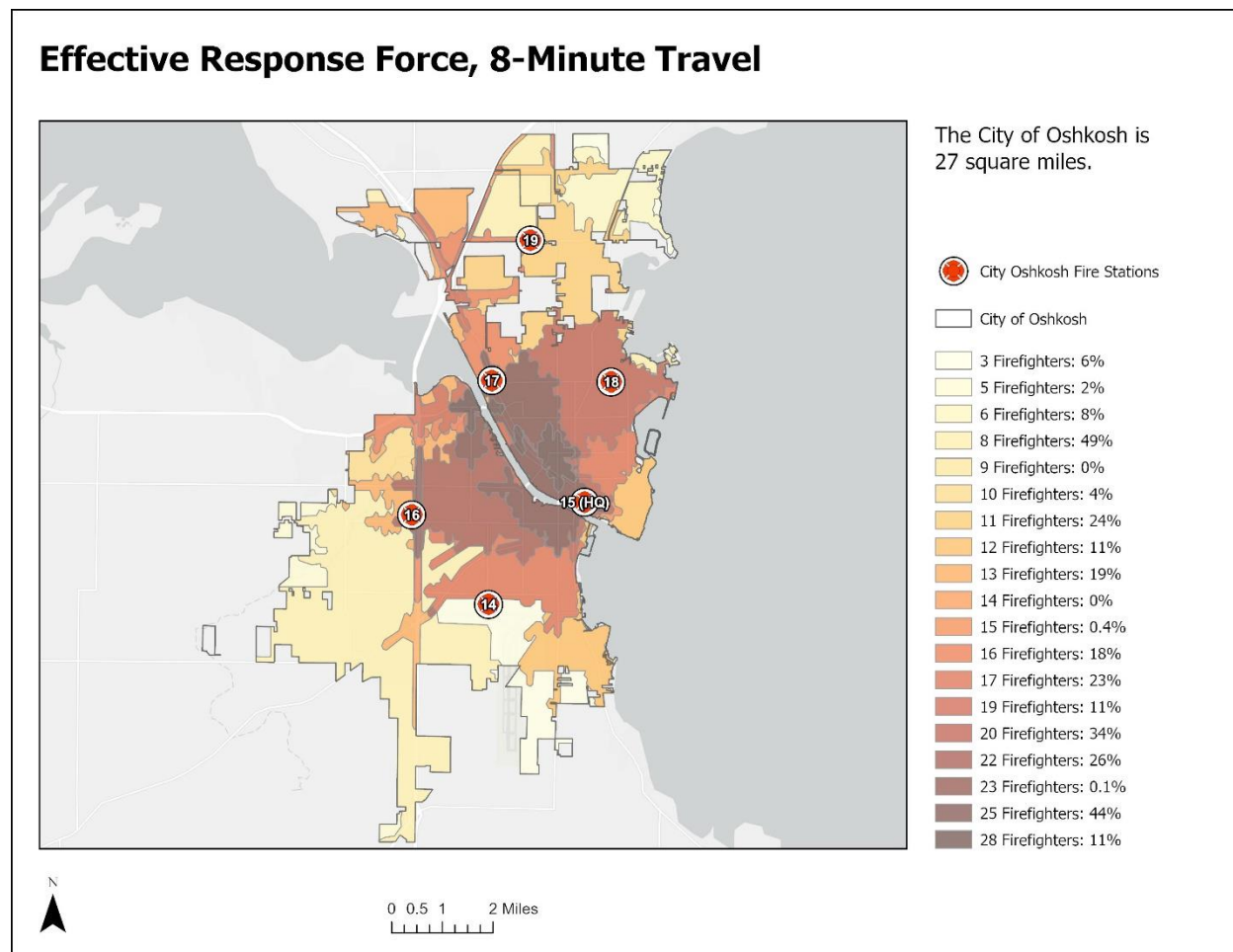


Figure 7: ERF, 8-Minute Travel Time



In alignment with NFPA 1710, OFD deploys 18 firefighters to a structure fire. However, OFD is limited to only 11% of the city for ERF performance in 28 firefighters arriving within the 8-minute travel time response goal. 25 firefighters, however, can arrive at a structure fire within the performance goal in 44% of the city.

Current Facilities

Fire stations play a critical role in the delivery of emergency services for several reasons. A station's location will dictate, to a large degree, response times to emergencies. A poorly located station can mean the difference between confining a fire to a single room and losing the structure. Fire stations also need to be designed to house equipment and apparatus, as well as meet the needs of the organization and its personnel.

Appropriately designed, maintained, and adequately located facilities are critical to a fire department's ability to provide services in a timely manner. At a high level, ESCI evaluated the six fire stations of the OFD. The following figure assigned an overall rating to each fire station using the criteria.

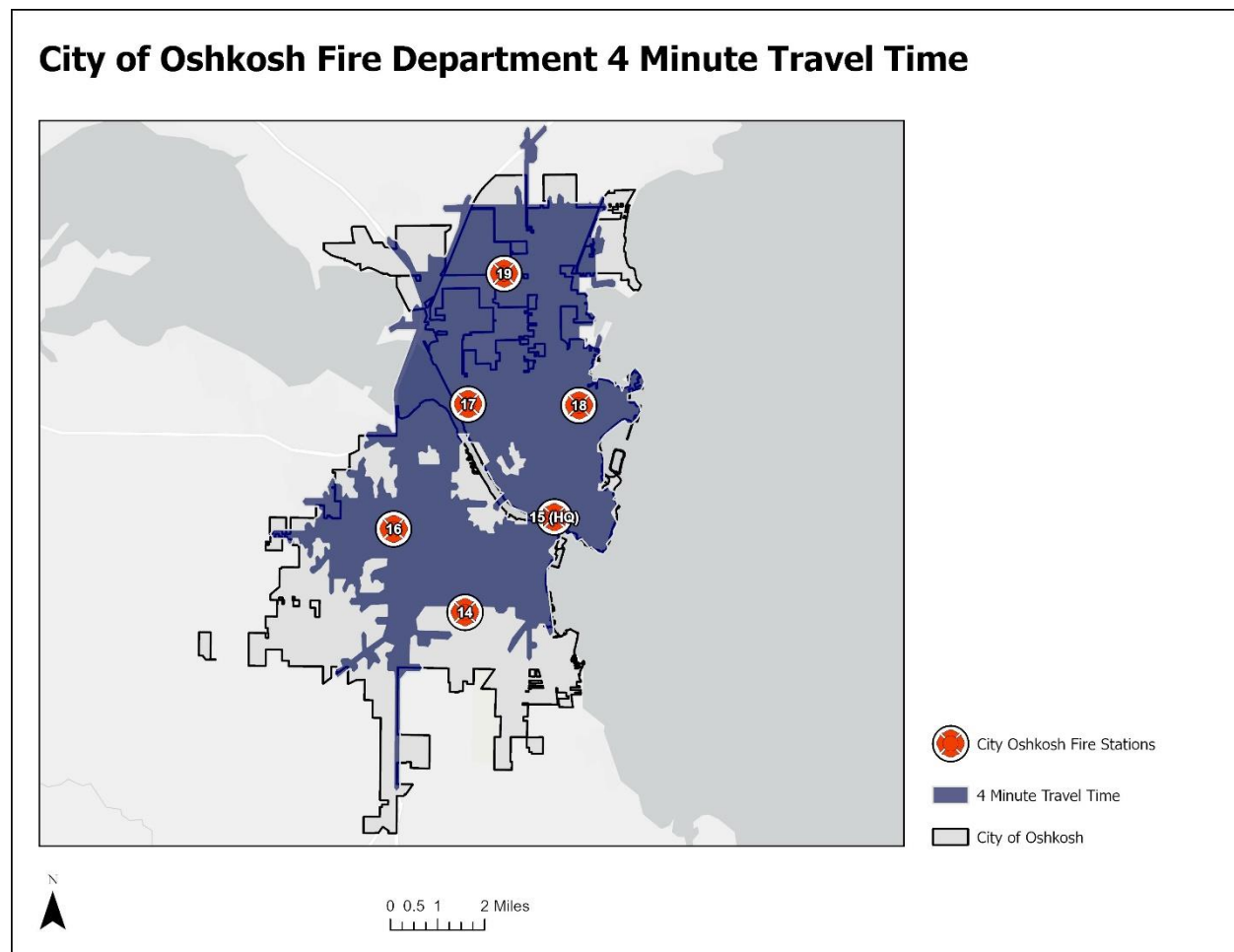
Note: ESCI provides an appendix to this report titled, “Facility Best Practices.” Refer to the appendix for details regarding facility best practices and industry standards.

Facilities

ESCI conducted an overview evaluation of the Oshkosh Fire Department fire Stations and reviewed an independent fire department facilities evaluation and concept planning study that was conducted in April of 2022. These evaluations looked at the location response efficiency, functionality, overall health and well-being of the staff, expansion and upgrade needs, and possibilities. Standards and recommendations are based on those in the Commission on Fire Accreditation International (CFAI) for fixed facilities. Through a Community Risk Assessment, the station should provide efficient and adequate response capabilities for the variety of calls for service in its jurisdictional area.



Figure 8: 4-Minute Drive-Time Analysis



ESCI visited and provided a high-level review of each facility and by referencing the 2021 SEH facilities report produced the following assessments.

At the time of construction, facilities adhered to all federal, state, and local codes and regulations. The OFD designates an assistant chief to oversee facilities maintenance. This chief identifies essential safety upgrades and addresses them as resources permit. Items requiring more extensive attention are incorporated into the agency's long-term capital improvement plan, which covers aspects such as fire alarm systems, sprinkler systems, seismic considerations, vehicle exhaust systems, and asbestos abatement.

Several fire stations need updates, renovations, and/or replacement. Unfortunately, OFD's past practices did not support new facilities and expansion. OFD leadership is currently working closely with city leadership to secure land and funding for future fire station replacement and renovation.

The following facility overviews are a combination of the consultant's direct observations and the review of the City of Oshkosh's *Facilities Evaluation and Concept Planning* produced by S.E.H, a national municipal facility consulting firm. The S.E.H. report is dated April 15, 2022.



Station #14

2050 Knapp Street

Station #14 primarily serves Wittman Regional Airport and the surrounding district. Owned by Winnebago County and managed cooperatively with the City of Oshkosh, the station is pivotal, especially during the EAA's annual Air-Venture event which attracts a significant influx of air traffic and visitors.

The current building, while in fair condition, faces multiple challenges. Structurally, there's inadequate space for the response units, poor moisture barriers, and deteriorating concrete. Aged components like single-pane windows and rusting doors indicate deferred maintenance. Inside, the kitchen and bathrooms are outdated, not conforming to modern fire station standards or being gender neutral.

Operational efficiency is compromised. The layout lacks dedicated spaces for essential activities, including report writing and gear decontamination. Accessibility is an issue, particularly in the kitchen, and the dormitory doesn't provide sound privacy, impacting personnel sleep and subsequently, their effectiveness. The lack of facilities accommodating female firefighters is also a recruitment challenge.

From a health and safety perspective, the station misses decontamination areas and proper exhaust filtering, risking firefighter exposure to carcinogens. The outdated alerting systems can abruptly wake personnel, leading to potential health issues. Furthermore, concerns about lead and asbestos, given the building's age, suggest additional hazards.



The building's energy inefficiency, marked by insufficient insulation, also requires attention. Retrofitting or expanding the current station might be challenging, making the case for a potential new facility. Assessing the cost and benefits of refurbishment versus building anew is critical. The station's significance, especially during large events like the Air Venture, calls for urgent action. Additionally, modernizing the station could help in attracting and retaining a diverse workforce, important in the face of declining interest in public safety jobs.

Table 5: Station 14 Apparatus Assignments

Unit ID	Apparatus Type	Year	Staffing /Shift
E-14	Engine/Pumper	2006	3
M-214	Ambulance	2016	Cross-Staffed
CRASH 1	ARFF R.I.V.	2016	Cross-Staffed
CRASH 2	ARFF Oshkosh T1500	1986	Cross-Staffed
CRASH 3	ARFF Stryker	2009	Cross-Staffed



Station #15

101 Court Street

Station 15, located in the heart of the city, stands as the operational hub of the Oshkosh Fire Department (OFD). Not only does it house an array of emergency vehicles but it also functions as the Fire Department Headquarters.

Externally, the building carries a masonry/brick finish. Internally, the structure's core is mostly in fair to good condition. However, signs of age manifest in the foundation, windows, and plumbing. The roof's life expectancy is pinned at 6–10 years, while the boiler and water heater, replaced in 2008, perform satisfactorily, albeit with temperature irregularities common in older constructions.

The facility's layout presents some challenges. The limited space restricts traffic flow, forcing vehicles to back into the station. Additionally, the large employee density poses an "obstacle course" risk during emergencies. The dormitory, positioned on the second floor, elicits mixed feelings among crew members who crave personal space. The current setup also complicates the laundering of soiled Personal Protective Equipment (PPE), which must be transported through communal areas.

Health and safety issues further accentuate Station 15's operational problems. While the building boasts a sprinkler system, the outdated alerting systems used by OFD's six stations have a jarring effect on the sleeping personnel. Staff members also voiced security concerns with community members sometime able to access secure areas.

With the city's Comprehensive Plan Update pointing to a significant rise in residential units within Station 15's area, there's an impending need for equipment and personnel expansion. As Station 15 nears its half-century mark, critical decisions loom regarding its future role in OFD's expanding community.

Table 6: Station 15 Apparatus Assignments

Unit ID	Apparatus Type	Year	Staffing /Shift
M-15	Ambulance	2019	2
E-15	Engine/Pumper	2021	3
L-15	Ladder	2016	3
C-15	Command	2017	1
Boat 15 & Tow	Inflatable Boat	2018	0
C-14	Reserve	2007	0
RM-1	Reserve ambulance	2016	0



Station #16

711 South Washburn Street

Station 16, currently housing Engine 16, Medic 16, and other specialized units is facing numerous challenges. Originally set up as a temporary emergency operations facility, its physical condition is deteriorating, with structural concerns arising from proximity to an Oshkosh Water tower. On some occasions, ice from this tower has damaged the station's roof. The station lacks appropriate mechanical ventilation, presenting health hazards from harmful gases. Electrical systems, while operational, would require updating with any facility expansion.

The station's design restricts efficient operations. All apparatus, except for Engine 16, need to be backed in from Washburn Street. With inadequate space for the crew and equipment, it is struggling to manage daily operations effectively. Living quarters are cramped, lacking modern amenities and gender-specific facilities, making staff recruitment challenging.

Further, the station's location near major roads poses operational and safety risks. A significant percentage of fire-related fatalities involve vehicle incidents, which is alarming. Also, the absence of an automatic sprinkler system, limited air circulation in living areas, and outdated alerting systems present significant health and safety challenges. Crew members have also voiced concerns regarding the station's security.

Given these challenges, the ESCI suggests relocating the building near the current Station 16. Decisions should consider the future growth of the station and potential service expansion. Meanwhile, traffic management changes might help mitigate current challenges.

Table 7: Station 16 Apparatus Assignments

Unit ID	Apparatus Type	Year	Staffing /Shift
E-16	Engine/ Pumper	2013	3
M-16	Ambulance	2019	2
M-216	Ambulance	2017	Cross-Staffed
SC-116	Special Rescue	2008	Cross-Staffed



Station #17

1813 Algona Boulevard

Station 17, which houses Quint 17, Medic 17, Medic 217, and Dive 17 operates with five emergency personnel on duty every shift. Built 25 years ago, the station, made of masonry and brick, appears sturdy, though it requires some improvements to ensure another 15–20 years of service. The roof, aging and worn, is scheduled for replacement in 2024–2025. Original windows, while still functional, lack energy efficiency. The plumbing, electrical systems, and the emergency generator show signs of age but remain operational. The apparatus bay is equipped with exhaust removal systems.

Operationally, the building's layout reflects its age. The kitchen and bathrooms, showing signs of heavy use, need upgrades to meet modern accessibility standards. The dormitory space is insufficient, lacking privacy especially for female staff, affecting the department's ability to recruit and retain personnel. Additionally, the second-floor fitness facility, shared with mechanical equipment, is less than ideal.

From a health and safety perspective, while Station 17 has a fire alarm, it lacks a fire protection system and proper decontamination areas. Current alerting systems in all Oshkosh Fire Stations are outdated, posing health risks due to abrupt awakening of staff. Turnout gear, exposed to exhaust and UV light, is stored on the apparatus floor. Concerns about station security have been raised, suggesting the need for better security infrastructure. Fortunately, Stations 17, 18, and 19 were constructed post the asbestos and lead ban, minimizing certain health risks. However, improvements in air quality are needed. The station also needs to address concerns about space for mothers and gender neutrality, as well as the decontamination of equipment and personnel.

Table 8: Station 17 Apparatus Assignments

Unit ID	Apparatus Type	Year	Staffing /Shift
Q-17	Quint / 105' Ladder	2016	3
Dive - 17	Rescue Squad	2000	Cross-Staffed
M-17	Ambulance	2019	Cross-Staffed



Station #18

811 East Murdock Avenue

Station 18, home to Engine 18, Medic 218, Reserve-1, and staffed by three emergency personnel, stands sturdy despite its years. With some improvements over time, it's projected to serve the community for another 15–20 years. The building's core structure is holding up well, though signs of age are evident. The roof was replaced in 2022. The exterior windows, original to the building, show wear and lack energy efficiency. The water heater is nearing its end of life and will require replacement, alongside the introduction of a recirculating pump for faster hot water access. Similarly, the building's furnace and AC units are original and demand attention soon.

Inside, the building's layout exhibits inefficiencies. The 26-year-old station reveals its age with an outdated kitchen and bathroom, and there's a pressing need for accessibility adjustments to the kitchen layout. The dormitory, cramped and absent of privacy, falls short of modern standards, making recruitment challenging. In the realm of health and safety, there are glaring gaps. Station 18 is equipped with an outdated alerting system, putting the well-being of personnel at risk. Protective turnout gear is stored in an area exposing it to vehicle exhaust and UV degradation. Concerns extend to building security and the lack of provisions for gender neutrality. For the health of its occupants, the introduction of a decontamination area is essential.

Table 9: Station 18 Apparatus Assignments

Unit ID	Apparatus Type	Year	Staffing /Shift
E-18	Engine / Pumper	2009	3
M-218	Ambulance	2012	Cross-Staffed
Reserve 1	Engine / Pumper	1997	



Station #19

1000 West Snell Road

Station 19 houses three personnel, and also serves the HazMat Response Team. Despite showing its age, the station remains in relatively fair condition, with the belief that with the right enhancements and upkeep, it could last two more decades. The building's windows, original to the station, have begun to show their age, lacking energy efficiency and occasionally malfunctioning. Similarly, aging plumbing demands attention, with the water heater nearing the end of its lifespan. The roof is due to be replaced in 2025.

Within the building, the flow of movement feels only adequate, especially given the evident wear from 26 years of constant use. Aging facilities like the kitchen and bathroom necessitate refurbishments, from cabinetry to floor coverings. Notably, the kitchen falls short in modern accessibility standards, making future redesigns imperative, although a complete shift to a commercial kitchen setup may be financially unfeasible.

The staff's living quarters present additional concerns. Cramped sleeping areas lack privacy. The current setup, with shared rooms, not only compromises sound privacy but also falls behind the best practices observed in newer stations in neighboring communities, affecting Oshkosh Fire Department's recruitment efforts.

Critical health and safety challenges include the absence of a fire protection system, outdated alerting mechanisms, and improper storage for the turnout gear. Furthermore, concerns about the building's security have been voiced, emphasizing the need for enhanced surveillance and monitoring systems.



Table 10: Station 18 Apparatus Assignments

Unit ID	Apparatus Type	Year	Staffing /Shift
E-19	Engine / Pumper	2021	3
M-219	Ambulance	2012	Cross-Staffed
Q -219	Reserve Ladder	1999	0
H-119	HazMat Truck and Trailer	2012	0
Reserve 2	Engine/ Pumper	2003	0
G-119	Grass / Brush Unit	2020	0
U-119	Rehab unit	2005	0
	UTV – Event Use	2020	0



Apparatus & Equipment

The Oshkosh Fire Department has a collection of apparatus appropriate for the level and type of service delivery. The vehicle stock is distributed appropriately across the city's response area in fixed facilities. Facilities with program and service deployment focus, such as water rescue and HazMat, house apparatus specific to the need.

Oshkosh Fire Department is working closely with apparatus manufacturers to take delivery of several specialized vehicles to replace and supplement the current fleet. Apparatus currently on order include:

- 100' Pierce Mid-mount Platform Aerial (2024)
- Pierce Velocity Pumper (2025)
- Pierce Velocity Pumper (2026)
- 3-Wheeled Coach Ambulances (2024)

Table 11: 2023 OFD Apparatus

Unit	Type	Station	Year	Manuf.	Pump Cap.	Mileage	Tank
CRASH 1	Rescue	14	2000	Ford	N/A		N/A
CRASH 2	Crash Truck	14	1985	Oshkosh			1500
CRASH 3	Crash Truck	14	2009	Oshkosh			1500
Boat 15	Inflatable	15	2018	Mercury	N/A	N/A	N/A
Car 14	Reserve Command	15	2007	GMC	N/A	101,238	N/A
Car 15	Command	15	2017	Ford	N/A	40,019	N/A
Dive 17	Utility	15			N/A		N/A
Tow 15	Utility	15		Ford	N/A		N/A
Engine 14	Engine	14	2006	Pierce	1500	99,100	750
Engine 15	Engine	15	2021	Pierce	1500	12,205	750
Engine 16	Engine	16	2009	Pierce	1500	62,282	750
Engine 18	Engine	18	2022	Pierce	1500	0	750
Engine 19	Engine	19	2021	Pierce	1500	29,160	750
G119	Grass/Brush	19	2022	Ford			100
H119	HazMat	19	2005	GMC	N/A		N/A



Unit	Type	Station	Year	Manuf.	Pump Cap.	Mileage	Tank
Husky 15	Air Boat	WCSO	2004	Huskey	N/A	N/A	N/A
Ladder 15	Aerial	15	2016	Pierce	1500	30,357	500
Medic 214	ALS Ambulance	14	2012	Chevy / Medtech	N/A		N/A
Medic 15	ALS Ambulance	15	2019	Ford/Lifeline	N/A	88,547	N/A
Medic 16	ALS Ambulance	16	2019	Ford/Lifeline	N/A	99,913	N/A
Medic 17	ALS Ambulance	17	2019	Ford/Lifeline	N/A	98,523	N/A
Medic 216	Reserve Ambulance	16	2017	Ford/Lifeline	N/A	103,079	N/A
Medic 218	Reserve Ambulance	18	2012	Medtech	N/A	147,864	N/A
Medic 219	Reserve Ambulance	19	2012	Medtech	N/A	137,132	N/A
Quint 17	Quint	17	2016	Pierce	1500	32,380	500
Reserve 1	Engine	18	2003	Pierce	1500		750
Reserve 2	Engine	19	1997	Pierce	1500		750
Reserve 3	Quint/Ladder	19	1999	Pierce	1250		500
Reserve Medic 1	Reserve Ambulance	15	2016	Ford	N/A		N/A
Reserve Medic 2	Reserve Ambulance	19	2016	Ford	N/A		N/A
SC116	Spec Ops	16	2008	Chevy	N/A		N/A
U119	Rehab	19	2013	Ford	N/A		N/A

Apparatus Maintenance Program

In the context of a comprehensive review of the Oshkosh Fire Department's operational frameworks and capacities, it is evident that the agency is committed to instituting standards and processes to safeguard its effectiveness and reliability.

The department uses the City of Oshkosh as the primary supplier of vehicle services. This city facility strives to ensure that each apparatus undergoes preventative maintenance and repair. Such infrastructure, coupled with the adequate tools and



resources, can increase the longevity and dependability of the department's apparatus assets.

In terms of vehicle readiness, the department utilizes a reserve vehicle fleet as noted in the apparatus table above. This fleet tries to ensure that the service remains uninterrupted, even during unforeseen apparatus downtimes. Additionally, and as noted above, the department has several vehicles on order that will transition some reserve apparatus out of the cycle.

The Oshkosh Fire Department, however, does not have a strong approach to inspection and documented preventive maintenance protocols. Instituting these measures, complemented by the well-defined replacement schedule, will ensure that every apparatus is operational.

Replacement Schedule

As part of the most recent Oshkosh Fire Department Strategic Plan, the department plans to create a robust apparatus management plan. Goal 5 of the 2022–2027 Strategic Plan states, “Develop a fiscally responsible plan to manage, maintain, and replace capital assets in compliance with established laws, regulations, and best practices to continue providing essential services.” The objectives related to apparatus replacement under this goal include:

- Develop an accurate inventory of fire department equipment to include age, condition, quantity, and location, utilizing a records management system.
- Identify and compile regulations and best practices to manage, maintain, and replace equipment.
- Establish a preventative maintenance program and replacement schedule for equipment.
- Create a replacement schedule for staff and utility vehicles.

Oshkosh Fire Department is working closely with apparatus manufacturers to take delivery of several specialized vehicles to replace and supplement the current fleet. Not unlike other localities across the U.S., Oshkosh experiences the strain resulting in manufacturing supply chain challenges. However, OFD has several apparatuses on order, which include:



- 100' Pierce Mid-mount Platform Aerial (2024)
- Pierce Velocity Pumper (2025)
- Pier Velocity Pumper (2026)
- 3-Wheeled Coach Ambulances (2024)

Equipment & Supplies

The Oshkosh Fire Department manages its resources to meet the needs of its functional areas including fire suppression, prevention, and HazMat, among others. The department works to ensure appropriate and sufficient distribution of tools and equipment but has also established schedules for timely replacements, integrating them well within the budgetary outlines to maintain the agency's readiness at all times.

Maintenance, testing, and inspections are performed by personnel following the manufacturer's guidelines, which increases the longevity and reliability of the equipment. To improve the process and establish formalized procedures, OFD is evaluating software solutions like PStrax.

Furthermore, the department allocates supplies and materials based on objectives, meeting the operational needs while aligning with the standards set at various governmental levels, highlighting OFD's commitment to excellence and regulatory compliance in all its initiatives.

ESCI reviewed the capital improvement plan for the department. The plan outlines a series of projects spanning from 2024 to 2033 with a total expenditure of \$15,586,110. In 2024, an allocation of \$750,000 is planned for acquiring land for fire stations, which has a useful life of 20–25 years. There are several equipment upgrades and replacements scheduled, notable among them being the procurement of Self-Contained Breathing Apparatus (SCBA's) in 2032 at \$1,000,000 with a 15-year lifespan. Additionally, a substantial investment is proposed in replacing fire engine vehicles over the years 2026 to 2028, amounting to \$4,435,610. Turnout gear will also see a phased replacement over the years, with a total outlay of \$1,804,800. Other notable projects include replacing cardiac monitors in 2024 (\$1,092,500), replacing radios in 2032 (\$1,000,000), and a series of ambulance replacements between 2026 and 2032 costing \$4,833,200. The plan further projects budget needs for other machinery, equipment, and vehicles essential for the department's operations.





Recommendations

Based on the interviews, document review, risk assessment, and the development of a standard of cover, ESCI developed the following recommendations. These recommendations are supported by industry standards, best practices, and the backgrounds and experiences of the project consultants. The recommendations are categorized into five groups:

1. Firefighter Safety, Health, and Wellness
2. Community Risk Reduction
3. Administrative Efficiencies
4. Operational Efficiencies
5. Operational Performance and Deployment

Firefighter Safety, Health, & Wellbeing

ESCI recommends following the guidance set forth by NFPA 1851 and continuing to fund and implement the current capital improvement plan for outfitting operational personnel with an additional set of firefighting ensembles. A **second set of turnout gear** aids in the routine and incident-related cleaning, drying, and proper care of gear. Additionally, this would help avoid firefighter exposure to the carcinogens contained in firefighting ensembles after exposure to the biproducts of combustion, such as house fire, vehicle fires, and trash fire.

ESCI recommends **upgrading fire stations to meet current commercial standards** to include automatic stove shut offs, commercial-style cooking hoods, fire suppression sprinklers, and door security. These upgrades support best practices in fire station fire safety. Refer to Appendix A, Facility Best Practices.

During the site visit, ESCI recognized the lack of privacy in the bedrooms at Stations 15, 16, 17, 18, & 19. ESCI recommends **supporting capital improvement plans to improve bedroom privacy** to support firefighter inclusion and improve employee retention.

Stations 14 and 16 store personal protective equipment in an open bay space exposed to diesel exhaust. ESCI recommends that OFD consider **separating the gear storage from the diesel exhaust**. Refer to Appendix A, Facility Best Practices.



Stations with pull-through bays have congested bay space. OFD frequently uses pull-through bays to store auxiliary equipment, forcing operations personnel to bypass the pull-through features and back apparatus into the fire station. ESCI recommends that OFD **explore additional storage strategies to maintain pull-through bays** and reduce apparatus from backing into stations. Additional storage may include additional fixed facilities either built to suit or acquired. Refer to Appendix A, Facility Best Practices.

Community Risk Reduction

ESCI recommends **evaluating the critical staffing needs of the fire prevention inspection program**. OFD is required by Wisconsin statute to complete more than 3,200 inspections annually. OFD utilizes operations staff to inspect approximately 2,300 occupancies. Many initial inspections, however, result in identified violations that require a reinspection. OFD does not exhibit the staffing to achieve both initial and follow-up inspections.

During the site visit, ESCI identified that OFD inspectors (assistant chief & captain positions in CRR) are not successful in coordinating, conducting, and following up on the approximately 3,200 fire code inspections required under Wisconsin law. Although fire operations conduct about 2,300 “company inspections,” those “inspectors” are not trained in code enforcement and lack the capacity for consistent inspection follow-up. The nearly 900 remaining inspections are located at high-risk occupancies, which take a considerable amount of time to evaluate. Furthermore, CRR staff are also required to oversee facility maintenance, assist in operational training, conduct fire inspections, and be assigned special projects. ESCI recommends **evaluating alternative deployment and staffing models for fire prevention inspections**. If the city is unable to fund additional sworn inspector positions, ESCI recommends exploring the partnership with third-party inspection services to meet the needs of the community and be aligned with Wisconsin law.

ESCI recommends formalizing a collaboration between community stakeholders and **developing a Frequent 911 Utilizer Workgroup**. The workgroup should consist of representatives from multiple agencies that have a stake in the community’s future mitigation efforts. Representatives may include police, social services, behavioral health, E911, healthcare, nonprofits, skilled nursing, etc.

ESCI recommends developing a **process for OFD staff to report non-incident interactions** with target populations, such as the city’s homeless individuals. OFD



reports frequent interaction in and around OFD facilities; however, those interactions are not recorded; thus, no data is available to assist in collaborative solutions. OFD has access to ArcGIS and record management system products that, together, can create adequate collection tools.

Based on the community risk associated with an older population, ESCI recommends **expanding the community fall prevention activities** and applying performance measures and attainable benchmarks. Additionally, ESCI recommends **exploring community partnerships to achieve more community reach** and decrease the utilization of OFD resources.

ESCI recommends instituting a **process that closes the loop between operational response and fire investigation**. The OFD should create processes to ensure the response personnel know the final cause determination and integrate department training and public education. The outputs of fire investigations can have a profound impact if the information is transferred appropriately.

ESCI acknowledges the community's efforts in developing the "Tiny Homes" project and other transitional housing for families experiencing housing challenges. ESCI recommends that OFD **strategically engage with the Tiny Homes community and other transitional housing projects** to expand public education for whole-community risk reduction.

ESCI recommends **engaging the Community Development Block Grant (CDBG) funding** opportunities to cover the costs of items, such as smoke alarms, carbon monoxide alarms, and other life safety expenses. CDGB funding is available for activities in a portion of the OFD response area. The funding can supplement the activities already in place by community risk reduction staff.

Administrative Efficiencies

ESCI recommends **intentional and documented planning for future fire station facilities** and land purchases. In the past, OFD did not plan for future expansion and new facilities, thus leaving the current department leaders without adequate real estate opportunities.

Station 15 and the associated administrative spaces are at maximum capacity. ESCI recommends that OFD and the city **consider future planning for expanded operations and administration spaces** at Station 15. Additionally, ESCI recommends **identifying**



alternative storage solutions (acquired building or new construction) to reduce the instances of fire apparatus from backing into fire stations because pull-through bays are blocked with stored items. Refer to Appendix A, Facility Best Practices.

ESCI recommends evaluating the **critical staffing needs of the fire prevention inspection program by conducting a job task analysis**. During the site visit, ESCI staff noted that fire prevention personnel oversee OFD facilities, assist with training academies, conduct public education, monitor controlled burns, witness in-person third-party testing of sprinkler and fire alarm systems, and other assigned projects within the organization. ESCI recognizes that mid-sized fire department organizations rely on cross-training and task distribution to achieve outcomes; however, the number of staff assigned to fire prevention activities does not support a successful fire prevention program.

ESCI recommends conducting a **workload demand study of the facility management activities**. The management of the OFD's aging facilities and associated coordination activities is the responsibility of the City's Fire Marshal and Assistant Chief of Community Risk Reduction. The organization's Community Risk Reduction Division is understaffed and unable to successfully deploy the primary mission. ESCI recommends **continuing transferring the facility management duties to the Administrative Services Department**. This change will increase the organization's efficiency in facility maintenance and repair coordination.

ESCI recommends that the **fire prevention staff develop an improved partnership with Community Development to increase information exchange** regarding change of use, new businesses, and vacant buildings. The fire department's deployment of operations and code enforcement can bolster the activities of the city's community development mission. Bolstering information sharing will create increases in government efficiency.

During on-site interviews, ESCI recognized that the two assistant chiefs within the organization have a high workload associated with low-level tasks. ESCI recommends **conducting a job task analysis to identify the assistant chief positions' primary focus and develop strategies to offload task-level activities**.

Consistent with the guidance set forth by the Commission on Fire Accreditation International, ESCI recommends that **all organizational documents, forms, standard operating procedures general guidelines, and manuals are reviewed at least every three years and updated**.



Operational Efficiencies

ESCI recommends **defining and communicating the role of the fire captain** within the organization. During the ESCI site visit, it was unclear whether personnel at several ranks (firefighter to battalion chief) understood the contrast between a fire lieutenant and a fire captain.

ESCI recommends reviewing and updating policy and training to continue support for battalion chiefs and expand the program to **enable company officers to conduct initial fire investigations**. During the site visit, ESCI recognized that fire investigators are requested on many structure fires. Within the OFD deployment model, the two fire investigators are the assistant chief and captain within the CRR division. The increased workload associated with investigations interferes with the primary duties of community risk reduction and code enforcement.

Considering the company **fire prevention inspection program**, ESCI recommends the OFD **evaluate the value and return on investment of the program's current deployment strategy**. In its current form, the program deploys operations personnel to conduct fire code inspections without formal training or the ability to consistently follow up, and the program focuses on low-risk occupancies. ESCI recommends retooling the program to focus primarily on pre-incident planning, community education, and life-safety hazard assessment while satisfying the code enforcement requirement by state statute. Additionally, operations personnel should begin pre-planning high-risk occupancies in coordination with the fire prevention staff.

The OFD incident-related workload is increasing. From a national standpoint, the experience in Oshkosh is not unlike other communities. ESCI recommends **exploring an EMS response model change and considering an alternative response to low-acuity calls for service**. Those incident responses are typically categorized as Alpha and Omega within the ProQA dispatch system. Dispatching the highest level of care (paramedic transport ambulance) to low-acuity incidents reduce the resources' reliability for actual emergencies. ProQA and Priority Dispatch are the gold standard for triaging 911 calls to match resources with needs. OFD should rely more heavily on the triaged dispatches.

OFD experiences operational efficiency with the ProQA emergency medical dispatch deployed by the Emergency Communications Center. However, the 911 center does not differentiate fire risk structure by occupancy type, facility size, height, or other risk



factors. In turn, OFD responds with a standard response to all structure fires. ESCI recommends **creating processes within the 911 center to identify building size, type, and other elements that affect firefighter risk**. These processes may include a ProQA emergency fire dispatch protocol, adding questions for the 911 call-taker, or tying the computer-aided dispatch to readily available city property data.

Operational Performance & Deployment

ESCI recommends transitioning a **fourth advanced life support transport ambulance** from the cross-staffed model to a fully-staffed deployment model. The fourth ambulance will improve the reliability of ambulances to the Oshkosh city community by offsetting ambulance utilization outside of the city. The city's commitment to providing high-quality EMS service to the surrounding communities is a testament to policymakers' investment in neighboring areas; however, the demand on ambulance resources prompts the need for an additional ambulance.

ESCI recommends **reducing the reliance on cross-staffed ambulances** within the city's emergency response system. Cross-staffed ambulances reduce the availability of fire engine personnel, tools, equipment, and an effective response force during non-medical emergencies. If OFD determines additional ambulances are needed, the department should seek support and staff an additional full-time ambulance.

ESCI recommends the OFD work toward meeting NFPA 1710, the Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments. NFPA 1710 states that fire departments of OFD's size and function should staff fire engines and ladder trucks with four personnel. Understanding the burden that this standard can place on the City of Oshkosh, ESCI further recommends that **OFD not reduce current staffing** on any fire suppression unit and maintain three personnel at all times.¹

Considering response time performance benchmarking, ESCI recommends **assessing the current turnout time** (time from the alarm sounding to the apparatus driving) and establishing incremental improvement strategies. An incremental improvement (ex:

¹ 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, Section 5.2.3.1.1



12% improvement in performance) over the next twelve months will assist OFD in achieving the sixty-and eighty-second turnout time established by NFPA 1710, the Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.

ESCI recommends that **OFD consider establishing risk-level-based turnout time goals** appropriate for the community and deployment. Based on community expectations, low-priority incident responses may not require immediate and rapid response.

ESCI recommends **encouraging the Winnebago County Communications Center to expand the certification and capability of the ProQA dispatch processes to include Emergency Fire Dispatch (EFD)**. Pairing EFD with the current Emergency Medical Dispatch (EMD) capability will increase the efficiency of call triage and resource deployment.

ESCI recommends following through with the plan for the installation of an appropriate **station alerting technology solution**. Station alerting technology pairs directly with the 911 Center and utilizes message boards, customizable alerts, and timers to increase resource mobilization performance.

ESCI recommends **establishing quarterly standards of cover compliance reporting and performance measurement on the adopted standards**. Quarterly reporting can assist agency leaders and policymakers in understanding the ongoing gaps in service and monitor the improvement in performance with resource and deployment changes.

ESCI recommends **updating the Standards of Cover document annually** with updated performance gap reporting and revised performance benchmarks.

ESCI recommends **establishing a workgroup to identify the incidents where adding a battalion chief would improve incident outcomes**. These incidents may include cardiac arrests and other incidents that require coordination outside of patient care. The automatic response of a commander will increase the operation's efficiency and safety when crews are performing life-saving measures.



Appendix A

Facilities Best Practices

ESCI recognizes fire station design best practices have changed significantly within the last ten years due to research and recent technology. ESCI understands it is not possible or financially practical to incorporate these best practices within existing fire stations. However, ESCI recommends that the OFD consider these when designing new facilities and remodeling existing facilities.

Automatic Sprinkler Protection

NFPA 1: Fire Code requires that "new buildings housing emergency fire, rescue, or ambulance services shall be protected throughout by approved supervised automatic sprinkler systems." The requirement for sprinkler protection not only protects the emergency services personnel occupying the facility but also reduces the risk of disrupting the provision of emergency services to the community because of a fire.

Cancer Prevention Engineering

The occupation of a firefighter is recognized as one where those working in the industry are more likely to be diagnosed with cancer than the public. Firefighters have a 9% higher risk of being diagnosed with cancer and a 14% higher risk of dying from cancer than most Americans.² The danger for firefighters does not stop when the fire is extinguished, but returns to the fire stations through their gear, equipment, and vehicles that were exposed to, and contaminated by, smoke or other vapors. When contaminated gear and equipment are returned to the station via their respective response apparatus, the potential for cross-contamination occurs.

The International Agency for Research on Cancer rates diesel engine exhaust as a Group 1 carcinogen, which means it is known to cause cancer in humans.³ Installing exhaust capture and removal systems in fire stations reduces exposure to these carcinogens.

To limit/reduce firefighter exposure to toxic products of combustion which occur after the fire, turnout gear should be stored in well-ventilated rooms to prevent additional

² "Registry aims to track firefighters' higher cancer risk."

³ Fire Station Design: Best Practices to Reduce Exposures. https://www.iaff.org/wp-content/uploads/FFCancer_FireStationDesign.pdf



firefighter exposure to off-gassing of chemicals absorbed into turnout gear during a fire. Fire departments should take additional steps to protect firefighters from cancer, including, but not limited to, relocating any current fitness areas that are housed within apparatus bays to locations where firefighters can exercise without exposure to the toxic products of combustion, pressurizing corridors to keep contaminants out of designated clean areas, as well as separating gear storage from the apparatus bay, living spaces, and private showers.

Back-In Bays

Back-in is a serious safety concern as many firefighter injuries and accidents occur when emergency vehicles are being backed into the fire station. For future stations, the OFD should consider a design that allows for drive-through bays that are large enough to accommodate all frontline and reserve apparatus.

Facility Security

Fire stations have typically been open environments where residents and visitors from the community have been allowed access to any part of a fire station with very few limitations. The current social environment requires emergency services providers to implement specific security measures limiting and controlling access to fire rescue facilities. This is driven by the need to protect firefighters, expensive equipment, and sensitive data from inadvertently being accessed by individuals desiring to harm the community.

ESCI lists the following security measures that the OFD should consider incorporating into current and future fire stations.

1. Dedicated secure parking

Dedicated parking areas for staff are a start, and fenced or walled secure parking areas are even better, providing physical and visual separation from the public.

2. Protection of building infrastructure

Facility infrastructure like emergency generators, fuel storage, transformers, and communications equipment are often outside the building enclosure. It is best to locate these items out of public view in a secure portion of the site, which might be within the secure parking area recommended previously. This keeps infrastructure



from being tampered with and avoids the possibility of children playing on sensitive or dangerous equipment.

3. Secure building zones

While most facilities want to project a friendly and welcoming atmosphere at the entrance, lobby, and reception desk, it is advantageous to create distinct control points with restricted access doors, solid walls, and lockable transaction counters. This can be accomplished at the lobby zone, enabling the public to enter the lobby, pick up literature, view antique rigs or historical photographs and gear, access a community room or restrooms, and even speak with someone at a reception desk without entering secure staff-only areas.

4. Community room access

When developing a dual-purpose training/community room, consider having two means of entry: one directly off from the lobby where the public can enter and a second from the secure portion of the facility. This strategy enables staff to come and go from training without having to circulate through the unsecured portion of the facility. This maintains the visual and physical separation of staff from the public.

5. Video monitoring and access control

Digital and/or electronic security measures add a higher level of security and can reduce theft and vandalism. Cameras and electronic locks can serve as an added deterrent against thieves and vandals and, if the situation arises, provide evidence in the prosecution of suspects. This includes video monitoring in parking areas and at entrance points. This also allows crews to see who is at the door without having to walk to the door.

6. Secure apparatus bay access

Overhead doors are frequently left open to aid in ventilation, cooling, or access to the apparatus bay. This reduces security for the staff, equipment, and building. Implementing a means to mitigate having the doors left open will improve security. Consider securing all doors of the apparatus bay by electronic means (electric lock, electric strike, or magnetic lock). This enables staff to gain access to the apparatus



bay from secure portions of the building without any restriction and limits potential unauthorized personnel to the bay itself.

Separate Administrative and Operational Areas

Fire service leaders, such as fire chiefs and assistant fire chiefs, are problem solvers by nature. When these leaders have easy access to operational personnel, there is a tendency to solve and work on low-level problems that should and can be solved at the company officer level.

Additionally, company officers need a space dedicated to administrative work with privacy measures. This measure will improve interactions between supervisors and staff during coaching, counseling, and mentoring sessions. The administrative areas, such as the captain's office, can be used for report writing, special projects, and to improve an individual's focus.

Separated Sleeping Quarters

Even though common sleeping quarters are normal among many fire departments across the United States, it is not ideal for assorted reasons. Many departments are now designing fire stations with individual living quarters. Improved effective sleep is a major benefit of having individual living quarters. Firefighters work a 24-hour shift, and the need for sleep to keep firefighters alert during their shifts is paramount for them to be at their best when they respond to an emergency. Studies have shown that being awake for 17 hours straight can impair cognitive abilities that are equivalent to a person with a blood alcohol level of 0.05 percent.⁴ Individual living quarters limit sleep interruptions with proper alerting systems, allowing members to only be alerted for responses for the specific unit they are assigned to during that shift. Other distractions found in communal living quarters, such as snoring and cell phones, are eliminated with individual living quarters. Recent research has increased understanding of the importance of effective sleep hygiene environments relative to mental and physical health. Sleep deprivation has been linked to cardiovascular disease, cancer, Alzheimer's disease, and immune system malfunctions.⁵ Ultimately, individual living

⁴ "EMS: Sleep-Deprived on the Job." <https://www.firehouse.com/careers-education/article/12159596/ems-sleepdeprived-on-the-job>

⁵ "The Dangers of Sleep Deprivation – Firehouse." <https://www.firehouse.com/safety-health/news/12268164/the-dangers-of-sleep-deprivation-for-emergency-workers>



quarters can help improve the ability of OFD members to perform in emergency incidents and improve their long-term physical and mental health.

Another important reason for individual sleeping quarters is that they provide privacy. As the industry seeks to improve the number of women within the department, moving towards individual living quarters can help departments recruit and retain women firefighters to make them feel more comfortable in the workplace.⁶ In an International Association of Women in Fire & Emergency Services survey, almost half of the women reported that they had problems with privacy within a firehouse.⁷ Sharing sleeping facilities can be uncomfortable, not just for women, but for all genders. A 2020 Civil Grand Jury of Santa Clara County, California report highlights the need for gender-separate accommodations in fire departments moving forward.⁸

Heart Safe Alert Tones

The tones that alert firefighters of a response in the fire stations are another concern. Historically, fire departments have used a loud and quick tone to alert firefighters of the need to respond. This tone causes a tachycardic response in firefighters, which means it makes their heart rate spike. Studies have shown that ramp-up tones are better for the heart health of firefighters. Experts say ramp-up alerting could be an effective way to deal with fatigue, tachycardia, and potentially long-term physical and psychological disorders.⁹ Ramp-up tones gradually increase the volume of alert tones.

Decontamination Area

A facility layout can encourage the proper decontamination process a firefighter must follow when returning from a call. Placement of the decontamination room, turnout cleaning, and turnout storage in a linear circulation pattern on the way to the

⁶ "Breaking the 'brass ceiling': Women face unique obstacles in the fire service."

⁷ "Women in the Fire Service." <https://www.powerdms.com/policy-learning-center/women-in-the-fire-service>

⁸ "Why Aren't There More Female Firefighters in Santa Clara County?" Civil Grand Jury of Santa Clara County.
https://www.sccourt.org/court_divisions/civil/cgj/2020/Why%20Arent%20There%20More%20Female%20Firefighters%20in%20Santa%20Clara%20County.pdf

⁹ "Ramp-up tones cut firefighter, paramedic rapid-heart response to station alarms."
<https://www.ems1.com/ems-products/fitness-mental-health-wellness/articles/ramp-up-tones-cut-firefighter-paramedic-rapid-heart-response-to-station-alarms-Z3C9s9Cbs4AuUUVC/>



apparatus bay supports the process of decontamination and turnout cleaning prior to entering the apparatus bay. The addition of handwashing sinks and boot cleaning stations at any entrance to the living area, in addition to the decontamination zone, helps firefighters maintain a clean-living area called the "Clean Zone" that is separated from the "Hot Zone" of the apparatus bay and support area. A facility also should provide an airlock vestibule "Transition Zone" at the connection points of the "Clean" and "Hot" zones to ensure the vehicle exhaust from the apparatus bay does not enter the area where firefighters live and sleep. These processes will protect the long-term health of the firefighters living at the station. A layout that features these zones can embed healthy practices into the culture of the department.

Estimate Square Foot Per Function

Fire station construction, design, and maintenance are of concern for fire chiefs and elected officials abroad. The rising cost of land and construction materials are the main elements in discussing if, and when, a government structure should forgo constructing a fire station. Once the decision has been made to construct a new emergency services facility, the next decision is to determine the structure's size. The organization's current and future needs should be included in this determination. To determine the needed square footage for a new facility, several standards and reports are available as references when discussing the required square footage. Selected architects and contractors would also assist in this determination.

- United States Fire Administration – Safety and Health Considerations for the Design of Fire and Emergency Medical Service – May 2018 – This guide addresses the key elements when discussing fire station design and square footage.
- NFPA 1500 Standard on Fire Department Occupational Safety, Health, and Wellness Program. Specific sections of this standard address fire station design, cancer prevention, firefighter fitness, and creating decompression spaces for firefighters' mental health.
- NFPA 1851 Standard on Fire Department Infection Control Program – has a section designated to PPE (Personal Protective Equipment) storage and cleaning. It also requires that PPE be separated from other laundry utilities.



In 2020, NFPA formed the Technical Committee on Emergency Responders Occupational Health to draft new procedures for firefighters, including station design layout among the organization's work.

A standard estimated square foot theme was present when comparing federal contracts for building a fire and emergency response facility.^{10 11}

- Training space – 25 square feet per person of the occupancy of the room
- Fire Chief's Office – 300 square feet
- Captains/Deputy's Office– 200 square feet
- Apparatus Bay – square footage is dependent on the quantity of response vehicles.
- Consider that using a drive-thru bay concept will require additional square footage.
- Add 33% additional square footage for apparatus support items (Decon, Laundry, SCBA, Storage, etc.).
- Community space – 500 to 550 square feet per person assigned. This does not include administrative offices.
- One acre for every 5000 square feet of the structure.

Many fire departments lack storage space, administrative working spaces, and essential operational functions. ESCI recommends planning for future growth when deciding how much space is needed to meet the needs of the department. Additionally, ESCI notes that leaders and executives usually require between 200– and 400–foot square feet of office space.¹² ESCI suggests that a new facility should include executive leadership space for future growth.

¹⁰ “How Much Office Space Do You Really Need?” <https://thereceptionist.com/blog/how-much-office-space-do-you-really-need/>

¹¹ “How much office space for that?” <https://www.officfinder.com/how.html>

¹² “How Much Office Space Do You Really Need?” <https://thereceptionist.com/blog/how-much-office-space-do-you-really-need/>



For company officers, inspection personnel, and administrative assistants, ESCI recommends office space of around 100–125 square feet for each person.¹³ ESCI suggests that a new facility should include offices of at least 100 square feet to allow for future growth.

¹³ “How much office space for that?” <https://www.officefinder.com/how.html>

