



# Wasatch County Utah



## WASATCH COUNTY FIRE DISTRICT WASATCH COUNTY EMS **MASTER PLAN**

September 2018



Emergency Services  
Consulting International

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## ACKNOWLEDGEMENTS

Emergency Services Consulting International wishes to acknowledge the various members and leadership of the Wasatch County Fire District, Wasatch County EMS, and other representatives and individuals in Wasatch County, without whose assistance this project could not have been completed.

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*...and all of the men and women of the Wasatch County Fire District and Wasatch County EMS, who daily serve their community with honor and distinction.*



## COMMUNITY & ORGANIZATIONAL OVERVIEW

The following section is an overview of the demography of Wasatch County, along with a basic description of the components that comprise the *Wasatch County Fire District* (WCFD) and public safety system.

### Wasatch County

Located in the north-central portion of Utah, about 40 miles east of Salt Lake City, Wasatch County is comprised 1,207 square miles of which 70% is publicly owned land. The estimated 2017 population of the County was 32,106 persons.<sup>1</sup> The majority of the population resides in the north and northwest ends of the County. There are approximately 11,710 housing units in the County, with a median value of \$336,100.<sup>2</sup> Resident medium income is \$71,337 annually.<sup>3</sup>

There are seven incorporated cities and towns in Wasatch County: Charleston, Daniel, Hideout, Independence, Midway, Wallsburg, Interlaken, and Heber City—which is the largest city and the County seat. Timber Lakes is unincorporated, and a portion of Park City lies within the County boundaries.<sup>4</sup>

### Organizational Overview

Organized in 1987, the *Wasatch County Fire Protection Special Service District* operates as the Wasatch County Fire District, whose primary response zone/service area is comprised of 1,175 square miles within the boundaries of Wasatch County.

### District Governance

The District is governed by the elected, seven-member *Wasatch County Council*. Representatives from the Council are appointed to the *Wasatch County Fire District Board of Directors*, who elects a Board Chair, and is responsible for budget approval and oversight of the District.

### Citizens Fire Advisory Board

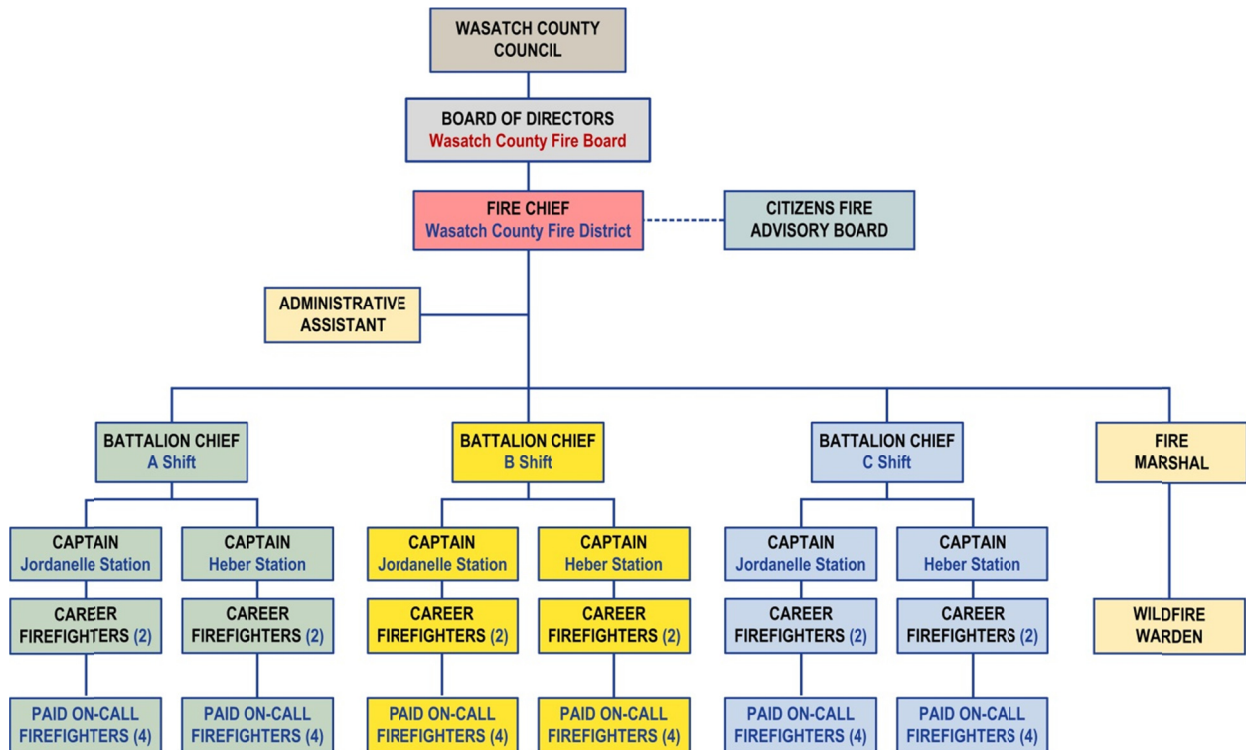
The *Citizens Fire Advisory Board* committee was formed by the Fire Chief to assist WCFD with identifying the needs and requirements of public safety within Wasatch County—with a primary focus on fire protection. The Committee has been formally chartered, and is comprised of local citizens of varying backgrounds, ranging from business management to government service.

The Committee meets bi-weekly, is overseen by the Fire Chief, and is led by a chairperson. Meetings are conducted in accordance with a defined agenda, which includes assigned tasks and completion dates. In addition to developing a countywide needs assessment and input to WCFD, the Committee will assist in disseminating information about fire department activities throughout the community.

## District Governance Discussion

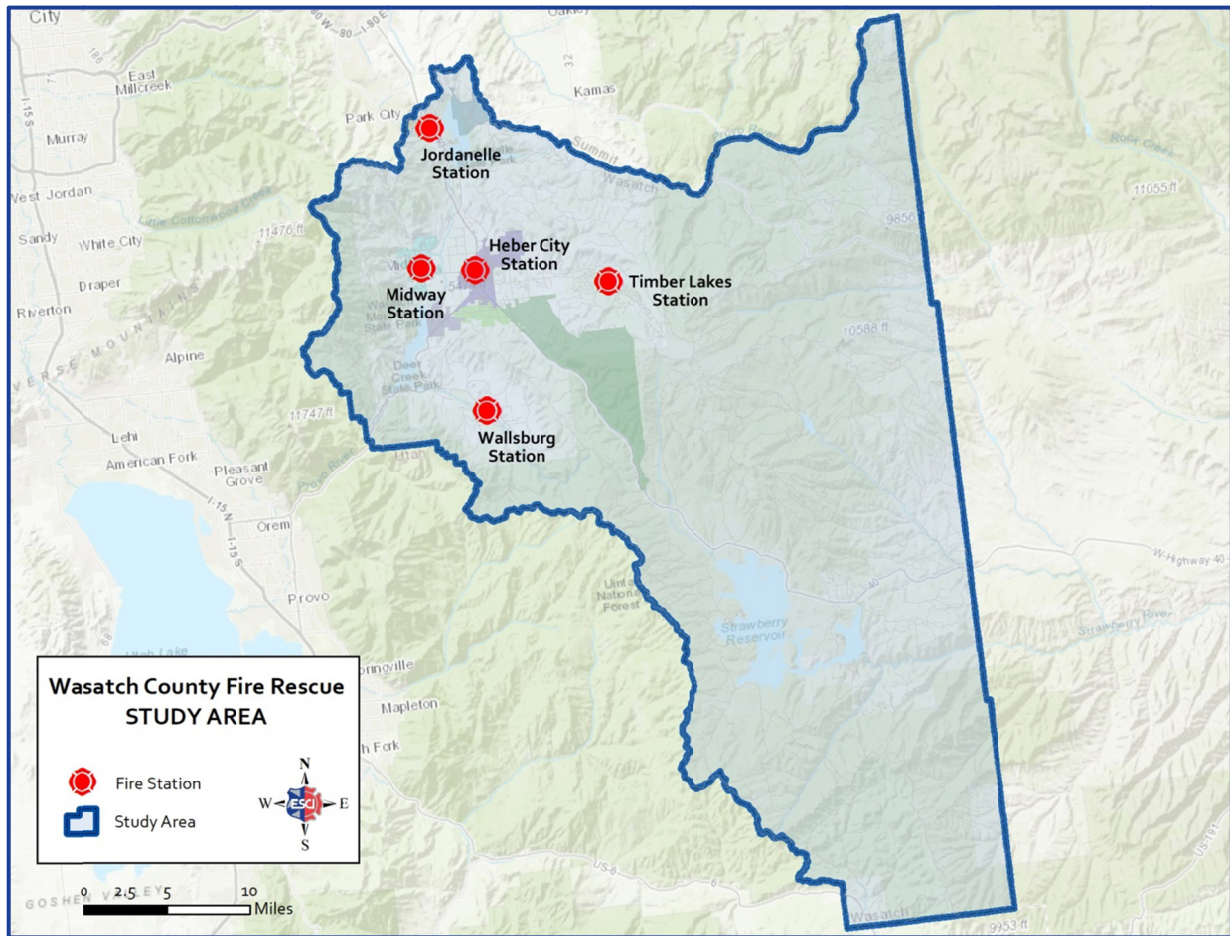
The Wasatch County Fire Protection Special Service District's form of governance is atypical of what is found in most communities. Usually, fire districts are governed by a separate and distinct elected board of fire commissioners or directors. Such boards have the sole responsibility of oversight of their respective fire districts. County council members have broad responsibilities in a variety of topics and issues, while a Board of Fire Commissioners focuses only on oversight and issues specific to the fire department.

**Figure 1: WCFD Organizational Chart (2018)**



## Wasatch County Fire District Service Area

The Wasatch County Fire District operates and deploys from five fire stations located throughout the County. The Jordanelle Station is staffed with three career firefighters 24 hours daily. Effective in the second quarter of 2018, the Heber City Station was converted from 12-hour to a 24-hour staffed station. A Battalion Chief is assigned to each of the three shifts. Paid on-call (POC) firefighters are utilized at all five stations. The following image shows WCFD's service area (study area).

**Figure 2: Wasatch County Study Area**

## Other Emergency Services System Components

### Emergency Communications

The *Wasatch County Dispatch Center* is operated by the Wasatch County Sheriff's Office (WCSO), and serves as the primary public safety answering point (PSAP) for both 911 and non-emergent calls. The Dispatch Center is responsible for dispatching WCFD; Wasatch County EMS; law enforcement agencies, search & rescue; and other emergency services organizations and agencies.

### Wasatch County Emergency Medical Services

*Wasatch County Emergency Medical Services* (WCEMS) is owned and operated by Wasatch County government, and functions as a "third service" medical transport provider. The agency is the sole provider of emergency medical transport in Wasatch County. WCEMS is overseen by an EMS Director who answers directly to the Wasatch County Manager. The County is governed by a seven-member County Council.

The Medical Director is a local board-certified emergency physician who practices at Heber Valley Hospital. He oversees all EMS providers in the County, and is compensated through a contractual arrangement with Wasatch County government.

WCEMS provides advanced-level ground emergency medical transport (GEMT) services throughout the County. Minimum ambulance staffing is typically comprised of at least one Advanced Emergency Medical Technician (AEMT) and one Emergency Medical Technician-Basic—but often may be staffed with up to three AEMTs or occasionally one Paramedic. However, the majority of the advanced-level personnel are certified as AEMTs (as opposed to Paramedics).

WCEMS utilizes a combination of “volunteer” single-role EMS providers and WCFD firefighters to staff its ambulances. Ambulances are deployed from the five fire stations, with three frontline units located at the Heber City Fire Station, and three at the Midway Station.

### **Air Medical Services**

On-scene, prehospital air medical services are available through *Intermountain® Life Flight* and the *AirMedCare Network®*. Both organizations provide rotary-wing helicopter service that enables the transport of certain critical patients to tertiary care facilities in Salt Lake City and other locations.

### **Hospitals & Tertiary Care Facilities**

*Heber Valley Hospital* (HVVH) is the only hospital located in Wasatch County. It is a Level IV designated trauma center. High-acuity trauma patients are typically transported by ground ambulance or one of the helicopter air medical services to one of three Level I Trauma Centers—one of which is a pediatric facility—located in the region of Salt Lake City.

Several other facilities in the areas of Salt Lake City are designated comprehensive stroke centers, as well as capable of providing percutaneous coronary intervention (PCI) in cases of ST-Elevation Myocardial Infarction (STEMI) and other cardiac events.

## MANAGEMENT COMPONENTS

Effectively managing a fire department is a complex task, often impacted by financial constraints, political pressures, and demanding community expectations. Today's fire department must address these complexities by ensuring an efficient and flexible organizational structure, adequacy of response, maintenance of competencies, a qualified work force, and financial sustainability.

The development of baseline management components in an organization enables it to move forward in an organized and efficient manner. In the absence of foundational management elements, the organization can flounder; lost in ineffective leadership and divergent views of purpose and vision.

A well-organized and efficiently administered organization has appropriate documentation, policies, procedures, and clearly understands, acknowledges, and addresses internal and external issues affecting the department. Processes must also be established to address the flow of information and communications within WCFD, as well as with its constituents. In the following section ESCI examines WCFD's current efforts to manage the organization.

### Mission, Vision & Values

The management of a fire department needs to be grounded in acceptance and adoption of a strong mission, vision, and values. Unfortunately, WCFD has not created the fundamental foundation blocks necessary to ensure everyone in the organization and the community understands why WCFD exists, the level of services provided, vision for the department over the next three to five years, and the goals and objectives to get there. A successful strategic planning process can enable organizational improvements related to the creation and maintenance of policies and procedures; enhancement of internal and external communications practices; improved operational deployment; recordkeeping; and sustainable financial practices, to name a few.

To be most effective, mission statements, visions, and a values statement must be part of a "living" process, consciously evolving as the department grows, and changes. This is often accomplished through a strategic planning process. Creating a strategic plan in the near future should be a high priority for the WCFD, and would empower department personnel to move together in a positive direction, and enable efficient change for the betterment of the organization and community. While many of the changes recommended in this master plan should become a part of a strategic plan, it is through this process that the organization can prioritize the order in which short-term, mid-term, and long-term goals can be accomplished.

### Management Issues & Processes

For any organization, documentation of activities is not only required to meet the organizational mission, it is also a legal requirement in many aspects of operations. This is critical because it is governed by state and federal regulations, and provides a mechanism for measuring performance.

Policy and procedure development and maintenance is necessary to ensure a stable, effective, and cohesive organization. It also provides a formal method for memorializing organizational decisions and processes. WCFD recently updated its policies and procedures in June 2018. Additionally, ESCI's evaluation of WCFD revealed that no capital facilities plan exists.

### **Internal Assessment of Critical Issues & Future Challenges**

The Fire Chief identified three critical issues facing WCFD:

- Address the need to increase resources to meet County growth demands.
- Improve business practices, including updating department policies and procedures.
- Update impact fees and a community needs assessment.

Interviews with the Fire Chief revealed other underlying challenges faced by the department, including how to legislate and enforce building construction fire code compliance in areas of the District without adequate fire flow. *ESCI considers this as a critical issue for the District, as once a building is constructed it forever becomes the responsibility of the District.* As additional growth occurs, it compounds the life-safety response challenges for the District.

Another significant issue identified by the Fire Chief was the potential feasibility of merging Wasatch County EMS into WCFD. The District and WCEMS have implemented several operational changes revealing potential benefits of full consolidation. This issue will be addressed later in the report.

### **Internal & External Communications**

In today's "hyper-speed" world of communication, the public expects strategic, frequent, responsive, and transparent communication from government agencies. Likewise, employees expect the same when disseminating internal messages. Without it, public and employee confidence in the organization can be severely damaged, and informal communication channels may be created to spread false and misleading information throughout the community and organization.

Specific to internal communications, ESCI noted WCFD holds regular business meetings for all staff. These are held monthly before the monthly training sessions. Information is disseminated to department members through email, memos, and communications with company officers.

Community newsletters, media coverage, and websites are the means most commonly employed by fire departments to communicate with the public. Fire and life-safety messages and upcoming political or fiscal issues can also be distributed in this manner.

### **Internal/External Communications Discussion**

WCFD uses the basic tools to communicate internally and externally. Most recently, a Citizens Fire Advisory Board was formed to assist in impartially addressing a variety of contentious issues, as well as identifying public safety needs.



The rural nature of Wasatch County, and the substantial “volunteer” nature of the organization, ensures the activities and support of the organization are engrained in the community. Without this, the department’s mission could be severely constrained.

Many emergency response agencies are now using interactive social media tools like Twitter®, Facebook®, Instagram®, and more. These tools are now entrenched in the fabric of the American social structure, with the potential to harness (or unleash) tremendous community support, concern, and action. WCFD maintains a web page, and an active social media presence on Facebook®—frequently posting local and national fire-service news of interest; public education topics; and the Fire Chief’s insights on the operations and direction of the department. Approximately 1,000 people follow their account, indicating some level of interest in WCFD’s activities. Of those that follow the District on Facebook®, it is unknown how many are local residents.

Internal communications are likely constrained by the physical distance between stations and assigned personnel, along with the relatively infrequent drill/meeting schedule. To illustrate, 20 miles separates two adjacent fire stations, presenting a significant barrier for frequent face-to-face communication and coordination.

### **Record Keeping & Document Control**

In any organization, documentation of activities is of paramount concern. Sound management decisions cannot be assured without accurate data, and organizational transparency to the public will be impeded if the department cannot explain what it is doing. The documentation of activities must be routine.

WCFD has a sound process for document control. Hard copy records are secured by lock and key in file cabinets and locked offices. Electronic files are secured by passwords assigned to users with rights to appropriate documents, and backed up on an external hard drive. ESCI understands a cloud storage service is being considered in the near future. These practices are consistent with industry standards.

Public records requests are fulfilled approximately once a month, and done so in a timely manner consistent with state public disclosure rules.

### **Facility Security & Financial Controls**

Basic station security is in place for all WCFD facilities, with code key locks on facility doors (not bay doors). Two of the stations—Jordanelle and Heber—have security cameras installed in strategic interior and exterior locations. None of the stations have intruder alarms.

There are no inventory controls in place for valuable equipment and supplies. Small capital items—tools and office equipment, for example—are inventoried only on an “as needed” basis. The District does not hold or use a petty cash account.

Payments (warrants) are vetted and authorized by the Fire Chief and administrative assistant, and approved monthly by the Fire Board. These payments and related documentation are audited quarterly by a certified public accounting firm hired by the District, in addition to the required annual state audit.

## STAFFING & PERSONNEL MANAGEMENT

Many emergency services organizations consider employees as their most valuable asset. Managing personnel to achieve maximum efficiency, professionalism, and personal satisfaction is an art as much as science. Consistency, fairness, safety, and opportunities for personal and professional growth are key values in a healthy management culture. These values are even more important when the organization relies on the participation and support of a “volunteer” workforce. Volunteer personnel may leave if they do not feel valued and/or experience personal satisfaction from their participation.

In this section of the staffing analysis, the ratio of administrative and support positions to total organizational staffing for WCFD is compared to industry best practices. An appropriate balance of administrative and support staff, compared to operational resources and service levels, is an important consideration to achieving organizational success.

Several national organizations recommend standards to address staffing issues. The *Occupational Health & Safety Administration* (OSHA) *Respiratory Protection Standard*, and the *National Fire Protection Association* (NFPA) Standard 1710 or 1720; (whichever is applicable) are frequently cited as authoritative documents.<sup>5,6,7</sup> In addition, the *Center for Public Safety Excellence* (CPSE) publishes benchmarks for the number of personnel recommended on the emergency scene for various levels of risk.

### The Wasatch County Fire District

As shown in the organizational chart in the “Organizational Overview” section of this report, WCFD employs a full-time Fire Chief, full-time Fire Marshal, full-time Fire Warden, and a full-time Administrative Assistant. Currently, there are 24 full-time career firefighters and officers assigned to two fire stations, and 41 volunteer (paid on-call) firefighters, and four unpaid volunteers. The volunteer number includes career firefighters when they are off duty.

### Administrative & Support Staffing

The following section reviews WCFD’s administrative and support staff organizational structure.

**Figure 3: WCFD Administrative & Support Staff**

SURVEY COMPONENT	WCFD
Fire Chief	1
Fire Marshal	1
Wildfire Warden	1
Administrative Assistant	1
<b>Total FTEs:</b>	<b>4</b>
<b>Percent Total of the District:</b>	<b>8%</b>



## Administrative & Support Staffing Discussion

The level of administration and support staffing reflects nearly 8% of the total workforce, and about 19% of the full-time personnel. This ratio of administrative to operations personnel is at the bottom end of the ratios that ESCI has found with other fire departments. Fire districts typically have higher ratios, since they must provide various administrative and support functions that a city or county government agency may provide (e.g., human resources, information technology, finance, and building and apparatus maintenance).

The Fire Chief, Fire Marshal, and Wildfire Warden share the responsibilities of fire-code enforcement and fire-code plan review for new construction. The full-time firefighters perform occupancy inspections. Other administrative functions, information technology support, and legal services are procured through contracts with outside vendors as necessary. The District uses part-time employees to perform financial tasks, and contracts with a certified public accountant (CPA) for required county and state audits.

ESCI notes two potential negative aspects to the lean number of WCFD administrative staff. First, a lack of “bench depth”—an absence of functional redundancies that can result in the crippling of normal operations if an administrative employee becomes unavailable for work for an extended period of time. Second, allowing limited staff to work at maximum capacity may result in focusing on myopic short-term tasks, and ultimately diminish the ability to strategize and/or perform long-term planning. Compounding this problem for WCFD administration is their role in also responding to routine emergency incidents while performing regular administrative duties.

WCFD’s administrative functions are physically located at the Jordanelle station. Like many smaller departments with a shared fire station and administrative facilities, this station is designed in such a way that administrative offices are housed together and separated (if only slightly) from the operations side of the facility.

## Personnel Management

Professional, compassionate, and competent management of personnel is critical to the success of an organization. Managers and organizational leaders in countless organizations have been replaced due to incompetency and/or unethical leadership, resulting in poor morale among personnel, failures in executing organizational missions and, in some cases, significant legal liability.

## Wasatch County Fire District

The WCFD Fire Chief has the sole responsibility for administering and overseeing career and volunteer firefighter staff—including hiring, promotions, and terminations. The District is not bound by civil service rules and regulations. Employees are hired at the will of the Fire Chief, using a process involving an interview, physical examination (fit for duty), and background check.

During interviews, firefighters and officers in particular, expressed a limited understanding of their roles and responsibilities within the organization. However, the District does maintain formal job descriptions signed by employees.

Career advancement and promotion of officers—including chief officers—have historically been determined by a vote of the firefighters, along with an informal evaluation and opinion of a candidate’s qualifications. There is no formal assessment and/or validation of qualifications for officer positions among the career personnel or volunteers. Interviews with recently promoted officers indicated that no formal promotional process was used to determine the best candidates.

### **Personnel Discussion**

The District appears to have relied on past methods for establishing current leadership positions. In today’s litigious environment, these methods will not survive significant scrutiny if challenged. Additionally, long-standing industry best practices are based on a foundation of contemporary job descriptions; measured performance against these job descriptions; structured initial hiring and promotional assessment processes; and formal performance evaluations for incumbent employees.

### **Wasatch County Emergency Medical Services**

The Wasatch County EMS Director is responsible for managing ambulance personnel, who are comprised primarily of paid on-call EMS personnel. The Director reports directly to the Wasatch County Manager, and receives administrative support from other County departments. The Director collaborates closely with WCFD in providing emergency medical transport services throughout the County, and maintains a good relationship with the Fire Chief and his staff.

### **Emergency Response Staffing**

An adequate number of properly trained staff of emergency responders is required for placing appropriate emergency apparatus and equipment to its best use in mitigating incidents. This is especially important due to the predominantly rural nature of WCFD’s response area, and the long distances between fire stations. Insufficient staffing at an operational scene—especially for first-in apparatus—negatively impacts the department’s ability to perform critical life and property saving tasks, as well as ensuring firefighter safety.

### **Wasatch County Fire District Staffing**

WCFD must ensure responding companies are capable of performing all of the described tasks in a prompt, efficient, and safe manner. The following figure lists WCFD’s emergency response staffing.

**Figure 4: WCFD Emergency Response Staffing<sup>1</sup>**

Survey Component	WCFD
Battalion Chief	3
Captain	6
Firefighter/EMT Volunteer	41
Firefighter/EMT–Full-time	11
Full-time Firefighter Paramedics	1
<b>Total Operations Personnel:</b>	<b>62</b>
<b>Total Personnel:</b>	<b>56</b>
<b>Operational Officers to Firefighters:</b>	<b>30%</b>

<sup>1</sup>As of June 17, 2018**Figure 5: WCFD Career Staff Schedule**

Survey Component	WCFD
Length of normal duty period	48 hours
FLSA period	28-day cycle
Duty hours per week (average)	53
Normal shift begins (time)	0600 hours
Call-back requirements	No
Residency requirements	No
Standby duty requirements	No

With the exception of a few, all WCFD firefighters are trained and certified as an Advanced Emergency Medical Technician (AEMT), with one firefighter certified as a Paramedic. The District mandates that both career and paid on-call firefighters to be trained as, and maintain, Utah licensure as AEMTs.

### WCFD Career Staffing

WCFD full-time operations personnel are assigned to one of three shifts, with a 48-hour on, 96-hour off schedule. This produces an average 53-hour workweek, with a total of 2,910 annual hours. Many of these employees also work for Wasatch County EMS during their off-duty hours, and may also respond back to the fire department to provide back-up coverage and incident response during times of peak demand and/or large-scale incidents. Requested vacation time is approved and coordinated by the Fire Chief.

Most career-staffed fire departments utilize a 24-hour work period. While the 24-hour shift remains the predominant schedule for fire departments in the Western United States, the 48-hour shift is not uncommon. However, the 48-hour schedule has been questioned by departments around the country due to concerns about sleep deprivation and safety impacts during the latter portion of the 48-hour shift.

The *Fair Labor Standards Act* (FLSA) is a federal regulation that requires firefighters be paid at an overtime rate for all hours worked over 212 hours in a 28-day work cycle. Each employer may adopt a period of time for averaging the employees' workweek from a maximum of 28 days to a minimum of seven days. Fire departments in the Western United States tend to use cycles that run from 24 to 28 days. Twenty-four-hour shifts are broken up by off-duty periods that can be regular or varied. For example, a common schedule is one 24-hour shift on duty, followed by two 24-hour shifts off duty. Another common variation is one shift on, one shift off, one shift on, one shift off, one shift on, four shifts off. Both examples provide 48 hours off-duty for every 24 hours on-duty. Both result in a workweek that averages 56 hours, and therefore requires the employer pay overtime for the extra hours, or schedule additional time off to reduce the overall average workweek overtime exposure.

### Career Staff Compensation Comparison

ESCI sent salary and benefit surveys to three Utah fire departments; Park City Fire Department, Layton Fire Department, and the Murray City Fire Department. The Park City Fire Department is adjacent to WCFD, and the Murray City and Layton City Fire Departments are located west of the Wasatch Range, south of Salt Lake City. The survey asked for information regarding hourly rates, annual salary information for first and top step pays, annual average hours worked, and the benefits provided. Murray City did not respond to the survey request. The following figure illustrates the combined average hourly rates of Park City and Layton City with WCFD's hourly rates for their positions.

**Figure 6: Comparison of WCFD Hourly Pay Rates**

WCFD Position	WCFD 2018 Hourly Rates	Average Hourly Rates Combined <sup>1</sup>	Differences in Hourly Pay
Firefighter	\$16.93	\$17.55	-\$0.62
Firefighter/Paramedic <sup>2</sup>	N/A	\$20.12	N/A
Captain	\$27.80	\$26.21	\$1.59
Battalion Chief	\$29.55	\$31.09	-\$1.54
Assistant Chief <sup>2</sup>	N/A	\$51.91	N/A
Fire Marshal	\$40.15	\$38.39	\$1.76
Assistant Fire Marshal	N/A	N/A	N/A

<sup>1</sup>Represents the combined averages of Park City Fire and Layton City Fire

<sup>2</sup>WCFR does not currently have these positions

In 2016, the *Citizens Compensation Advisory Committee* of the City of Salt Lake published an annual report comparing regional (Wasatch Front Range) salaries for various government jobs. The report included findings from regional fire departments. The average full-time firefighter 2016 annual wage in Wasatch Front Range departments was \$42,412, which equals \$14.52 for a firefighter working 2920 hours per year.<sup>8</sup>

The higher firefighter hourly rates described above, compared to the findings of the CCAC may be the result of salary adjustments and/or cost of living considerations between the Front Range and the Park City and Heber areas. A job search website (*Soku*) currently lists \$16.51 per hour as a statewide average firefighter salary, and another website (*Salary.com*) currently lists \$14.63 per hour as the Wasatch Front Range average firefighter salary, if working 2,920 hours per year.

The Park City and Layton City fire departments offer a wide range of employee benefits, including: health and dental insurance; life and disability insurance; tuition reimbursement; retirement/401K benefits; and either provide uniforms or give a uniform allowance. In addition, Park City's health plan includes a tax-free healthcare savings account to pay for post-employment medical expenses. WCFD offers a similar benefits package, with the exception of the post-employment healthcare savings account.

### **Career Employee Compensation Discussion**

WCFD employees previously received a \$735 per month stipend, along with \$16–\$18 per hour callback pay for off-duty response to District incidents—including EMS incidents. Recently, the stipend was “rolled” into their base pay. However, the off-duty response expectations are still in place. This practice is inconsistent with FLSA law, as full-time employees are required to be paid at 1.5 times their regular rate of pay for all call-back hours worked (beyond their scheduled hours worked).

Several WCFD full-time employees also work part-time during their off-duty hours for Wasatch County EMS, and are compensated with a \$721 monthly stipend, and a \$16–\$18 per hour callback rate. This appears to be consistent with what is allowed by FLSA regulations, as they are technically working for another employer—even though they are performing work similar to their full-time work. However, if WCEMS is consolidated into the District, this deployment model would require paying firefighters at the appropriate overtime rate in order to comply with FLSA requirements.

Given the low number of salary surveys returned, and the FLSA issue described above, it is difficult to draw significant conclusions and recommendations regarding salary and benefits adjustments. However, the available data indicates WCFD firefighters and Battalion Chiefs are paid slightly less when compared to the other departments. However, Captains and the Fire Marshal are paid moderately more than similar positions at the other departments.

### **WCFD Volunteer Staffing**

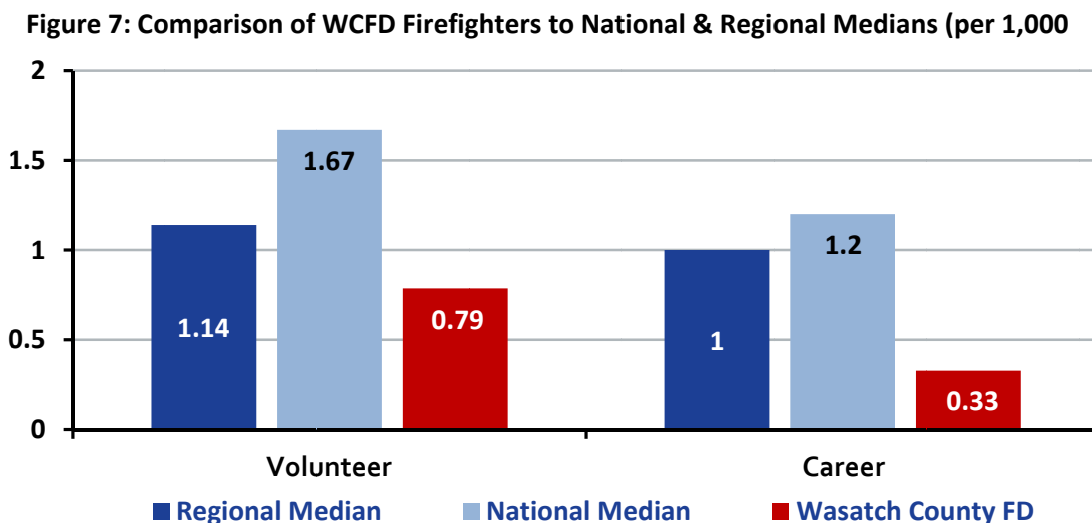
The term “volunteer” in the context of WCFD is misleading. In reality, these individuals are part-paid employees (paid on-call) of the District, receiving a \$735 monthly stipend. In this report, the term “volunteer” has been used interchangeably with the term “paid on-call.” Volunteer firefighters are trained to the same standards as career personnel before they are permitted to respond to structural and other emergency incidents. This training requirement includes obtaining and maintaining AEMT licensure. They respond out of the five WCFD stations, three of which are staffed solely by volunteers, and almost always work in support and coordination with the career firefighters.

Volunteer firefighters respond when paged by Wasatch County dispatch, and usually report to their stations before responding to the incident scene. However, some volunteers carry a set of turnout gear in their vehicles, allowing them to respond directly to an incident scene when necessary.

### WCFD Staffing Discussion

Structure fires and other complex and rapidly evolving incidents require rapid and simultaneous performance of tasks to effectively control the situation. If there are insufficient resources to perform all required tasks, the incident commander must prioritize task assignments to maximize the effectiveness and safety of the limited resources.

The following figure compares WCFD's full-time firefighter staffing against western region and national departments with similar populations. The regional and national statistics used for comparison are from the NFPA's 2009 *U.S. Fire Department Profile*.



The preceding figure does not represent a comparison of communities of a population size similar to WCFD's service area. Calculations were based on available data from communities with the next closest population match. However, this figure does not take into account the substantial transient population increases in Wasatch County due to recreational activities. Also, this analysis does not take into account the number of hours worked per week by firefighters (which vary among jurisdictions), or the issue of whether the fire departments in question provide emergency medical transport.

Using this comparison, WCFD appears to be below both the regional and the national medians for career personnel. The current size of the career force is limited by fiscal resources available to the District, and the size of the volunteer force is limited by the number of willing and physically able residents of the District and its commitment to training and maintaining a volunteer force.

The NFPA recommends that career fire departments maintain a minimum engine-company staffing of four personnel. This standard was developed from a consensus of experts, but is also supported by scientific research. In 2010, the *National Institute of Standards & Technology* (NIST) published a study that found four-person firefighting crews were able to accomplish essential firefighting and rescue tasks 25% faster than three-person crews.<sup>9</sup> Another study analyzed the effectiveness of firefighting crews in high-rise operations.<sup>10</sup> The study found that firefighting crews of five or six members, instead of three or four, were significantly faster in completing search-and-rescue operations and extinguishing fires.<sup>11</sup> ESCI mentions this only as another example of evidence-based research supporting the use of sufficient personnel.

Considerable ongoing local, regional, and national discussions and debate draws a strong focus and attention to the matter of firefighter staffing. Frequently, this discussion is set in the context of firefighter safety. While there are published national standards (NFPA Standards 1710 and 1720) regarding firefighter staffing, they generally speak in terms of the number of firefighters assigned to a particular response apparatus, and often characterized as a “minimum of four personnel per engine company.” ESCI notes that the more critical issue is the number of firefighters that are assembled at the scene of an incident in conjunction with the scope and magnitude of the tasks expected of them—regardless of the type or number of vehicles upon which they arrive.

Although older, a 2001 study of the *Houston Fire Department* determined that fire apparatus staffing is an even greater citizen-safety issue than firefighter safety.<sup>12</sup> The report termed the understaffing situation a “crisis situation that demands immediate intervention.” Decreasing the number of firefighters without eliminating any of the tasks fire departments are expected to accomplish, causes the department to delay some of the required tasks, or to attempt to perform all tasks unsafely with inadequate staff. The study also noted that “Firefighters working in understaffed environments are too often expected to perform beyond their capabilities.” And, that inadequate staffing creates “a cumulative effect” caused by combined delays and lost functions of crews, resulting “in an even greater loss of overall effectiveness.”

When looking at the minimum requirements for accomplishing the tasks necessary in containing and extinguishing a residential fire, it should be noted that WCFD’s minimum on-duty daily staffing does not provide adequate personnel resources, even when all on-duty units are available. The District attempts to address this deficit in several ways.

Off-duty firefighters are alerted and notified via pager, and are required to respond. Neither career nor volunteer personnel are required to live in the District. WCFD and its neighboring fire departments rely upon a system of mutual and automatic aid to assist one another in gathering adequate resources to mitigate emergencies beyond the capability or capacity of an agency’s resources.

### **Mandatory Firefighter EMS Training**

As discussed previously, the Wasatch County Fire District requires all career and volunteer firefighters to maintain continuing medical education and licensure as a Utah Advanced Emergency Medical Technician. ESCI found that many of the volunteer firefighters had little or no opportunity to perform emergency medical skills at either the basic or advanced levels.

## Wasatch County EMS Staffing

Wasatch County EMS operations utilize 43 part-time employees; of which 33 work out of the Heber City Fire Stations, and 11 at the Wallsburg Fire Station. This staffing is augmented by WCFD full-time firefighters who cross-staff WCEMS ambulances throughout the County.

EMS personnel assigned to the Heber station are required to work a minimum of four shifts per month (two weekday shifts and two weekend shifts Friday through Sunday), and are paid a stipend of \$721 in four equal weekly installments. Personnel assigned to the Wallsburg station are required to work seven shifts a month with no mandatory weekend work-requirement. EMS providers are allowed to trade shifts as desired.

Those assigned to the Wallsburg station receive the standard \$721 monthly stipend, plus \$80 for each shift over the mandatory four shifts per month. Holiday shift-coverage is determined by lottery. Names of the EMS personnel are placed in a hat, and the person whose name is drawn has the pick of the remaining holidays to choose from—beginning with Memorial Day. All EMS personnel are expected to work at least one holiday shift per year, if all required shifts have been fulfilled.

One of the mandatory requirements to become a volunteer with Wasatch County EMS is that personnel must obtain certification as a Firefighter I and Firefighter II—despite the fact that most will not participate in fire suppression and other fire service operations.

## WCEMS Staffing Discussion

WCEMS' requirement that volunteers obtain Firefighter I and II certification has been an impediment in attracting new EMS providers who may not have an interest in firefighting. Some do not have the time, interest, or physical ability to participate in the training or fire-service activities. Unfortunately, because of this, WCEMS has lost opportunities to acquire qualified individuals interested in participating in the EMS system. Registered nurses, respiratory therapists, and other healthcare professionals—if properly trained in prehospital care and equipment—could be valuable assets to the EMS delivery system.

Although Wasatch County EMS utilizes both career firefighters and EMS volunteers certified as Advanced Emergency Medical Technicians to staff their ambulances, WCEMS does not provide Advanced Life Support (ALS) services at the Paramedic level. There are certain advanced skills (e.g., endotracheal intubation, etc.) that can be performed by a Paramedic, not an AEMT. Therefore, a *full* ALS service would require ambulances staffed with Utah-licensed Paramedics equipped with the necessary equipment, supplies, and medications to provide the highest level of prehospital advanced life support.



## BUDGET & FINANCE

A critical component of the success and operation of any business—private or public—is a consistent and reliable funding stream. In the case of public agencies, this funding is usually provided by the assessment and collection of various forms of taxation, such as ad valorem (real estate) taxes, sales taxes, special assessments, billing for services and, in some instances, an apportionment of state or local income taxes. Recognizing funding limitations, city and county public safety agencies are limited by the types and amount of revenues that can be assessed and acquired. Some public safety organizations may have the option of charging fees for other services under contractual arrangements to areas outside their political boundaries, or patient transport fees, if applicable.

### Special Service District Financial Practices

The *Wasatch County Fire Protection Special Service District* (WCFPSSD) utilizes an accounting and budgeting system like most municipal forms of government. This system utilizes multiple “funds,” more easily described as separate operating companies, to track expenditures made by, and revenues attributable to, the operation of each fund. The WCFPSSD General Fund reflects the performance of the core services provided by the agency, including revenues from property taxes; plan and inspection fees; charges for services; and other miscellaneous revenues. The General Fund accounts for expenditures that include salaries and benefits; legal and professional services; office expenses; insurance; repairs and maintenance of equipment; training; and uniforms and personal protective equipment. WCFPSSD has created a Special Revenue Fund that has been utilized to account for revenues and expenses associated with contracts to provide services in the Jordanelle Area Enhancement and Emergency Medical Services. Additionally, WCFPSSD has established a Capital Projects Fund for equipment and long-lived assets.

The District operates on a calendar year basis for accounting and reporting purposes. The information provided by WCFD staff in the following historical revenues and expenses section has been used as a basis to explain the variances between the historic figures and the 2018 budget. The 2018 general fund budget is \$3,090,100, which will be discussed later in this report. The assessed value on which property taxes are based in the 2018 budget year is \$7,114,005,671, or approximately 55% higher than the 2017 value. This was a significant increase, and will be addressed later in the budget discussion.

A significant amount of financial information and supporting data was provided to ESCI by the staff of the Wasatch County Fire District. This underwent a comprehensive review, including an audit report dated December 31, 2017 and a budget review for the calendar year ending December 31, 2018.

### WCFD Revenues

Revenues are separated into two categories: recurring and non-recurring. Recurring revenues are those expected to continue annually, such as property taxes, special assessments, sales taxes, and contracts for service. Non-recurring revenues are those that have an expectation of not continuing, such as sales of assets, grant revenues, transfers from reserve funds, loan proceeds, and insurance proceeds; or those receipts that cannot be reasonably quantified.

Loan proceeds may be received in one fiscal year but not be utilized until a future fiscal year—which can significantly distort cash flow in both years. The following figure provides a historic table of revenues from the combined funds activity for the years 2013–2017.

**Figure 8: Historic Revenues from Combined Funds (2013–2017)**

Revenue Sources	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
<b>Recurring Revenue</b>					
Property taxes	957,629	1,596,977	1,741,032	1,987,649	2,157,754
Plans & inspections	151,511	146,620	213,659	210,817	269,802
EMS revenues	—	—	313,400	309,467	547,277
Assessment fire station	475,037	564,566	364,179	421,025	542,797
Jordanelle Area Assessment	—	—	300,000	150,000	150,000
Cell tower revenue	15,840	15,890	15,840	17,424	17,424
Office lease	53,046	53,046	54,543	56,040	56,040
<b>Total Recurring Revenue:</b>	<b>\$1,653,063</b>	<b>\$2,377,099</b>	<b>\$3,002,653</b>	<b>\$3,152,422</b>	<b>\$3,741,094</b>
<b>Non-Recurring Revenue</b>					
Fire warden revenues	5,730	6,030	—	81,276	—
Wildland firefighter revenues	12,817	1,926	10,203	1,271	—
Ambulance revenues	22,694	66,997	63,118	—	—
Extrication revenues	—	2,100	—	—	—
Grant	27,320	22,965	38,609	48,557	—
HazMat revenues	14,842	15,714	—	—	—
Interest	8,011	4,968	9,432	18,000	29,598
Other	865	4,292	5,750	13,373	4,052
Settlement gains	—	—	438,480	—	571,885
Revenue recoveries	—	4,891	—	24	—
Sale of surplus property	—	—	—	27,850	—
Penalties & interest	831	8,098	1,955	390	16,544
<b>Total Non-Recurring:</b>	<b>\$93,110</b>	<b>\$137,981</b>	<b>\$567,547</b>	<b>\$190,741</b>	<b>\$622,079</b>
<b>Total All Revenue Sources:</b>	<b>\$1,746,173</b>	<b>\$2,515,080</b>	<b>\$3,570,200</b>	<b>\$3,343,163</b>	<b>\$4,363,173</b>

Property tax revenues are affected by two primary components: the assessed value of the real and personal properties taxed, and the tax rate charged against that value. The value of a property is affected by the market conditions in the community and may, in the future, be subject to state legislation limiting the growth of real estate tax assessments.

The following figure recognizes the growth of property values and the related increase in property tax revenue for the fiscal years 2013 through 2017. Property values increased by approximately 33% between 2013 and 2017, with tax rates increasing 64% from 0.000244–0.000399 in the same time period, providing for the 100% increase in property tax revenues between 2013 and 2017.

**Figure 9: Property Tax Valuation & Revenues (2013–2017)**

Property Tax	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
<b>Property Tax</b>					
Valuation	3,628,800,384	3,782,670,653	4,029,880,755	4,501,459,545	4,893,416,714
Tax rate per \$100	0.000244	0.000419	0.000402	0.000429	0.000399
Property taxes	—	—	—	1,925,784	1,900,930
<b>Property Taxes Collected</b>					
Current tax year	819,489	1,499,941	1,617,158	1,945,311	1,958,271
In lieu of fee	41,473	38,459	52,148	18,267	120,899
Prior tax years	92,156	56,771	70,065	25,816	77,182
Penalties & interest	4,511	1,806	1,661	(1,745)	1,402
<b>Total Collected:</b>	<b>\$957,629</b>	<b>\$1,596,977</b>	<b>\$1,741,032</b>	<b>\$1,987,649</b>	<b>2,157,754</b>

Property taxes are not the only recurring revenue source funding the operations of WCFFD. The District has an agreement with Wasatch County EMS in which firefighters staff some of the ambulances, and to be paid a flat fee for providing those services. This fee has historically produced revenue in excess of \$300,000 annually for the past three years.

The Special Revenue Fund is used to account for the collection and use of assessments levied against property in specially designated portions of the County. This fund was created to account for the activities related to the Jordanelle Station area. The revenue amount is calculated at an assessment rate of \$0.25 of \$1,000 of assessed market value within the specially designated area. Revenue from this source has grown as the property value in the Basin Area has increased. The revenue derived from this assessment has been the subject of litigation since its inception, and the court case regarding the fee for the enterprise fund was settled in 2017, with the District changing its ability to assess the tax (the court case for the assessment has yet to be settled). The District provides plan review and inspection services to the County's building industry on a limited basis. The following figure provides details of the sources of other recurring revenues.

**Figure 10: Other Recurring Revenues (2013–2017)**

Recurring Revenue	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
Plans and inspections	151,511	146,620	213,659	210,817	269,802
Assessment fire station	475,037	564,566	364,179	421,025	542,797
EMS Revenue	—	—	313,400	309,467	547,277
Jordanelle Area Assess.	—	—	300,000	150,000	150,000
Cell tower revenue	15,840	15,890	15,840	17,424	17,424
Office lease	53,046	53,046	54,543	56,040	56,040
<b>Total Recurring:</b>	<b>\$220,397</b>	<b>\$780,122</b>	<b>\$1,261,621</b>	<b>\$1,164,773</b>	<b>\$1,599,887</b>

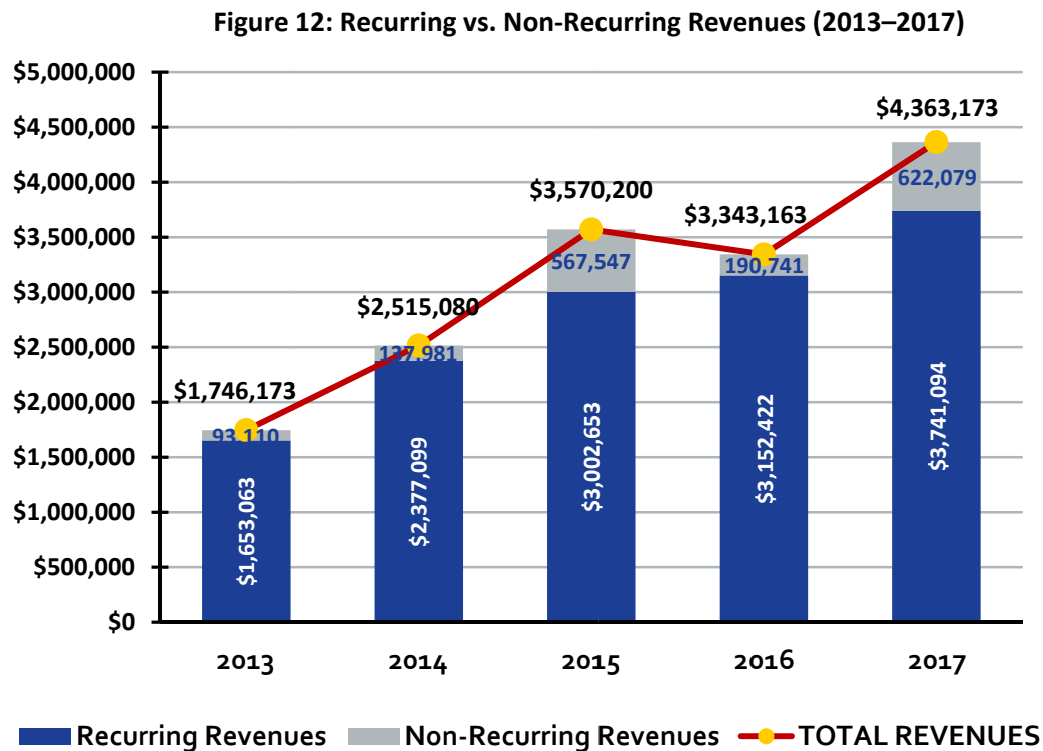
Non-recurring revenues include grant receipts, settlements; hazmat billings; the *Federal Emergency Management Agency* (FEMA) and state reimbursements; ambulance and EMS billings prior to the formalization of a contract with the County; interest on fund balances; transfers from reserve accounts; sales of assets; and other miscellaneous receipts.

**Figure 11: Non-Recurring Revenues (2013–2017)**

Non-Recurring Revenue	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
Fire Warden revenues	5,730	6,030	—	81,276	—
Wildland revenues	12,817	1,926	10,203	1,271	—
Ambulance revenues <sup>1</sup>	22,694	66,997	63,118	—	—
Extrication revenues	—	2,100	—	—	—
Grant	27,320	22,965	38,609	48,557	—
HazMat revenues	14,842	15,714	—	—	—
Interest	8,011	4,968	9,432	18,000	29,598
Other	865	4,292	5,750	13,373	4,052
Settlement gains	—	—	438,480	—	571,885
Sale of surplus property	—	—	—	27,850	—
Penalties & interest	831	8,098	1,955	390	16,544
Revenue recoveries	—	4,891	—	24	—
<b>Total Non-Recurring:</b>	<b>\$93,110</b>	<b>\$137,981</b>	<b>\$567,547</b>	<b>\$190,741</b>	<b>\$622,079</b>

<sup>1</sup>Represents standard revenue source combined with that from the Jordanelle Assessment

The following figure provides a graphic illustration of the relationship between the Wasatch County Fire District's recurring and non-recurring revenues.



### WCFD Expenditures

The fire department administration drafts the annual budget considering the needs of the community and in consideration of the financial resources available. The budget is discussed with the Citizens Fire Advisory Board, which consists of citizens from communities in which services are provided by WCFD. The budget is then presented to the Fire District Board of Directors for review, public comment, and ultimate approval by the Wasatch County Council.

Similarly, with the revenue section, fire department expenditures are categorized as recurring or non-recurring. Recurring expenditures are those core items such as salary and benefits, supplies, services, maintenance, and other repetitive expenditures that amount of which is easily ascertainable such as a recurring debt payment.

**Figure 13: Historic Expenditures from Combined Funds (2013–2017)**

Expenditures	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual
<b>Salaries</b>					
Salaries	1,080,715	1,096,026	1,306,515	1,432,243	1,569,563
Taxes & benefits	495,374	519,209	648,487	685,357	750,998
<b>Total Salaries &amp; Benefits:</b>	<b>\$1,576,089</b>	<b>\$1,615,235</b>	<b>\$1,955,002</b>	<b>2,117,570</b>	<b>\$2,320,561</b>
<b>Recurring &amp; Non-Recurring Expenses</b>					
Supplies	38,815	66,451	110,952	60,610	100,373
Services	335,776	241,822	210,654	271,309	191,592
Utilities	27,469	24,103	31,416	28,951	39,612
Repairs & maintenance	103,387	85,656	102,861	76,837	82,129
<b>Total Recurring Expenses:</b>	<b>\$2,081,536</b>	<b>\$2,033,267</b>	<b>\$2,410,885</b>	<b>\$2,555,307</b>	<b>\$2,734,267</b>
Capital	19,566	—	—	81,281	879,996
Bad debt	0	164,922	—	—	—
Contingencies	1,018,156	1,166,571	373,534	430,003	559,341
<b>Total Non-Recurring:</b>	<b>\$1,037,722</b>	<b>\$1,331,493</b>	<b>\$373,534</b>	<b>\$511,284</b>	<b>\$1,439,337</b>
<b>Total Expenditures:</b>	<b>\$3,119,258</b>	<b>3,364,760</b>	<b>2,784,419</b>	<b>3,066,591</b>	<b>\$4,173,604</b>

## Recurring Expenditures

### Salaries & Benefits

WCFD utilizes 21 full-time and 25 volunteer firefighters in its deployment model. The Jordanelle Station staffs three personnel 24 hours per day, seven days per week. The Heber City Station was previously staffed daily from 6:00 am to 6:00 pm. In June 2018, 24-hour staffing was added. However, since the Heber City Station does not have sleeping quarters, the crew is required to move to the Midway Station at night. The Wallsburg and Timber Lakes stations are staffed with volunteers.

Salaries have increased from \$1,080,715 in 2013, to \$1,569,563 in 2017, or approximately 45%. This was the result of an increase in five full-time equivalent positions and a cost of living salary adjustment over the years. Employee benefit costs have increased approximately 52% between 2013 and 2017. Benefit costs typically increase in concert with increased compensation, with the exception being healthcare costs, which have traditionally outpaced other increases. In WCFD's case, the increase has been approximately 32% between calendar years 2013 and 2017.

### Supplies

Supplies necessary to operate the fire district on an ongoing basis have increased approximately 159% between 2013 and 2017. An anomaly occurred in 2015, resulting from the purchase of a significant quantity of protective clothing for firefighters.

### Services

Services include audit, legal, insurance, training, and other professional services. As previously mentioned, the special assessment fee assessed in the Jordanelle Basin area has been contested by several of the area residents, which has resulted in extraordinarily high legal fees for an organization of this size. The legal fees have cost the District substantially, but have decreased over the years between 2013 and 2017.

### Utilities

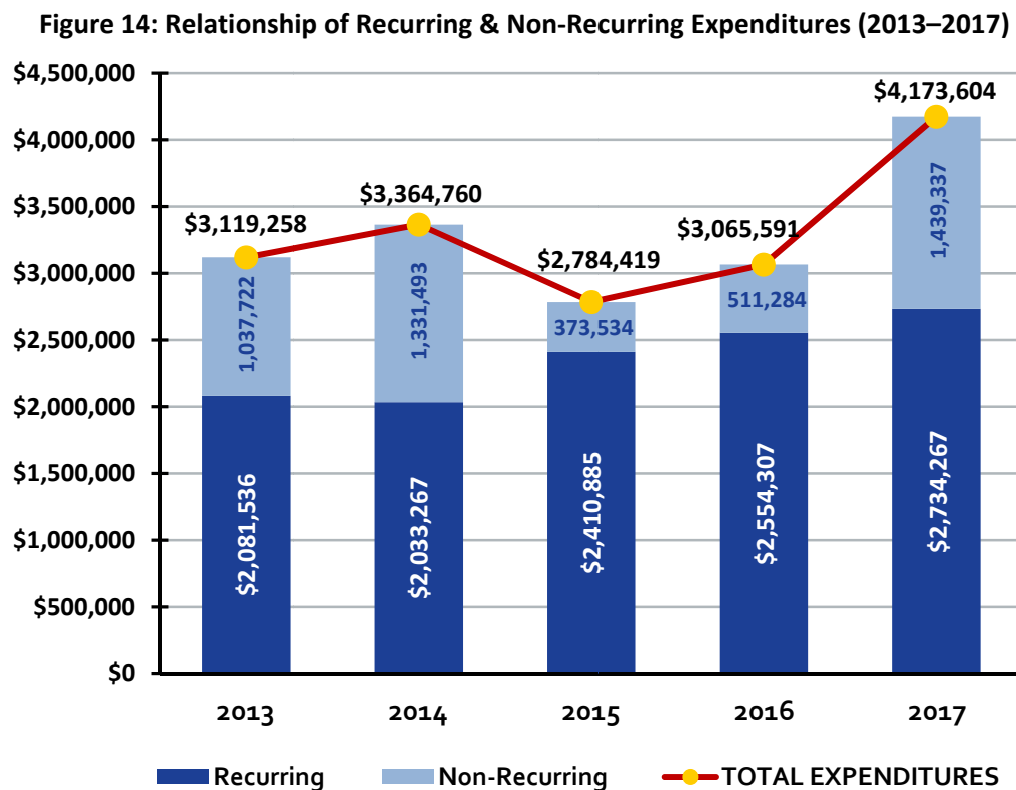
Utility costs, consisting of electricity and telephone charges, have increased approximately 43% during the review period.

### Repairs & Maintenance

Repairs and maintenance of District buildings, apparatus, and equipment have decreased approximately 21% between 2013 and 2017.

### Non-Recurring Expenditures

Non-recurring revenues include capital purchases, transfers to reserve accounts, and contingencies. Capital purchases include long-lived assets and apparatus. The contingencies category reflects the reserves established to fund the potential liability to return the special assessment fees collected from properties in the Jordanelle Basin area. The following figure reflects the relationship between recurring and non-recurring expenditures.



## WCFD Current-Year Budget

### Recurring Revenues

The current year budget (2018) indicates a very significant increase in property tax revenue from the prior year. This increase is explained by a substantial increase in the property tax rate. The rate was increased as a result of the loss of revenue from the Jordanelle Basin Special Assessment area.

Other recurring revenues were reduced significantly between 2017 and the current year budget. The Fire Station Assessment and the Jordanelle Area Enhancement revenues have been eliminated in the current year budget, reducing recurring revenue by approximately \$692,000. Plans and Inspection revenues are budgeted at \$144,802 less than 2017, and EMS revenues are budgeted at \$140,277.

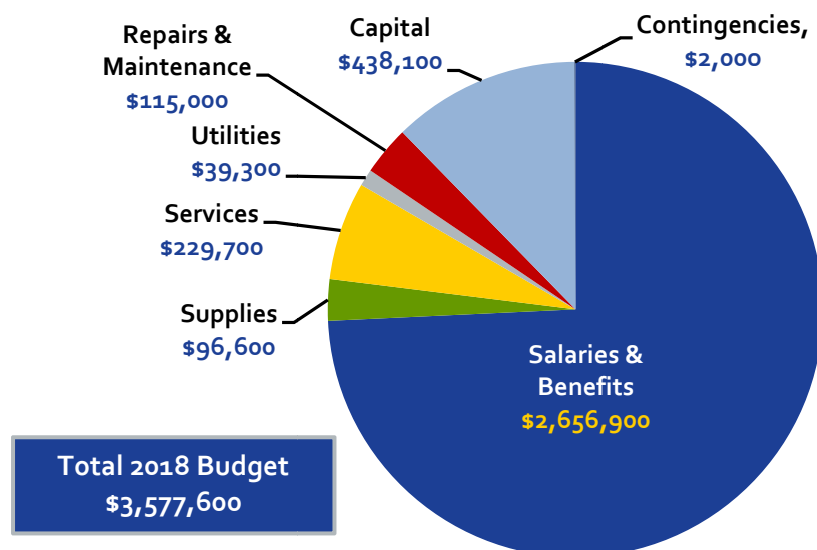
### Non-Recurring Revenues

Non-recurring revenues are budgeted to be slightly lower in the current budget year than in calendar year 2017—by approximately \$550,000. In 2017, a settlement gain was recognized for \$571,885 related to the lawsuit over fees charged by the District's Enterprise Fund prior to 2013.

### Recurring & Non-Recurring Expenses

As with most public safety agencies, the salaries and benefit costs consume approximately 75% of the expenditures of the District on an annual basis. Legal, auditing, and other professional services require approximately 6% of the budget and supplies. Utilities and maintenance, combined, comprise another 4% of the budget. Recurring expenses are approximately 85% of the 2018 expenditures. The non-recurring expenditures in the 2018 budget consist of a capital expenditure of \$438,100 for apparatus replacement and a projected contingency expense of \$2,000.

**Figure 15: Wasatch County Fire Protection Special Service District Budget (2018)**





## System Funding & Cost-Recovery Discussion

There are numerous alternatives available to fund the operations of counties, cities, and fire districts. In Utah, property taxes, special assessments, sales taxes, and billings for services are options. Presently, the District assesses a property tax on its taxable value. The District's efforts to create a special assessment district in the Jordanelle Basin, and assesses a \$0.25 per thousand dollars of valuation on properties located within that area, was unsuccessfully challenged by property owners in that area. That source of revenue is now no longer available. The District also bills for EMS service, plan reviews, inspections, and hazardous materials incidents. The District has negotiated a lease arrangement with the *Utah Highway Patrol* for space in the basement floor of the Jordanelle Station, and receives lease payments for a cell phone tower. In the past, the District has taken advantage of federal grants and requested reimbursement for deployment of its resources to incidents outside of its boundaries.

## WCEMS Budget & Finance

Wasatch County EMS provides ground emergency medical transport (GEMT) services to all areas of Wasatch County. Since the County has experienced significant growth, the EMS agency has seen the demand for its services increase by over 50% between 2013 and 2017. Patient billings have increased approximately 65% during the same period. However, similar to the experience of EMS organizations around the country, collecting on those billings is a challenge. Collection rates have dropped from 48% to 43% during 2013–2017. Again, similar to the experience of other EMS agencies, the rate of payment denials has increased dramatically from 50 of 833, or 6% in 2014 to 38% (483 of 1,270 claim submittals) in 2017.

ESCI was told by local officials that Wasatch County is one of the fastest-growing counties in the United States, and has continued to grow at a rapid rate. The population has increased by 25% since the 2010 census. Since a community's population and demographics are the primary drivers of the demand for EMS, Wasatch County can anticipate a continued increase in EMS service-demand. The following figure indicates the growth in EMS transports and related increase in revenue since 2014.

**Figure 16: WCEMS Transports & Billing History**

Billing Description	2014 Actual	2015 Actual	2016 Actual	2017 Actual
Billable transports	833	1,085	1,189	1,270
Average charge/transport	\$1,338	\$1,379	\$1,412	\$1,445
<b>Total Amount Billed:</b>	<b>\$1,114,867</b>	<b>\$1,496,526</b>	<b>\$1,679,029</b>	<b>\$1,834,371</b>
Cash collected	\$559,000	\$621,000	\$851,000	\$898,000
<b>Collection Rate Percentage:</b>	<b>50.1%</b>	<b>41.5%</b>	<b>50.7%</b>	<b>49.0%</b>

## Cash Collection Rates

As mentioned, WCEMS outsources its billing and collection services. The collection-rate numbers in the preceding figure represent the percentage of what was received out of the total amount billed. As shown, the collection rates have fluctuated since 2014; with an annual average rate of 47.8%.

Collection percentages can be affected by billings sent out in one calendar year, but not collected until the next year. Regardless, given the payor mix in Wasatch County, a slightly higher cash-collection rate could be expected. ESCI's experience in similar communities has shown rates of 50–60% or higher.

Revenue from emergency medical responses and related transports is a mathematical calculation based on demographic information of the population served. In today's environment of highly technical medical evaluations, patient assessments, the appropriate "coding" of recommended interventions, changing payment structures of insurance companies, and the federal system, forecasting revenues is a challenge. As indicated in the preceding figure, a reasonable person would anticipate substantial revenue growth from the increase in transport services and increase in gross billings—but this has not been the case. Non-recurring revenue for Wasatch County EMS takes the form of special events and grants.

### Payor Mix

An analysis of the 2017 billable transports indicates that commercial payors were responsible for 478 incidents, or 38% of the 2017 transports. At 29%, Medicare was second, with patient-pay transports being the third highest at 16% of the billed transport services. The following figure shows the payor mix for Wasatch County EMS during 2017.

**Figure 17: Wasatch County EMS Payor Mix (2017)**

Payor	Transports	% of Total
Insurance	139	11%
Commercial	478	38%
Medicaid	74	6%
Medicare	365	29%
Patient Pay	198	15%
Worker's Compensation	15	1%
<b>Totals:</b>	<b>1,269</b>	<b>100%</b>

### Recurring Expenses

Salaries and benefits consumed almost 70% of the total budget of WCEMS and represented over 71% of the recurring expenditures in 2017. WCEMS has expanded its operational capabilities significantly between 2014 and 2017 to meet community needs. Other recurring expenditures include the costs (6%) associated with operating its fleet of ambulances. WCEMS outsources its medical billing and collection services to a private company (McKesson, Inc.), who retained approximately 9.75% of the 2017 revenue. Other professional services and Medicaid payments are included in the services section of the recurring cost category.

The following figure includes a line-item list of the historical revenues and expenses at Wasatch County EMS for the period 2014–2017. As shown in the figure, WCEMS consistently had a negative cash flow between 2014 and 2017.

**Figure 18: WCEMS Historical Revenue & Expenses (2014–2017)**

Revenue & Expenses	2014 Actual	2015 Actual	2016 Actual	2017 Actual
<b>Revenues</b>				
Transport fees	519,167	566,835	802,611	859,340
<b>Total Recurring:</b>	<b>\$519,167</b>	<b>\$566,835</b>	<b>\$802,611</b>	<b>\$859,340</b>
EMS collections	—	—	—	23,749
Special events	—	—	—	11,950
Grants	—	7,039	—	2,200
Miscellaneous	39,407	47,390	48,401	1,106
<b>Total Non-Recurring Revenue:</b>	<b>\$39,407</b>	<b>\$54,429</b>	<b>\$48,401</b>	<b>\$39,005</b>
<b>Total Revenue:</b>	<b>\$558,574</b>	<b>\$621,264</b>	<b>\$851,012</b>	<b>\$898,345</b>
<b>Expenses</b>				
Salaries & benefits	489,836	815,213	872,625	1,008,101
Supplies	64,931	77,537	82,500	99,211
Services	140,419	158,314	186,132	223,410
Fleet costs	75,000	75,000	85,000	87,500
Payments to WCFD	66,997	63,118	3,467	—
<b>Total Recurring Expenses:</b>	<b>\$837,183</b>	<b>\$1,189,182</b>	<b>\$1,229,724</b>	<b>\$1,418,222</b>
Capital	26,248	21,406	56,576	31,955
<b>Total Non-Recurring Expenses:</b>	<b>\$26,248</b>	<b>\$21,406</b>	<b>\$56,576</b>	<b>\$31,955</b>
<b>Total Expenditures:</b>	<b>\$863,431</b>	<b>\$1,210,588</b>	<b>\$1,286,300</b>	<b>\$1,450,177</b>
<b>Net Gain or Loss:</b>	<b>-\$304,857</b>	<b>-\$589,324</b>	<b>-\$435,288</b>	<b>-\$551,832</b>

## Financial Analysis of a WCFD/WCEMS Consolidation

ESCI has been tasked with the creation and analysis of the financial ramifications of a merger between the Wasatch County Fire District and Wasatch County EMS. The previous discussions have evaluated the current conditions of each of the entities, and will form the basis of this section of the report. The following forecasts will utilize a 5% growth rate for both property taxes and medical transport revenues. All other revenues have been forecasted to remain static.

### Recurring & Non-Recurring Expenses in a Consolidation

Salaries and benefits expenses—representing approximately 85% of the recurring costs—are expected to continue to increase at a 5% annual amount, to provide for salary adjustments and related healthcare cost increases. Professional fees should be significantly reduced and stabilized once the Jordanelle lawsuit has been settled. Other recurring costs are forecasted to increase 1% annually. The 2018 budget includes the expenditure of Wasatch County EMS funds to acquire an ambulance.

### Combined Revenue & Expenses

Those revenue and expense items that were recognized between WCFD and WCEMS have been eliminated in the forecast. This will result in the EMS Revenue category being eliminated on the WCFD section, and the related Wage & Benefit category being eliminated on the WCEMS section. It is anticipated that additional savings will be realized through the consolidation of offices, computer systems, telephone systems, the combination of liability insurance programs, and communications (radios and pagers) costs. However, the reduction of these costs was not included in the forecast.

Based on historical data, the next figure presents the combined revenues and expenditures of the Wasatch County Fire District and Wasatch County EMS, and includes a five-year forecast based on the assumptions described previously. This also assumes retention of the current staffing models.

**Figure 19: Combined WCFD/WCEMS Status Quo Revenue & Expense Projections (2019–2023)**

	Budget		Projected Revenue & Expenses			
Revenue & Expenses	2018	2019	2020	2021	2022	2023
Property taxes	2,916,200	3,057,245	3,205,342	3,360,844	3,524,122	3,695,563
Transport fees	902,307	947,422	994,793	1,044,533	1,096,760	1,151,598
Plans & inspections	125,000	125,000	125,000	125,000	125,000	125,000
Cell tower revenue	17,400	17,400	17,400	17,400	17,400	17,400
Office lease	56,000	56,000	56,000	56,000	56,000	56,000
<b>Total Recurring Revenue:</b>	<b>\$4,016,907</b>	<b>\$4,203,067</b>	<b>\$4,398,535</b>	<b>\$4,603,777</b>	<b>\$4,819,282</b>	<b>\$5,045,558</b>
Fire warden	32,000	32,000	32,000	32,000	32,000	32,000
Grants	12,200	12,200	12,200	12,200	12,200	12,200
Interest	24,100	24,100	24,100	24,100	24,100	24,100
Other	36,805	36,805	36,805	36,805	36,805	36,805
Penalties & interest	2,000	2,000	2,000	2,000	2,000	2,000
<b>Total Non-Recurring:</b>	<b>\$107,105</b>	<b>\$107,105</b>	<b>\$107,105</b>	<b>\$107,105</b>	<b>\$107,105</b>	<b>\$107,105</b>
<b>TOTAL REVENUE:</b>	<b>\$4,124,012</b>	<b>\$4,310,172</b>	<b>\$4,505,640</b>	<b>\$4,710,882</b>	<b>\$4,926,387</b>	<b>\$5,152,663</b>
Salaries	2,225,982	2,337,281	2,454,145	2,576,853	2,705,695	2,840,980
Taxes & benefits	1,061,024	1,114,075	1,169,779	1,228,268	1,289,681	1,354,165
<b>Total Salaries &amp; Benefits:</b>	<b>3,287,006</b>	<b>3,451,356</b>	<b>3,623,924</b>	<b>3,805,121</b>	<b>3,995,376</b>	<b>4,195,145</b>
Supplies	231,666	233,983	236,323	238,686	241,073	243,484
Services	442,275	381,047	384,858	388,707	392,594	396,520
Utilities	45,117	45,568	46,023	46,484	46,949	47,418
Repairs & maintenance	208,039	210,120	212,221	214,343	216,486	218,651
<b>Total Recurring Expense:</b>	<b>\$4,014,103</b>	<b>\$4,322,074</b>	<b>\$4,503,349</b>	<b>\$4,693,341</b>	<b>\$4,892,478</b>	<b>\$5,101,218</b>
Capital	438,100	—	—	—	—	—
Contingencies	2,000	2,000	2,000	2,000	2,000	2,000
<b>Total Non-Recurring:</b>	<b>\$440,100</b>	<b>\$2,000</b>	<b>\$2,000</b>	<b>\$2,000</b>	<b>\$2,000</b>	<b>\$2,000</b>
<b>TOTAL EXPENSES:</b>	<b>\$4,654,203</b>	<b>\$4,324,074</b>	<b>\$4,505,349</b>	<b>\$4,695,341</b>	<b>\$4,894,478</b>	<b>\$5,103,218</b>
<b>Net Gain or Loss:</b>	<b>-\$530,191</b>	<b>-\$13,902</b>	<b>\$292</b>	<b>\$15,541</b>	<b>\$31,909</b>	<b>\$49,445</b>

### Discussion of the Financial Aspects of Consolidation

The preceding figure indicates that a consolidation of WCEMS into the Wasatch County Fire District may be feasible from a fiscal perspective, albeit with minimal net gain from a financial perspective. Additionally, this model assumes the *status quo* of emergency operations and staffing levels. Therefore, if staffing and other infrastructure and services are increased, it will be necessary to acquire additional revenue to account for any changes.

## CAPITAL FACILITIES & APPARATUS

The following section describes the features of the five WCFD fire stations, and the apparatus assigned to each. This is followed by more detailed descriptions on WCFD's apparatus and vehicles.

### Facilities

The following figures list specific details on each of WCFD's five fire stations. With the exception of the Jordanelle Station, each of the other fire stations is owned by Wasatch County (instead of the District).

**Figure 20: Heber City Station**

**Address/Physical Location:** 80 West 100 South, Heber City, UT 84032



#### General Description:

The station is 28 years old, and located in a central portion of Heber City. While there is ample space for apparatus, and a large meeting room, there are no quarters for sleeping. There are two small rooms; one with kitchen facilities, and another in an office format. Both are very small and limited in capacity.

#### Structure

Construction Type	Metal beams and siding (Type 1)			
Date of Construction	1990			
Seismic Protection	None			
Auxiliary Power	None			
General Condition	Fair			
Apparatus Bays	1	Back-in bays	4	Drive-through bays
Special considerations (ADA, etc.)	None			
Square Footage	7,200			

#### Facilities Available

Separate Rooms/Dormitory/Other	<input type="radio"/>	Bedrooms	<input type="radio"/>	Beds	<input type="radio"/>	Beds in dormitory
Maximum station staffing capability	No living quarters; volunteer station					
Exercise/Workout Facilities	None					
Kitchen/Dormitory	Kitchen					
Individual Lockers/Storage Assigned	None					
Shower Facilities	None					
Training/Meeting Rooms	Yes, meeting and training facilities					
Washer/Dryer	Yes					

#### Safety & Security

Sprinklers and/or Smoke Detection	None
Decontamination/Biohazard Disposal	None
Security	Door-code access
Apparatus Exhaust System	None

**Figure 21: Jordanelle Station****Address/Physical Location:** 10420 N. Jordanelle Parkway Blvd., Heber City, UT 84032**General Description:**

This is a large station with ample facilities and offices, and serves as the headquarter station. The basement is leased to the Utah Highway Patrol. Its location is distant from the more populated areas, although future new construction of multistory buildings will make this station more strategic.

**Structure**

Construction Type	Brick and mortar (Type 3)		
Date of Construction	1999		
Seismic Protection	As per code at time of construction		
Auxiliary Power	Yes		
General Condition	Good		
Apparatus Bays	0	Back-in bays	4 Drive-through bays
Special considerations (ADA, etc.)	ADA and built to code 1999		
Square Footage			

**Facilities Available**

Separate Rooms/Dormitory/Other	7	Bedrooms	7	Beds	N/A	Beds in dormitory
Maximum station staffing capability	7					
Exercise/Workout Facilities	Yes					
Kitchen/Dormitory	Yes					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	Yes					
Washer/Dryer	Yes					

**Safety & Security**

Sprinklers and/or Smoke Detection	Both
Decontamination/Biohazard Disposal	Decontamination room
Security	Key code and card access
Apparatus Exhaust System	No

**Figure 22: Midway Station****Address/Physical Location:** 100 West 32 North, Midway City, UT 84049**General Description:**

Station is currently being remodeled by department members who are installing living quarters, including a kitchen, day room and 4 sleeping quarters. Apparatus floor houses an ambulance, ladder/pumper, reserve engine, tower ladder, SCBA filling station & compressor, and commercial washer and dryer.

**Structure**

Construction Type	Brick and mortar/steel (Type 1 and 3)			
Date of Construction	2016			
Seismic Protection	As per code			
Auxiliary Power	No			
General Condition	Excellent			
Apparatus Bays	3	Back-in bays	0	Drive-through bays
Special considerations (ADA, etc.)	As per code			
Square Footage	8,128			

**Facilities Available**

Separate Rooms/Dormitory/Other	4	Bedrooms	4	Beds	N/A	Beds in dormitory
Maximum station staffing capability	4					
Exercise/Workout Facilities	Not at current time					
Kitchen/Dormitory	Yes					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	Yes					
Washer/Dryer	Yes					

**Safety & Security**

Sprinklers and/or Smoke Detection	Both					
Decontamination/Biohazard Disposal	None					
Security	Key-code access					
Apparatus Exhaust System	None					



**Figure 23: Timber Lakes Station****Address/Physical Location:** 2085 Timberlakes Drive, Heber City, UT 84032**General Description:**

A three-bay station of ordinary construction, with two drive-through bays. This station serves solely as an apparatus storage facility. There are no living, office or separate equipment storage spaces in the facility. Houses an ambulance, Type 1 engine, a Type 6 brush unit, and two water tenders (2,000 and 3,000 gallons).

**Structure**

Construction Type	Brick and mortar (Type 3)		
Date of Construction	2015		
Seismic Protection	As per code at construction		
Auxiliary Power	None		
General Condition	Good		
Apparatus Bays	0	Back-in bays	3 Drive-through bays
Special considerations (ADA, etc.)	Storage only with one restroom		
Square Footage			

**Facilities Available**

Separate Rooms/Dormitory/Other	0	Bedrooms	0	Beds	N/A	Beds in dormitory
Maximum station staffing capability	No sleeping quarters					
Exercise/Workout Facilities	None					
Kitchen/Dormitory	None					
Individual Lockers/Storage Assigned	None					
Shower Facilities	None					
Training/Meeting Rooms	None					
Washer/Dryer	None					

**Safety & Security**

Sprinklers and/or Smoke Detection	Sprinkler protection
Decontamination/Biohazard Disposal	None
Security	Key-code access
Apparatus Exhaust System	None

**Figure 24: Wallsburg Station****Address/Physical Location:** 130 E 300 S., Wallsburg, UT 84082**General Description:**

Built in 1974, this station originally had three back-in bays, with two additional deeper bays added in 2016. The station lacks bathroom, kitchen, office, and other facilities. Essentially, it is a large garage. ESCI found the station to be cluttered and unkempt, and the apparatus did not appear to be well maintained.

**Structure**

Construction Type	Steel beams and siding		
Date of Construction	1974 with an addition 2016		
Seismic Protection	As per code at construction and addition		
Auxiliary Power	None		
General Condition	Fair		
Apparatus Bays	5	Back-in bays	o Drive-through bays
Special considerations (ADA, etc.)	None		
Square Footage	Not reported		

**Facilities Available**

Separate Rooms/Dormitory/Other	o	Bedrooms	o	Beds	N/A	Beds in dormitory
Maximum station staffing capability	Volunteer only					
Exercise/Workout Facilities	None					
Kitchen/Dormitory	None					
Individual Lockers/Storage Assigned	None					
Shower Facilities	None					
Training/Meeting Rooms	None					
Washer/Dryer	None					

**Safety & Security**

Sprinklers and/or Smoke Detection	None
Decontamination/Biohazard Disposal	None
Security	Key-code access
Apparatus Exhaust System	None

**Facilities Discussion**

The Heber City Fire Station is more than 28 years old, and does not currently have sleeping quarters. Full-time personnel must use the Midway Fire Station at night (usually after 6 pm) until such time that the Heber City Fire Station can be remodeled or upgraded. The Jordanelle Fire Station is an excellent facility that is well designed. The Midway Station is only two years old and in excellent condition. Both the Timber Lakes and Wallsburg stations are essentially apparatus garages, and do not have additional storage space, bathroom facilities, kitchens, or other amenities typically found in modern fire stations.

## Apparatus & Vehicles

Fire apparatus are typically unique pieces of equipment, often very customized to operate efficiently in a narrowly defined mission. An engine (pumper) may be designed such that the compartments fit specific equipment and tools, with virtually every space on the truck designated in advance for functionality. This same vehicle, with its specialized design, cannot be expected to function in a completely different capacity, such as a hazardous materials unit or a rescue squad. For this reason, fire apparatus are very expensive and offer little flexibility in use and reassignment. As a result, communities across the country have sought to achieve the longest life span possible for these vehicles.

The Wasatch County Fire District maintains a relatively large fleet of frontline and reserve apparatus assigned to its five fire stations. These include engines (pumpers), wildland apparatus, aerial apparatus, and other specialty vehicles. WCFD apparatus call signs/numbers are preceded by their respective stations. For example, "Jordanelle Engine 1" and "Midway Engine 1."

### Apparatus Assigned to Heber City Station

The Heber City Station (and Midway at night) is staffed with career firefighters 24 hours daily, and houses a ladder, structural engine, rescue, and two wildland engines.

**Figure 25: Heber City Station Apparatus**

Apparatus Designation	Type	Make/Model	Year	Condition	Mileage	Pump Capacity	Tank Capacity
Heber Ladder 1	Aerial	Peirce	1999	Good	14,659	1500	300
Heber Engine 2	Pumper	Seagrave	2007	Good	23,048	1500	750
Heavy Rescue	Rescue	Freightliner	1995	Good	25,773	250	500
Heber Engine 3	Wildland	Ford	2000	Fair	27,058	250	500
Heber Engine 5	Wildland	Ford	1991	Fair	23,575	250	300
Heber Engine 631	Wildland	Chevrolet	1980	Fair	9,890	250	300

### Apparatus Assigned to Jordanelle Station

The Jordanelle Station, which is staffed with career firefighters 24 hours daily, houses a wildland engine, structural engine (pumper), and new aerial apparatus.

**Figure 26: Jordanelle Station Apparatus**

Apparatus Designation	Type	Make/Model	Year	Condition	Mileage	Pump Capacity	Tank Capacity
JN Engine 1	Wildland	Ford	2011	Good	30,875	250	500
JN Engine 2	Pumper	International	2001	Good	32,120	1250	500
Ambulance 1	Type III	Ford	2010	Good	64,693	N/A	N/A
JN Ladder 1	Aerial	Peirce	2018	Excellent	2,010	1500	750

### Apparatus Assigned to Midway Station

The Midway Station is currently staffed with career personnel from the Heber City Station at night (since there are no sleeping quarters at Heber City), with volunteer firefighters and houses a structural and wildland engine.

**Figure 27: Midway Station Apparatus**

Apparatus Designation	Type	Make/Model	Year	Condition	Mileage	Pump Capacity	Tank Capacity
Midway Engine 7	Pumper	Ford	1981	Fair	18,485	1250	500
Midway Engine 1	Wildland	Ford	1992	Fair	22,755	250	300
Midway Engine 9	Utility	Ford	1971	Fair	9,828	N/A	N/A
Midway Ladder 1	Aerial	Mack	1971	Fair	10,371	N/A	N/A

### Apparatus Assigned to Timber Lakes Station

The Timber Lakes Station is staffed by volunteer firefighters and houses a structural and wildland engine.

**Figure 28: Timber Lakes Station Apparatus**

Apparatus Designation	Type	Make/Model	Year	Condition	Mileage	Pump Capacity	Tank Capacity
TL Engine 1	Pumper	Ford/Pierce	1981	Fair	62,195	500	600
TL Tanker 616	Tanker	AG	2008	Unknown	3,830	250	4,000
TL Tender 603	Tender	AG	1986	Unknown	26,024	250	1,200
TL Engine 604	Wildland	Ford	1996	Unknown	78,221	250	300
TL Engine 653	Wildland	Chevrolet	1970	Unknown	12,941	250	300

### Apparatus Assigned to Wallsburg City Station

The Wallsburg City Station houses a structural and wildland engine, and is staffed by volunteer firefighters.

**Figure 29: Wallsburg City Station Apparatus**

Apparatus Designation	Type	Make/Model	Year	Condition	Mileage	Pump Capacity	Tank Capacity
WB Engine 2	Pumper	FMC	1987	Fair	26,581	1250	500
WB Tender	Pumper	AG	1985	Unknown	1,743	250	1200
WB Engine 1	Wildland	Ford	1999	Good	78,919	250	500
WB Engine 612	Wildland	Chevrolet	1985	Unknown	62,541	250	300

## Apparatus Age & Condition

The following figure lists the combined average age and mileage of the Wasatch County Fire District frontline apparatus and vehicles.

**Figure 30: Average Age & Mileage of WCFD Apparatus**

Apparatus Type	Average Age	Average Mileage
Structural Engines	28 years	24,579
Wildland Engines	20 years	26,177
Aerial Apparatus <sup>1</sup>	22 years	9,006
Other Vehicles	21 years	43,431
<b>All Apparatus Combined:</b>	<b>24 years</b>	<b>25,798</b>

<sup>1</sup>Includes a 2018 ladder truck at the Jordanelle Station

The preceding figure indicates that the combined average age of WCFD's structural and wildland engines tend to be older. The average age of the aerial apparatus is somewhat misleading, as there are only two of these apparatus. While one was built in 1999, the other is new and built in 2018. Those in the "Other Vehicles" category consist of rescues, tenders, and other vehicles.

While the age of fire apparatus and vehicles can be a factor in the status of their condition, likely mileage—and pump hours on engines—may be more significant. For example, a five-year-old apparatus with 100,000 miles is probably in worse condition than a ten-year-old apparatus with 5,000 miles.

## Apparatus & Vehicle Maintenance

Unfortunately, no mechanical piece of equipment can be expected to last forever. As a vehicle ages, repairs tend to become more frequent, parts more difficult to obtain, and downtime for repair increases. Given the emergency mission that is so critical to the community, this factor of downtime is one of the most frequently identified reasons for apparatus replacement.

Minor apparatus maintenance is done by WCFD on-duty firefighters. More complex maintenance is done by the Wasatch County Public Works Department. Major repairs and maintenance requiring a higher level of expertise is done by *Apparatus Equipment & Service, Inc.* (AES) in Salt Lake City. AES is a full-service maintenance and repair company specializing in fire apparatus and emergency services vehicles.

## Apparatus Replacement Planning

Because of the large expense of fire apparatus, most communities find the need to plan for the cost of replacement. To properly do so, agencies often turn to the long-accepted practice of establishing a life cycle for the apparatus which results in a replacement date being anticipated well in advance. Forward thinking organizations then set aside incremental funds during the life of the vehicle so replacement dollars are ready when needed. Currently, the Wasatch County Fire District does not have a formal apparatus or capital equipment replacement plan.

## Life Cycle Theory of Vehicle Replacement

The *Life Cycle Theory of Vehicle Replacement* establishes vehicle classes and benchmarks based on practical, empirical information that is easy to observe and verify. This method is often used by fire departments due to its simplicity and ease of understanding. One example of vehicle classification is shown in the following figure.<sup>13</sup>

**Figure 13: Vehicle Classification Based on Condition**

Condition	Characteristics	
<b>Excellent</b>	<ul style="list-style-type: none"> <li>• &lt; Five years old.</li> <li>• &lt; 800 engine hours.</li> <li>• &lt; 25,000 miles if not used in stationary applications.</li> <li>• No known mechanical defects.</li> </ul>	<ul style="list-style-type: none"> <li>• Very short downtime and very little operating expense.</li> <li>• Excellent parts availability.</li> <li>• Very good resale value.</li> <li>• Meets all NFPA 1911 safety standards.</li> </ul>
<b>Very Good</b>	<ul style="list-style-type: none"> <li>• &gt; Five, but fewer than 10 years old.</li> <li>• &gt; 800, less than 1,600 engine hours.</li> <li>• &gt; 25,000 but fewer than 50,000 miles if not used in stationary applications.</li> <li>• No known mechanical or suspension defects present.</li> </ul>	<ul style="list-style-type: none"> <li>• Short downtime and above average operating costs.</li> <li>• Good parts availability.</li> <li>• Good resale value.</li> <li>• Meets all NFPA 1911 safety standards.</li> </ul>
<b>Good</b>	<ul style="list-style-type: none"> <li>• &gt; 10 years but less than 15 years old.</li> <li>• Some rust or damage to the body or cab.</li> <li>• &gt; 1,600 but fewer than 2,400 engine hours.</li> <li>• Some existing mechanical or suspension repairs necessary.</li> </ul>	<ul style="list-style-type: none"> <li>• Downtime and operational costs are beginning to increase but not terribly above the average.</li> <li>• Parts are still available but difficult to find.</li> <li>• Resale value decreasing.</li> <li>• Meets NFPA 1911 safety standards.</li> </ul>
<b>Fair</b>	<ul style="list-style-type: none"> <li>• &gt; 15 but fewer than 20 years old.</li> <li>• Rust, corrosion, or body damage apparent on body or cab.</li> <li>• &gt; 2,400 engine hours.</li> <li>• &gt; 75,000 but fewer than 100,000 miles if not used in stationary applications.</li> <li>• Existing mechanical or suspension repairs necessary.</li> </ul>	<ul style="list-style-type: none"> <li>• Downtime is increasing, and operational costs are above the historical average.</li> <li>• Parts are becoming harder to find and/or obsolete.</li> <li>• Very little resale value.</li> <li>• Does not meet all NFPA 1911 safety standards.</li> </ul>
<b>Poor</b>	<ul style="list-style-type: none"> <li>• &gt; 20 years old.</li> <li>• Rust, corrosion, or damage to body of cab impacting apparatus use.</li> <li>• &gt; 2,400 engine hours or 100,000 miles.</li> <li>• Existing mechanical/suspension problems affecting apparatus operation.</li> </ul>	<ul style="list-style-type: none"> <li>• Downtime is exceeding in-service availability.</li> <li>• Operational costs are exceeding the resale value of the apparatus.</li> <li>• Parts are obsolete.</li> <li>• Does not meet NFPA 1911 safety standards.</li> </ul>

## Unit Workload Theory of Vehicle Replacement

A review of workload by response unit can reveal much about response time performance. Although fire stations and response units may be distributed in a manner to provide quick response, that level of performance can only be obtained when the response unit is available in its primary service area. If a response unit is already on an incident and a concurrent request for service is received, a more distant response unit will need to be dispatched, and this will increase response times. Based on the information provided by the District, unit workload could be a factor in the current replacement plan.

## Economic Model of Vehicle Replacement

The *Economic Theory of Vehicle Replacement* says that, as a vehicle ages, the cost of capital diminishes and its operating cost increases. The combination of these two costs produces a total cost-of-ownership curve. The model suggests the optimal time to replace any piece of apparatus is when the operating cost begins to exceed the capital cost. Thus, the optimal replacement time may not be a *fixed point*, but rather a *range over time*.

Shortening the replacement cycle to this window allows an apparatus to be replaced at optimal savings to the department. If an agency does not routinely replace equipment in a timely manner, the overall reduction in replacement spending can result in a quick increase of maintenance and repair expenditures. Officials, who assume that deferring replacement purchases is a good tactic for balancing the budget, need to understand two possible outcomes that may happen because of that decision:

1. Costs are transferred from the capital budget to the operating budget.
2. Such deferral may increase overall fleet costs.

Regardless of its net effect on current apparatus costs, the deferral of replacement purchases unquestionably increases future replacement spending need.

## TRAINING PROGRAM

Delivering safe and effective fire and emergency services requires a well-trained work force. Initial, ongoing, and high-quality training and education is critical for agency effectiveness and the safety of its personnel. Without it, the community may experience poor outcomes and/or citizen or emergency responder injury or death.

The initial training of newly hired firefighters is essential. It requires a structured recruit training program and testing process; after which regular ongoing verifiable training must be conducted to ensure skill and knowledge retention and competency. Delivering high-quality training requires dedicating significant internal training resources, and/or contracting with outside agencies and providers for these services. Effective training requires specific written objectives, lesson plans, and methods to verify learning knowledge comprehension and retention.

Nationally, volunteer fire departments comprise the majority of the fire service. With that said, today's fire service is finding it more difficult to recruit, hire, and retain volunteer firefighters. A volunteer firefighter fact sheet authored by the *National Volunteer Fire Council* in 2017 noted:

*The number of volunteer firefighters in the U.S. reached a low in 2011. While there has been a slow increase since then, the growth isn't enough to meet the steady increase in call volume, which has tripled in the last 30 years due in large part to the increase in emergency medical calls. Major factors contributing to recruitment challenges include increased time demands, more rigorous training requirements, and the proliferation of two-income families whose members do not have time to volunteer. Fire departments today are also expected to provide a wide range of services and multi-hazard response, creating further challenges for resource-constrained departments.*

WCFD's experience in recruiting and retaining firefighters is consistent with this national problem. District leadership expects this problem to continue into the foreseeable future, with continued significant population growth, along with other demographic and generational changes.

A significant challenge in delivering District training is the significant distance between fire stations. This is often exacerbated by inclement weather during the winter months, making it difficult to balance timely response availability with valuable training and teamwork building activities between career and volunteer personnel. Currently, volunteers from all outlying stations muster at the Heber station on drill nights for training.

In the following section, ESCI reviewed WCFD's training program, resource allocation, schedule, training documents, and practices. ESCI then compared them to national standards and best practices, and made recommendations accordingly.



## Training Resources & Methodology

Delivering high-quality training to fire and EMS personnel requires providing instructors with specific resources and adequate facilities. At present, there is no dedicated training ground, classroom facility or specialized props are immediately available to the District to support and augment basic firefighter training—including live fire props and fire evolution props (e.g., roof ventilation, forcible entry props, etc.). All props and associated equipment were obtained from working with the fire and rescue academy.

## General Training Competencies

Along with required tools, props and facilities, standardized training is another critical component in providing the necessary emergency response training throughout the organization. This should be based on established standards, best practices, and a validated curriculum. There are a variety of sources for training standards. WCFD references the NFPA and *International Fire Service Training Association* (IFSTA) resources, and complies with applicable *Utah Department of Occupational Safety & Health* (UOSHA) regulations and standards. It also follows the *Utah's Bureau of Emergency Medical Services & Preparedness* requirements and standards for Emergency Medical Technicians and Paramedics.

## Training Manual, Methodologies, & Scheduling

District training is coordinated and delivered primarily by the Training Officer and Assistant Training Officer. However, they do not have formal fire service instructor certifications. The Assistant Training Officer is a certified EMT instructor. Occasional outside training is provided by recognized subject matter experts, including instructors from *Utah Valley University*. WCFD does not have a standardized training manual.

The Training Officer coordinates most department training, and ensures all personnel complete mandatory skills evaluations on an annual basis. During the winter season, volunteer stations and on-duty career personnel drill and train together only once a month. The drill frequency increases to twice a month during the rest of the year. Multi-company drills and mutual-aid agency drills are infrequently conducted (less than once a year). The department's hazardous materials technicians train with the regional *Wasatch Back Hazardous Materials Team* at least once a year.

Safety is stressed during initial training; during regular drills and exercises; and at emergency scene operations. However, company officers are not trained and certified as incident Safety Officers.

## New Personnel Training

Comprehensive and robust training of new fire and EMS personnel is critical to ensuring their safety and effectiveness before being authorized to respond to emergency incidents. Specific knowledge and skills for basic fireground, EMS, incident command, and other basic emergency operations must be effectively taught and retained by new employees. Due to the District's limited training resources, those seeking employment must possess Firefighter I and II certifications, HAZWOPER Awareness and Operations certification, and EMT-Basic certification prior to employment. Additionally, new firefighters are required to obtain Wildland I certification within their first year.

## Incumbent & Specialized Training

After initial orientation into the WCFD, personnel are required to annually complete training in the topics listed in the next figure.

**Figure 31: Required Annual Training Topics**

TOPICS	TOPICS
Communications	Prevention & Preparedness
CPR	Ropes
Emergency Vehicle Operations	Salvage
Fireground Evolutions	Safety
Fireground Support	Self-Contained Breathing Apparatus (SCBA)
Forcible Entry	Search & Rescue
Hoses, Nozzles	Ventilation
Ladders	Water Supply
Overhaul	Wildland Fire Operations
Personal Protective Equipment (PPE)	EMT continuing education

The District also has access to a regional fire service training resource provided through UVU's *Emergency Services Training Division* located in Provo, Utah. This valuable resource delivers on-campus and off-campus fire service academic and practical skills training classes, taught by UVU instructors, or local instructors using UVU provided materials. WCFD appears to use this resource on a limited basis.

All personnel complete the 100 and 700 curriculum of the National Incident Management System (NIMS). Officers and command staff also complete the NIMS 200-400 curriculum. All operational personnel at WCFD are certified at the Hazardous Materials Operations level as part of their Firefighter II certification. In addition, four career members are trained to the Hazardous Materials Technician level. Due to the risk of wildfire during summer months/dry season, all personnel are trained and certified at the NFPA Wildland Firefighter I level.

Emergency medical technician (EMT) training and recertification is coordinated and delivered by the Training Officers. The department's Advanced EMTs and Paramedics work under the direction of advanced patient-care protocols.

## Training Program & Administration

To function effectively, a training program must be closely monitored, supported, and funded. Administrative program support is important, along with program guidance in the form of training plans, goals, and defined objectives. The next figure reviews the WCFD training program administration and management practices.

**Figure 32: Training Program Administration & Management**

SURVEY COMPONENT	WCFD
Goals & objectives identified	Only for mandatory skills annually assessed
Certified instructors used	For EMS only
Annual training report produced	No
Priority by management toward training	Yes
Budget allocated to training	\$10,000
Condition of capital facilities for training admin.	Fair
Adequate office space, equipment, supplies	Yes
Clerical staff support assigned to training admin	Yes

The training provided to each individual firefighter is recorded using paper-based documentation, with applicable certification records archived in individual folders. Each training class is documented on a standard department training form signed by the employee and instructor. The Training Officer maintains a hard copy spreadsheet of all employees' progress in completing the required annual training courses.

### Discussion

The WCFD Training Program operates under the supervision of a fire Captain assigned to Operations. As in any combination department, providing and tracking training to volunteer firefighters is a significant challenge. A review of WCFD training documentation revealed appropriate and consistent use of the *Fire Training Hours* subject-matter sign-off sheet. However, there was no documentation of curricula or lesson plans; specific subjects covered within a topic; or validation of skills or knowledge performance by the instructors. ESCI found that several employee-training forms were missing instructor signatures.

WCFD staff stated that training activities were previously recorded electronically, tracked, and archived. However, an *Insurance Services Office* (ISO) inspector advised the department to maintain original paper copies of all training records and certificates, as electronic copies did not satisfy the ISO requirements. As a result, the department reverted back to manually maintaining and tracking training. Returning to an electronic method of training documentation would assist the Training Officer in easily identifying and maintaining required training, certifications, and expirations for each employee.

Training delivery during drill nights is also a concern. Due to the large area covered and distance between stations, requiring all volunteers to meet in a single location strips the outlying areas of response personnel during training sessions. While this approach may help with team cohesion; sharing of information; and a reduction of the workload on the training staff, alternatives should be explored to ensure adequate response-capability for the outlying areas of the District during drill nights.

Career personnel interact with outlying stations for training on an occasional basis. Each station only drills once a month in the winter, and twice a month in the summer, limiting the amount of contact with other personnel from throughout the District.

## FIRE PREVENTION & PUBLIC EDUCATION

Proactive fire prevention and life-safety code enforcement services is a key component in maintaining safety in a community, and is a much more cost-effective approach than mitigation of working fires and other emergencies. It is also a fire department's best opportunity to minimize human suffering and financial loss in the community.

*The National Fire Protection Association recommends a multifaceted, coordinated risk reduction process at the community level to address local risks. This requires engaging all segments of the community, identifying the highest priority risks, and then developing and implementing strategies designed to mitigate the risks.<sup>14</sup>*

A fire department needs to understand and embrace the role of fire prevention, public education, and fire code enforcement in a community's planning efforts. The fundamental components of an effective fire prevention program are listed in the following figure, accompanied by the elements needed to address each component.

**Figure 33: Fire Prevention Program Components**

FIRE PREVENTION PROGRAM COMPONENTS	ELEMENTS NEEDED TO ADDRESS PROGRAM COMPONENTS
Fire Code Enforcement	<ul style="list-style-type: none"> <li>• Proposed construction and plans review</li> <li>• New construction inspections</li> <li>• Existing structure/occupancy inspections</li> <li>• Internal protection systems design review</li> <li>• Storage and handling of hazardous materials</li> </ul>
Public Fire & Life Safety Education	<ul style="list-style-type: none"> <li>• Public education</li> <li>• Specialized education</li> <li>• Juvenile fire setter intervention</li> <li>• Prevention information dissemination</li> </ul>
Fire Cause Investigation	<ul style="list-style-type: none"> <li>• Fire cause and origin determination</li> <li>• Fire death investigation</li> <li>• Arson investigation and prosecution</li> </ul>

### Fire & Life Safety Code Enforcement

Preventing fires or minimizing the impact of fires by requiring specific fire protection features in buildings is much more effective than relying on the availability and capabilities of a fire department response when a fire starts. A strong fire code enforcement program, bolstered by local adoption of current state, national and international building, and fire codes, is critical to improving fire safety in a community.

Wasatch County adopted the International Fire Code (IFC) 2015 Edition, the NFPA 13 2013 Edition, the NFPA 13R 2013 Edition, and adheres to the Utah State Fire Code Act, with local amendments. The County also adopted amendments to NFPA 13D and 13R related to installation of residential sprinkler systems.

**Figure 34: Fire Prevention Code Enforcement**

Survey Component	Wasatch County Fire District
Fire codes adopted	Yes
Code used	2015 Utah Fire Code
Local codes/ordinances; amendments	Local amendments; adopted Utah Code
Sprinkler ordinance in place	Only for buildings over 10,000 sq. ft.

## New Construction Plan Review & Inspection

New construction and development plan reviews is the foundation of an effective fire code enforcement program. Once buildings and/or developments are completed, the fire department assumes the responsibility for protecting the structures forever. WCFD has a fundamental interest and duty to ensure all buildings and developments within its jurisdiction are properly constructed and protected, but are not participating in all plan reviews in Wasatch County.

**Figure 35: New Construction Plan Review & Inspection**

Survey Component	Wasatch County Fire District
FD consulted in new construction	No
Perform fire and life-safety plan review	No
Sign-off on new construction	Limited, dependent on jurisdiction
Charges for inspections or reviews	Plan reviews only
Perform existing occupancy inspections	Yes
Special risk inspections	Yes
Storage tank inspections	Yes
Key-box entry program in place?	Yes, Knox Box
Hydrant flow records maintained?	By individual water districts & city engineer

## Plan Review Discussion

Until the spring of 2017, the Fire Chief was responsible for fire code plan review and code enforcement. However, significant disagreement arose between WCFD and the County Council related to application of the IFC and Utah State Fire Code residential sprinkler requirements for residential construction. The Council passed two ordinances that reduced the sprinkler requirements for residential buildings, including exempting new structures under 1,500 square feet from sprinkler requirements. Subsequently, the Council passed a resolution removing the responsibility of fire code compliance review of new building construction from WCFD and moved it solely to the purview of the County building official.

Prior to this administrative change, WCFD new construction code enforcement activities consisted of regular review of submitted residential and commercial plans—including development plans—within the WCFD. WCFD staff relayed to ESCI that new residential development and construction plans are no longer sent to them by the County for review.

The Fire Marshal is ICC-certified to perform plan reviews but is certified to perform fire inspections and fire protection acceptance testing. Therefore, developers and builders are required to have required fire protection systems reviewed and approved by a third party before submitting plans to the County for review and approval. The Fire Chief and/or Fire Marshal perform a variety of fire code compliance inspections and acceptance testing during building construction.

### General Discussion

The new commercial construction plan review process is appropriate and properly established for building permits. The Wasatch County building official processes and completes fire code plan review of new residential construction permits, but the District is no longer included in the process. The County may or may not contact the District; at best the District may have the opportunity to comment on access and water supply concerns but does not complete a proper fire and life safety review of the submitted residential plans or sign off on the authorization for issuance of the building permit.

Mandating installation of fire sprinkler systems in new and remodeled residential construction is a controversial issue in many jurisdictions. The 2009 International Residential Code (IRC) mandated the installation of fire sprinkler systems in all one and two family residential structures and dwellings. However, state and local jurisdictions regularly amend building codes to meet local needs. With that said, developers, building industry associations and lobbyists have taken the fight against requiring residential fire sprinklers in new construction to the state and local level, asserting cost prohibitive installation, ongoing maintenance costs, and overall negative cost vs. benefit. Conversely, life safety advocates, fire service associations, and insurance groups continue to push for formal adoption of residential fire sprinkler installations, citing scientific evidence, advances in cost-effective sprinkler system technology, and real-world experiences where fire sprinkler activations saved lives and property.

Scientific and real-world experience has proven the effectiveness and speed of fixed fire sprinkler systems in containing and/or extinguishing incipient fires in commercial and residential structures. As more residential systems are installed, the number of fire incidents involving residential sprinkler installations should bring clarity and consensus as to their cost effectiveness and safety.

Due to limited water supply sources and systems and relative remoteness and potential road access issues throughout Wasatch County, *ESCI recommends the District be included in the formal review and approval process of all new residential building construction permits in remote locations with inadequate fire flow.* At a minimum, consistent review of fire department access and available water supply should be conducted. To be fully effective, however, either the District should complete a fire and life safety plan review or assure that an acceptable review is completed via the County's permitting system.

## Existing Occupancy Inspection Program

Existing property inspections to find and eliminate potential life hazards are an essential part of the overall fire protection system. These efforts are most effective when completed by individuals having the proper combination of training and experience, and when completed with appropriate frequency. WCFD provides existing occupancy inspections for assembly, schools, businesses, and high-risk facilities on an annual basis. Other commercial occupancies are inspected on a semi-annual basis.

WCFD is responsible for the inspection of approximately 1000 commercial and multi-family residential structures in the County. Career operations officers and crews conduct all existing occupancy inspections for the WCFD and officers complete an online company officer inspection course and practical skills assessment and conduct approximately 30 inspections per month. The District attempts to inspect all “B” occupancies every other year, and all other applicable buildings and target hazards annually.

Utilizing fire suppression personnel who are adequately trained in basic fire inspection practices is an appropriate and effective practice in some instances and doing so has the benefit of increasing inspection capabilities and frequency. Furthermore, it provides excellent opportunities for engine crew building familiarization and pre-incident planning. ESCI recommends expanding this program to incorporate the participation (as available) of volunteer firefighters as well, so they can benefit from the building familiarization and pre-planning discussions.

## Fire & Life Safety Public Education Program

Providing fire and life safety education to the public to minimize the number of emergencies while training the community to take appropriate actions when an emergency occurs is essential to a fire and life safety program. Life and fire safety education provides the best chance for minimizing the effects of fire, injury, and illness to the community. WCFD does not have a formal public education program, resulting in sporadic education efforts driven by specific requests for training and presentations; although the District attempts to accommodate all education requests.

WCFD considers public education and outreach as an important part of the agency’s mission. However, staff resources limit the level of attention that can be paid to the program. Generally, public education outreach is conducted only on upon request, and is not an element of a fully developed or structured program.

Public education and outreach is assigned to the Fire Marshal or other administrative staff, bolstered with the support of operations personnel on an as-needed basis. ESCI recommends WCFD expand and enhance its fire and life safety public education outreach by developing a more effectively structured program. Several commercially available public safety curriculums, lesson plans, and teaching aids are readily available.

ESCI understands WCFD allows firefighters over the age of 65 to remain on the department, fulfilling support roles exclusive of emergency response. Consideration should be given to engaging them to bolster the department's public education efforts, under the Fire Marshal's direction. Furthermore, the department should explore partnering with local businesses in sponsoring public safety education initiatives, including engaging the Chamber of Commerce, local tourism boards, and real estate associations to provide life safety and department information to new residents and businesses. ESCI believes this increased presence in the community may also have a side benefit in recruiting volunteer firefighters.

### **Fire Cause & Origin Investigation**

Accurately determining the cause of a fire is an essential element of a fire prevention program. When fires are set intentionally, identification and/or prosecution of the responsible offender is critical in preventing additional fires and potential loss of life. Further, identifying cause and potential trends enables the department to provide specific public information and fire prevention education to prevent reoccurrence.

WCFD operations and administrative officers do not have formal certifications in arson investigation. Fire cause and origin determination in WCFD starts with the company officer on the scene of a fire, or Battalion Chief on larger incidents. At a small incident, a company officer may determine whether a fire has an obvious cause or is suspicious. If on-scene personnel view the fire as questionable or are unsure about the fire's cause, they will request assistance from the Utah State Fire Marshal, Battalion Chief, Fire Marshal, or Fire Chief. Suspected arson and fires involving significant injury or death are referred to local law enforcement and the Utah State Fire Marshal's office for investigation, cause determination, and criminal charges as appropriate.

The current procedures for investigating fires appear to be sufficient, given the size of the department and the relatively few fires experienced annually.



## SERVICE DELIVERY & RESPONSE PERFORMANCE

The most important aspect of any fire department or emergency services organization is its ability to deliver services to its community when requested. This requires efficient notification of an emergency and a rapid response from well-located facilities in appropriate apparatus with a sufficient number of well-trained personnel following a well-practiced plan of action. In this section of the report, ESCI evaluates the current and historical service-delivery elements of the Wasatch County Fire District. The following categories will be addressed:

- Service Demand Study
- Resource Distribution Analysis
- Resource Concentration Study
- Response Reliability Assessment
- Response Performance Summary

Analysis of service delivery and performance is largely data-driven and subject to the integrity of available records. This analysis is dependent on the quality and accuracy of the data provided to ESCI. ESCI notes that the data provided by WCFD through the Utah State Fire Marshal's office was limited and lacked specific data elements important in conducting a thorough analysis. WCFD management does support the collection of accurate data, which enables the District's leaders to make informed decisions.

### Performance Goals & Assembly of an Effective Response Force

An important component of service-delivery planning and analysis is the definition of performance goals. Without defined targets that a fire department wants to achieve, it is impossible to enable deployment of resources effectively.

The industry standard is to define response-goals by first evaluating the desires of the community, and then setting standards for achievement—typically defined in a percentile fashion (e.g., respond to structure fires within six minutes, 90% of the time). WCFD has not established response performance standards, nor has it developed a determination of what constitutes an adequate number of firefighters and apparatus at an emergency scene to meet operational needs—referred to as an *Effective Response Force* (ERF).

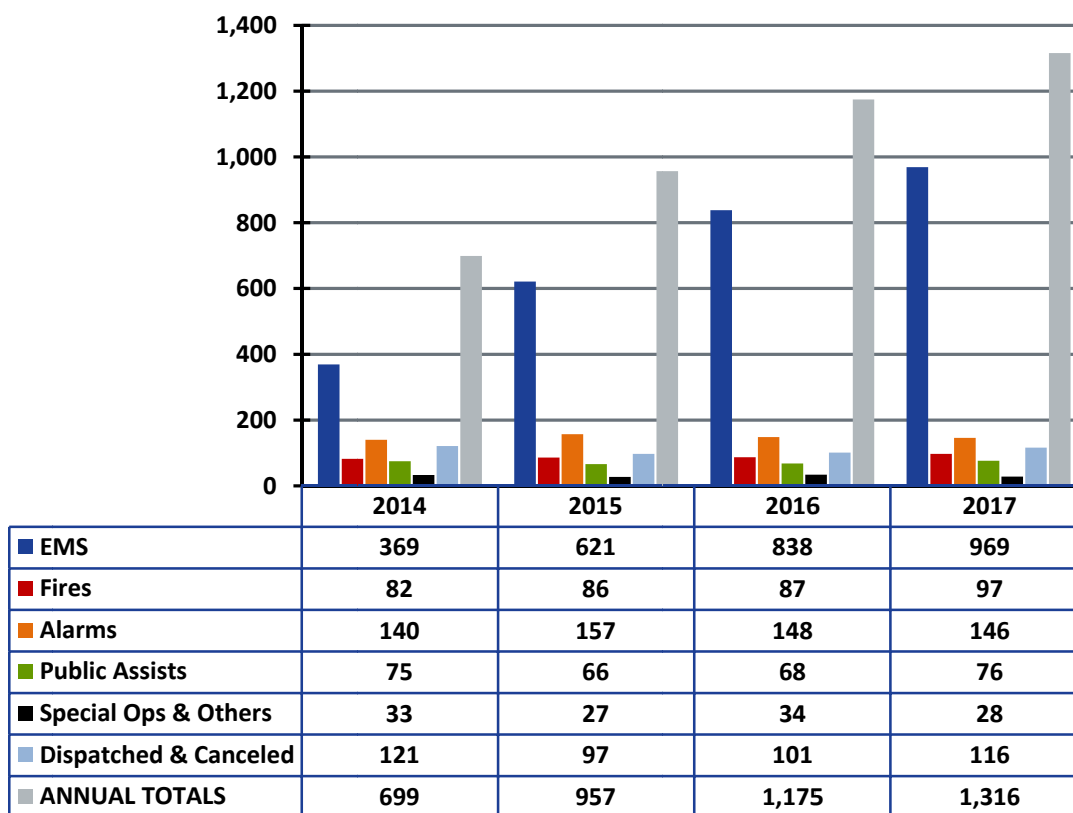
Establishing an ERF is viewed the next critical step in WCFD's planning; something that should be undertaken to establish a baseline for the placement of future fire stations and additional personnel.

### Service-Demand Study

In the service-demand study, ESCI reviews the Wasatch County Fire District's historical service-demand by incident types, as well as the temporal variations. Geographical information software (GIS) is utilized to provide geographical illustrations of service demand in the WCFD study area. The following figure shows service-demand by general categories during calendar years 2014–2017. The categories were based on the type codes used in the *National Fire Incident Reporting System* (NFIRS).

**Figure 36: WCFD Historical Service-Demand by Type**

Source: Utah State Fire Marshal's Office



The preceding figure represents NFIRS incident data provided by the *Utah State Fire Marshal's Office* (USFMO). In this illustration, some NFIRS codes were grouped into one of the general categories (e.g., Public Assists, Special Ops & Others).

The data shows that demand for emergency medical services has substantially and steadily continued to increase annually since 2014. This is typical of most fire departments, as EMS represents the majority of service-demand. In Wasatch County, EMS calls escalated by nearly 163% between 2014 and 2017. Fires and other incident-types (false alarms, service calls, hazardous conditions, etc.) remained relatively flat over the 48-month study period. The following represents each portion of total calls by incident type during the study period. Of the total incidents dispatched, 9% were canceled prior to arrival of the WCFD apparatus.

- EMS—67%
- Fires—8%
- Alarms—14%
- Public Assists—7%
- Special Ops & Others—3%
- Dispatched & Canceled En Route—10%

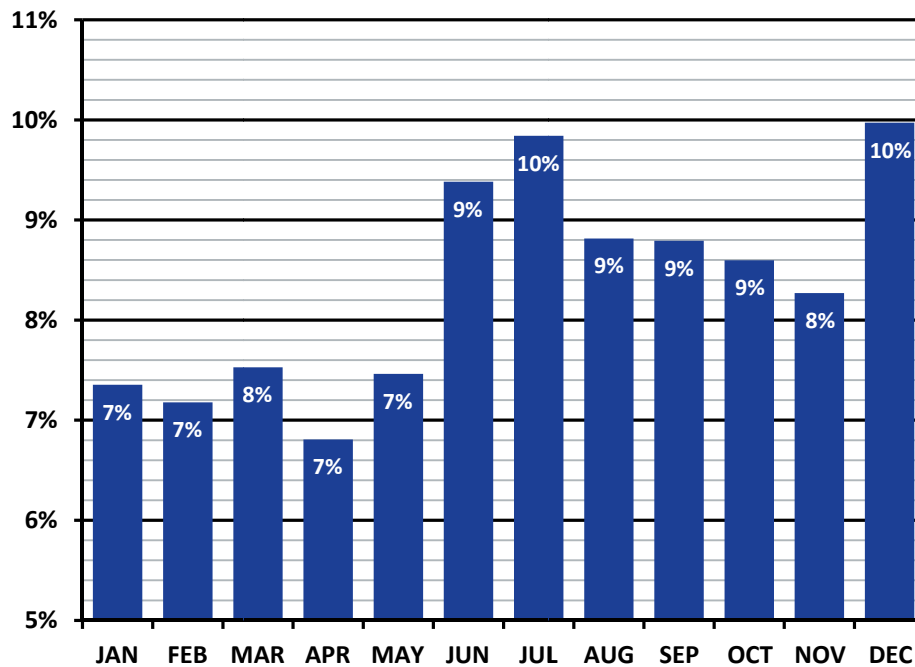
## Temporal Variations

### Service-Demand by Month

The following figure shows the WCFD service-demand of all incident-types by month, for the 48-month study period of 2014–2017.

**Figure 37: WCFD Service-Demand by Month (2014–2017)**

Source: Utah State FMO



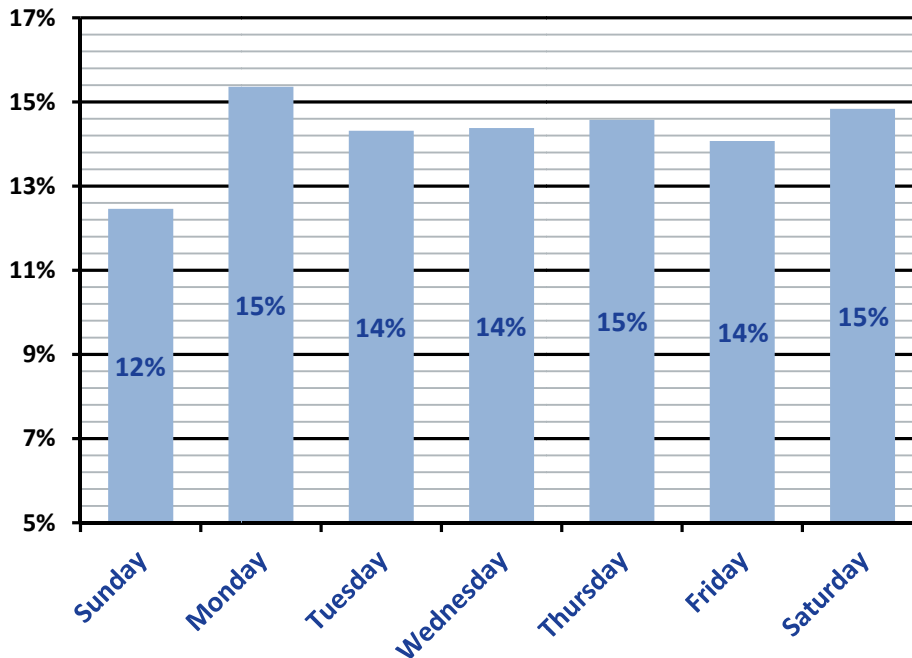
The preceding figure indicates that the months of July and December tended to have the highest demand for service. However, June, August, September, and October had a similar share of call volumes.

### Service-Demand by Day-of-Week

The next figure illustrates the combined service-demand on the Wasatch County Fire District by day-of-the-week during the 48-month study period 2014–2017.

**Figure 38: WCFD Service-Demand by Day-of-Week (2014–2017)**

Source: Utah State FMO



Although slightly busier on Saturdays and Mondays, there were not significant differences in call volumes by day-of-the-week. Based on the data provided by the Utah State Fire Marshal's Office, the Wasatch County Fire District averaged just over three calls per day during the 48-month period between calendar years 2014 and 2017. Currently, EMS and fire calls average approximately 6.7 calls per 24 hours.

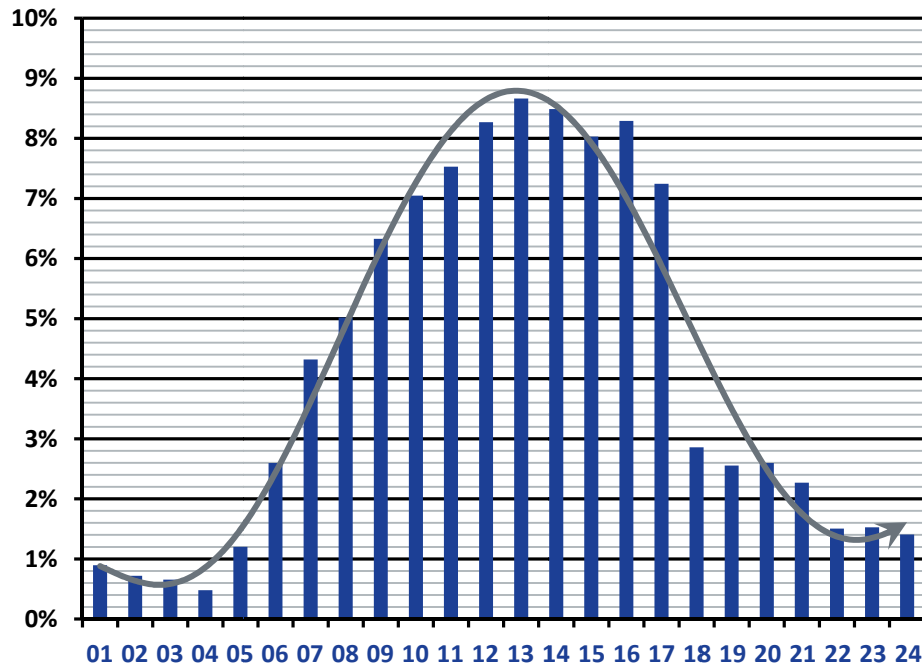
### Service-Demand by Hour

The next figure shows service-demand by hour-of-the day during the combined 48-hour study period. Evaluating service-demand by the hour is an important analysis, as it can help to determine the most effective staffing model—especially when considering the addition of staffed apparatus or peak-activity units (PAU).

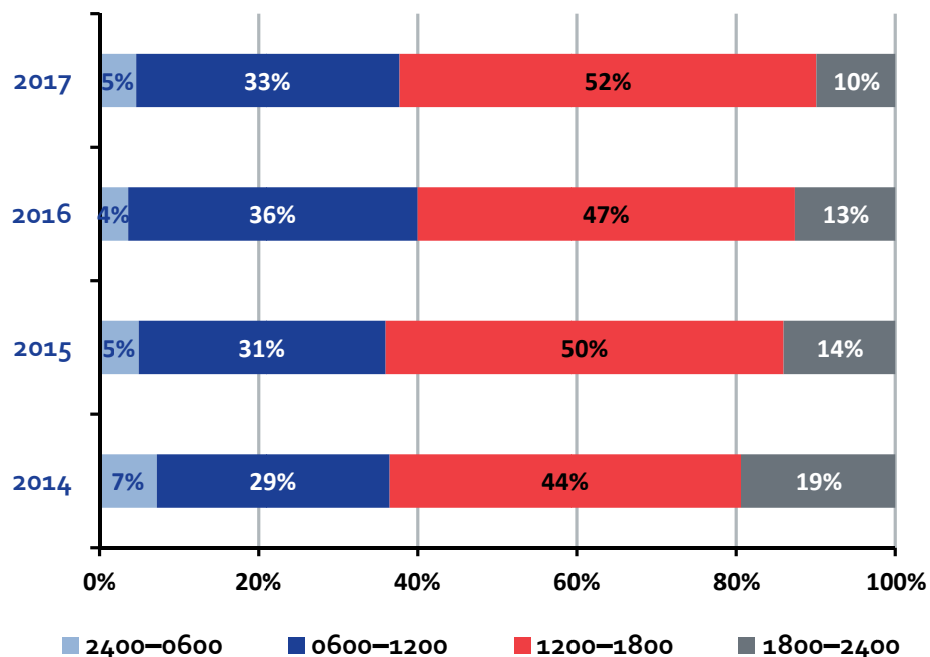
As anticipated, service-demand follows a diurnal pattern and begins to increase after 0600 hours (6 am), peaks in the early afternoon, and declines substantially after 1700 hours (5 pm). The results found in this analysis is typical of what is found in many communities, as these times are consistent with periods when human activity is at its highest. However, in ESCI's experience, service-demand in many systems tend to be higher between 1800 and 2000 hours.

**Figure 39: WCFD Service-Demand by Hour (2014–2017)**

Source: Utah State FMO



During 2014–2017, the busiest consecutive 12-hour periods were 0600–1800 hours and 0700–1900 hours; both representing 85% of the total daily service demand. The analysis also showed that the 12-hour interval between 1800 and 0500 hours represented about 18% of the total daily call volumes. The next figure shows historical service demand by hour for each year 2014–2017.

**Figure 40: WCFD Historical Service-Demand by Hour & Year**

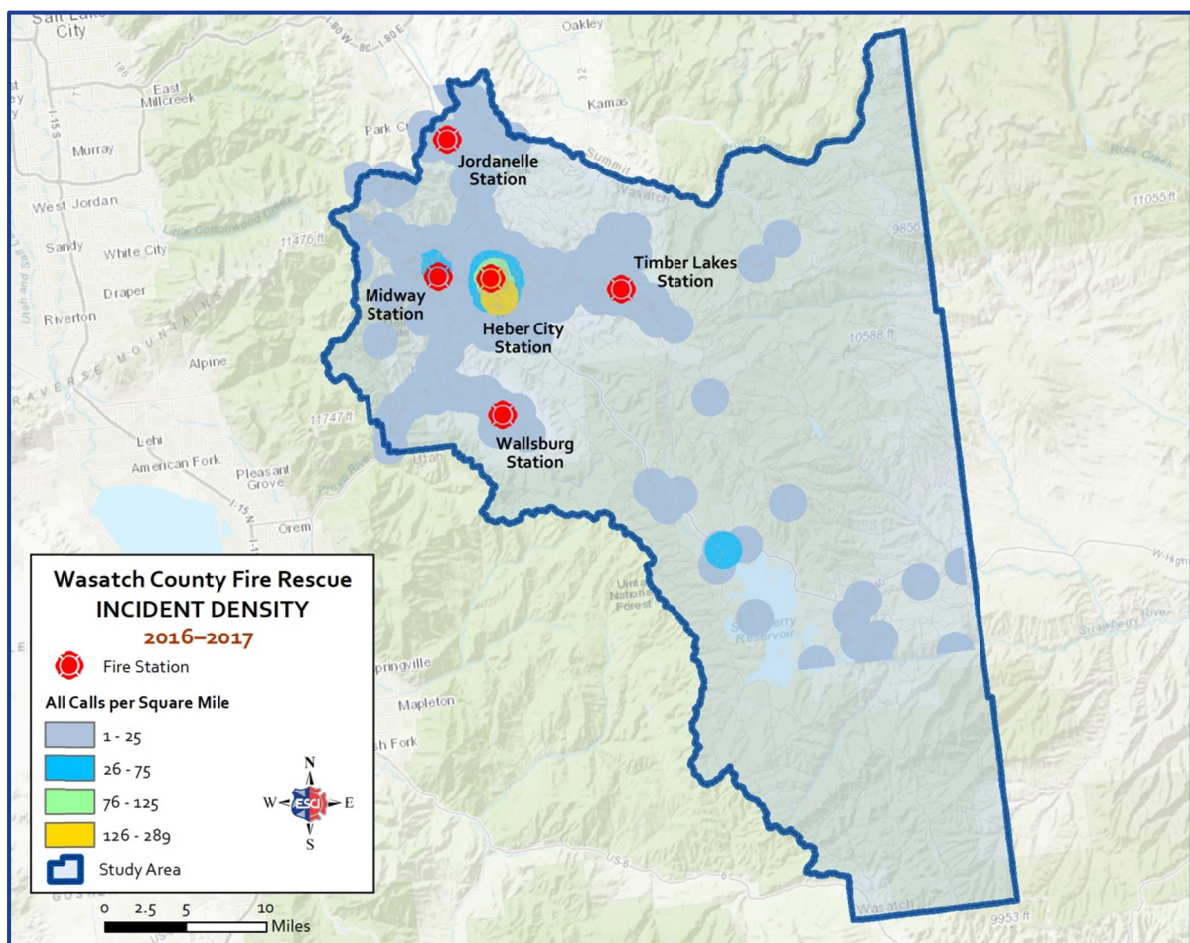
The preceding figure demonstrates that the period 0600–1800 hours consistently represented the highest 12-hour period for service demand for each year since 2014; and that 1200–1800 hours was the busiest four-hour period.

### Geographic Service Demand

In addition to the temporal analysis of service demand, it is useful to evaluate the geographic distribution of the various incident types. In the following figure, incident data provided to ESCI was utilized to display the mathematical density of incidents that occurred during 2016–2017. As anticipated, the majority of calls occurred in and around Heber City, where the largest population densities exist in Wasatch County.

With the exception of one small location, the rural areas on the southeast end of Wasatch County tended to have the lowest call densities at 1–25 incidents per square mile. The Jordanelle, Timber Lakes, and Wallsburg City fire stations had relatively low call densities (1–25 per square mile) in those areas surrounding each of those station locations.

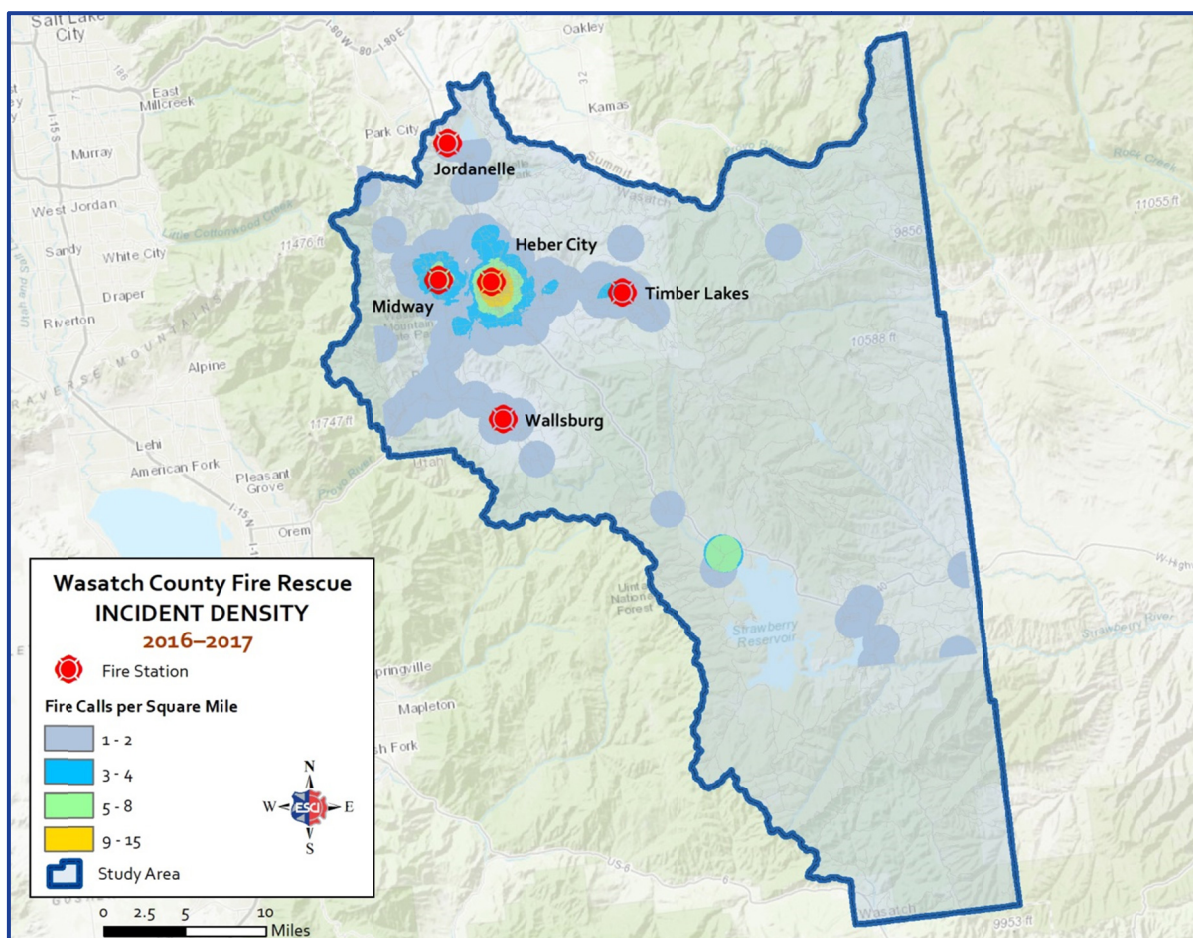
**Figure 41: WCFD Incident Density—All Call Types (2016–2017)**



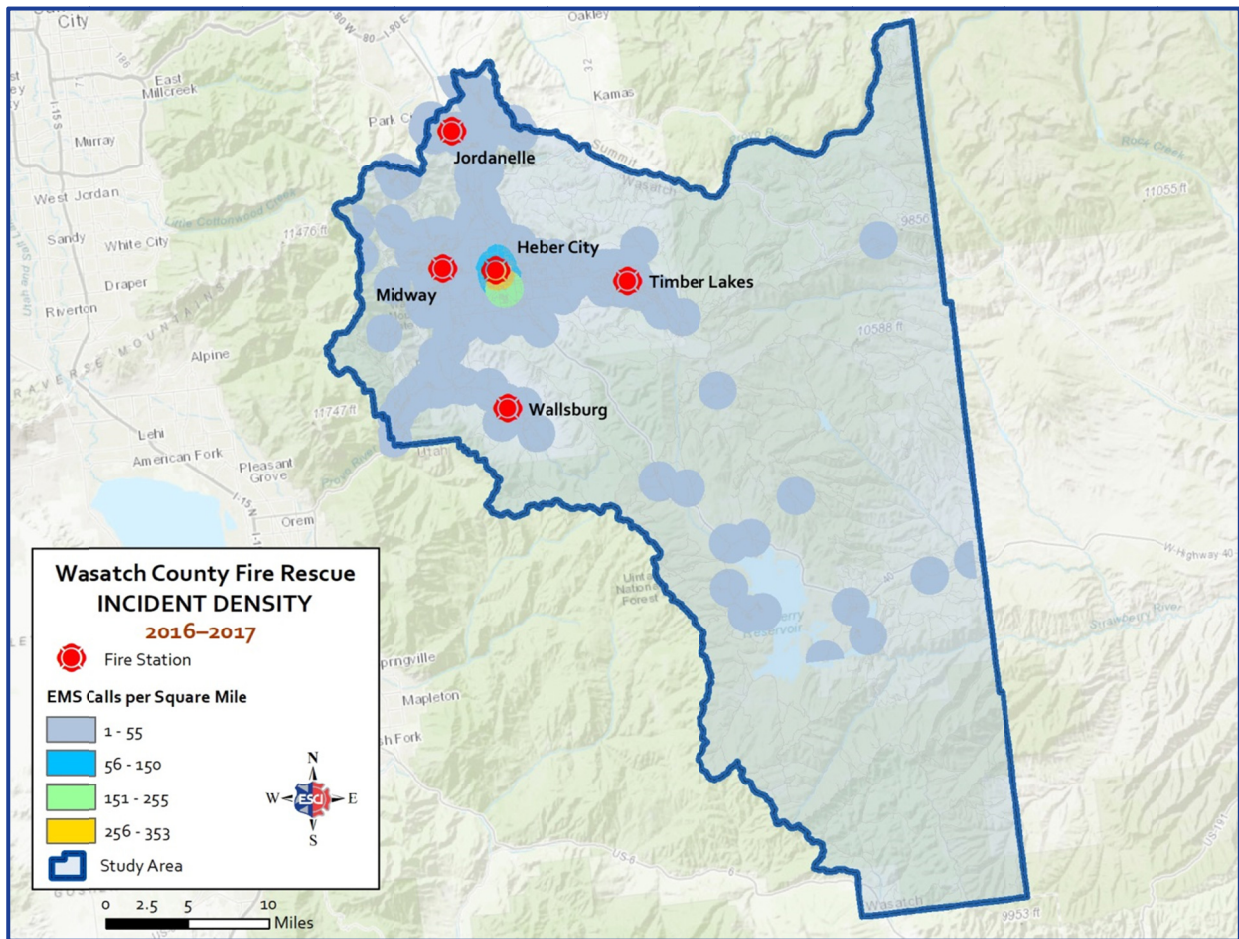


The next figure shows the incident density of fires and fire-related incidents during 2016–2017. Not surprisingly, fire incidents displayed a similar pattern to the figure showing all incidents. The map shows that most of the fires occurred around the Midway and Heber City fire stations, with incident densities ranging from 3–4 fires per square mile.

**Figure 42: WCFD Incident Density—Fires Only (2016–2017)**

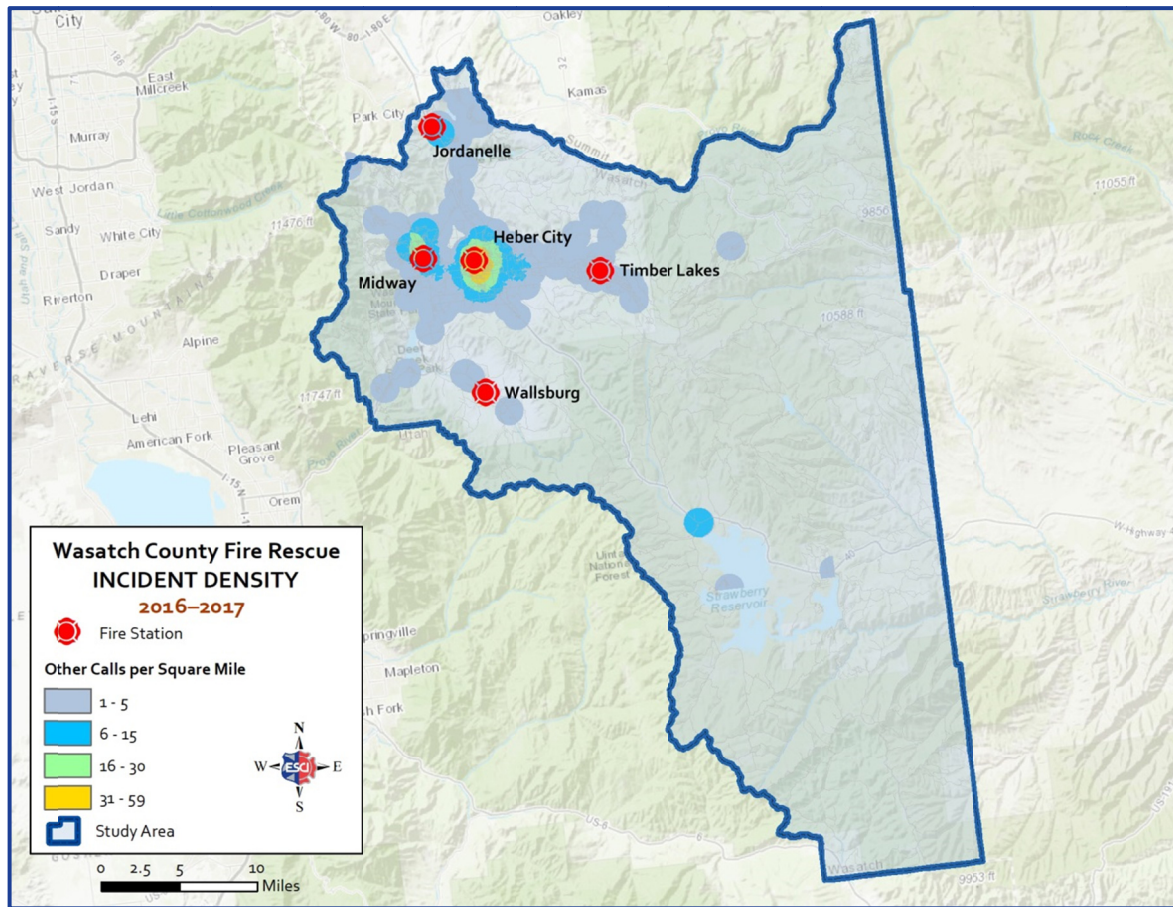


The following figure is yet another GIS display of EMS call-density during 2016–2017. The results of this analysis showed a different pattern than the preceding two figures. In this case, the highest densities of EMS incidents occurred in locations immediately surrounding the Heber City Fire Station, and particularly south of that station. Incident density ranged from 56–353 emergency medical calls per square mile over the 24-month study period.

**Figure 43: WCFD Incident Density—EMS Calls Only (2016–2017)**

The final incident-density image represents all “other” calls that do not entail fires, fire-related incidents, or EMS calls. Once again, these incidents follow a similar pattern found in the incident-density images for fires and all calls combined. However, there is one location in the southwest area of Wasatch County with a slightly higher density of 6–15 incidents per square mile.

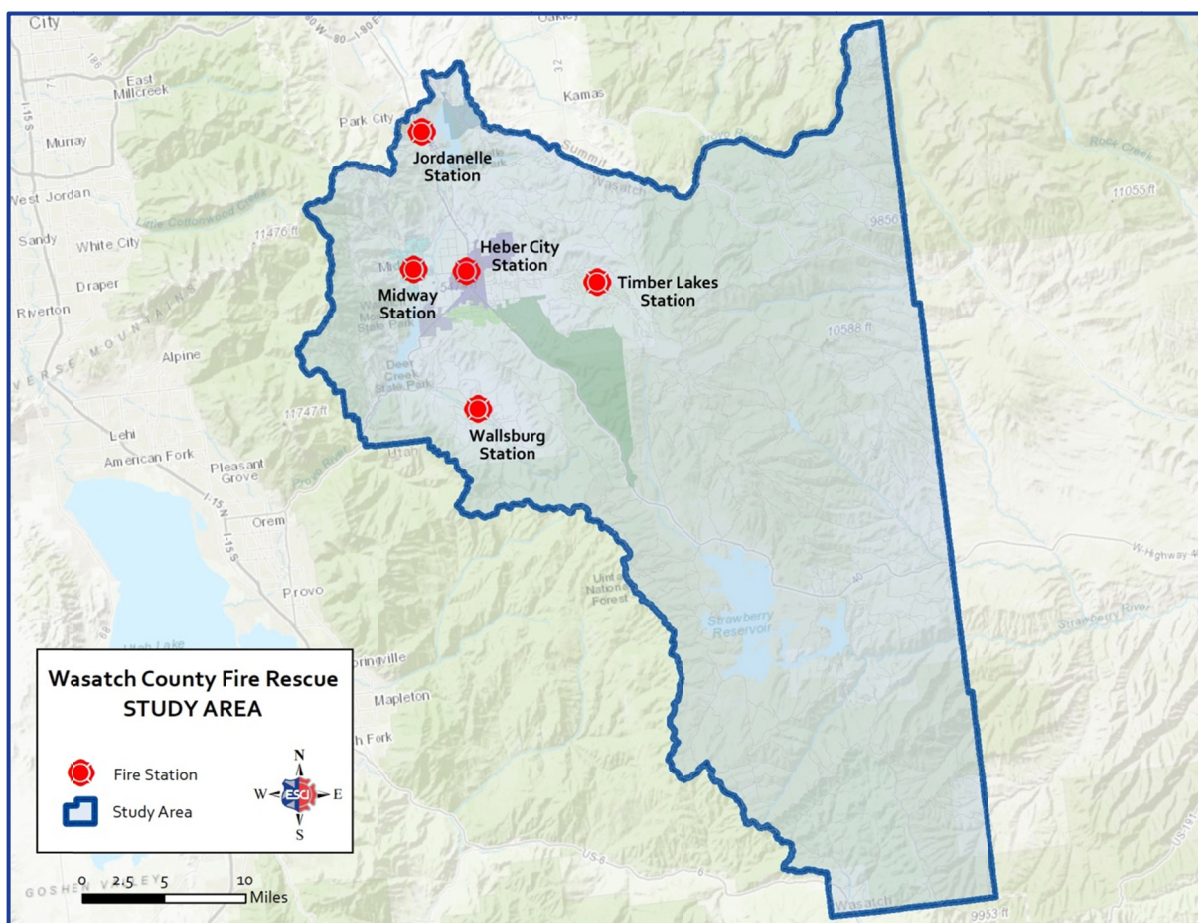


**Figure 44: WCFD Incident Density—Other Calls Only (2016–2017)**

## Resource Distribution Analysis

The Wasatch County Fire District's primary service area encompasses the entire geographic area within the boundaries of Wasatch County; which consists of 1,207 square miles. As shown previously in this report, the following figure represents the department's service area, which encompasses the study area used in this report.

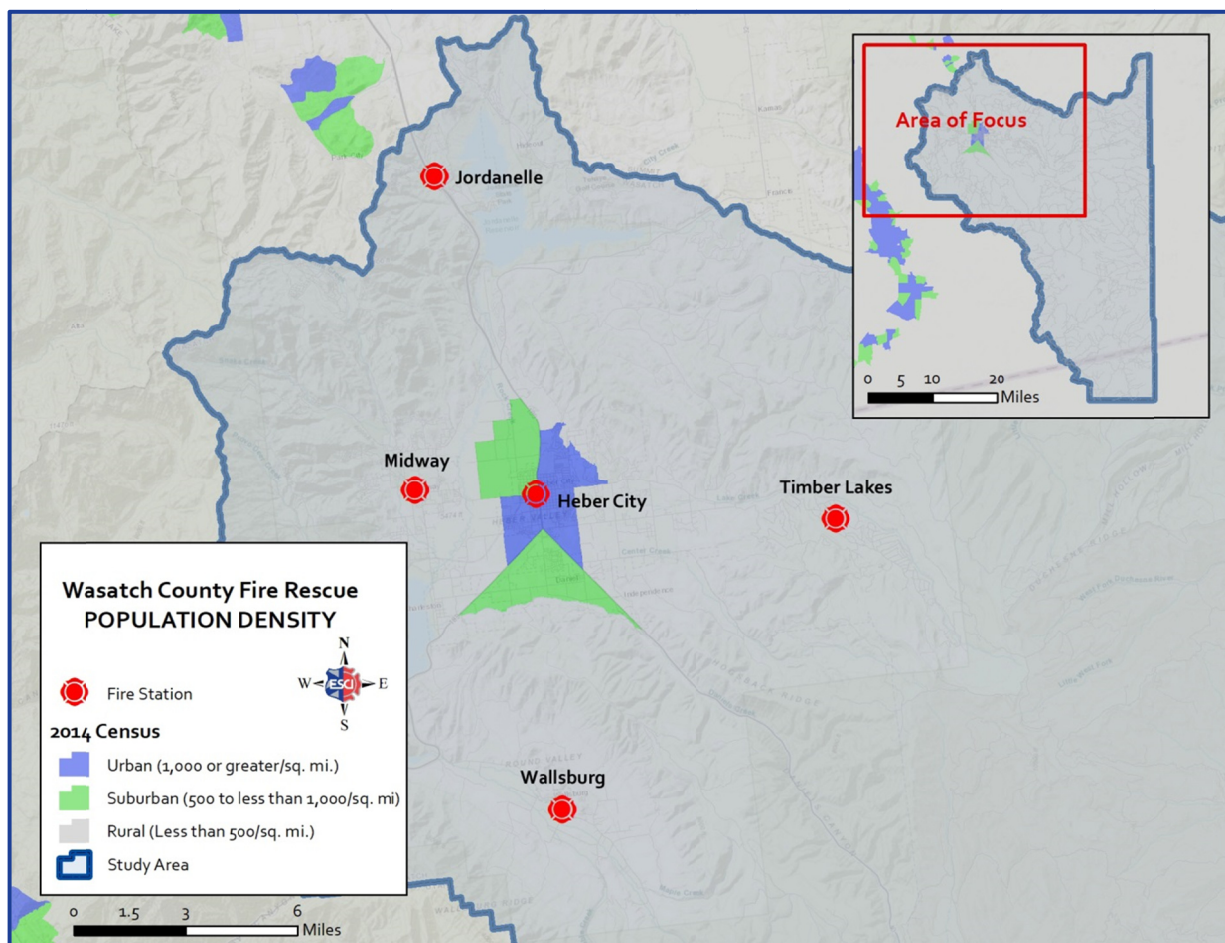
**Figure 45: Wasatch County Fire District Service Area**



In the next figure, ESCI uses 2014 *United States Census Bureau* data to examine population density throughout Wasatch County. This was the latest available data for use in a GIS application. As will be seen in a later section of this report, 2017 population estimates will be slightly higher than shown in the following figure. However, the differences in density are insignificant.

**Figure 46: Population Density in Wasatch County**

Source: U.S. Census Bureau (2014)



As shown in the preceding figure, Wasatch County is predominantly rural, with the largest population in and around Heber City. Based on 2014 census data, a large portion of Heber City has an urban population density, with suburban populations to the south and northwest of the city.

### Insurance Services Office Rating

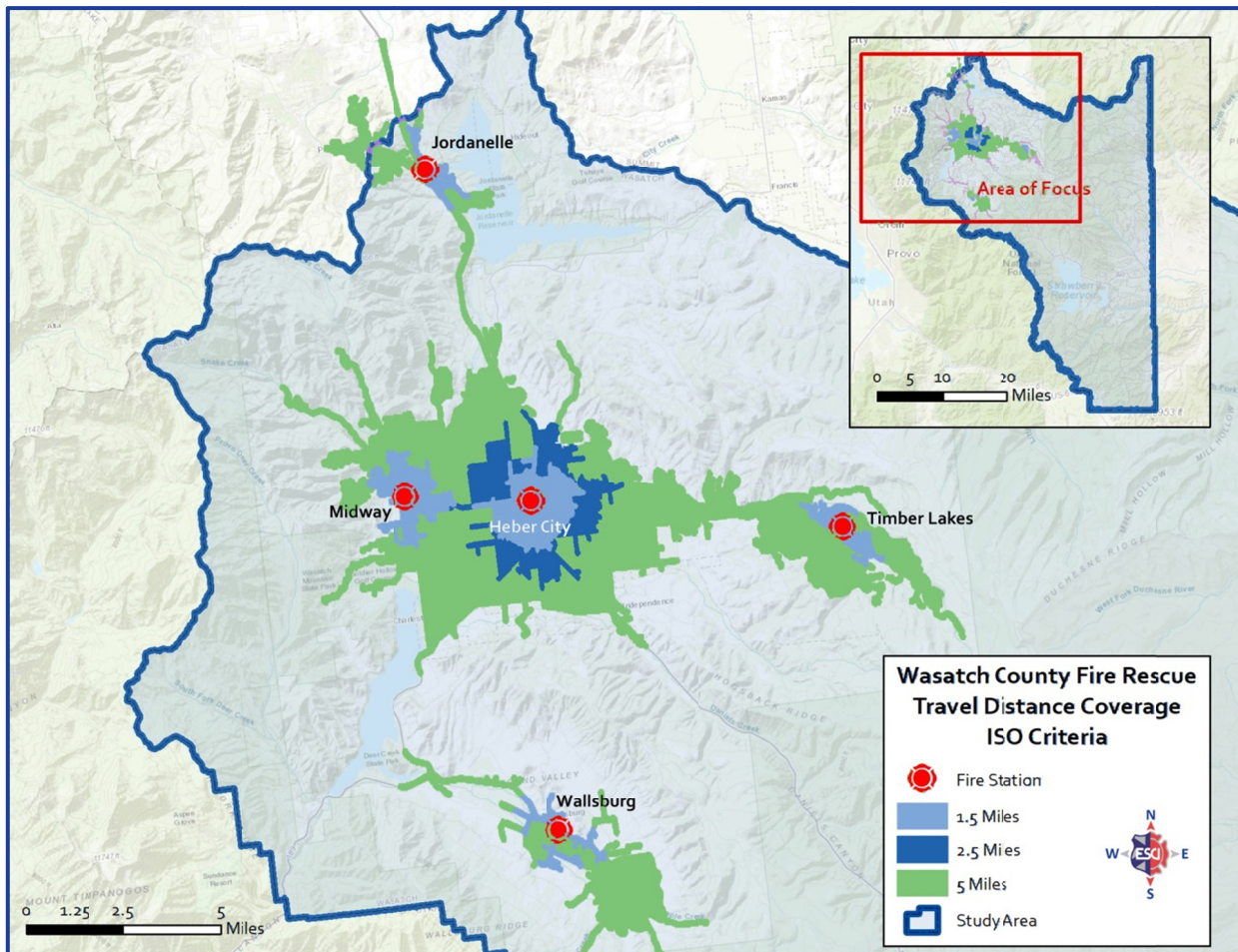
The *Insurance Services Office (ISO) Public Protection Classification (PPC®)* score was developed for communities to provide recommendations for key areas of improvement. The PPC® system is a national system used by ISO to provide insurance providers with a classification rating of a local community's fire protection. The PPC® score classifies communities based upon a rating scale of 1 (best protection) to 10 (no protection), and assesses all areas related to fire protection broken into four major categories that include: emergency dispatch and communications (10 points); water-system supply and distribution capabilities (40 points); the fire department (50 points); and Community Risk Reduction (5.5 points). The scoring system is developed using the *Fire Suppression Rating Schedule (FSRS)*, which outlines sub-categories and the detailed requirements for each area of the evaluation.



In 2015, the District was given a rating of o6/6X by ISO. The “6” class applies to communities within five road miles of a fire station, and within 1,000 feet of a fire hydrant or alternative water supply. The “X” class applies to properties beyond 1,000 feet of a fire hydrant, but within five road miles of a fire station. It is important to note that ISO PPC score only applies to suppression activities, and does not include performance and capabilities regarding EMS and other non-fire responses.

A jurisdiction’s ISO rating is an important factor when considering fire station and apparatus distribution, since it can affect the cost of fire insurance for individuals and businesses. For ISO purposes, response areas are measured at 1.5 miles of travel distance for each engine, and 2.5 miles for a ladder company (aerial apparatus) on existing roadways. For a structure to be in a protected rating for insurance purposes, it must be within five miles of a fire station. The next figure examines current station and apparatus distribution based on credentialing criteria by ISO.

**Figure 47: WCFD ISO Fire Station Travel Distances Criteria**

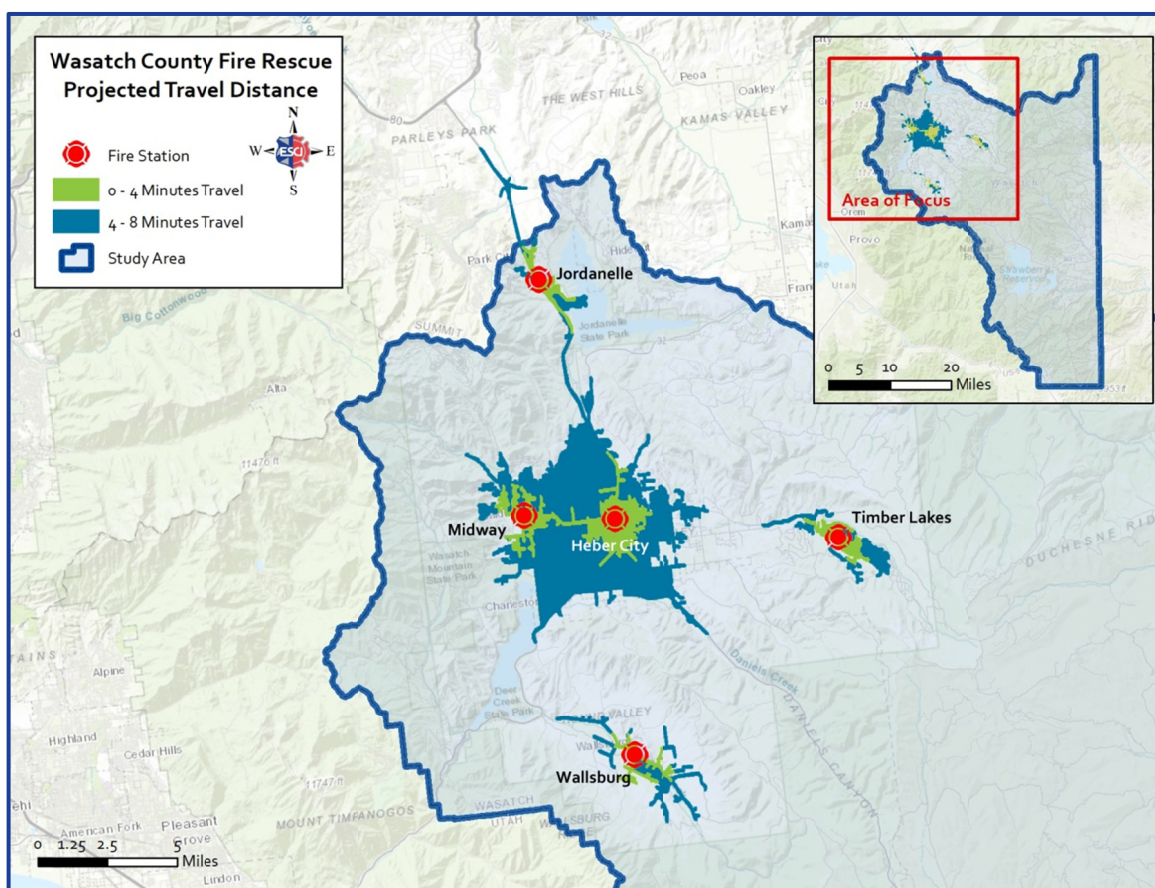


The preceding figure shows travel distances of 1.5 (engine); 2.5 (ladder); and 5 miles (fire station proximity) from Heber City. Since the only aerial apparatus is located at the Heber City Station, travel distances from the other four fire stations are shown at 1.5 and 5-mile travel distances only.

## Resource Concentration Study

Standard firefighting procedures call for the arrival of the entire initial assignment (sufficient apparatus and personnel to effectively deal with an emergency based on its level of risk) within a reasonable amount of time. This is to ensure that enough people and equipment arrive soon enough to safely control a fire or mitigate any emergency before there is substantial damage or injury. In this analysis, ESCI has examined WCFD's ability to assemble multiple resources across the study area. The following figure uses the four and eight-minute travel-time models to illustrate the concentration of WCFD resources available within an eight-minute or less travel time.

**Figure 48: WCFD Projected 4 & 8-Minute Travel Times**

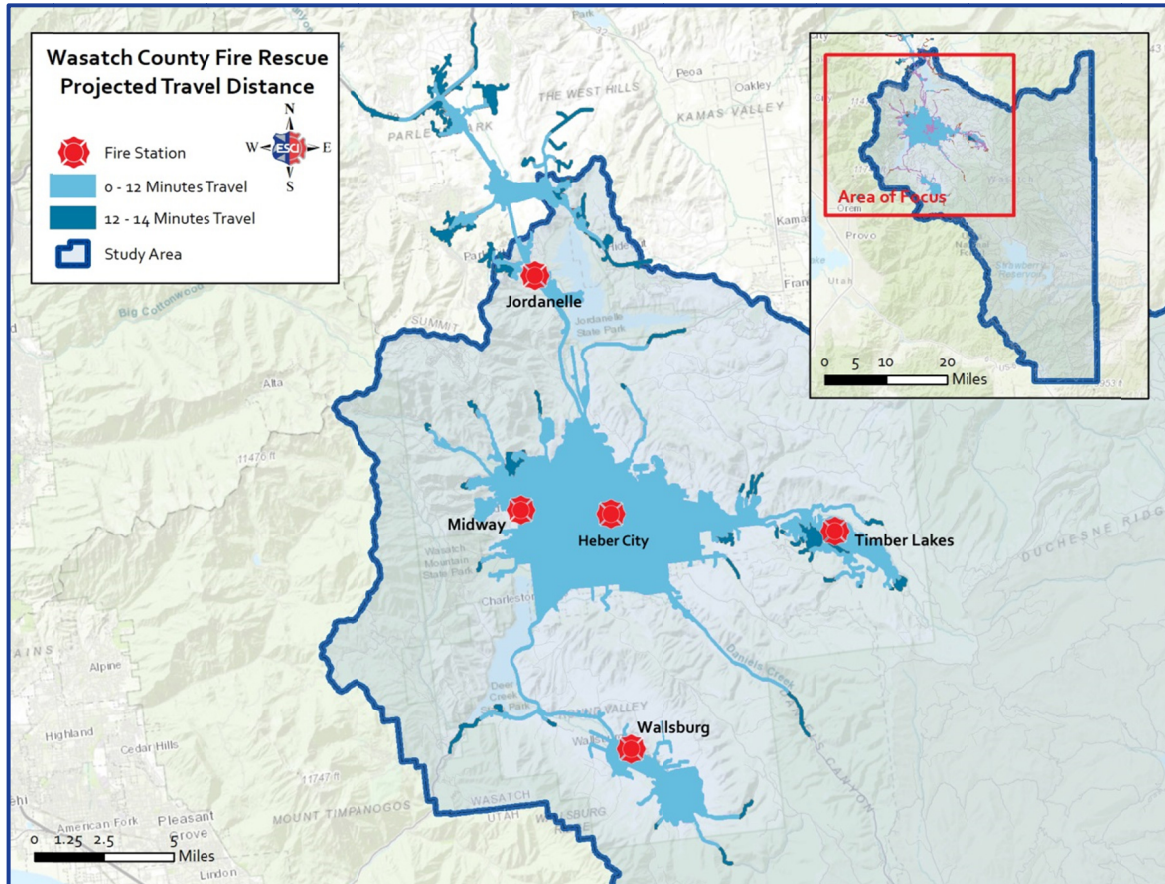


The GIS analysis in the preceding figure shows that the most populated areas of Wasatch County can be accessed within a travel time of eight minutes or less from each of the five fire stations. This can vary depending upon weather, road conditions, and traffic.



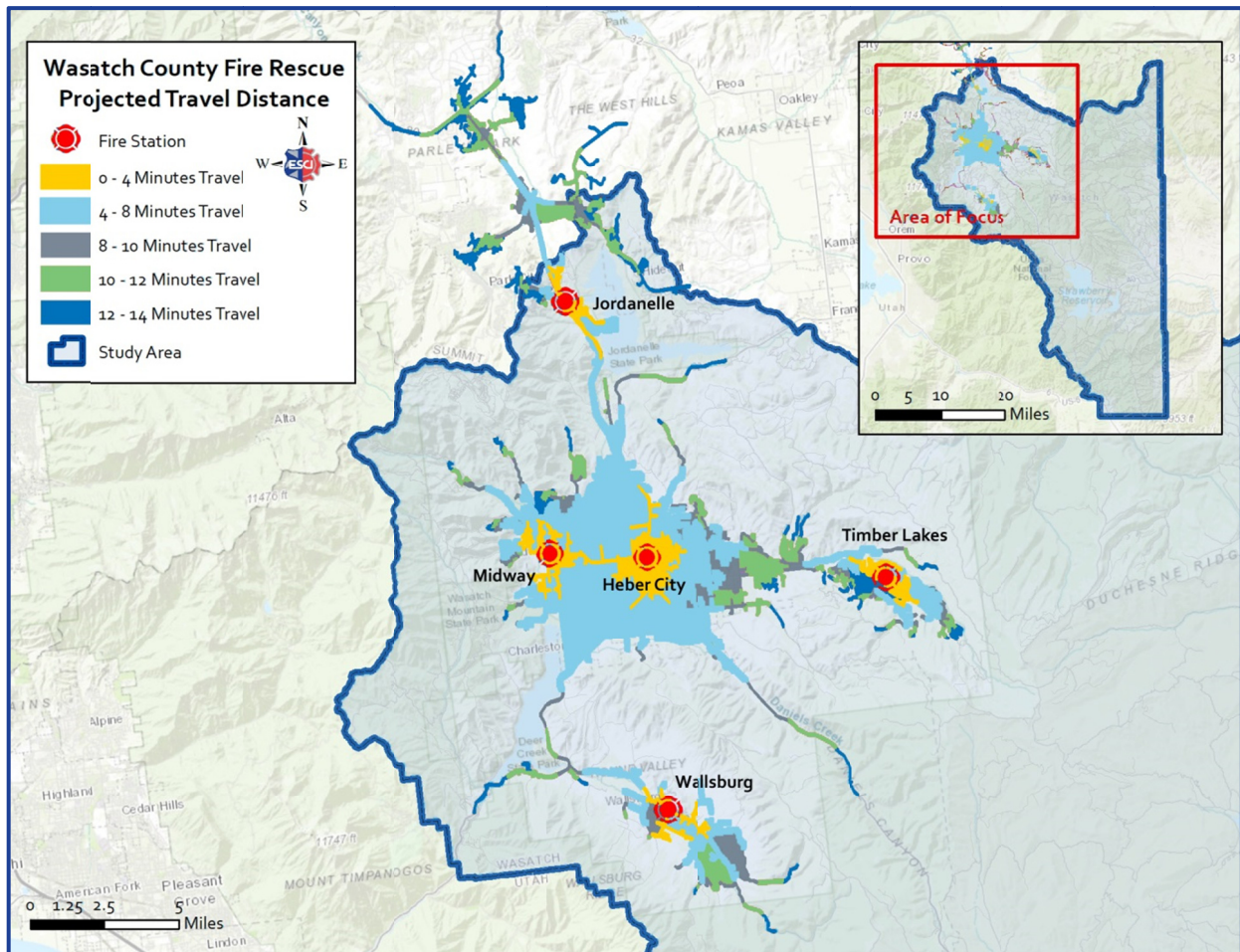
The next figure shows projected 12 and 14-minute travel times from each of the five fire stations. The GIS study indicates that largest population centers in Wasatch County can be accessed within a 12-minute or less travel time.

**Figure 49: WCFD Projected 12 & 14-Minute Travel Times**



The next figure shows the projected GIS illustration of potential of each of the 4, 8, 12, and 14-minute travel times from each of the five fire stations. As expected, travel times to most of the south and southeast portions of Wasatch County require a travel time well beyond 14 minutes. Although the urban and suburban communities in the north end of Wasatch County are accessible within relatively short travel times, the rural areas throughout the County are only accessible with substantially longer travel times.

Figure 50: WCFD Projected 12 &amp; 14-Minute Travel Times



## Response Performance Summary

In the response performance summary, ESCI analyzes the emergency response-performance of the WCFD service area, using available incident records provided by the Utah State Fire Marshal's Office. It is important to note that the dataset did not distinguish emergency from non-emergency responses. Wherever possible, data outliers and invalid data were excluded from the analysis.

## Response Time Definitions & Measurement Processes

In most national standards—including those described by the *National Fire Protection Association* (NFPA) and *Commission on Fire Accreditation International* (CFAI)—Total Response Time (TRT) is defined as the interval between the time the call is received at the communications center and the time the apparatus arrives on scene. TRT is comprised of several time intervals:

- *Alarm Handling Time* (or Call Processing Time)—the interval between the time the call is received at the public safety answering point (PSAP) or communications center, and the time the apparatus is dispatched (comprised of several components as described in NFPA 1221).<sup>15</sup>
- *Turnout Time*—the interval between the time apparatus is notified of a call, and the time it begins to respond.
- *Travel Time*—the interval between the time the apparatus begins to respond, and the time it arrives on scene.

When combined, the preceding three time-intervals represent TRT. ESCI was provided with a dataset that did not include the timestamps necessary to calculate alarm-handling times as part of the TRT. Therefore, in this analysis, TRT will represent the *interval between when the apparatus was dispatched until the time of its arrival on scene*.

## National Performance Standards

Response performance benchmarks have been established for career fire departments in the NFPA 1710 standard and CFAI recommendations as follows:<sup>16,17</sup>

- *Alarm Handling* (or Call Processing) *Time*—60 seconds or less at 90%.
- *Turnout Time*—80 seconds or less at 90% for fires and special operations; 60 seconds or less at 90% for EMS incidents.
- *Travel Time*—based on criteria for the different risk categories, and within guidelines provided for the service area and/or population density.

## Performance Measurement Process

In most cases in this section, response performance was calculated using the “fractile” method of measurement. Typically, the results are measured at the 90<sup>th</sup> percentile. Using this method follows industry best practices, and is considered a more accurate measurement than “average” calculations. When using an average measurement, unusually high or low numbers can distort the results, and not provide an accurate analysis of actual performance.



## WCFD Turnout & Travel-Time Data

Turnout-time performance is one element of the total response time continuum in which the fire department has direct control. This is the interval between when the apparatus is dispatched and when the fire apparatus begins to respond. Obviously, shorter turnout times will shorten total response times.

Unlike turnout times, the fire department has minimal control over the length of its travel times. This is the interval between when the apparatus begins to respond and when it arrives on the scene. Numerous factors can impact these times, including weather conditions; distance from the station; and road conditions.

The dataset provided to ESCI did not include the necessary date and timestamps with which to determine both the turnout time and travel time performance of the Wasatch County Fire District. However, the WCEMS incident data—shown later in this report—will provide some insight into WCFD’s turnout and travel times.

## WCFD Response-Time Performance

The following figure lists both the average response time and times at the 90<sup>th</sup> percentile for all WCFD incident-types during the 48-month study period. When analyzing the average times, times beyond 60 minutes were excluded. Since the dataset did not include the timestamps for the alarm-handling times, the following results represent the interval between when the call was dispatched until arrival of the first unit.

**Figure 51: WCFD Response Time Performance for All Incident Types Combined**

Calculation Method	2014	2015	2016	2017
TRT at 90 <sup>th</sup> Percentile	17 min., 0 sec.	17 min., 0 sec.	18 min., 0 sec.	18 min., 0 sec.
Average TRT	18 min., 25 sec.	18 min., 25 sec.	20 min., 8 sec.	24 min., 54 sec.

## Mutual & Automatic Aid

According to the dataset provided to ESCI, the Wasatch County Fire District *provided* mutual aid on only one occasion in 2014. This was to the small community of Francis, Utah and involved providing additional manpower to apparatus already at the scene. The data did not specify the incident type, but appears to have been a residential structure fire.

During this same 48-month period, WCFD *received* mutual aid on ten occasions. Of the ten incidents, seven were for fires; two for EMS; and one documented as “Service.” The latter was described as a “cover assignment” and move-up. For the fire-related incidents, four involved wildland fires; two were structure fires; and one was a passenger vehicle fire.

## WASATCH COUNTY EMERGENCY MEDICAL SERVICES

In this section, ESCI has evaluated various components of Wasatch County EMS. The purpose of this is to determine the impact on WCFD in anticipation of a potential merger with Wasatch County EMS. Currently, there is significant crossover between the two departments. WCFD provides much of the staffing needs for WCEMS, whose ambulances are co-located at some of the fire stations.

### WCEMS Training & Quality Management

As with any EMS provider organization, initial training and effective continuing medical education is critical for ensuring that prehospital care providers maintain the necessary skills and knowledge to deliver appropriate patient care. Along with that, a comprehensive EMS quality management program that evaluates both operations and clinical care can provide mechanisms for measuring the effectiveness of the EMS delivery system.

The following figure lists the basic components of the EMS training and continuing medical education program at Wasatch County EMS.

**Figure 52: WCEMS Training & CME Program**

Survey Component	Wasatch County EMS
<b>Training Program</b>	
Staff responsible for EMS training & CME	Two Training Officers
Training officers regularly monitored/evaluated	Limited
EMS Field Training & Evaluation Program (FTEP)	No
Designated Field Training Officers (FTO)	No
New staff required to attend FTEP prior to field work	Not applicable
New staff required to attend agency orientation	Not applicable
Agency provides tuition reimbursement to EMS staff	No
Annual training plan developed	At beginning of each shift
Plan meets state & local CME requirements	Not applicable
Plan meets agency mission & scope of care	Not applicable
<b>Training Records &amp; Documentation</b>	
Personnel training/CME records maintained	Ninth Brain System
Electronic system used for documentation	Custom program
Actual skills performed documented for each member	Yes
Advanced clinical skills success rates documented	Yes
Other clinical skills success rates measured	Yes
Certification expiration dates tracked internally	Yes
Training requirements monitored for compliance	Yes

As the preceding figure shows, WCEMS has appointed two individuals to serve as Training Officers (TO). Although the TO's are monitored and evaluated, this is done infrequently. WCEMS does not have a formal FTEP program for new personnel. Training and CME provided by WCEMS is done on a monthly basis rather than through the development of annual training plan. Training and CME records are documented using paper-based forms and a custom electronic system developed internally. Clinical skills are tracked as well.

### Training & CME Delivery Methods

The following figure lists the various training and CME delivery methods utilized by WCEMS.

**Figure 53: WCEMS Training & CME Delivery Methods**

Survey Component	Wasatch County EMS
On-line/web-based application	ImageTrend application
Computerized interactive simulations	Yes
Classroom/lectures	Yes
Clinical skills practice/evaluation	Yes
Simulation lab	No
Other training/CME methods	Outside speakers; ACLS course; PEPP course

As shown in the preceding figure, WCEMS utilizes an assortment of traditional methods for providing training and continuing medical education to their personnel.

### EMS Quality Management

The following figure outlines the basic components of the WCEMS quality management (QM) program.

**Figure 54: WCEMS Quality Management Program Components**

Survey Component	Wasatch County EMS
Staff position(s) responsible for QM	WCEMS Director
Annual or regular reports on QM results	No
Program in place to address frequent EMS users	No
Agency participates protocol development	Yes
System in place to address patient (and other) complaints	Yes
Agency conducts regular customer satisfaction surveys	No
Agency attempts to achieve the IHI Triple Aim concepts	No
EMS operational performance criteria established	Per protocol
Criteria established by (internal; regulatory)	No
EMS operational quality management program in place	Yes
Program identifies areas for improvement	Yes
System performance evaluated	Yes

The preceding figure lists the basic components of the QM program, as well as those processes used to evaluate operational performance. It was unclear to ESCI whether WCEMS has either internal or regulatory operational performance criteria (e.g., response-time performance criteria, etc.). The next figure describes clinical quality management processes.

**Figure 55: WCEMS Clinical Quality Management**

Survey Component	Wasatch County EMS
Defined EMS <i>clinical</i> quality management program in place	Yes
Program encourages personnel to report adverse events	Yes
Disciplinary actions taken for unintentional acts	Yes
Internal quality management/ improvement committee	No
Feedback provided to individual EMS field providers	No
Patient refusals reviewed	No
PCRs spot-evaluated for accuracy	WCEMS Director
Medical director and/or physician advisor participates	No
Patient outcomes tracked	Via ImageTrend
Agency participates in clinical research	Yes

### Quality Management Discussion

There are several areas of concern regarding quality management at WCEMS. The organization does not publish annual reports on the QM results, nor do they conduct patient satisfaction surveys. Regular reports on operational effectiveness and the results of customer satisfaction surveys can provide both employees, managers, and other key stakeholder's insight into the effectiveness of their organization.

WCEMS does not maintain an internal peer-review clinical QM committee, which can be valuable in identifying clinical performance issues and problems in specific patient-care protocols. Patient refusals are not reviewed, but can be a major source of liability for ambulance services. Of further concern is the lack of participation in QM by the Medical Director, which is crucial for ensuring effective prehospital clinical care.

### WCEMS Capital Equipment & Vehicles

The next section is a brief summary of the significant capital medical equipment, ambulance fleet, and other vehicles utilized by Wasatch County Emergency Medical Services.

#### Ambulances & Vehicles

The following figure is an inventory of the WCEMS ambulance fleet and other vehicles. Two of the ambulances are currently in use as frontline units, with the rest in a reserve status for use when necessary. All ambulances are Type I and manufactured by *Wheeled Coach Industries* (Winter Park, FL).

**Figure 56: WCEMS Ambulance & Vehicle Fleet Inventory**

Unit Designation	Type	Year	Condition	Mileage	Status
Heber Ambulance 1 (HA1)	Type I	2017	Good	15,453	Frontline
Heber Ambulance 2 (HA2)	Type I	2015	Good	19,098	Frontline
Heber Ambulance 3 (HA3)	Type I	2013	Good	81,000	Reserve
Midway Ambulance 1 (MA1)	Type I	2007	Fair	71,796	Reserve
Midway Ambulance 2 (MA2)	Type I	2006	Fair	110,000	Reserve
Midway Ambulance 3 (MA3)	Type I	199	Fair	76,000	Reserve
Timber Lakes Ambulance 1 (TL1)	Type I	2002	Poor	81,102	Reserve
Wallsburg Ambulance 1 (WA1)	Type I	2012	Good	76,000	Reserve
Unit 1009	Pickup	2005	Fair	60,000	Supervisor
Unit 1010	Gator	2001	Fair	N/A	Special Events

The forename of the ambulance unit designations represents their locations. For example, Heber Ambulance 1 is located at the Heber City Fire Station. The two frontline ambulances are currently deployed from the Heber City Fire Station. Reserve units are located at the Midway, Timber Lakes, and Wallsburg fire stations, and TL1 is rarely used due to its poor condition.

Of the eight Type I ambulances operated by WCEMS, six are in a reserve status. The two frontline units are in good condition with relatively low mileage. Two reserve ambulances are in good condition, three in fair condition, and one in poor condition. WCEMS utilizes a John Deere Gator utility vehicle for special events. The EMS Director is assigned a pickup truck.

In addition, the District maintains their own ambulances that are equipped and configured nearly the same as the WCEMS ambulances.

**Figure 57: WCEMS Ambulance****Figure 58: WCFD Ambulance**

### Capital Medical Equipment

Wasatch County EMS equips its ambulances with either the Zoll® E Series or X Series cardiac monitor/defibrillators. They maintain five of the older E-Series and three of the X Series. Most of the devices are well equipped with 12-lead capability; pacing; NIBP; SPO<sub>2</sub>; ETCO<sub>2</sub> and other features.

The type of stretcher/cot utilized by an ambulance service is important for both provider and patient safety. Powered stretchers can substantially reduce back and other injuries among EMS personnel. WCEMS equips its ambulances with Stryker® ambulance cots. Of the eight stretchers owned by the agency, four are powered, and four are “manual” lift. The powered models range in age from 1–6 years.

## WCEMS Service Delivery & Performance

In the following section, ESCI has evaluated specific incident data and patient records (with patient identifiers) as documented by WCEMS. The datasets were acquired from the *Utah Department of Health, Bureau of EMS & Preparedness* (UDH)—which had been submitted to them by WCEMS from their electronic patient-care records (ePCR). These consisted of records during the 48-month period between January 1, 2014 and December 31, 2017. Incident data and electronic patient-care records are documented in accordance with Versions 2 and 3 of the *National Emergency Medical Services Information System* (NEMSIS) codes.

A review of the incident data from both WCFD and WCEMS indicates that there is likely duplication of some records. Because of this, the following section will not include all of the elements normally presented in an evaluation of service-delivery and performance. Additionally, a substantial number of patient records had inconsistencies; empty fields; and other issues that limited more accurate and detailed analyses.

## WCEMS Service Demand

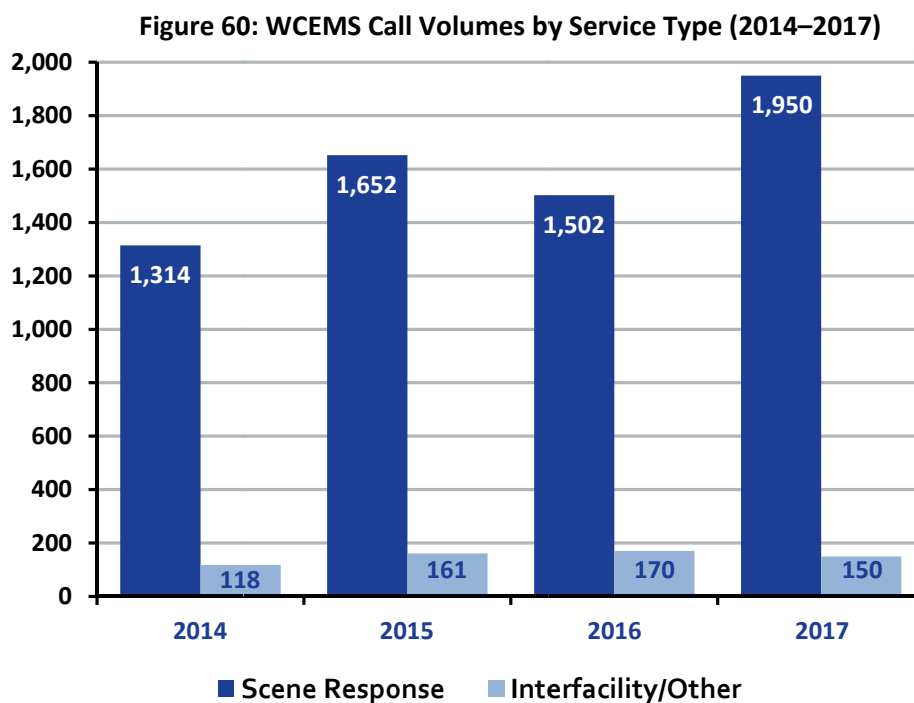
The next figure is an illustration of the service demand on Wasatch County Emergency Medical Services during 2014 through the end of 2017. Incidents were categorized by the NEMSIS codes used within the “Service Requested” field. In this report, scene responses are defined as any call not involving an interfacility transport, and are typically an incident requiring an emergency response (911 calls). These can also include intercepts and other emergency responses. The “Interfacility/Other” category was a group of several categories that included interfacility transports (IFT); mutual aid calls; standbys; and public assistance calls. Within that group, IFT consisted of the majority of incidents.

The following figure shows the frequency of calls dispatched and the number of proportion of patients transported for each year. Since 2014, the percentage of transported patients to calls dispatched has tended to fluctuate from year to year.

**Figure 59: WCEMS Calls Dispatched vs. Patients Transported**

Description	2014	2015	2016	2017	Cumulative
Calls Dispatched	1,314	1,652	1,502	1,950	<b>6,418</b>
Patients Transported	1,073	1,101	1,189	1,271	<b>4,634</b>
<b>Percent Transported:</b>	<b>82%</b>	<b>67%</b>	<b>79%</b>	<b>65%</b>	<b>72%</b>

The results in the following figure represent WCEMS calls *dispatched*, not necessarily the volume of patients transported. As shown, WCEMS service-demand has continued to increase steadily since 2014.



Requests for 911 scene responses have increased by over 50% between 2014 and 2015. Interfacility transports and other service-types have fluctuated, with a high in 2016, but have increased by approximately 27% since 2014. Total service demand has had an average annual increase of 5.5% (total fire and EMS 6.7%).

### Daily Service Demand

The next figure shows average daily service-demand by type and year.

**Figure 61: WCEMS Average Daily Service Demand**

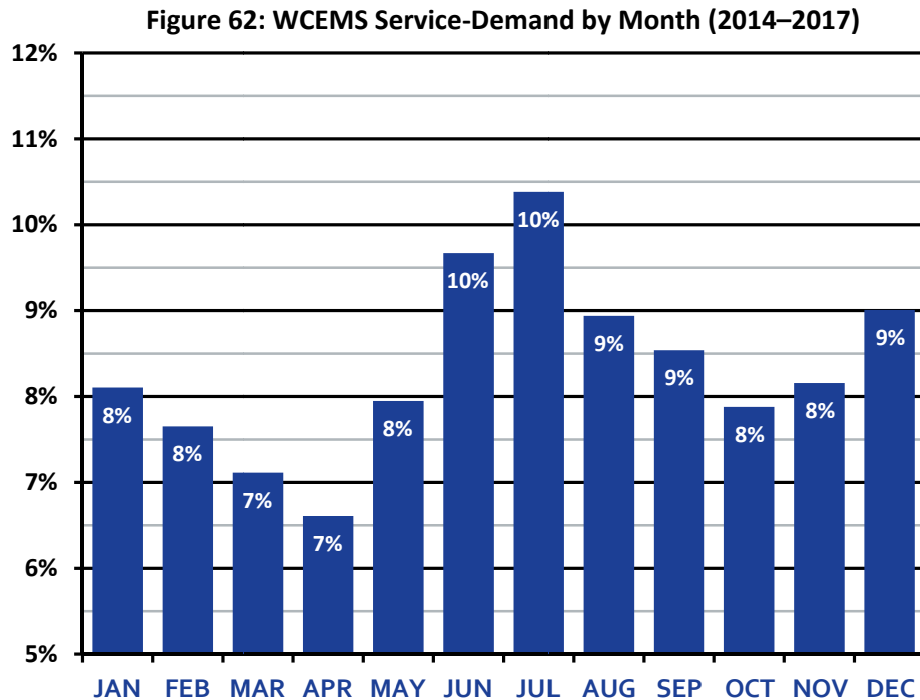
Service Type	2014	2015	2016	2017
Scene Responses	2.8	3.4	3.9	6.7
Interfacility Transports Only	0.3	0.4	0.5	0.4

### Temporal Analysis

The various analyses of temporal variations of service demand are important in determining adequate staffing and resource deployment. In some cases, the results can indicate the need to add more ambulances or peak-activity units (PAU). Service-demand is not static, and workload tends to vary by month, day-of-the-week, and time-of-day.

### *Service-Demand by Month*

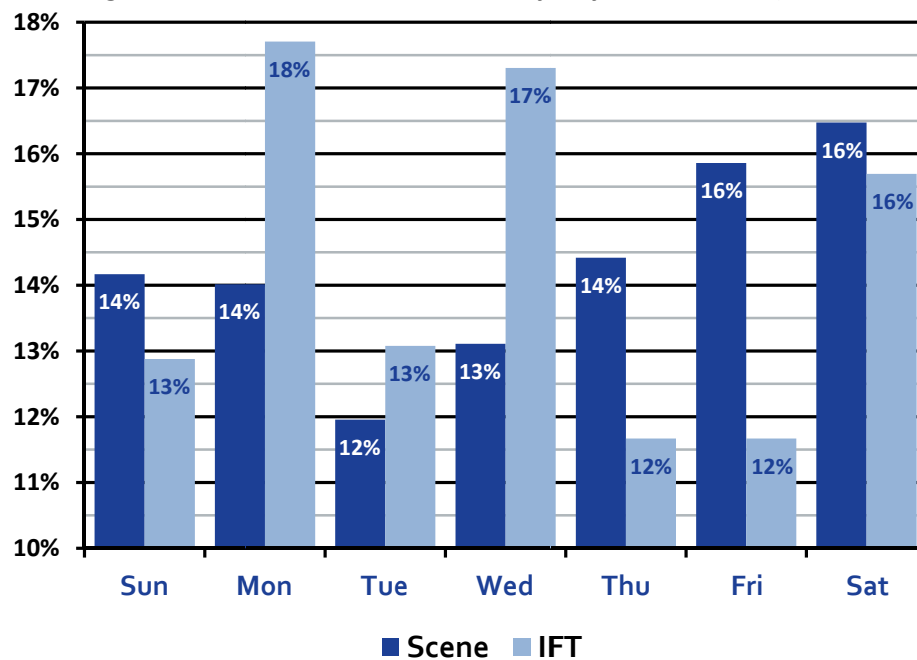
The following figure illustrates the service-demand of all incident types by month, over the 48-month study period. As shown, the busiest months were July, June, December, and August, respectively. Likely, the higher service-demand during these months can be attributed to the summer and winter recreational activities that occur in Wasatch County.



### *Service-Demand by Day-of-the-Week*

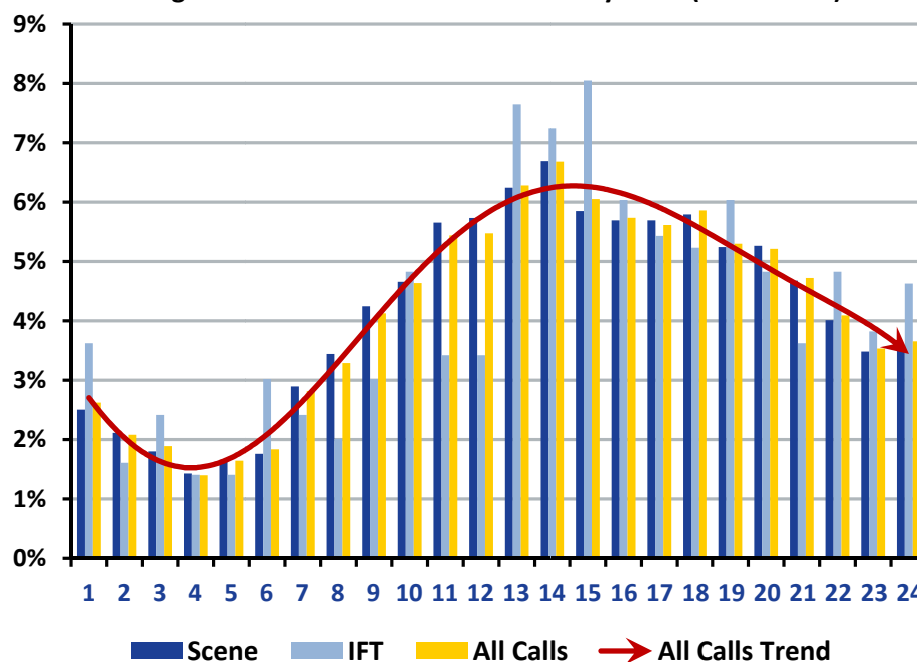
The next figure shows service-demand by day-of-the-week and categorized by scene response and IFTs. The results show that highest service demand for scene responses occurred on Fridays and Saturdays, while IFTs were significantly higher on Mondays, Wednesdays, and Saturdays respectively.



**Figure 63: WCEMS Service-Demand by Day-of-the-Week (2014–2017)**

### *Service-Demand by Hour*

One of the most important temporal analyses is service-demand by hour-of-the-day, as this can be a major element of how ambulances are staffed on a daily basis. The next figure illustrates EMS service-demand by scene calls and IFTs, along with all calls combined.

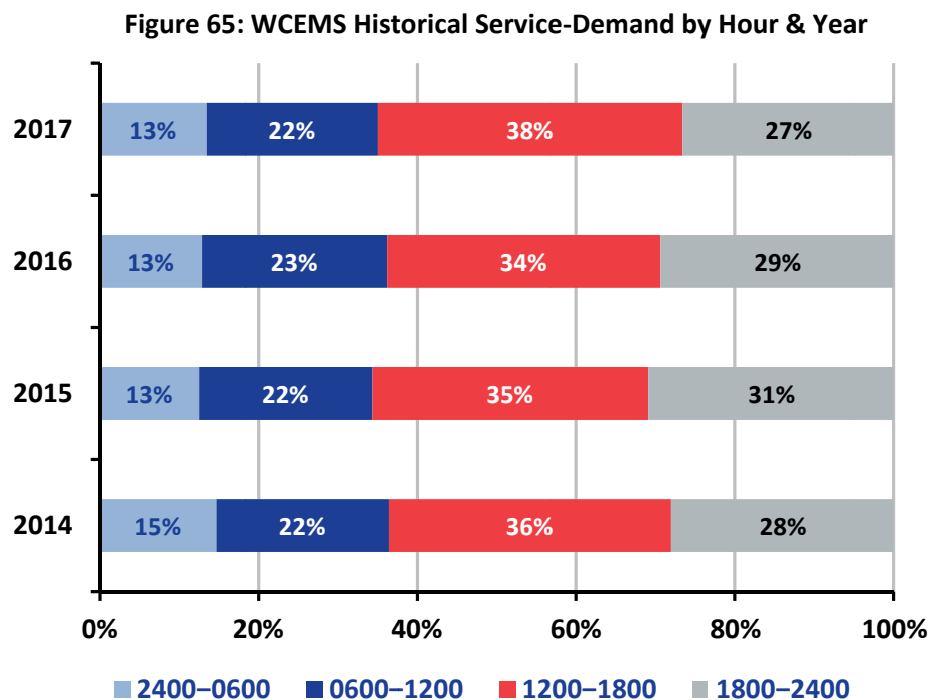
**Figure 64: WCEMS Service-Demand by Hour (2014–2017)**

Hourly EMS service-demand in Wasatch County follows the same pattern found in most communities throughout the U.S., where calls volumes tend to be higher during times when human activity is at its highest.

Interfacility transports occurred most frequently between 1300 and 1600 hours, and accounted for 29% of the total IFTs. However, there were a considerable number of IFTs between midnight and 0100 hours.

The 12-hour span between 0600 and 1800 hours represented 58% of the total daily call volume for WCEMS. This should be taken into consideration since this is the current 12-hour schedule of WCFD firefighters at the Heber City Fire Station.

The next figure illustrates historical emergency medical service-demand on Wasatch County EMS by hour, for each year 2014–2017. The results include all calls dispatched, and includes all emergency responses and interfacility transports.



The preceding figure shows that 0600–1800 hours remained the busiest 12-hour period consistently during 2014 through 2017. This is important information to know, when determining future staffing and ambulance scheduling.

## Patient Transport Analysis

The following figure lists the five most frequent patient-transport destinations during 2014–2017. As expected, the majority of patients were transported to Heber Valley Hospital.

**Figure 66: Most Frequent Patient Transport Destinations (2014–2017)**

Facility	% of Transports	Approximate Distance <sup>1</sup>
Heber Valley Hospital (HVH)	56%	Local
Utah Valley Regional Medical Center (UVRMC)	17%	27 miles
Park City Medical Center (PCMC)	6%	14 miles
Intermountain Medical Center (IMC)	4%	46 miles
Primary Children's Hospital (PCH)	4%	40 miles
Other Facilities combined	13%	—

<sup>1</sup>Represents approximate distance from Heber City

The preceding figure indicates that 87% of the patients transported during the 48-month study period went to five facilities. Combined, HVH and UVRMC comprised 73% of the patient transport destinations.

## Patient Demographics & Characteristics

Male patients represented the majority at 50%, with females at nearly 48%. In the remaining percentage (2%) of cases, the patient's gender was unknown or undocumented. Patient ages ranged from 1–99 years, with a median age of approximately 50.5 years.

## Primary Provider Impressions

The patient-care records include a field to document the EMS provider's primary impression of the patient's condition. In 44% of the patient records, this was unknown or undocumented. During the 48-month study period, WCEMS recorded 132 distinct primary impressions. The following figure lists the most common primary impressions excluding the unknown or undocumented records.

**Figure 67: Most Frequent Primary Impressions (2014–2017)**

Primary Impression	% of Total
Traumatic Injuries	33%
Behavioral Disorder	8%
Altered LOC	7%
Abdominal Pain/Problems	4%
Respiratory Distress	4%
Seizure(s)	3%
Chest Pain/Discomfort	3%
Poisoning/Drug Ingestion	3%
Syncope	3%
Diabetic Symptoms	3%
Other Primary Impressions Combined	29%

In 72% of the records, the mechanism of injury (MOI) was either not recorded, not applicable, or unknown. Of the trauma cases, the MOI was caused by blunt force in 91% of the calls; penetrating in 4%; burns in 1%; and “other” mechanism in 4% of the cases.

### Patient Disposition

In those records in which it was reported, the patient’s final acuity upon arrival at the hospital had improved in 28% of the cases; worsened in 3%; and remained unchanged in 69% of the patients. The following lists the disposition of patients as documented in the WCEMS ePCRs for 2014–2017. Note there are conflicts in the number of patients transported found in the incident dataset versus the patient dataset.

- Treated, Transported by EMS: 68%
- Patient Refused Care: 22%
- No Treatment Required: 4%
- Treated and Released: 4%
- Treated, Transferred Care: 3%
- Dead at Scene: <1%

### WCEMS Response Performance

The WCEMS NEMSIS incident dataset provided to ESCI contained a large number of errors and other issues in the timestamps utilized to perform the various analyses in the following section. Wherever possible, errors were repaired, but a large number of records had to be excluded during the analyses. However, ESCI is confident that for those records that were complete and error-free, the analyses are valid.

The various elements that comprise the response-time continuum have been described previously in this report. In this case, the dataset did not include the necessary timestamps to calculate the alarm-handling times by the dispatch center for WCEMS calls. Therefore, response-time performance includes the interval between when the ambulance was dispatched until arrival at the scene. In addition, response-time performance only included those calls dispatched as emergent (lights & siren).

### WCEMS Turnout Times

The following figure illustrates the WCEMS ambulance crew turnout times for the 48-month study period. It shows both the fractile method at the 90<sup>th</sup> percentile, and average times.

**Figure 68: WCEMS Turnout-Time Performance (2014–2017)**

Year	90 <sup>th</sup> Percentile	Average
2014	9 min., 30 sec.	5 min., 30 sec.
2015	7 min., 30 sec.	5 min., 30 sec.
2016	8 min., 0 sec.	5 min., 30 sec.
2017	9 min., 0 sec.	6 min., 30 sec.

From an industry standard perspective, WCEMS turnout times were unusually long. The NFPA, for example, recommends a turnout time of 60 seconds or less at the 90<sup>th</sup> percentile. Although some industry experts may consider 60 seconds as an unrealistic goal, WCEMS' historical turnout times were beyond most acceptable standards.

### WCEMS Travel Times

The following figure shows historical travel times, which includes the interval between when the ambulance began to respond and when it arrived on scene.

**Figure 69: WCEMS Travel-Time Performance (2014–2017)**

Year	90 <sup>th</sup> Percentile	Average
2014	21 min., 0 sec.	19 min., 32 sec.
2015	16 min., 0 sec.	18 min., 57 sec.
2016	17 min., 0 sec.	18 min., 45 sec.
2017	18 min., 0 sec.	18 min., 08 sec.

WCEMS travel-time performance fluctuated annually between 2014 and 2017, but exceeded 16 minutes in each year. Travel times have improved since 2014, however it must be noted that WCEMS has little or no control on these times when using static deployment methods.

### WCEMS Total Response-Time Performance

The next figure shows the WCEMS historical response-time performance of emergency responses to all areas within Wasatch County.

**Figure 70: WCEMS Total Response-Time Performance (2014–2017)**

Year	90 <sup>th</sup> Percentile	Average
2014	27 min., 0 sec.	22 min., 55 sec.
2015	22 min., 0 sec.	23 min., 57 sec.
2016	23 min., 0 sec.	23 min., 08 sec.
2017	25 min., 0 sec.	21 min., 20 sec.

WCEMS response times have fluctuated from year to year since 2014. The results are not surprising due to the size and nature of Wasatch County.

### WCEMS Response-Performance Discussion

Following the results of the data analyses, one area of concern were the extended turnout times that occurred over the preceding 48 months. Since WCFD firefighters staff and respond in WCEMS ambulances, these results could also be applied to the fire department's performance. Wasatch County is a large geographic area with relatively long response times. By improving turnout times, WCFD and WCEMS could reduce total response times throughout the County.

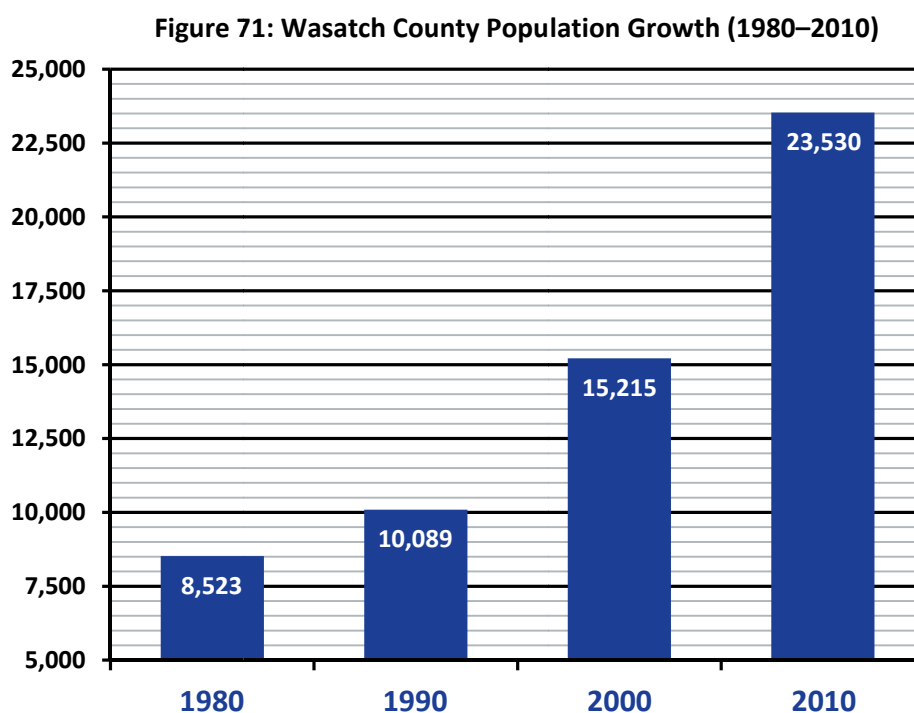
## FUTURE SYSTEM-DEMAND PROJECTIONS

In the following section, future system-demand projections begin with an overview of historical population growth within Wasatch County, and followed by projected population growth over the next 10 years.

### Population History & Projections

#### Historical Population Growth in Wasatch County

The following figure illustrates population growth in Wasatch County from 1980 through the last United States Census in 2010.<sup>18</sup>



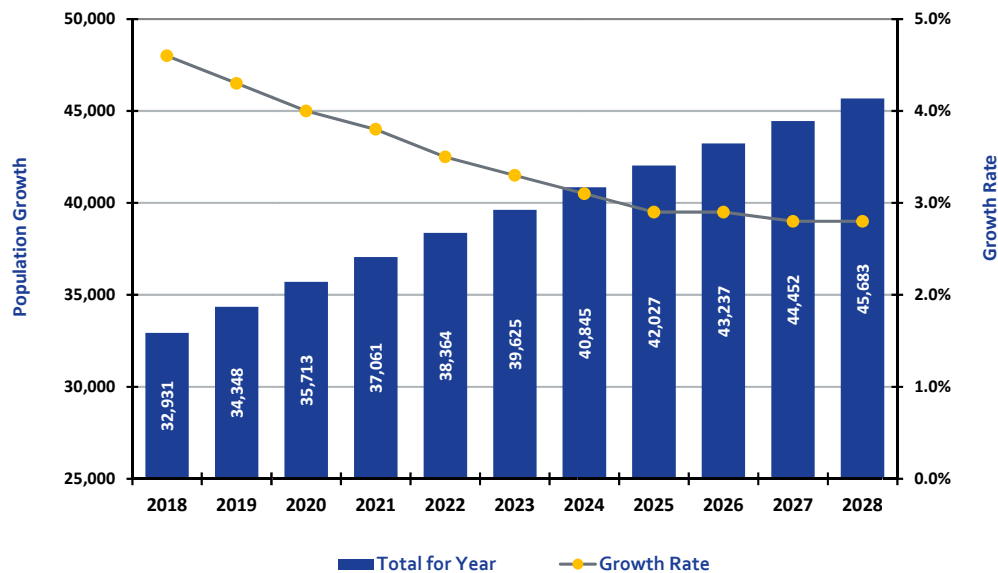
The population of Wasatch County has shown a steady increase. The average growth rate for each ten-year period was 42.3% (or about 15,007 persons). However, between 1980 and 1990, the population increased by only about 18.4%. Since 2010, Wasatch County's population has increased by nearly 36.5% (or 8,576).

#### Projected Population Growth in Wasatch County

As mentioned earlier in this report, the U.S. Census Bureau estimated that the 2017 population of Wasatch County was 32,106 persons. In the following figure, ESCI utilized demographic projections prepared by the University of Utah.<sup>19</sup> The University's projections begin with a 2018 population estimate of 32,931 persons.

**Figure 72: Projected Population Growth in Wasatch County (2018–2028)**

Source: University of Utah



The Wasatch County growth projections demonstrate that beginning in 2018 through 2020, the population growth will increase each year at rates between 4.0–4.6%. The growth rate will start to decline in 2021, to increase of 2.8% between 2027 and 2028. By 2028, the projected population of Wasatch County is anticipated to be 45,683 persons—an increase of about 42.3% over 2017. Over the next 10 years, population growth is expected to increase annually, on average, by 3.5%.

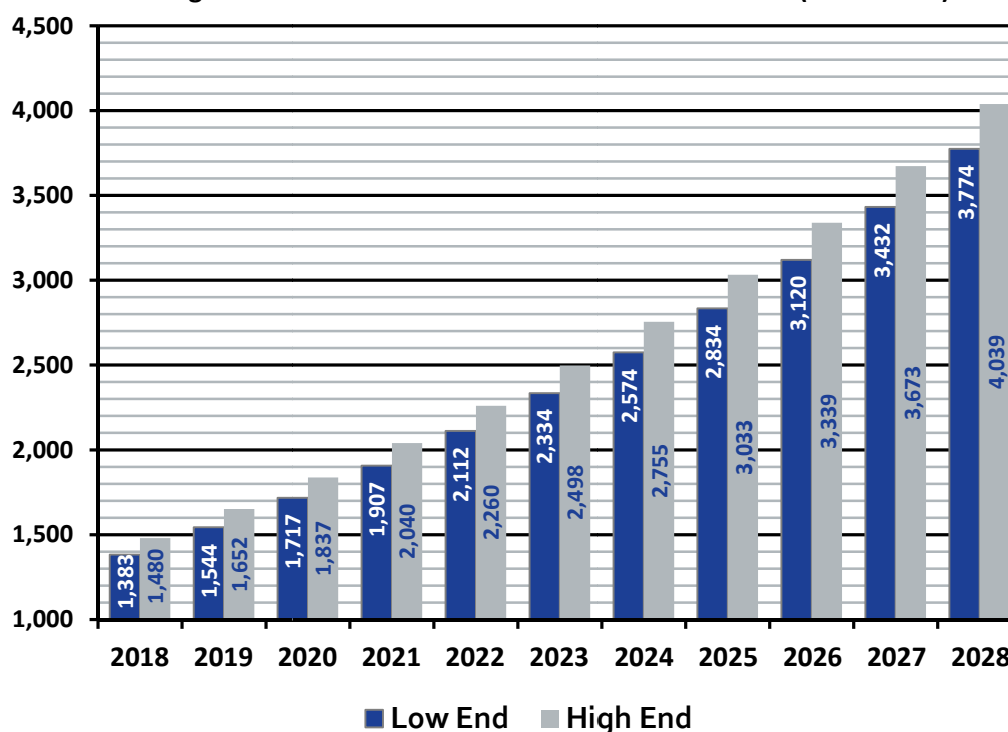
### Service-Demand Projections

It is important to consider projected population growth when determining future service-demand and planning for the potential need to add staff, facilities, apparatus, and other resources. Increases in population growth—particularly in EMS service-demand—can directly affect fire department workload and the effectiveness of the organization. Changes in service-demand may require variations and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance.

It is not the intent of this study to be a definitive authority for the projection of future service-demand in the District's service area, but rather to base recommendations for future fire protection and EMS needs on a reasonable association with projected service demand. Since human activity is a primary driver of emergency service demand, it is important to have a population-based projection of the future size of the community.

The next figure represents annual projected WCFD service demand from 2018 through 2028. ESCI utilized two different methods to determine the estimates. The first entails projections at the low end, using the most recent rate of service demand by per capita population. The higher end uses the same formula, but with a 7% annual increase. Likely, future service-demand increases will probably fall somewhere between the two of these.



**Figure 73: WCFD Estimated Future Service-Demand (2018–2018)**

Although population growth can vary, and may change over time, it is likely that the population of Wasatch County and the WCFD service area will continue to increase over the next 10 years. The District's leadership should soon begin the planning process, in order to prepare for the future and ensure there are resources sufficient to meet the growing demand for fire protection and emergency medical services.

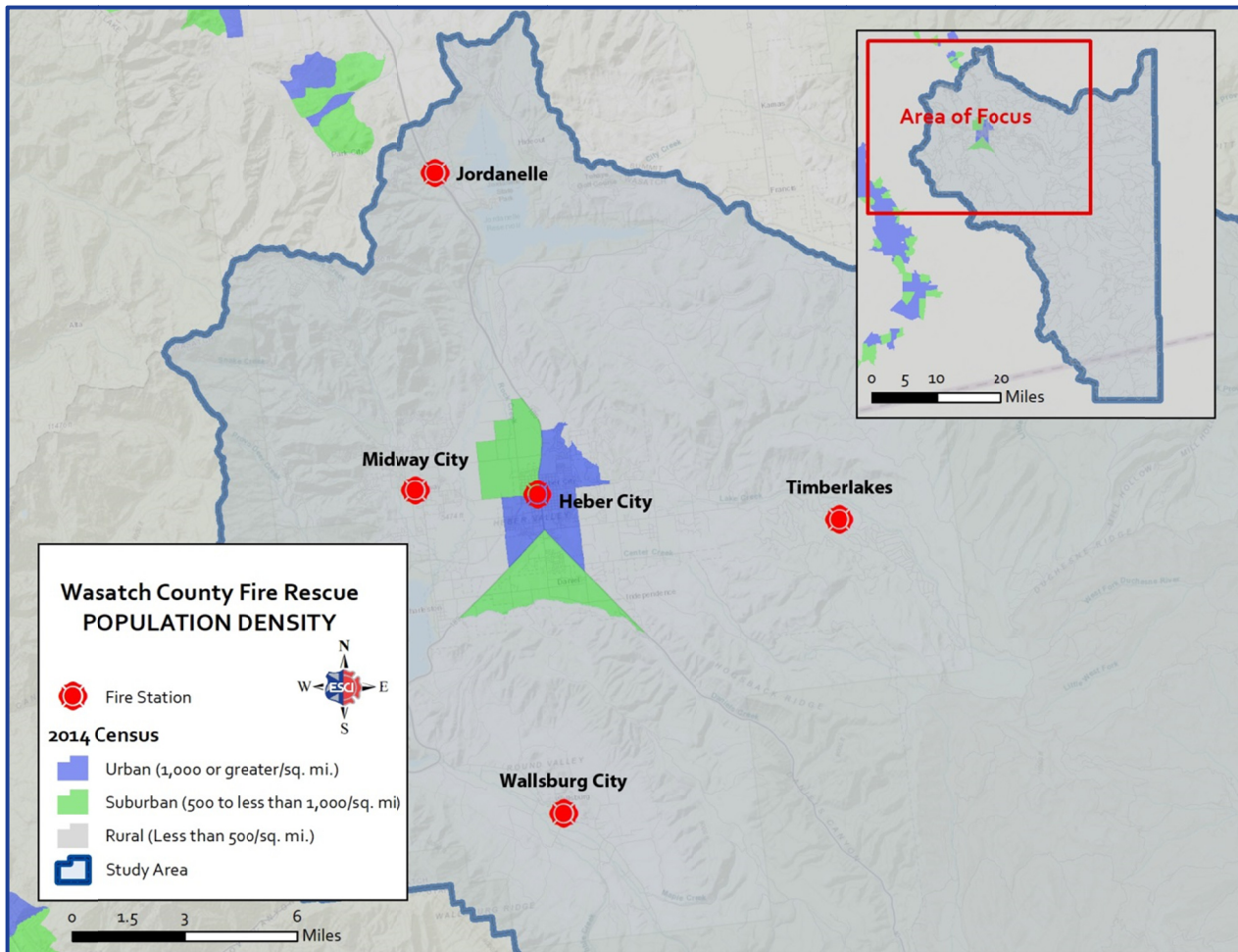
### Overview of Community Risk & Demographics

The following section is an overview of community risk, which is based on a number of factors: the service area population and population density; the demographics of the population served; and zoning and land-use regulations. In the following figure, ESCI re-examines the population density map used earlier in this report, to display population density in the Wasatch County Fire District service area.

The following figure is a reiteration of the Wasatch County population density map presented earlier in this report. It is included again in this section for easy reference regarding community risk issues and demographics.

**Figure 74: Population Density in Wasatch County**

Source: U.S. Census Bureau (2014)



### Current Land-Use Risk Categorization

GIS zoning data within the incorporated and unincorporated jurisdictions of Wasatch County were limited. Portions of the unincorporated areas lacked data. The following definitions of risk are based on the zoning and land-use as assigned by each of the jurisdictions.

#### High-Risk Areas

- *Unincorporated Wasatch County:* Industrial
- *Heber City:* Residential, commercial, manufacturing, industrial, mixed-use residential commercial
- *Midway:* High-density residential, business, and manufacturing

#### Moderate-Risk Areas

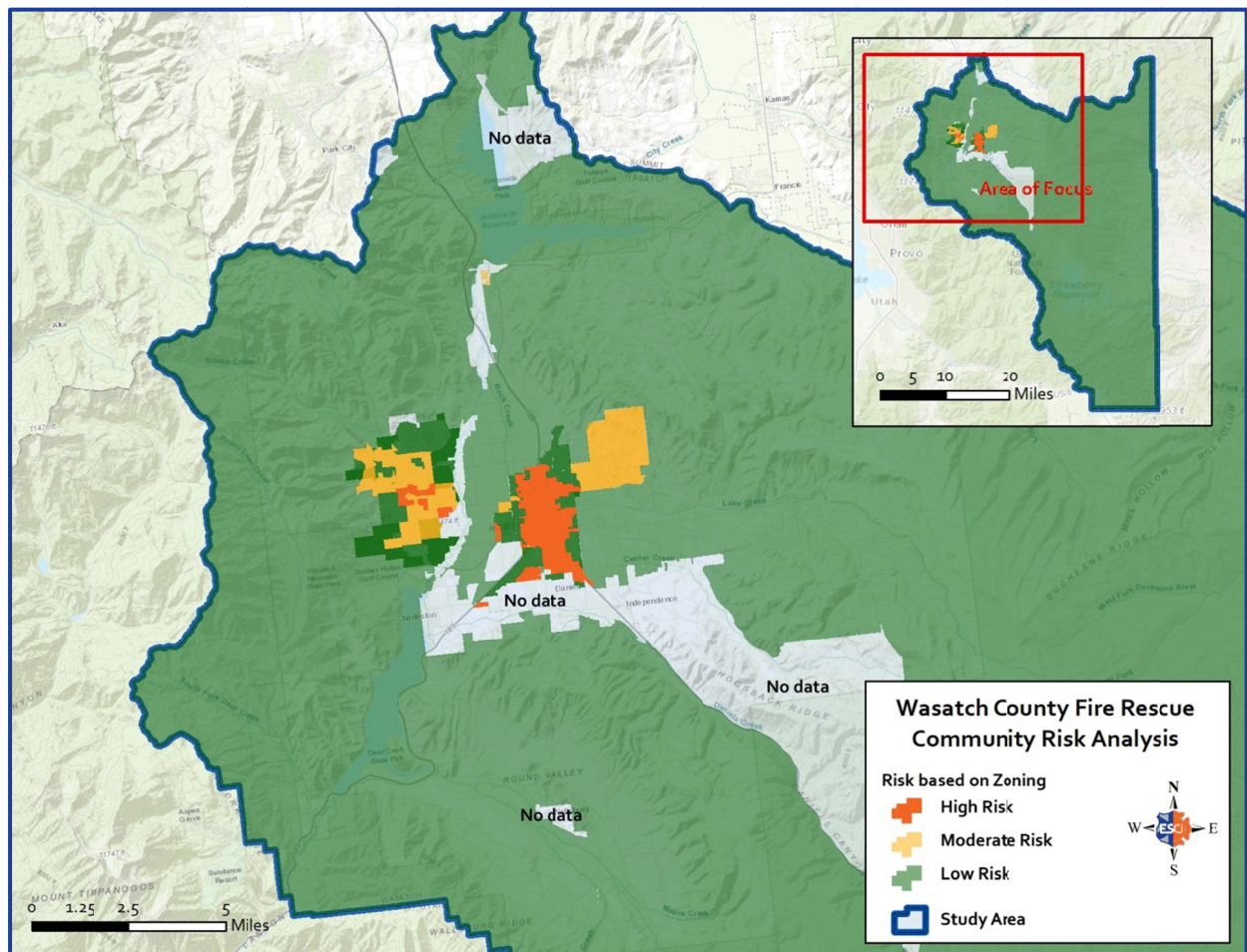
- *Unincorporated Wasatch County:* Commercial, highway services
- *Heber City:* General commercial, mixed commercial, planned community (under construction)
- *Midway:* Mixed commercial, mixed residential

### Low-Risk Areas

- *Unincorporated Wasatch County:* Agricultural, mountain, preservation, public facilities, residential, Strawberry recreation area
- *Heber City:* Planned community mixed use, agricultural, residential agriculture
- *Midway:* Residential agricultural, recreational resort

Using the preceding definitions, the following figure illustrates the areas of risk throughout Wasatch County.

**Figure 75: WCFD Community Risk by Local Zoning & Land Use**



As shown, the majority of unincorporated Wasatch County is zoned as low risk, while all of high and moderate risk areas are found in Heber City and the Town of Midway.

## DEVELOPMENT OF RESPONSE STANDARDS & TARGETS

The establishment of fire and EMS response-time performance standards and targets is the primary responsibility of local policymakers and community expectations. These must be balanced against the financial aspect of what a community is able and willing to afford. Once established, these standards launch measurable goals for service delivery, which then form the foundation upon which planning for deployment of resources is based. Absent these processes, the organization is not able to determine where it needs to go, nor is it able to know when it is achieving its goals and meeting the community's expectations.

### Community Outcome Expectations

ESCI cannot establish standards for WCFD, but instead will provide guidance and examples of what are considered acceptable metrics. In the following figure, ESCI offers sample statements that are *not* those of the Wasatch County Fire District, but may be representative of community expectations for various common types of emergency services provided by the department.

**Figure 76: Example Community Expectations of Response Objectives**

Service Type	Example Community Outcome Expectations <sup>20</sup>
<b>Fire Suppression</b>	Responders shall arrive in a timely manner with sufficient resources to stop the escalation of the fire and keep the fire to the area of involvement. An effective concentration of resources shall arrive within enough time to contain the fire, rescue at-risk victims, and perform salvage operations—while providing for the safety of the responders and general public.
<b>Wildland Fires</b>	The District shall arrive in a timely manner with sufficient resources to first protect homes and other buildings, then to begin controlling the rate of fire spread.
<b>Emergency Medical</b>	The District shall arrive in a timely manner with sufficiently trained and equipped personnel to provide services that will stabilize the situation, provide care and support to the victim, and reduce, reverse, or eliminate conditions that have caused the emergency, while providing for the safety of the responders. When warranted, timely transportation of victim(s) to appropriate medical facilities shall be accomplished in an effective and efficient manner.
<b>HazMat Response</b>	Responders shall arrive with sufficient resources to stabilize the situation and establish an action plan for the successful conclusion of the incident. For incidents requiring more extensive technician-level functions, personnel will call for and support additional specially trained and organized regional resources to perform the necessary mitigation procedures, while providing for the safety and security of the responders, public, and the environment.
<b>Vehicle Extrication</b>	Where victim-rescue is required, responders shall arrive in a timely manner with sufficient resources to stabilize the situation and extricate the victim(s) without causing further harm to the victim, responders, and public.



## Critical Tasks, Risk, & Staffing Performance

Tasks that must be performed at a fire can be broken down into two key components: life-safety and fire flow. Life-safety tasks are based on the number of building occupants, and their location, status, and ability to take self-preservation actions. Tasks related to life-safety involve search, rescue, and evacuation of victims. The fire-flow component involves delivering sufficient water to extinguish the fire and create an environment within the building that allows entry by firefighters.

The number and types of tasks needing simultaneous action will dictate the minimum number of firefighters required to combat different types of fires. In the absence of adequate personnel to perform concurrent actions, the command officer must prioritize the tasks and complete some in chronological order, rather than concurrently. These tasks include:

- Command
- Scene safety
- Search and rescue
- Fire attack
- Water supply
- Pump operation
- Ventilation
- Back-up/rapid intervention

Critical task analysis also applies to non-fire type emergencies, including medical, technical rescue, and hazardous materials incidents. Numerous simultaneous tasks must be completed to effectively control and mitigate an incident. WCFD's ability to quickly and sufficiently muster needed numbers of trained personnel is critical, and can determine the successful outcome of an incident.

The minimum emergency incident staffing recommendations of the *Commission on Fire Accreditation International* are defined as follows:

- **Low Risk**—Minor incidents involving small fires (fire flow less than 250 gallons per minute), single patient non-life threatening medical incidents, minor rescues, small fuel spills, and small wildland fires without unusual weather or fire behavior.
- **Moderate Risk**—Moderate risk incidents involving fires in single-family dwellings and equivalently sized commercial office properties (fire flow between 250 gallons per minute to 1,000 gallons per minute), life threatening medical emergencies, hazardous materials emergencies requiring specialized skills and equipment, rescues involving specialized skills and equipment, and larger wildland fires.
- **High Risk**—High risk incidents involving fires in larger commercial properties with sustained attack (fire flows more than 1,000 gallons per minute), multiple patient medical incidents, major releases of hazardous materials, high risk rescues, and wildland fires with extreme weather or fire behavior.

## Critical Tasking

Critical tasks are those activities that must be conducted by firefighters early on and in a timely manner, in order to control the situation, stop loss, and perform the necessary tasks required for a medical emergency. A fire department is responsible for assuring that responding companies can perform all the described tasks in a prompt, efficient, and safe manner. These are the minimum number of personnel needed by incident type. More personnel will be needed for incidents of increased complexity or size.

The most crucial period during the suppression of a fire occurs with the first 15 minutes. How quickly, effectively, and efficiently firefighters perform during this period has a significant impact on the overall outcome of the incident. This general concept is applicable to fire, rescue, and medical situations.

Critical tasks must be conducted in a timely manner to control a fire or to treat a patient. Three scenarios of commonly encountered emergencies are routinely utilized by fire departments when conducting field validation and critical tasking: a moderate-risk structure fire; a traffic collision with a trapped victim; and a cardiac arrest. Each scenario is conducted using standard operating procedures and realistic response times based on actual system performance. Each scenario is normally run multiple times with a variety of fire companies to validate and verify observations and times. The following figure is a sample of critical-task staffing by type of risk.

**Figure 77: Sample of Critical-Task Staffing by Risk Type<sup>21</sup>**

Task	Structural Maximum Risk	Structural Significant Risk	Structural Moderate Risk	Non-Structural Low Risk
Attack line	4	4	2	2
Back-up line	4	2	2	2 <sup>A</sup>
Support for hose lines	4	3	2	—
Search and rescue	4	4	2	—
Ventilation	4	2	2	—
Rapid intervention team	4	4	2	—
Pump Operator	2	1	1	1
Second apparatus operator	1	1	1 <sup>A</sup>	—
Command	2	1	1	1 <sup>B</sup>
Safety	2	1	1 <sup>B</sup>	—
Salvage	4	—	—	—
Rehabilitation	2	—	—	—
Division/group supervisors	2 <sup>A</sup>	—	—	—
<b>Totals:</b>	<b>37–39</b>	<b>23</b>	<b>14–16</b>	<b>3–6</b>

<sup>A</sup>Indicates tasks may not be required at all such incidents

<sup>B</sup>Indicates task may, at times, be completed concurrently with another position

To further validate the analysis process, results are compared with records from actual working fires and similar incidents from previous years. Overall results are reviewed to determine if the actions taken within the early minutes of an incident resulted in a stop-loss or not, and if additional resources were required. The critical task analysis process demonstrates the rate in which the current deployment plan results in stopping loss, a high percentage of time within initial critical time goals.

### All-Risk Critical Resource Tasking

Fire departments respond to many incidents other than structure fires, including hazardous materials (dangerous goods) releases, motor vehicle collisions, basic and advanced life support medical emergencies, and non-structural fires. Personnel responding to these types of incidents should be assigned tasks similar to structure fires.

The following figures are included as examples of the various types of incidents. However, ESCI recommends WCFD conduct its own field validation exercises with its career and volunteer personnel, in order to verify the critical tasking analysis provided. After WCFD completes the field validation, it may find that the critical tasking can be adjusted appropriately upward or downward for each incident type.

**Figure 78: Examples—EMS & MVC Critical Tasking**

Tasks	No. Personnel
<b>Emergency Medical Services</b>	
Medical First Response (MFR)	4
Patient Care & Transport	2
<b>Total:</b>	<b>6</b>
<b>Emergency Medical Services: Cardiac Arrest</b>	
Direct Patient Care	1
CPR	2
Advanced Life Support	2
Transport (Driver)	1
<b>Total:</b>	<b>6</b>
<b>Motor Vehicle Collision: Entrapment</b>	
Incident Command	1
Pump Operator & Primary Attack Line	3
Extrication	3
Patient Care & Transport	2
<b>Total:</b>	<b>9</b>



**Figure 79: Examples—Exterior Fires & Interior Structure Fires Critical Tasking**

Tasks	No. Personnel
<b>Non-Structure Fire: Exterior Attack</b>	
Incident Command	1
Pump Operator	1
Primary Attack Line	2
<b>Total:</b>	<b>4</b>
<b>Structure Fire: Interior Attack</b>	
Incident Command	1
Pump Operator	1
Primary Attack Line	2
Water Supply <sup>1</sup>	1
Backup Line	2
Rapid Intervention Team (RIT)	2
Ventilation	2
Search & Rescue	2
Utilities & Exposures	2
<b>Total:</b>	<b>15</b>

<sup>1</sup>Additional personnel required for rural water supply operations using tenders

**Figure 80: Example—Hazardous Materials Incident Critical Tasking**

Tasks	No. Personnel
<b>Hazardous Materials Incident</b>	
Incident Command	1
Pump Operator	1
Primary Attack Line	2
Backup Line	2
Support Personnel	7
<b>Total:</b>	<b>13</b>

Note that the preceding figures are only examples, as it is important that WCFD develop and validate its own critical tasking accordingly. It is the responsibility of the Wasatch County Fire District to ensure that both career and volunteer responding companies are capable of performing all of the necessary tasks in a particular incident type, in a prompt, efficient, and safe manner.

## Response-Time Performance Objectives

Once WCFD has established response objectives, identified the critical tasks, and determined the number of personnel necessary to achieve those critical tasks, the department can begin the process of defining emergency response-time performance objectives.

The process of setting response-time performance objectives will include answering the following questions:

- What are the expectations of the community and elected officials with regard to initial response times of the fire department to an emergency incident?
  - What is the public's perception of quality emergency services where response time is concerned?
- What response-time performance would be reasonable and effective in containing a fire, stopping the loss, and saving lives when considering the common types of incidents and fire risks faced by the Wasatch County Fire District?

## National Consensus Standards

WCFD's Board of Directors, the Fire Chief, and Citizens Fire Advisory Board should use the results of the data analyses found in the "Service-Delivery & Performance" section of this report to provide a comparison of the Wasatch County Fire District's performance against industry standards.

National consensus standards such as NFPA 1710 and NFPA 1720 contain response-time goals for career fire jurisdictions (NFPA 1710) and combination/volunteer fire jurisdictions (NFPA 1720).<sup>22</sup> The NFPA 1710 standard is primarily suited for heavily developed and densely populated urban areas. The NFPA 1720 standard recognizes that many fire jurisdictions serve diverse large areas, and contains response-time standards based on population density.

The CPSE/CFAI document recommends that response-performance goals and standards are developed considering the current capabilities of the jurisdiction, historical service-demand, risk analysis and exposure, and community expectations. Although none of these standards are mandates or codified, the overarching goal of all these documents is to offer response-time goals that provide for the arrival of the appropriate fire department resources in time to safely and effectively mitigate the emergency.

The NFPA 1720 standards are currently the most applicable to the Wasatch County Fire District. The following figure lists the NFPA 1720 recommended staffing and response-time standards by population density.

**Figure 81: Staffing & Response-Time Standards to Structure Fires (NFPA 1720)**

Population Density	Minimum Staff to Respond	Response Time Standard <sup>1</sup>	Performance Objective
<b>Urban Areas</b> (> 1,000/sq. mile)	15	≤ 9 minutes	90%
<b>Suburban Areas</b> (500–1,000/sq. mile)	10	≤ 10 minutes	80%
<b>Rural Areas</b> (< 500/sq. mile)	6	≤ 14 minutes	80%

<sup>1</sup>Defined as the interval between when the unit was dispatched until arrival on scene

For emergency medical incidents, CFAI suggests the following benchmark standards. The standard does not distinguish between the different densities among particular populations.

**Figure 82: EMS Response-Time Standards (CFAI)**

Unit Type	Response Time Standard <sup>1</sup>	Performance Objective
BLS Unit with AED	≤ 5 minutes	90%
ALS Unit	≤ 9 minutes	90%

<sup>1</sup>Includes turnout time of 1 minute or less, plus travel time

The discussion presented in this section of the report describing development of response standards and targets, and the findings in the “Service-Delivery & Performance,” provides WCFD with the information necessary to begin the process of establishing response zones and response performance goals. The District is encouraged to begin the process as soon as feasible in order to assist with future planning needs.

## Strategic Planning

An important part of the process described in the preceding section is to determine “customer” needs and community expectations of the District. This can be accomplished through a formal strategic planning process, which begins with identifying external customers and key members of the community. Once identified, meetings with these individuals should be convened for the purpose of addressing the various issues described in this section. At a minimum, representatives should include:

- Business owners
- Prominent citizens in the community
- Representatives of the WCFD Citizens Fire Advisory Board
- Members of civic and service groups (i.e., Chamber of Commerce, Rotary, Lions)
- Media representative(s)
- Multiple citizens who have been actual recipients of fire and EMS services
- Representatives of neighborhood organizations and/or homeowner associations

- Representatives of non-profit organizations
- Representatives of local industry
- Other relevant citizen-customers

The strategic planning process of includes representation from every major interest group within the fire department. Each WCFD member and employee would need to feel that their interests are represented by someone in attendance on the planning team. Typically, all personnel are invited to submit responses to an electronic survey, which includes their individual, anonymous feedback.

The strategic planning process should seek to identify:

- How customers prioritize the services provided by WCFD.
- Areas of customer concern about WCFD.
- Customer expectations.
- Customer perspectives on the positive attributes of WCFD.
- How “good service” is measured by the customer.

If conducted appropriately, a formal strategic planning process can produce clear goals and measureable objectives based on community input, as well as the strengths, weaknesses, opportunities, and threats from the perspective of the WCFD’s personnel.

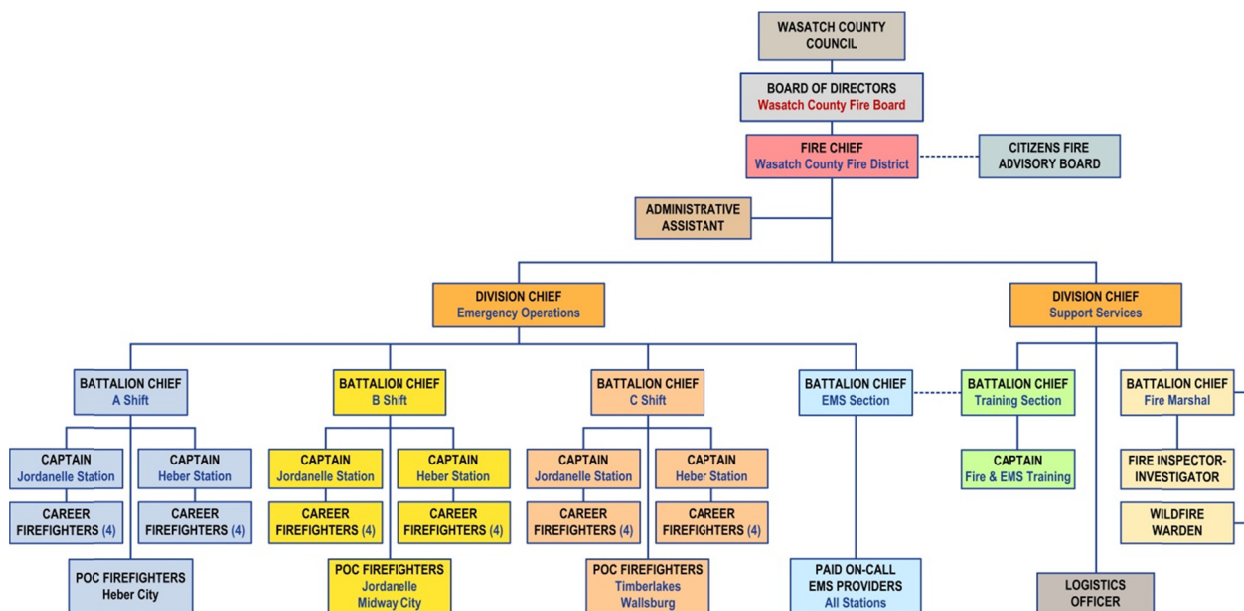
## PROPOSED FUTURE SERVICE-DELIVERY OPTIONS

Wasatch County is considered one of the fastest growing counties in the United States. As the community continues to grow, the demand for services from the District and Wasatch County EMS will continue to increase as well. The District and WCEMS need to position themselves to be able to effectively address these demands. ESCI believes that maintaining the status quo would impede WCFD from meeting the needs of the residents and visitors to Wasatch County, and that change needs to begin in the near future.

### Reorganization of the Wasatch County Fire District

The following figure is an illustration of a proposed reorganization of the Wasatch County Fire District. The illustration includes a merger of Wasatch County EMS into WCFD (will be discussed later in more detail).

**Figure 83: Proposed Organizational Structure of the Wasatch County Fire District**



As shown, ESCI recommends that WCFD establish two separate divisions: Emergency Operations and Support Services, each to be overseen by a Division Chief subordinate to the Fire Chief. This model would require employing new personnel, along with the creation of new positions.

### Support Services Division

Within the Support Services Division, there would be a Battalion Chief responsible for the Training Section, with a Captain assigned to this section. Training is a critical element of an effective fire department, and requires sufficient staff to ensure adequate fire suppression; emergency medical care; rescue operations; and other topics are delivered to staff. A Battalion Chief would serve as the Fire Marshal and oversee fire prevention, inspections, new construction reviews, and the Wildfire Warden.

## Operations Division & Staffing

The Operations Division would continue to include three operational shifts with one Battalion Chief, and one Captain on each shift assigned to the Jordanelle Fire Station, and one assigned to the Heber Fire Station. Each Captain would function as a company officer, and in addition be assigned the responsibility of one or more of the other three “volunteer” fire stations.

Along with the Captains, the Heber and Jordanelle fire stations would each be assigned a minimum of four firefighters scheduled 24-hours daily; with one of those being a Utah-licensed Firefighter/Paramedic assigned to each of those two fire stations.

One Captain and two firefighters would be assigned to a first-due fire apparatus, which would include cross staffing other apparatus. One firefighter and a Firefighter/Paramedic would staff an ambulance. When necessary, the other three members could cross-staff a second ambulance when service-demand requires additional units.

## Alternative for Adding Personnel

In the event that funding cannot be acquired to hire additional personnel to staff the Heber and Jordanelle fire stations on a 24-hour basis, WCFD and Wasatch County should consider the following:

- Hire four Firefighter/Paramedics initially, and assign them as the fourth position on the engine crew (or applicable apparatus).
  - This crew could cross-staff an engine with one firefighter and Captain, and the ambulance with one firefighter and a Firefighter/Paramedic.
  - In this configuration, they could respond to fire incidents as a four-person crew, respond to medical emergencies in their first-response area as a two-person engine crew and a two-person ambulance.
- A second alternative would be that they respond to EMS incidents outside their first-response area as a two-person medic crew, leaving the Captain and firefighter at the station and available to respond to subsequent incidents.

## Paid-On Call Firefighters

In this model, the POC Firefighters would continue to supplement the fire suppression staffing at all of the fire stations. Essentially, their current roles within WCFD would remain unchanged (as discussed later, ESCI recommends the requirement to maintain Advanced EMT licensure be dropped).

## WCFD/WCEMS Merger

From a functional perspective, WCFD and WCEMS currently operate almost as one organization, as ambulances are deployed from stations owned by or shared with WCFD; firefighters provide much of the medic-unit staffing both on-duty and on their days off; and both organizations share a close working relationship.

### **Paid On-Call EMS Personnel**

WCFD should continue to utilize POC EMS personnel to staff ambulances and supplement emergency medical transport services during periods of high demand, as well as during community events, multiple casualty incidents, and other special operations or events.

### **Fire & Rescue Operations & Deployment**

Depending upon the staffing configuration, fire, rescue, hazmat, and other services would remain consistent with current practices and deployed accordingly.

### **EMS Operations & Deployment**

In this model, one 24-hour staffed ALS ambulance would be deployed from the Heber Fire Station and one from the Jordanelle Fire Station. A minimum of one Firefighter/Paramedic would be assigned to each of those stations 24 hours daily. The current deployment of ambulances to 911 emergency scene calls would remain unchanged.

### **Interfacility Transports**

The majority of interfacility transports (IFT) tend to be to locations outside Wasatch County. These transports require a substantial amount of time, and take ambulances out of service for extended periods. For long distance IFTs, ESCI recommends:

- WCFD utilize POC EMS personnel for low-acuity, non-emergent transports if sufficient staff can be assembled in a reasonable time.
- High-acuity emergency IFTs requiring immediate transport would be conducted by the on-duty medic-unit crews.
- The on-duty Battalion Chief would be responsible for coordinating the interfacility transports; ensuring the appropriate ambulances are sent; and notifying POCs or other personnel to come to the station to staff a back-up ambulance.

### **Cost Projections of Additional Personnel**

The following figure lists the estimated costs of employing additional personnel, and transferring the current WCEMS Director to WCFD to the position of EMS Battalion Chief. It is important to note that these are *estimates* only, and that Wasatch County made need to make adjustments accordingly.



**Figure 84: Estimated First-Year Costs for Additional Staff Positions**

Positions	FTE	Estimated Wages	Estimated Benefits	Total Wages & Benefits
Division Chief	2	195,160	112,217	<b>307,377</b>
EMS Battalion Chief <sup>1</sup>	1	88,709	51,008	<b>139,717</b>
Training Battalion Chief	1	94,302	54,068	<b>148,100</b>
Captain Fire & EMS Training	1	88,463	50,866	<b>139,329</b>
Firefighter/Paramedic	4	241,601	138,921	<b>380,522</b>
Firefighter/EMT (or AEMT)	9	457,415	263,013	<b>720,428</b>
Logistics Officer <sup>2</sup>	1	53,873	30,977	<b>84,850</b>
<b>Total Estimated Costs:</b>	<b>19</b>	<b>\$1,219,253</b>	<b>\$701,070</b>	<b>\$1,920,323</b>

<sup>1</sup>Current WCEMS Director moved into this position as part of the merger

<sup>2</sup>Could be a civilian position

The next figure lists the estimated start-up costs to equip new personnel with uniforms, turnout gear, the cost of a physical exam, and assorted other miscellaneous costs.

**Figure 85: Estimated Staff-Related Start-Up Costs**

Description	Quantity	Cost Each	Totals
Uniforms	19	700	13,300
Turnout Gear	19	3,900	74,100
Physical Exam	19	350	6,650
Miscellaneous Costs	19	250	4,750
<b>Total Estimated Costs:</b>		<b>\$5,200</b>	<b>\$98,800</b>

### WCEMS Expense Reductions in the Event of a Merger

Certain administrative costs of WCEMS may be reduced due to a consolidation of technology, telephone, radio costs, and professional fees. Additionally, payments made to WCFD by WCEMS will be eliminated but this will have no effect on the consolidated operating results, as a similar amount will be eliminated from revenue with WCFD.

In addition, the increase in full-time staffing of two ambulances will produce a reduction in the costs of POC staffing. This staffing reduction could eliminate several volunteer "stipend" payments of \$735 per month, plus the payment of the \$16–\$18 per hour response or callback pay. The addition of four additional full-time Firefighter/Paramedics and nine additional Firefighter/EMTs should significantly reduce the need for all 43 volunteer EMS positions—saving an estimated \$250,000 annually.

The following figure is an estimate of the reduction of these costs using a 50% reduction factor as the estimate. The results show a relatively modest reduction in expenses that would occur in the event of a merger.

**Figure 86: Projected Cost Reductions in WCEMS Expenses in a Merger**

WCEMS Expenses	2019	2020	2021	2022	2023
Information system maintenance	2,355	2,379	2,403	2,427	2,451
Telephone & communications	2,937	2,967	2,996	3,026	3,057
Professional & technical services	8,685	8,771	8,859	8,948	9,037
Radio & pager fees	15,861	16,020	16,180	16,342	16,505
Computer replacement	2,906	2,935	2,964	2,994	3,024
Information system services	10,726	10,834	10,942	11,051	11,162
<b>Total Estimated Cost Reductions:</b>	<b>\$43,471</b>	<b>\$43,905</b>	<b>\$44,344</b>	<b>\$44,788</b>	<b>\$45,236</b>

### Financial Summary of a WCEMS/WCFD Merger

Using historical financial data, the next figure entails an estimated forecast of the combined revenues and expenses resulting from a merger of Wasatch County EMS into the District. The figure also includes the projected start-up and recurring costs of adding the proposed new staff positions.

**Figure 87: Projected Revenue & Expenses of a WCEMS/WCFD Merger & Additional Staff**

	Budget		Projected Revenue & Expenses			
Revenue & Expenses	2018	2019	2020	2021	2022	2023
<b>Revenue Sources</b>						
Recurring Revenue	\$4,016,907	\$4,203,067	\$4,398,535	\$4,603,777	\$4,819,282	\$5,045,558
Non-Recurring	\$107,105	\$107,105	\$107,105	\$107,105	\$107,105	\$107,105
<b>Total Revenue:</b>	<b>\$4,124,012</b>	<b>\$4,310,172</b>	<b>\$4,505,640</b>	<b>\$4,710,882</b>	<b>\$4,926,387</b>	<b>\$5,152,663</b>
<b>Expenses</b>						
Recurring Expense	\$4,214,103	\$4,322,074	\$4,503,349	\$4,693,341	\$4,892,478	\$5,101,218
Non-Recurring	\$440,100	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
<b>Subtotal Expenses:</b>	<b>\$4,654,203</b>	<b>\$4,324,074</b>	<b>\$4,505,349</b>	<b>\$4,695,341</b>	<b>\$4,894,478</b>	<b>\$5,103,218</b>
<b>Additional Staff Position Costs</b>						
Wages & Benefits	—	\$1,920,323	\$2,016,339	\$2,117,156	\$2,223,014	\$2,334,165
Initial Start-Up	—	\$98,800	\$24,700	\$24,700	\$24,700	\$24,700
<b>Subtotal Expenses:</b>	<b>—</b>	<b>\$2,019,123</b>	<b>\$2,041,039</b>	<b>\$2,141,856</b>	<b>\$2,247,714</b>	<b>\$2,358,865</b>
<b>TOTAL ESTIMATES:</b>	<b>\$4,654,203</b>	<b>\$6,343,197</b>	<b>\$6,546,388</b>	<b>\$6,837,197</b>	<b>\$7,142,192</b>	<b>\$7,462,083</b>
<b>Net Gain or Loss:</b>	<b>-\$530,191</b>	<b>-\$2,033,025</b>	<b>-\$2,040,748</b>	<b>-\$2,126,315</b>	<b>-\$2,215,805</b>	<b>-\$2,309,420</b>

### Additional Recurring Revenue Requirements

The following figure indicates the additional recurring revenue that would be required in each of the five forecast years. The calculation combines the cash flow from operations adjusted first for the increased costs associated with adding 19 full-time positions, with the savings in administrative costs and savings associated with reducing the number of volunteer EMS positions and required callback positions necessary to staff the ambulances.

**Figure 88: Estimated Additional Recurring Revenue Required**

Description	2019	2020	2021	2022	2023
Cash-flow after adding employee costs (deficit)	-2,033,025	-2,040,748	-2,126,315	-2,215,805	-2,309,420
Administrative cost savings	43,471	43,925	44,344	44,788	45,236
Savings from reduction of POC EMS personnel	250,000	262,500	275,625	289,406	303,877
<b>Required Additional Revenue:</b>	<b>\$1,739,554</b>	<b>\$1,734,323</b>	<b>\$1,806,346</b>	<b>\$1,881,611</b>	<b>\$1,960,307</b>

The preceding estimates illustrate that, should Wasatch County EMS be merged into the Wasatch County Fire District, and each of the recommended staff positions were added, that the District would require additional revenue of approximately \$1.74 million to \$1.96 million annually through 2023.

## RECOMMENDED IMPROVEMENT GOALS

The following section outlines various proposed improvement goals for both WCFD and WCEMS. In some cases these will apply to WCFD in its current organizational structure, while in other cases they will apply to the potential merger of WCFD and WCEMS. Improvement goals have been categorized as short-term (6–12 months); mid-term (12–24 months); and long-term (24 months or longer).

It is important to note that these time frames are *estimates*, and some could be accomplished in either a shorter or longer time period. In most cases, the short-term strategies represent the highest priority, with the mid-term and long-term strategies as the next most important priorities respectively.

### Short-Term Strategies

The following is a list of various improvement goals that could be accomplished within the short-term.

#### Improvement Goal A-1: Full-Time Firefighter Overtime

- Wasatch County should *immediately* obtain an outside legal opinion on the FLSA implications of using full-time firefighters as “volunteers” or paid on-call firefighters, and adjust policies and wages accordingly.

#### Improvement Goal A-2: Strategic Planning

- WCFD should engage in a strategic planning process that would address the development of a mission statement, vision, and department values; along with identifying the priorities of the citizens of Wasatch County. ESCI believes without it, making significant improvements in the organization will be much more difficult to accomplish.
- WCFD should consider conducting a formal strategic planning process with the primary goal of identifying issues, expectations, and support of the community. It may be advisable to conduct this process prior to implementing some of the major recommendations of this report.
  - An alternative to this would be to conduct a structured community survey to obtain as much feedback as possible from the citizens.

#### Improvement Goal A-3: Internal Communications & Planning

- The District should consider implementing more structured staff meetings on a regular basis, so as to ensure administrative consistency, strategic continuity, and transparency throughout WCFD.
- Consider publishing a quarterly internal newsletter to be distributed to all career and POC staff. This should include determining the best methods for distribution, such as a printed format, social media, e-mail, or other methods.
- Shift Battalion Chiefs and Captains should have regular meetings with career personnel in the Operations Division. This should include meetings with POC personnel.
- Upper management (Fire Chief and Division Chief) should have at least two meetings annually with career and POC fire and EMS personnel.

**Improvement Goal A-4: Personnel Issues & Job Descriptions**

- WCFD should work with the Wasatch County Human Resources Department to develop formal policies and a structured hiring process for new firefighters and other employees.
  - This should include a formal competitive process for firefighters, officers, and other employees seeking promotion.
- WCFD should develop formal job descriptions for all full-time employees, which should include minimum qualifications for each position.
  - Following this, the same should be completed for paid on-call firefighters and EMS personnel.
- WCEMS (or WCFD) should discontinue the mandatory requirement for new and current EMS volunteers to obtain Firefighter I and Firefighter II certifications, and encourage interested individuals and healthcare professionals to volunteer.
- POC firefighters not functioning in an EMS role should be allowed to drop the requirement to maintain Advanced EMT licensure and, instead be required to maintain a minimum of *Emergency Medical Responder* (EMR) certification.
- As anticipated growth in service-demand increases, the negative impacts on safety as a result of sleep deprivation should be assessed by WCFD to determine if a shorter shift schedule may be indicated to help manage firefighter fatigue and safety.

**Improvement Goal A-5: Capital Facilities Planning**

- The District should expend considerable effort in creating a capital facilities plan, especially given the continued growth in the County. A growing population and new construction will not only result in an increase in service-demand, but may also shift call-density away from currently located stations (a discussion of the Heber Fire Station is discussed later in more detail under the “Long-Term Improvement Goals” section).
- In addition, changes in building safety codes and NFPA standards should be referenced and incorporated into capital facilities planning, to ensure a safe working and living environment for firefighters and staff.

**Improvement Goal A-6: Patient Billing & Other Fees**

- WCEMS (or the District) should consider evaluating other billing/collection services that may produce a greater percentage of collections for billed services, as well as at a lower percentage rate of the cash collections. At a rate of 9.75%, the billing/collection service may be charging a rate above what typically may be found with other organizations (5–7%).
- The County should retain an outside firm to conduct an audit of the billing and collection practices. This should include an evaluation to determine if these practices are consistent with the requirements of the U.S. Office of the Inspector General.
- The fee structure in place for plan reviews and inspections should continue to be assessed. As salary and benefit costs increase, fees for services provided to the community should be adjusted. One benchmark against which to measure these fees are those rates found in neighboring jurisdictions.

## Mid-Term Strategies

The following is a list of various improvement goals that could be accomplished within the mid-term.

### Improvement Goal B-1: Training & Continuing Medical Education

- ESCI recommends considering a transition to electronic tracking of training—especially given the anticipated fire department growth and recommended increase in training activities.
  - An annual training activity report should be generated and publicly shared. This report can be an effective tool in demonstrating and justifying to the public the amount of time and resources expended by the department and staff in ensuring safe and effective emergency responses.
- The amount of historical individual training and hours per year should be evaluated to ensure the time dedicated to training not only meets annual department skills and knowledge requirements, but also the training and proficiency requirements as described in the NFPA 1001 standard.<sup>23</sup>
- Consideration should be given to also delivering serial classes at each of the stations to maximize drill time, while maintaining timely emergency response-capability in station response areas.
- ESCI recommends the department increase the drill and training opportunities to at least once a week, and increase the number of multi-company drills to ensure continuity and proficiency of emergency operations.
- WCFD should consider taking greater advantage of UVU's substantial fire-training resources, and maximize the utilization of their services. UVU does not charge for their services, and the District has underutilized this available resource.
- The District should consider adding a qualified and experienced individual to a full-time Training Officer position. This will become more and more important as the community and District grows and adds additional career and volunteer personnel.

### Improvement Goal B-2: Update Standard Operating Guidelines (SOG)

- ESCI recommends that WCFD immediately begin reviewing and updating all of its current policies and procedures (Standard Operating Guidelines), along with developing an annual review process.
  - Personnel in the review process should include those most familiar with the policy and procedures being assessed, along with a chief officer that can provide overall policy guidance and expertise.

**Improvement Goal B-3: Equipment Inventory & Supplies**

- Given the value of the equipment stored in each station, consideration should be given to installing intruder alarms and/or camera systems in all stations—especially those that are not staffed regularly.
- The District should establish an inventory control policy.
  - Capital and valuable equipment should be inventoried, and a policy established requiring an annual audit to determine if any equipment is missing; the condition of the equipment; and future replacement needs.
- To better manage the District's cash flow, it is recommended the District establish an apparatus and equipment reserve fund. Fleet replacements costs should be calculated based on the estimated useful lives of apparatus, and provisions made to fund the appropriate amounts annually.

**Improvement Goal B-4: Property Valuations & Tax Revenues**

- Property valuation trends should continue to be monitored with annual discussions with the area's economic development teams. This provides information on not only the continued development of the County, but also the locations, sizes and types of developments being planned.
- Property tax revenues are the single largest source of revenue for the District. The District should continue to take advantage of opportunities to thoughtfully adjust its tax rate, and create special assessment districts to obtain assistance in providing services to previously undeveloped portions of the County.

**Improvement Goal B-5: Grant Opportunities**

- WCFD should continue to evaluate grant opportunities to acquire or replace equipment or, if the opportunity arises, to expand its staffing through the use of a SAFER grant.



## Long-Term Strategies

The following is a list of various improvement goals that could be accomplished in the long-term.

### Improvement Goal C-1: Fire District Governance

The seven-member Wasatch County Council has the statutory authority to oversee the Wasatch County Fire Protection District. Representatives are appointed from members of the Council to serve as the Wasatch County Fire District Board of Directors. While they have no direct authority, the Citizens Fire Advisory Board provides input, from a citizen's and taxpayer's perspective, to the Fire Chief and staff.

The Wasatch County Council has myriad areas of responsibility beyond those related to the Wasatch County Fire Protection Special Service District. For many years, the County Council has done a good job of providing administrative oversight. This is an atypical model, as most fire districts throughout the United States are overseen by an independent board of fire commissioners or directors.

The management and oversight of a fire department providing response to fire, rescue, hazmat, EMS, medical transport, and other incident-types is complex, and requires regular attention and comprehensive knowledge. With a growing community and potentially more complex fire department, Wasatch County may want to consider another option for providing administrative oversight of WCFD.

- Wasatch County should seek legal counsel and subject-matter expertise, and begin to explore the potential of establishing an independent District-elected Board of Directors with the statutory authority to oversee WCFD.
  - A five- to seven-member Board of Directors may be the most appropriate for a district the size of the Wasatch County Fire Protection Special Service District.
  - If this implemented, WCFD should continue to receive input from the Citizens Fire Advisory Board.

### Improvement Goal C-2: WCFD Fire Stations

#### Heber City Fire Station

As described previously, career personnel at the Heber City Station must move to the Midway Station at night, due to the lack of sleeping quarters at Heber. This may be sufficient on a temporary basis, but not in the long term. Since Heber City contains the highest population density in the County, and a high number of commercial occupancies, it is important for that station to be staffed 24-hours daily. ESCI recommends:

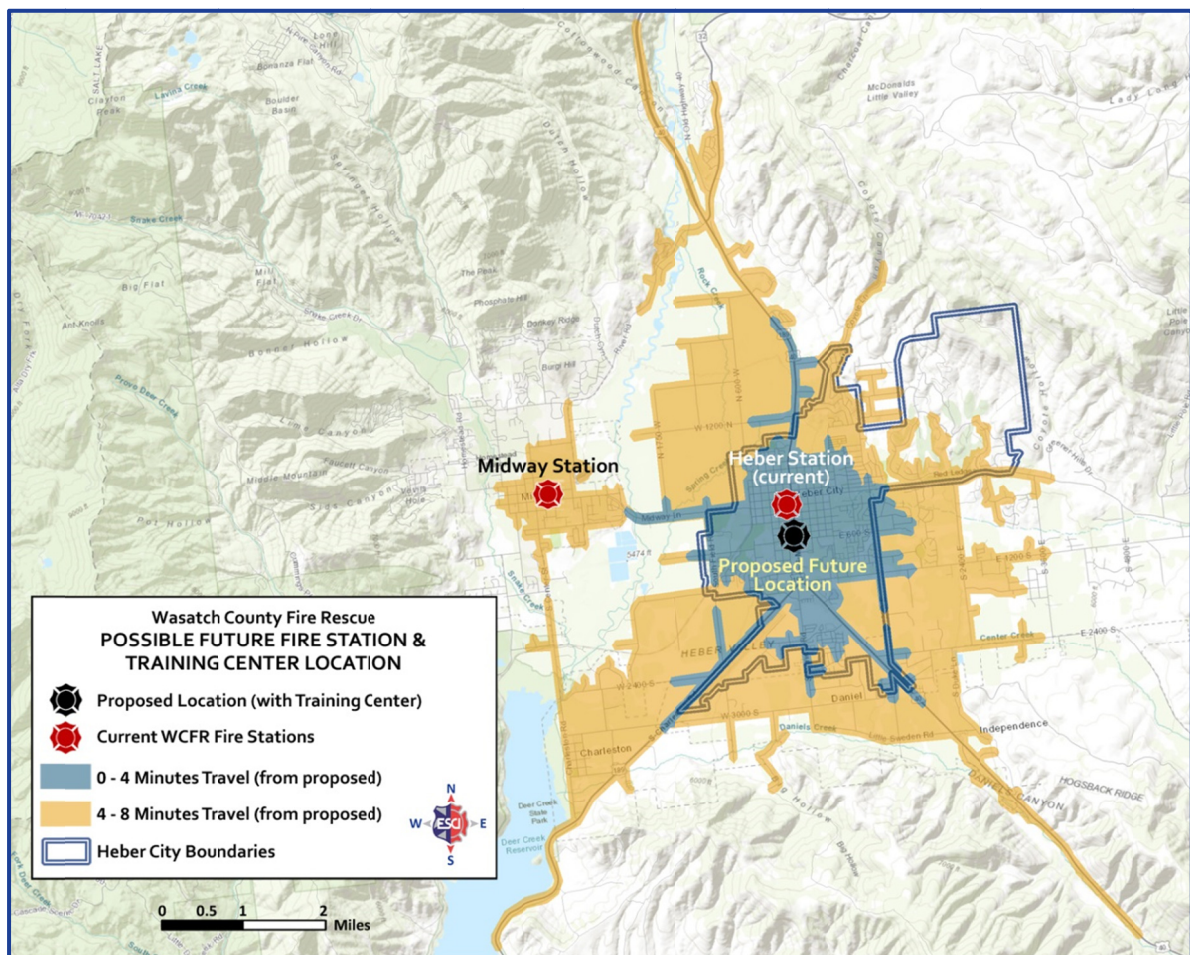
- The District should consider the costs and options for adding sufficient sleeping quarters to the Heber City Fire Station for a minimum of 5–6 career personnel (this could be accomplished in the short term).

### Heber City Fire Station Relocation

At some point in the future, the District should plan to replace and re-locate the current Heber City Fire Station. Through the use of a GIS analysis, ESCI has identified a potential future location for relocating the existing station. This is based on historical service-demand and optimal travel times.

The following figure illustrates a general location in which a future station could be located. The image shows that, from this area, Heber City (and most of Midway City) could be easily accessed within either a 4-minute or 8-minute travel time. Considering the 8-minute travel time, areas well beyond the Heber City limits could be easily accessed within that timeframe. In addition, the location would provide rapid access to Highways 189 and 40 (Victory Highway), and enable better response times to southern ends of Wasatch County.

**Figure 89: Potential Future Heber City Fire Station & Training Center Location**



### Training Facility

WCFD lacks a training facility in which firefighters can participate in live fire training; utilize assorted training props; practice hose evolutions; participate in apparatus and pump operations; practice rescue operations; participate in EMS practical skills sessions and other continuing medical education; and attend classroom sessions. ESCI recommends:

- If Wasatch County elects to acquire property for a future replacement of Heber City Fire Station, that a location should be selected with sufficient property to build a future training facility and tower adjacent to the fire station.
- Locating a training facility in Heber City makes sense, as it is in a relatively central location, which would allow both on-duty and POC personnel somewhat easy access.
- WCFD should utilize NFPA Standard 1402, *Guide to Building Fire Service Training Centers* to assist in determining property needs and infrastructure.
- Recognizing the significant costs to build such a facility, ESCI recommends this be included in WCFD's long-range capital facilities planning.

### Timber Lakes & Wallsburg Stations

The Timber Lakes and Wallsburg fire stations are essentially apparatus storage facilities without the basic amenities found in most fire stations. There are no sleeping quarters, kitchen facilities, or adequate storage. At present, these stations appear to be sufficient for the needs of the District. However, future growth and increased service-demand may eventually require these stations to be staffed or partially staffed.

- If indicated, Wasatch County and WCFD should include potential upgrades to these fire stations in its long-term capital facilities plan.
- WCFD should regularly monitor service-demand occurring in the response zones of these stations, in order to determine needs and options for deployment of fire apparatus and/or ambulances, and plan accordingly.

### General Fire Station Recommendations

- In anticipation of future needs, ESCI recommends that Wasatch County begin pursuing the purchase of property that could be used for a future fire station and training facility, even if current capital funds are not available for a new building.
- WCFD should consider retaining an engineering and architectural firm—with experience and expertise in fire station design—to conduct a comprehensive assessment of each of the current fire stations; with the exception of the Jordanelle Fire Station, to determine the best options for these facilities in the long-term.
- Monolithic fire and EMS stations are becoming increasingly rare due to their substantial costs. It is unlikely WCFD would need such a facility. While a standalone facility would probably be ideal, Wasatch County may want to consider a unique configuration that could reduce the cost and even produce revenue.

The following figure is an example of a unique fire station configuration that includes the typical layout for a fire station, but also contains commercial space and four stories of residential apartments. This mixed-use facility allows capital to be used more efficiently with no degradation in fire protection or EMS.

**Figure 90: Example of a Mixed Use Facility (Fire Station 209, Alexandria, VA)**



## CONCLUSION

Emergency Services Consulting International conducted a comprehensive study of the myriad components that comprise the Wasatch County Fire District and Wasatch County Emergency Medical Services. The study identified areas needing improvement and expansion, as well as a number of positive attributes of the organization.

Throughout this study, ESCI found the Wasatch County Fire Chief, the Wasatch County EMS Director, and their respective employees and “volunteer” staff to be highly dedicated with a strong desire to provide high-quality, efficient, and cost-effective emergency services throughout Wasatch County. ESCI appreciates the considerable time, cooperation, and input from those individuals, as well as the valuable input provided by the elected and appointed officials of Wasatch County, and the members of the Citizens Fire Advisory Board.

The study concluded with a list of short-term, mid-term, and long-term goals that ESCI recommends for improvement. ESCI recognizes that some of these would entail substantial additional costs. Therefore, it is understood that, if accepted, the various recommended improvement goals may require implementation on an incremental basis. ESCI strongly believes that once employed, the ultimate results of these recommendations will be in the best interests of the visitors and citizens of Wasatch County.

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- <sup>1</sup> United States Census Bureau, July 1, 2017 Population Estimates.
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<sup>22</sup> NFPA 1720: Standard for the Organization & Deployment of Fire Suppression Operations, Emergency Medical Operations, & Special Operations to the Public by Volunteer Fire Departments (National Fire Protection Association).

<sup>23</sup> NFPA 1001: Standard for Fire Fighter Professional Qualifications (2013 Edition).