



**CITYGATE**  
FIRE & EMS

# PARAMEDIC SERVICES DELIVERY STUDY

## WEBER COUNTY, UTAH

**AUGUST 31, 2023**



**CITYGATE**  
FIRE & EMS

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## **EXECUTIVE SUMMARY**

Weber County, Utah (County) commissioned Citygate Associates, LLC (Citygate) to conduct an analysis of the County-provisioned delivery of Paramedic care via multiple fire departments. The study includes a detailed analysis of how Paramedic response squad care is meeting the County's current needs, as well as project how it will meet future needs over the next six years resulting from expected growth. The resultant analysis and evaluations allow for recommendations for improved patient care within fiscal constraints.

This report is presented in one volume beginning with this Executive Summary, which contains a summary of Citygate's analysis and suggested next steps. This is followed by Sections 1 and 2, which contain a review of the County's Paramedic service program and how it supports local fire engines and ambulances. This concludes with ongoing operational recommendations. Section 3 offers concluding analysis and recommendations.

Throughout this report, Citygate reports key findings and, where appropriate, specific action item recommendations. Overall, there are 15 key findings and 4 specific action item recommendations.

### **POLICY CHOICES FRAMEWORK**

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There are no mandatory federal or state regulations directing the level of fire and EMS service response times and outcomes. The level of service provided, and any resultant cost, is the choice of local communities in the United States. Thus, there is often a constructive tension between the desired level of service and the level that can be funded, and many communities may not have the level of service they desire. The County's investments in Paramedic services over the past years serve as its baseline commitment today.

The fundamental policy choices that drive the County's investment in Paramedic services are derived from two key questions that drive response time and the resultant placement of Paramedic squads into the differing neighborhoods of the County:

1. **What outcomes are desired for the EMS emergencies to which the Paramedic squads respond?** Is the desire to provide emergency medical care in time to lessen the possibility of preventable death and severe disability?
2. **Should equitable response time coverage be provided to all neighborhoods with similar risks (building types and population density) to protect?** Once desired outcomes are determined, Paramedic squad placement to support fire first responder and ambulance deployment can then be designed to cover the most geography in the fewest minutes to meet stated outcome goals.

## **OVERALL SUMMARY OF PARAMEDIC SQUAD DEPLOYMENT NEEDS**

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Overall, the Paramedic squad system is operating as designed; to provide fewer, highly trained Paramedics over a wide area, with longer response times, given the local fire-department-provisioned ambulance personnel's first responder skills. In recent years, the increased skills up to Advanced EMT in the fire department ambulance programs narrowed the gap to have Paramedics quickly available.

Citygate's analysis shows that the need for rapid Paramedic skills is infrequent. Some of the medications are needed only a few times per year on a very small number of patients. The AEMT ambulances provide the level of care needed to the majority of the low- to moderate-acuity patients.

However, as in fire services fire crew deployment, the agencies need to provide a level of "standby" service, as each neighborhood should have equity of access to a Paramedic unit's skills, when needed, even if infrequently. The current system is covering most of the population and incidents. The workload per Paramedic squad is not yet high enough to warrant the immediate addition of one or more squads. The simultaneous demand is not yet excessive (two at a time at 20 percent of all incidents), but all the high-demand areas are in Ogden; when Ogden has two or more incidents, County areas are spread thin at the outer urban and suburban areas.

There is low usage of full Paramedic skills and medicines compared to other systems where Citygate has reviewed clinical use. In Ogden (higher volume) with 30.6 percent of the medicines being reserved to Paramedics, they are only used on 14.1 percent of the incidents. For all field procedures, only 45 percent are Paramedic level. Most urban systems care about Paramedics seeing enough patients to maintain serious skill and medicine usage rates; in other words, there can be too many Paramedics.

## **FINDINGS AND RECOMMENDATIONS**

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Considering the research conducted and extensive consultation with the County and area fire department leadership, Citygate makes the following specific findings and actionable recommendations.

### **Findings**

**Finding #1:** The Paramedic service area communities are still growing, but the modest year-over-year growth rate will not quickly saturate the current five Paramedic squads.

**Finding #2:** The County's Paramedic squad program has not established response performance goals consistent with best practice recommendations as published by the Commission on Fire Accreditation International and National Fire Protection Association. It is therefore difficult to know when increased demand for service is decaying response time performance past acceptable outcome-driven goals.

- Finding #3:** The Paramedic squads are needed for substantial demand 24/7/365 and not just some hours of the day or days of the week.
- Finding #4:** The Paramedic squad use is clearly driven by population density and other socioeconomic factors such as age and access to preventative health care.
- Finding #5:** The Paramedic squad simultaneous demand pattern is not yet critical, but if the rate of three incidents at once increases from 20 to 30 percent at peak hours of the day, at least a part-time relief unit could be needed.
- Finding #6:** While the squad unit-hour utilization<sup>1</sup> (UHU) rates are not yet at or over 30 percent hour over hour, one squad is in the low 20-percent range during peak demand hours. This unit’s workload should be closely monitored, and a relief unit planned for and deployed when 30 percent UHU is reached.
- Finding #7:** While the dispatch center uses “rapid” dispatching on critical calls, that time is not tracked. The 90 percent process times reflect the sum of all EMS calls in which the dispatchers ask more questions to determine the needed apparatus to send.
- Finding #8:** The Paramedic squad crew turnout times are past a best practice of 2:00 minutes, counted over 24 hours. This time can be improved easily to under 2:00 minutes.
- Finding #9:** The squad travel times are close to national advisory and clinical best-practice-based goal for arrival of the first Paramedic at 8:00 minutes travel time *when* a first responder arrives first.
- Finding #10:** The system-wide 9-1-1 call to arrival times for the Paramedic squads, at 11:38 minutes, are very close to a best-practices-based goal of 11:30 minutes. Those few that are not are in very difficult to serve geographic pockets. If rapid dispatch would be measured for acute incidents and turnout times reduced, the systemwide 9-1-1 call to arrival measure could easily decrease by 2:00 minutes.
- Finding #11:** The geographic mapping analysis shows the five Paramedic squads are covering most of the population within an 8:00 minutes’ travel time, consistent with national best practices.
- Finding #12:** There are rural area incidents past 8:00 minutes’ travel, more so in the southwest and northeast service areas.

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<sup>1</sup> See Section 2.1.4.

**Finding #13:** While the number of procedures authorized and *administered* is either side of 50/50 percent by caregiver type, the percent used by the Paramedics is 45.4 percent of the systemwide total. However, in Ogden the Paramedic procedure usage is much higher, at 71 percent, than in Weber and Roy at 29 percent.

**Finding #14:** The medications authorized for AEMT use are **69.4 percent** of the total medications list including Paramedic ones. Subtracting for the general use of oxygen and saline IVs, only 39.4 percent of all medication administrations were for more serious needs.

**Finding #15:** The overall need for Paramedic level medications is only 22.6 percent of all Paramedic squad administrations.

Considering the analysis in this study, Citygate recommends the following:

**Recommendation #1:** The Paramedic system must evolve. The communities past the core coverage plan of the five Paramedic squads are growing slowly year over year, and that will not soon stop. Discussions need to begin now regarding how and where to increase the number of Paramedics, at whose expense, and for what reason.

**Recommendation #2:** Adopt response time goals, such as:

- 1:30 minutes' call processing / dispatch
- 2:00 minutes' crew turnout
- 8:00 minutes' Paramedic squad travel (11:30 minutes total call receipt to arrival)
- 10:00 minutes' ambulance travel (13:30 minutes total call receipt to arrival)

All at 90 percent reliability.

**Recommendation #3:** Trigger Points for Added Paramedics: Adopt a Paramedic squad unit-hour utilization (UHU) saturation point policy of no more than 30 percent over eight consecutive hours. Limit simultaneous incident demand to three of five units to 25 percent of the time. Beyond either and/or both these two thresholds, added resources are needed.

**Recommendation #4:** Add Paramedic Strategies: The County needs to resolve and choose an option to reinforce 8:00-minute Paramedic travel in the growing, outer-suburban and rural areas. Methods used elsewhere include:

- Adopt slower response time measures system-wide or in light-population-density and call areas; many systems now use a 10:00 minutes or more transport travel time where first-response ALS exists (AEMT use rare).
- Adopt split response time measures for urban, suburban, and rural population densities.
- Add two Paramedic squads; this is expensive and will have low utilization until and unless severe growth occurs past the urban population density areas.
- Move outer-edge ambulances to 1+1—AEMT and Paramedic
- The added Paramedic is lost to transport downtime.
- This still adds more Paramedics than are clinically needed.

**Recommendation #5:** Cost Policy Strategies: Most EMS systems are not fully self-supporting on billed revenues due to federal and state payment policies. The County could increase its expense (subsidy) to add outer-area Paramedics, or until the thresholds are crossed to increase the five County squads, allow two to three of the outer-edge fire departments to add Paramedics to one or more ambulances at their local expense as a bridging solution.

## **NEXT STEPS**

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### **Near Term**

- ◆ Review and absorb the content, findings, and recommendations of this report.
- ◆ Adopt response performance goals and workload thresholds to maintain service levels as community growth and changes in pre-hospital health care occur.
- ◆ The County or the partners should start the process to identify funding to add a modest number of Paramedics to the edges of the Paramedic service areas as identified in this study, and/or to Ogden if its squad workload reaches adopted limits for quality of service.



## **SECTION 1—INTRODUCTION AND BACKGROUND**

Weber County, Utah (County) commissioned Citygate Associates, LLC (Citygate) to conduct an analysis of the County-provisioned delivery of Paramedic care via multiple fire departments. The study includes a detailed analysis of how Paramedic response squad care is meeting the County’s current needs, as well as project how it will meet future needs over the next six years resulting from expected growth. This will assist the County in determining whether the current levels of Paramedic squad service are appropriate for the risks to be protected and that the methods to ensure suitable service levels are consistent with generally accepted national standards and benchmarks.

Citygate’s scope of work conforms with the methodology outlined in *Standards of Response Coverage* (fifth and sixth editions) as published by the Commission on Fire Accreditation International (CFAI) and addresses all elements of the City’s requested scope of work. The study also incorporates guidelines and best practices in the field of ambulance deployment and risk analysis from the National Fire Protection Association (NFPA), the Occupational Safety and Health Administration (OSHA), relevant federal, Utah and Weber County EMS laws and regulations, and other recognized industry best practices.

### **1.1 REPORT ORGANIZATION**

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This report is organized into the following sections.

- |                          |                                                                                                                                                                                        |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Executive Summary</b> | Summarizes the Paramedic squad program service policy choices and all findings and recommendations that can be used to strategically guide County and partner Fire Department efforts. |
| <b>Section 1</b>         | <b>Introduction and Background:</b> Describes Citygate’s project approach, methodology, and scope of work and provides an overview of the Paramedic squad program.                     |
| <b>Section 2</b>         | <b>Paramedic Program Deployment Analysis:</b> Describes service demand and response performance analysis in detail.                                                                    |
| <b>Section 3</b>         | <b>Concluding Analysis and Recommendations:</b> Describes the overall principles informing Citygate’s recommendations and the recommendations themselves.                              |

#### **1.1.1 Goals of Report**

Citygate makes findings and recommendations as appropriate. Findings and recommendations throughout this report are sequentially numbered. A complete list of the same findings and recommendations is provided in the Executive Summary.

This document provides technical information about how ambulance services are provided in the County, how they are legally regulated, and the way the Paramedic squad program currently operates. This information is presented in the form of recommendations and policy choices for consideration by County leadership. The result is a strong technical foundation upon which to understand the advantages and disadvantages of the choices County leadership faces regarding the best way to provide Paramedic squad services and, more specifically, at what level of desired outcome and expense.

### **1.1.2 Limitations of Report**

In the United States, there are no federal or state regulations requiring a specific minimum level of fire and ambulance services. Each community, through the public policy process, is expected to understand the local EMS risks and its ability to pay, and to then choose its level of EMS services accordingly. *If* EMS services are provided at all, federal and state regulations specify how to safely provide them, both for the public and for the personnel providing the services.

While this report and technical explanation can provide a framework for the discussion of ambulance services, neither this report nor the Citygate team can make the final decisions, nor can every possible alternative cost be estimated. Once final strategic choices receive policy approval, County and fire department staffs can conduct any final costing and fiscal analyses as typically completed in its normal operating and capital budget preparation cycle.

## **1.2 PROJECT APPROACH AND SCOPE OF WORK**

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### **1.2.1 Project Approach and Methodology**

At the start of this study, Citygate received relevant background data from the fire departments and the County to better understand current squad service levels, costs, and the history of service level decisions, including prior studies. We also conducted several listening sessions and interviews with the agencies providing the squads and others that receive Paramedic care from the squads.

Citygate subsequently reviewed demographic information about the communities served and the potential for future growth and development. Citygate also obtained incident response data from the County dispatch center—from which we modeled current and projected Paramedic squads' deployment.

Once Citygate gained an understanding of the squad service areas, the Citygate team then examined prior response data against future community growth to model service demand and evaluate potential alternative EMS delivery models. This resulted in Citygate proposing an approach to address current and long-range needs with effective and efficient use of existing resources. The result is a framework for enhancing Paramedic squad services while meeting reasonable community expectations and fiscal realities.



### **1.2.2 Scope of Work**

Citygate’s approach to this study included the following components.

- ◆ Reviewing relevant information data and information provided by the Department.
- ◆ Interviewing partner agencies leadership.
- ◆ Using regulatory and best practice guidelines.
- ◆ Understanding current and envisioned community growth.
- ◆ Forecasting the County’s squad system needs and staffing options.
- ◆ Preparing a comprehensive report that includes analysis-based findings and recommendations, including an Executive Summary presentation of the written report for County and partner agency leadership.

### **1.3 PARAMEDIC SQUAD SERVICE AREA OVERVIEW**

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The County was founded in 1850 and occupies a stretch of the Wasatch Front, part of the eastern shores of the Great Salt Lake, and much of the rugged Wasatch Mountains. Over the last several decades, as the need for ambulance services grew with population and business development, the County and area fire departments began their own ambulance services or contracted for them from a private provider. Starting in the 1970s, pre-hospital Emergency Medical Care (EMS) skills grew from very basic to well-trained Paramedic.

The first level of increased care was that of Emergency Medical Technician (EMT), which was embraced by the County’s fire departments and, on a limited basis, private ambulance companies for first responder fire engine and ambulance services. As Paramedic programs became available, the agencies agreed to cooperatively operate a Paramedic program. Over the years, the capacity of private ambulance companies had diminished or ceased operations to the point where most of the fire departments were providing transport ambulance service with EMTs.

When discussing how to provide Paramedic level care, leadership at the time understood that a Paramedic level care was not needed for every patient. EMS systems worked under two care levels – Basic Life Support (BLS) and Advanced Life Support (ALS – Paramedic). Weber County adopted a Paramedic care delivery model of Paramedic squads, which are non-transport, two-person units with firefighter/Paramedics. These were spaced out to support EMT BLS ambulances in the different communities. In the event a Paramedic was needed for traveling to the hospital, the squad Paramedic rode in the ambulance and the squad followed to the hospital to retrieve its second Paramedic.

In recent years, the State of Utah increased EMT skills to that of EMT-Advanced. This certification allowed rural EMTs to use many, but not all, of the Paramedic skills and drugs. While designed for non-Paramedic, small communities, the fire departments in Weber County embraced EMT-Advanced and trained all their ambulance crews to that level. This means that on many EMS incidents, the Paramedic squad can be cancelled or, if it arrives, its advanced skills might not be needed.

Over the decades, the County's role became to fund the Paramedic squads to cover the most populated areas in a County containing 659 square miles. The system is as follows.

- ◆ The County has a Paramedic agreement with *Ogden, Weber, and Roy* Fire Departments for five non-transport Paramedic rescues placed strategically throughout a defined Paramedic service area. Three units are located inside Ogden and the other two are located, one each, to Weber and Roy.
- ◆ Then three other fire departments—Northview Fire Protection District, Riverdale City, and South Ogden City—plus two volunteer-only agencies are covered by the Paramedic squads.
- ◆ Both the Paramedic rescue and other three fire departments, for a total of six agencies, operate ten Advanced EMT (AEMT) transport ambulances.
- ◆ The regional Paramedic program is divided into first-due and backup areas.
- ◆ Paramedic responses are determined by Weber Area Dispatch 911 and Emergency Services District from Alpha (minor) to, in increasing severity, Bravo, Charlie, Delta, and Echo using a clinically driven and accredited EMS dispatch algorithm. Based on this screening, the following resources are dispatched.
  - Alpha – 1 Engine/Ladder (non-urgent), 1 Ambulance (non-urgent)
  - Bravo –1 Engine/Ladder (urgent), 1 Ambulance (non-urgent)
  - Charlie – 1 Engine/Ladder (urgent), 1 Ambulance (urgent), 1 Paramedic unit (urgent)
  - Delta – 1 Engine/Ladder (urgent), 1 Ambulance (urgent), 1 Paramedic unit (urgent)
  - Echo – 1 Engine/Ladder (urgent), 1 Ambulance (urgent), 1 Paramedic unit (urgent)

### **1.3.1 County Agreement Key Terms**

The County contract with the three fire departments to provide the five Paramedic rescues are:

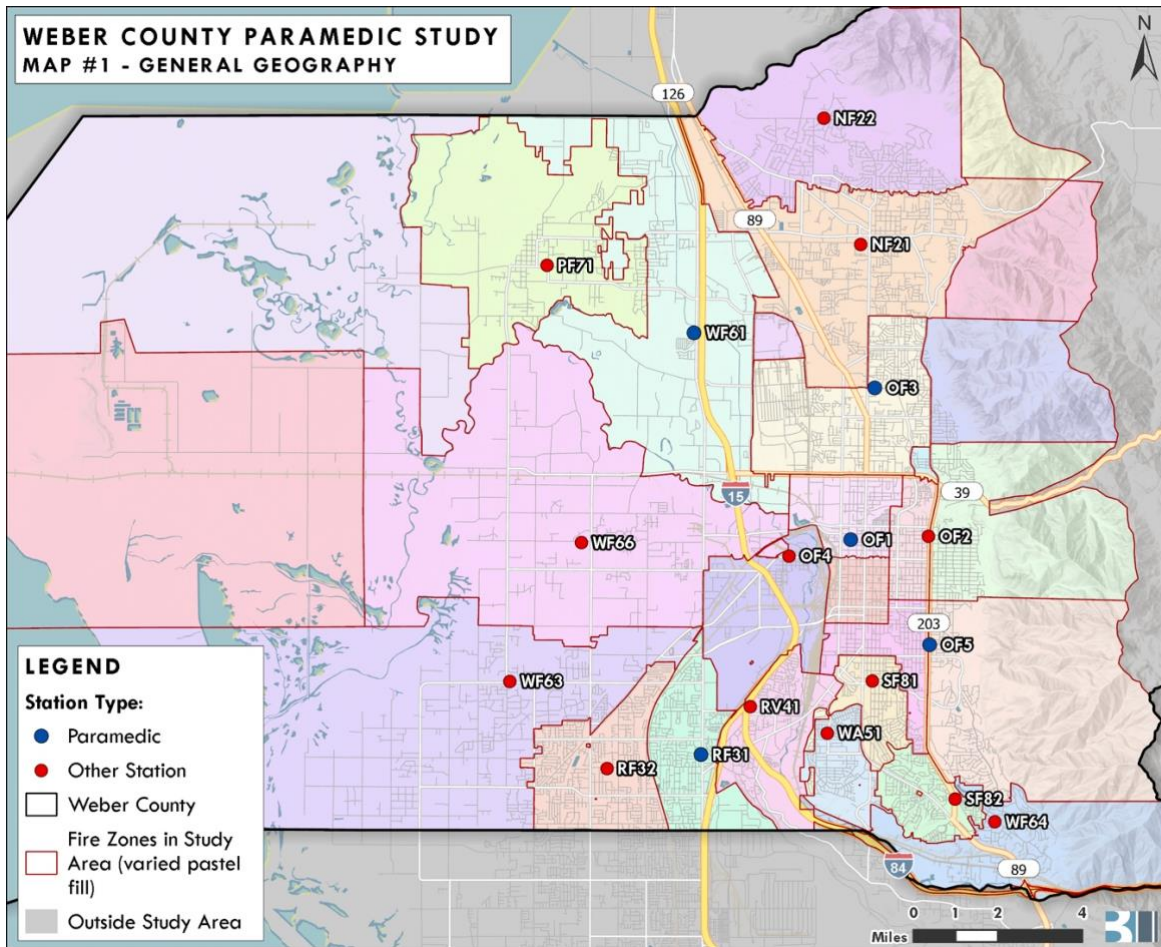
- ◆ To furnish and provide Paramedic services within the jurisdictional boundaries of Ogden City and the northeast and southeast portion of the County at a level commensurate to Paramedic services provided by different agencies in other areas of the County.
- ◆ To employ a minimum of twenty-two (22) Paramedics to provide proper coverage of Paramedic rescue units as set forth in the Utah Mobile Paramedics Rules of the Utah Emergency Medical Services System Act (U.C.A. 26-8a-101). The Paramedics' salary and benefits shall correspond with the salary and benefits schedule as determined by the agencies from time to time.
- ◆ To keep in good repair all necessary equipment mandated by the Utah Mobile Paramedic Rules of the Utah Emergency Medical Services Systems Act (U.C.A. 26-8a-101) and return any equipment purchased by county funds to the County at the expiration of its useful life or the expiration of this Agreement, whichever occurs first.
- ◆ To make good faith efforts to levy and collect a Paramedic aboard fee when Paramedics accompany a patient aboard the ambulance. Each Paramedic provider shall retain these funds to be used to help offset its costs of operating the Paramedic program and shall provide a biannual report to the Administrator on the amount of funds collected.
- ◆ To provide the County with a current inventory of equipment purchased by the providers to operate the Paramedic rescue units.
- ◆ To coordinate delivery of county-wide Paramedic services with each other, and any other fire and rescue agency in the County which may interface with the Paramedic program.
- ◆ To receive Paramedic dispatch for the Paramedic rescue units through Weber Area Dispatch 911 and Emergency Services District.
- ◆ The County shall provide major durable equipment utilized by the Paramedics including vehicles. The County and the providers will establish an equipment vehicle replacement schedule.
- ◆ Title to vehicles and equipment purchased by County shall pass to the providers upon delivery to each provider. Each provider shall provide insurance or self-insure against loss or damage for the fair market value of

all equipment and vehicles, the projected cost of which is included in the annual compensation.

- ◆ Providers shall return all vehicles and equipment to County at the end of their useful life or at the expiration of this Agreement, whichever occurs first. If a vehicle or equipment is damaged while owned by the provider in accordance with this Agreement, the provider shall repair the equipment or vehicle or pay to County the fair market value of the equipment or vehicle prior to the damage, which payment will be used toward replacement.
- ◆ For Fiscal Year 2022 the total County budget for the Paramedic squad program, operating and capital was \$2,922,983 dollars.

The following figure (also located in Appendix A) shows the Paramedic squad service area and all the squad and ambulance provider stations.

**Figure 1—Weber County Paramedic Squad Service Area**



## **1.4 FUTURE GROWTH AND DEVELOPMENT**

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Population drives 9-1-1 service demand. The challenge is to provide a baseline “safety blanket” across the entire Paramedic service area to ensure an *equitable amount of access* to a Paramedic squad within a reasonable response time. Once baseline demand is accounted for, daytime population peaks due to employment, tourism, and other human activities increase EMS demand above that baseline. The County’s Paramedic squad capacity must manage peaks in demand accordingly.

The communities served by the Paramedic squads are still growing and envisioning infill residential development. This study utilizes recent *historical* EMS demand to then project what future changes to EMS demand might occur. At some crossover point, when an EMS deployment system becomes saturated, an agency must add resources to ensure units are available to deliver the desired response times.

Citygate obtained growth information from the three Paramedic providers and the other ambulance providers in the County’s Paramedic service area. The key growth measures follow.

- ◆ **Ogden** – From 87,321 to 105,000 by 2045; 2 percent growth rate
  - In 2021, 3,296 units under consideration at 2.76 per dwelling unit = 9,096 residents
  - Seeing more “mid-height” residential
- ◆ **Roy** – From 39,979 to 41,890 by 2030, or about 238 more per year
- ◆ **Weber Fire District** – 14,773 across 515 square miles
  - Long-term Countywide growth rate is 1.2 percent through 2037; this remains the fourth largest in State
  - Weber sees approximately 50 percent of that, or 1,091
- ◆ **Northview** – 39,709 to 75,000–80,000 at buildout
  - Two- to three-story story multi-family and high-end residential; 2,670 dwelling units x 2.95 = 7,876 people
  - Multiple retail projects totaling 283,919 square feet
- ◆ **Riverdale** – 9,000 to 13,000–14,000 by 2041; mostly residential
- ◆ **South Ogden** – 17,680 to 22,100, or 25 percent growth by 2027
  - All high-density residential

- ◆ **County Unincorporated** – 2,183, or 14 percent growth rate

### **1.4.1 Growth Impacts**

The overall added population by 2045 could be an additional 70,400 but spread over a large area with higher concentrations in the already very urbanized communities. Outside of Ogden, the added population per agency across seven to twenty years is very modest when compared to other high-growth areas in the western United States.

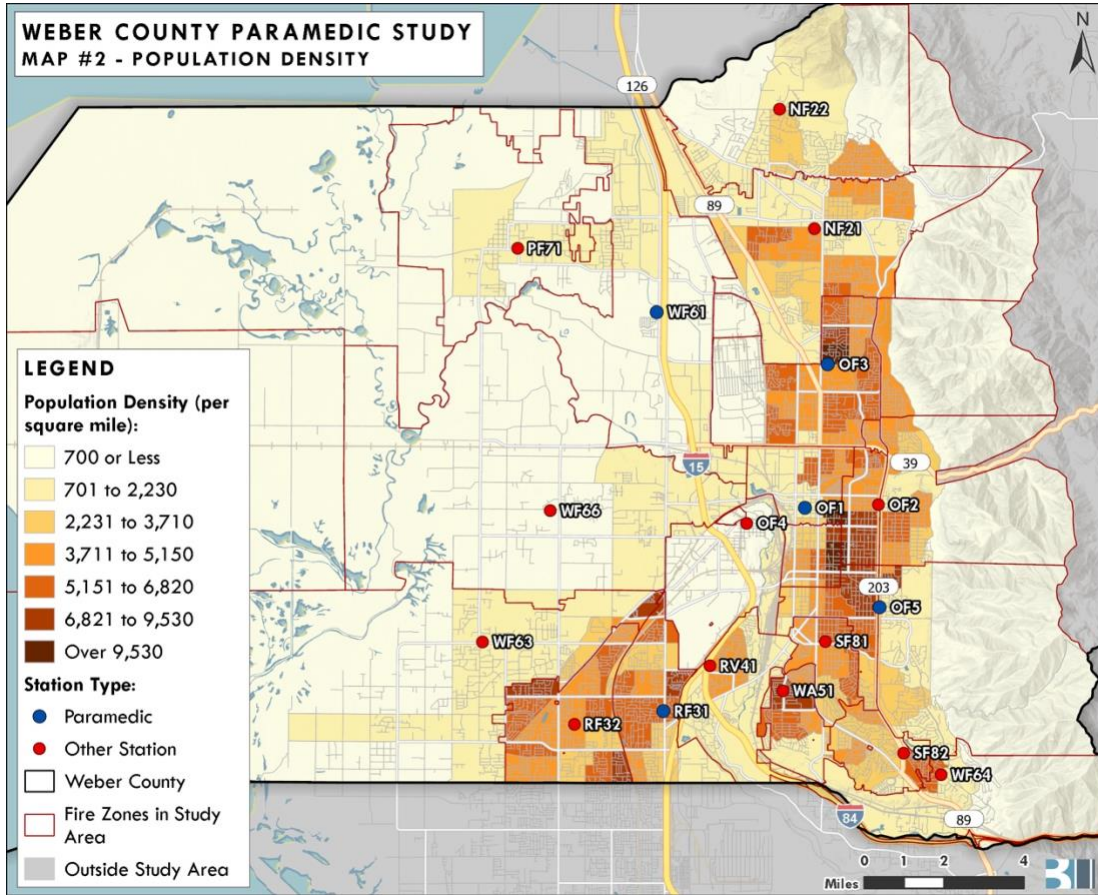
In addition, the needs of some populations for EMS can vary widely. The younger, employed populations with health insurance and that are raising families tend to be less dependent on EMS. The very young and the elderly depend on EMS much more. For example, if one community added a cluster of elder care housing, that would significantly impact the local Paramedic provider.

At the current Ogden rate of 61 calls per 1,000 population, incident growth across the entire Paramedic service area could total 4,295 incidents by 2045. This is an average of 12 per day or .5 per hour, or an annual rate of 187 per year or .5 per day.

The following map (also located in Appendix A) shows the current population densities and where most of the infill growth will occur.



**Figure 2—Weber County Population Density**



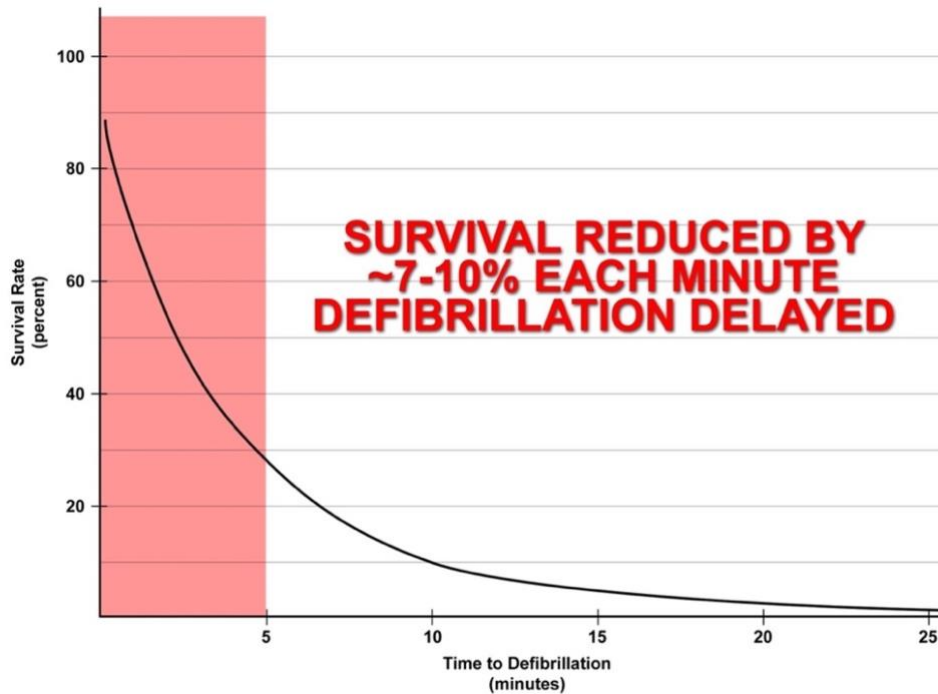
**Finding #1:** The Paramedic service area communities are still growing, but the modest year-over-year growth rate will not quickly saturate the current five Paramedic squads.

### 1.5 RESPONSE TIME CRITERIA AND CURRENT PROGRAM GOALS

Response times matter for first responder fire units, transport ambulance units, and Paramedic squads to *critical*, life-threatening events. However, only a small portion of initial 9-1-1 ambulance requests are due to life-threatening incidents. The deployment plan must balance delivering the right resource, in the right amount of time, to the critical, low-volume, high-risk events, even when the system is being consumed with high-volume, *low-risk* patients. The deployment plan must consider three key variables: the likely volume of demand, the road network’s ability to deliver efficient travel times (urban versus rural), and the location of the receiving facility—traditionally a hospital emergency room.

Situations for which time matters most are medical emergencies or traumas preventing blood from delivering oxygen to the brain; every moment of delay is critical. The following figure illustrates the reduced survivability of a cardiac arrest victim as time to electrical defibrillation increases. When the heart stops completely or is quivering and not effectively beating to pump blood, brain death shortly becomes irreversible.

**Figure 3—Survival Rate versus Time of Defibrillation**



As the figure shows, effective care must be delivered in 4:00 to 6:00 minutes or less. This includes care rendered by bystanders. In trauma, where surgical repair is essential, a patient should be able to get to definitive care within an hour.

Based on the goal of positive outcomes, crew size and response time can be calculated to provide appropriate ambulance spacing to achieve the desired goal. Emergency medical incidents include situations with the most severe time constraints. The brain can only survive 4:00 to 6:00 minutes without oxygen. Cardiac arrests and other events can cause oxygen deprivation to the brain. Cardiac arrests make up a small percentage, with drowning, choking, trauma constrictions, or other similar events having the same effect. If response is to achieve positive outcomes in severe emergency medical situations, *all* responding crews must arrive, assess the situation, and deploy effective measures before brain death occurs.

Thus, from the time of 9-1-1 receiving the call, an effective deployment system is *beginning* to manage the problem within a 7:00- to 8:00-minute total response time. This is right at the point that brain death is becoming irreversible. Each neighborhood needs a first-due response goal that

is within a range to give the situation hope for a positive outcome. It is important to note that medical emergency events continue to deteriorate from the time of inception, not from the time the fire engine or ambulance starts to drive the response route. Ideally, the emergency is noticed immediately, and the 9-1-1 system is activated promptly. This step of awareness—calling 9-1-1 and giving the dispatcher accurate information—takes, in the best of circumstances, 1:00 minute. Then crew notification and travel time take additional minutes. Upon arrival, the crew must approach the patient or emergency, assess the situation, and appropriately deploy its skills and tools. Even in easy-to-access situations, this step can take 2:00 minutes or more. This period may be increased considerably due to long driveways, apartment buildings with limited access, multiple-story buildings, or enclosed shopping centers.

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

### **1.5.1 Current Paramedic Squad Response Time Goals**

When the County Paramedic squad program was established, the squads would support the local neighborhood first responders and arrive second to support those crews. In recent years, as EMT-Advanced skills were acquired by many of the fire agencies in the system, there was even less pressure for a Paramedic squad to arrive before the first responders had accessed the patient and conducted an initial clinical assessment. Further, if immediate EMT-Advanced interventions were needed, they could be used.

Therefore, the current Medical Director has not established Paramedic arrival response time goals. There was no clinical follow-up evidence to suggest that the five squads were not able to arrive in each of highest density population clusters.

In light of the unique nature of a wide-area Paramedic squad program, not having a response time goal is understandable. However, it makes measuring the squad deployment against common EMS systems and national best practices difficult. Some of the cooperating transport fire departments have adopted both first responder and ambulance response time goals consistent with best practices published by the several national advisory bodies which are commonly in most EMS systems.

The Weber squad system is using best practices in using clinical severity criteria to sort the type of unit response. Therefore, this study reports the response times and reviews the clinical skills and medications used, and in what amount, on Paramedic squad responses. Then the system's performance will be compared to national best practices. However, absent a local response time goal, it is difficult to specify a trigger point for adding more squads other than simply workload capacity reducing a squad's availability to respond at all.

National best practices for establishing response times for all three response time elements—dispatch processing, crew turnout, and travel time—are measured with reliability percentages.<sup>2</sup> NFPA Standard 1710, a recommended deployment standard for career fire departments in urban/suburban areas, recommends initial (first-due) intervention units arrive within a travel time of 4:00 minutes, and all resources comprising a multiple-unit First Alarm arrive within a travel time of 8:00 minutes, all at 90 percent or better reliability.

**Finding #2:** The County’s Paramedic squad program has not established response performance goals consistent with best practice recommendations as published by the Commission on Fire Accreditation International and National Fire Protection Association. It is therefore difficult to know when increased demand for service is decaying response time performance past acceptable outcome-driven goals.

The most recently published NFPA best practices have decreased recommended dispatch / call processing time to 1:00 minute for events with an imminent threat to life or significant property damage and 1:30 minutes for hazardous materials or technical rescue incidents, for joint response with law enforcement involving weapons, or for incidents involving language barriers.<sup>3</sup> Further, for crew turnout time, 60 to 80 seconds is recommended. However, the prior edition of NFPA Standard 1221—and Citygate’s experience across many systems—finds 90 seconds for dispatch, and a turnout time of 2:00 minutes, across a 24-hour-per-day average, to be effective and safe goals. During high-demand daylight hours, the turnout goal should be closer to 1:30 minutes.

If a common Paramedic travel time of 8:00 minutes is added to dispatch processing and crew turnout times recommended by Citygate and NFPA best practices, then a realistic 90 percent first-due unit response performance goal would be 11:30 minutes from the time of the County’s 9-1-1 dispatch center receiving the call. This includes 1:30 minutes for call processing / dispatch, 2:00 minutes for crew turnout, and 8:00 minutes for Paramedic squad travel time.

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<sup>2</sup> NFPA 1710 – Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition).

<sup>3</sup> NFPA 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems (2019 Edition).

## SECTION 2—PARAMEDIC PROGRAM DEPLOYMENT ANALYSIS

### 2.1 HISTORICAL USE OF THE SQUADS

Weber County provided computer-aided-dispatch (CAD) system data for the response of County Paramedic rescue squads per protocol for the period 7/1/2018–6/30/2022. This data was divided into 42,416 unique incidents with related apparatus records. The apparatus records, which included various fire department resources, was reduced to only County Paramedic rescue units. This resulted in 42,515 Paramedic squad responses. Thus, except for less than 100 incidents, only one County Paramedic squad was assigned to each incident. The squad Unit IDs in the record set are:

- ◆ Rescue 1, 3, 5 – Ogden
- ◆ Rescue 2 – Roy (R31)
- ◆ Rescue 4 – Weber (W61E)

For *response time analysis*, because some responses end up being cancelled during response or the local fire department ambulance transports soon after the squad arrives, Citygate modeled a subset of incidents with dispatch severity types D and E to study the truly life threatening incidents which, over four years, yielded an “Acute” incident sample size of 24,916 incidents with complete call-to-arrival time stamps. Citygate believes this sample size is sufficient to measure response time over all neighborhoods in the Paramedic squad operating area.

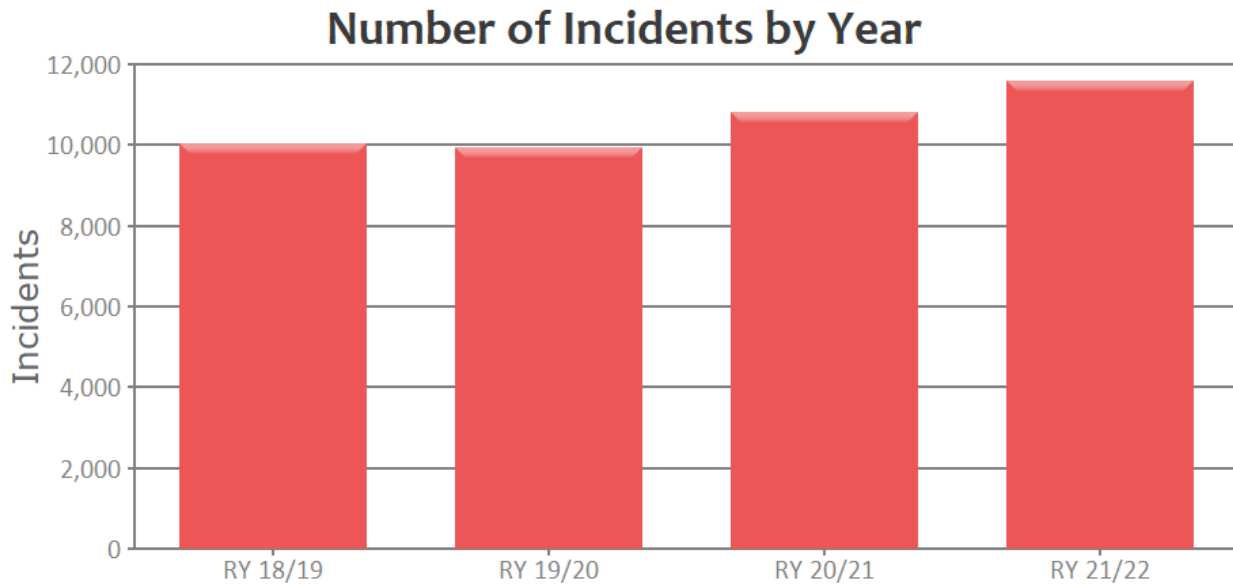
Data was assembled into the following four reporting years (RY):

- ◆ RY 18/19      7/1/2018–6/30/19
- ◆ RY 19/20      7/1/2019–6/30/20
- ◆ RY 20/21      7/1/2020–6/30/21
- ◆ RY 21/22      7/1/2021–6/30/22

#### 2.1.1 Squad Demand

In RY 21/22, squads responded to 11,588 incidents. On average, there were 31.75 incidents per day. The number of County ALS incidents has increased in the last two years.

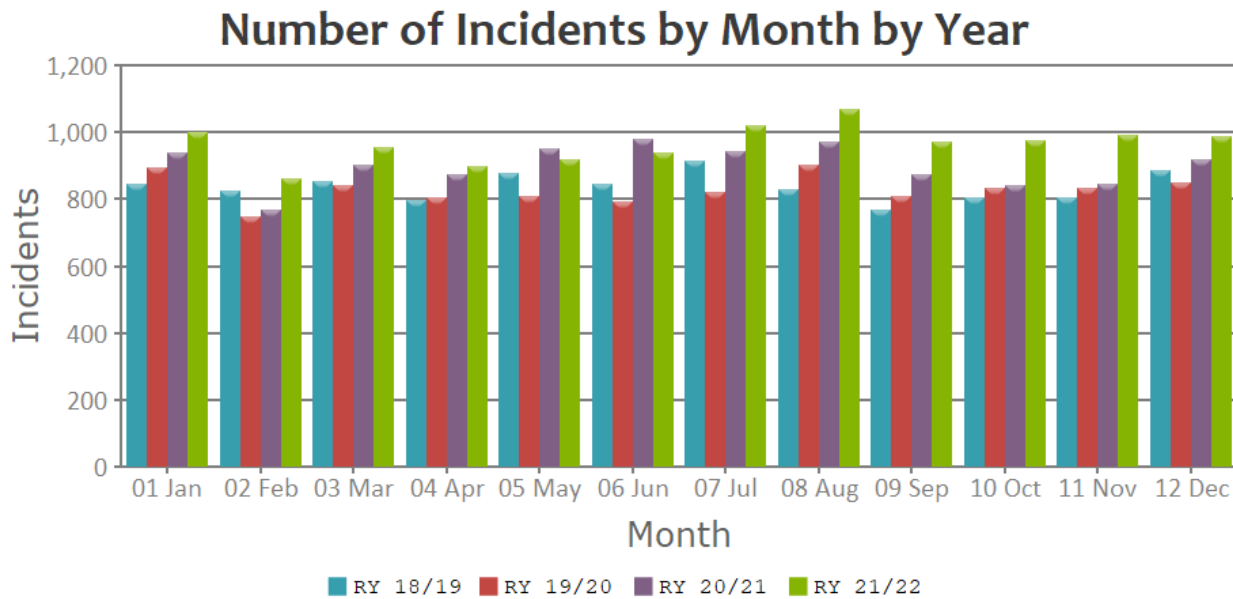
**Figure 4—Number of Incidents by Year**



The previous figure shows each time a squad was assigned to an incident. Once assigned, squads arrived on the scene just over 75 percent of the time over all four years of this analysis.

The following figure shows the number of incidents by month of the year. Activity is uniform month to month, with a slight increase in activity in August.

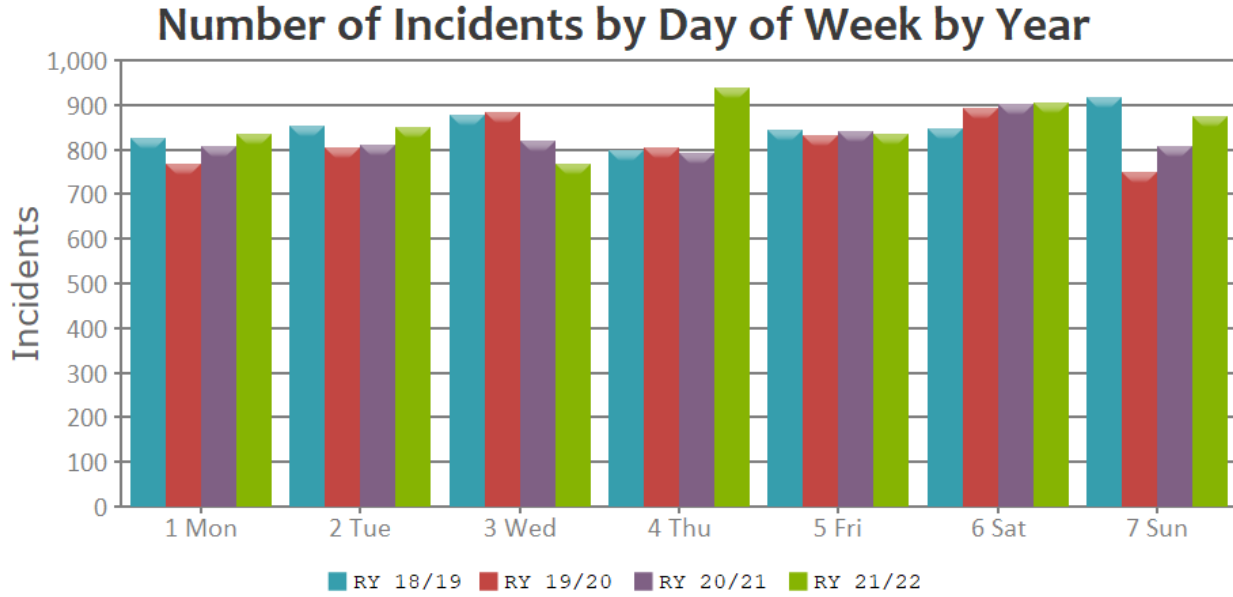
**Figure 5—Number of Incidents by Month by Year**





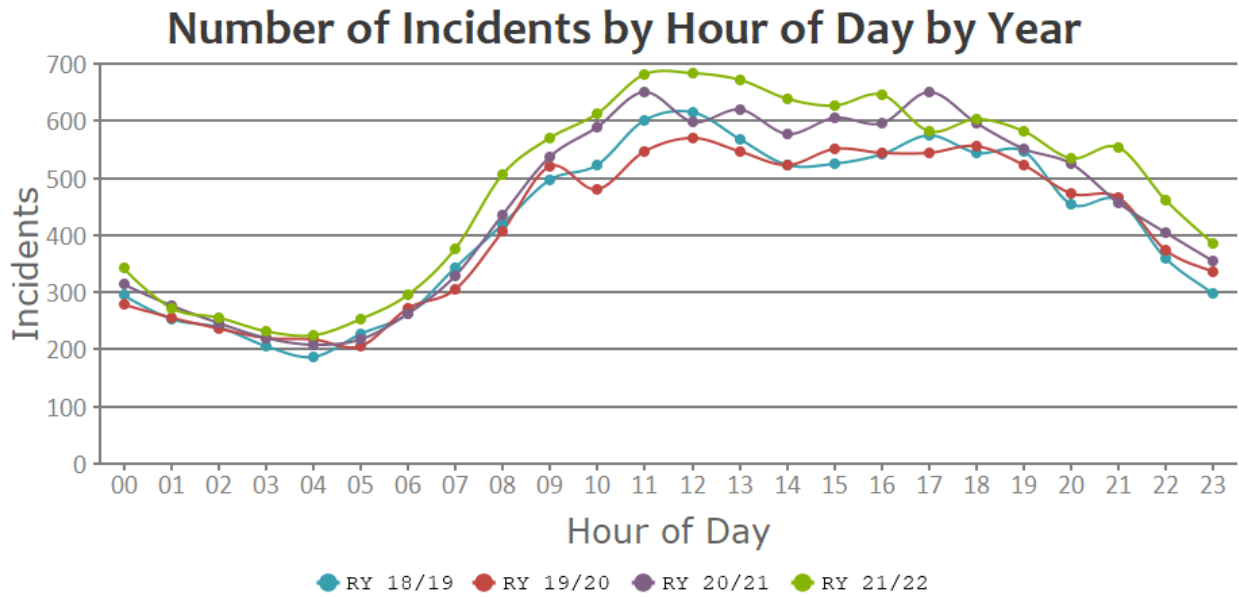
The following figure shows the number of incidents by day of week by year. Activity is uniform by day of week, with slightly increased activity on Saturday and slightly diminished activity on Sunday.

**Figure 6—Number of Incidents by Day of Week by Year**



The following figure shows the number of incidents by hour of the day by year. There is a sharp decrease in activity in the early morning hours. The heaviest activity occurs from 9:00 am to 7:00 pm.

**Figure 7—Number of Incidents by Hour of Day by Year**



**Finding #3:** The Paramedic squads are needed for substantial demand 24/7/365 and not just some hours of the day or days of the week.

### 2.1.2 Paramedic Squad Incident Count by Fire Agency

The following is a list of agencies and their abbreviations used in the dataset.

- ◆ NF North View Fire District
- ◆ OF Ogden City Fire
- ◆ PF Plain City Fire Department
- ◆ RF Roy Fire Department
- ◆ RV Riverdale Fire Department
- ◆ SF South Ogden Fire Department
- ◆ UF Weber Fire District Covers
- ◆ WA Washington Terrace Fire
- ◆ WF Weber Fire District

The following table shows the number of incidents by agency.

**Table 1—Number of Incidents by Agency by Year**

Agency	RY 18/19	RY 19/20	RY 20/21	RY 21/22	Total
NF	994	982	969	1,006	<b>3,951</b>
OF	4,898	4,802	5,154	5,423	<b>20,277</b>
PF	80	96	103	130	<b>409</b>
RF	1,091	1,171	1,370	1,486	<b>5,118</b>
RV	387	372	404	398	<b>1,561</b>
SF	731	716	736	854	<b>3,037</b>
UF	32	25	23		<b>80</b>
WA	471	410	471	534	<b>1,886</b>
WF	915	888	1,024	1,210	<b>4,037</b>
<b>Total</b>	<b>9,599</b>	<b>9,462</b>	<b>10,254</b>	<b>11,041</b>	<b>40,356</b>

The following tables uses the same data but is sorted by the busiest agencies first.

**Table 2—Number of Incidents by Agency by Year (Sorted)**

Agency	RY 18/19	RY 19/20	RY 20/21	RY 21/22	Total
OF	4,898	4,802	5,154	5,423	<b>20,277</b>
RF	1,091	1,171	1,370	1,486	<b>5,118</b>
WF	915	888	1,024	1,210	<b>4,037</b>
NF	994	982	969	1,006	<b>3,951</b>
SF	731	716	736	854	<b>3,037</b>
WA	471	410	471	534	<b>1,886</b>
RV	387	372	404	398	<b>1,561</b>
PF	80	96	103	130	<b>409</b>
UF	32	25	23		<b>80</b>
<b>Total</b>	<b>9,599</b>	<b>9,462</b>	<b>10,254</b>	<b>11,041</b>	<b>40,356</b>

**Finding #4:** The Paramedic squad use is clearly driven by population density and other socioeconomic factors such as age and access to preventative health care.

### 2.1.3 Simultaneous Analysis

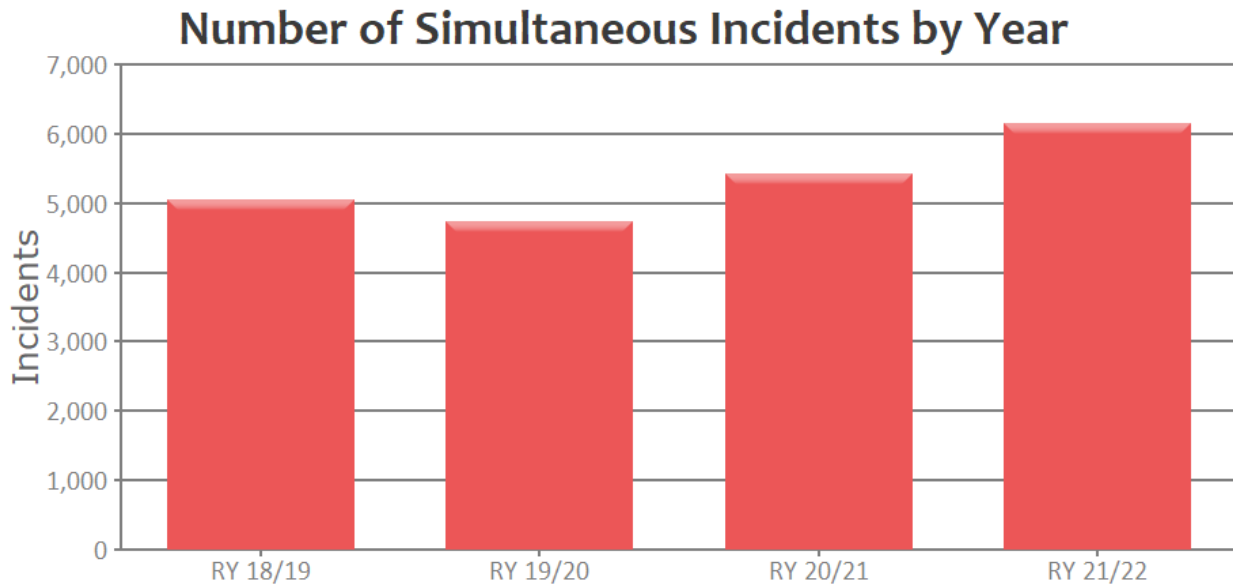
Simultaneous incidents occur when other incidents are underway at the time a new incident begins. During RY 21/22, 53.13 percent of the squad incidents occurred while one or more other squad incidents were underway.

The following shows the percentage of simultaneous incidents broken down by number of simultaneous incidents.

- ◆ 53.13 percent for 1 or more simultaneous incidents.
- ◆ 20.00 percent for 2 or more simultaneous incidents.
- ◆ 05.69 percent for 3 or more simultaneous incidents.
- ◆ 01.21 percent for 4 or more simultaneous incidents.

The following figure shows the number of simultaneous incidents is increasing in recent years. In a larger agency, simultaneous incidents in different station areas have very little operational consequence. However, in a system with only five responding squads, when simultaneous incidents occur within a single station area, there can be significant delays in response times.

**Figure 8—Number of Simultaneous Incidents by Year**



The following table breaks down simultaneous incidents in RY 21/22 by hour of the day and day of the week.

**Table 3—Simultaneous Incidents by Hour of Day and Day of Week – RY 21/22**

Hour	1 Mon	2 Tue	3 Wed	4 Thu	5 Fri	6 Sat	7 Sun	Total
00:00-00:59	18	17	15	8	18	24	27	127
01:00-01:59	8	10	15	8	14	21	16	92
02:00-02:59	12	14	6	3	15	20	10	80
03:00-03:59	5	10	8	2	7	14	19	65
04:00-04:59	8	10	6	6	9	10	14	63
05:00-05:59	15	10	13	16	8	7	14	83
06:00-06:59	19	14	11	18	15	9	10	96
07:00-07:59	32	19	31	20	16	23	12	153
08:00-08:59	50	32	38	37	34	26	29	246
09:00-09:59	54	49	55	50	59	26	32	325
10:00-10:59	57	52	51	45	67	37	39	348
11:00-11:59	61	65	58	56	67	58	55	420
12:00-12:59	54	91	63	56	53	43	57	417
13:00-13:59	53	57	65	63	71	63	50	422
14:00-14:59	72	63	66	63	59	46	24	393
15:00-15:59	63	47	68	56	61	62	37	394
16:00-16:59	65	64	71	53	60	51	39	403
17:00-17:59	54	58	61	35	41	41	50	340
18:00-18:59	50	55	51	46	47	49	47	345
19:00-19:59	52	48	52	65	42	55	45	359
20:00-20:59	52	35	36	32	47	46	37	285
21:00-21:59	40	31	45	42	47	57	41	303
22:00-22:59	24	38	26	35	42	48	25	238
23:00-23:59	25	19	17	14	26	40	19	160
<b>Total</b>	<b>943</b>	<b>908</b>	<b>928</b>	<b>829</b>	<b>925</b>	<b>876</b>	<b>748</b>	<b>6,157</b>

**Finding #5:** The Paramedic squad simultaneous demand pattern is not yet critical, but if the rate of three incidents at once increases from 20 to 30 percent at peak hours of the day, at least a part-time relief unit could be needed.

### **2.1.4 Unit-Hour Utilization**

The unit-hour utilization percentage is calculated using the number of responses and duration of the responses to show the percentage of time that a response resource is committed to an active incident during a given hour of the day. In Citygate’s experience, a unit-hour utilization of 30 percent or higher over *multiple* consecutive hours becomes the point at which other responsibilities, such as training, do not get completed. The following table shows a unit-hour utilization summary for the five Paramedic squads. It calculates committed time on any incident in such a way that if another EMS call occurs and the closest squad is busy, it is not able to respond. The busiest squads are listed first:



**Table 4—Unit-Hour Utilization – Squads (RY 21/22)**

Hour	RE1	RE5	RE3	RE31	RE61
00:00	12.32%	12.21%	9.38%	8.84%	3.25%
01:00	10.37%	13.48%	5.65%	7.21%	3.27%
02:00	7.77%	6.60%	7.23%	6.34%	2.84%
03:00	6.75%	8.88%	6.41%	8.00%	3.55%
04:00	8.13%	6.57%	5.89%	5.88%	2.96%
05:00	5.49%	8.07%	5.35%	8.38%	3.88%
06:00	7.39%	11.47%	7.00%	10.07%	3.28%
07:00	12.39%	12.49%	8.63%	8.63%	4.56%
08:00	10.95%	14.94%	13.04%	14.93%	8.69%
09:00	15.83%	15.55%	14.17%	15.43%	9.15%
10:00	15.91%	19.49%	17.80%	16.54%	10.74%
11:00	21.32%	17.18%	16.18%	18.75%	13.27%
12:00	24.68%	16.58%	18.92%	19.29%	9.06%
13:00	21.99%	17.04%	17.70%	18.28%	12.45%
14:00	20.12%	16.84%	17.31%	16.11%	11.17%
15:00	21.79%	17.14%	14.92%	17.69%	11.91%
16:00	16.61%	20.45%	19.47%	14.51%	10.78%
17:00	20.30%	13.51%	17.22%	14.64%	10.30%
18:00	21.50%	17.33%	16.53%	16.89%	8.14%
19:00	22.63%	14.14%	16.98%	12.90%	8.69%
20:00	17.75%	13.22%	13.13%	14.45%	8.67%
21:00	18.98%	14.73%	16.91%	13.58%	8.51%
22:00	14.54%	13.11%	13.60%	8.59%	10.42%
23:00	12.06%	12.14%	9.59%	9.96%	6.36%
Overall	15.32%	13.88%	12.88%	12.75%	7.75%
<b>Runs</b>	<b>2,984</b>	<b>2,798</b>	<b>2,234</b>	<b>2,384</b>	<b>1,296</b>

**Finding #6:** While the squad UHU rates are not yet at or over 30 percent hour over hour, one squad is in the low 20-percent range during peak demand hours. This unit’s workload should be closely monitored, and a relief unit planned for and deployed when 30 percent UHU is reached.

## **2.2 HISTORICAL RESPONSE TIME PERFORMANCE**

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Approximately 75 percent of ALS apparatus complete their response and arrive on the scene of emergencies. To accurately measure the performance of the system, only emergency (“D” and “E”) codes will be used in the following performance analyses. Measurements are the number of minutes and seconds necessary for 90 percent completion of:

- ◆ Call processing
- ◆ Turnout
- ◆ Travel
- ◆ Call to arrival.

### **2.2.1 Call Processing**

Call processing measures the time from the first incident timestamp until apparatus are notified of the request for assistance. The following table shows call-processing performance by year.

**Weber County, UT**  
Paramedic Services Delivery Study

**Table 5—Call-Processing Performance by Year (Time and Quantity)**

<b>Zone</b>	<b>Overall</b>	<b>RY 18/19</b>	<b>RY 19/20</b>	<b>RY 20/21</b>	<b>RY 21/22</b>
<b>System-Wide</b>	<b>03:05 (24,916)</b>	<b>03:04 (5,844)</b>	<b>03:05 (5,819)</b>	<b>03:07 (6,289)</b>	<b>03:04 (6,964)</b>
Zone NF21	02:50 (1,868)	03:03 (444)	02:47 (475)	02:50 (430)	02:44 (519)
Zone NF21W	02:59 (12)	02:59 (3)	04:07 (3)	01:38 (3)	02:00 (3)
Zone NF22	02:56 (439)	02:37 (99)	02:56 (111)	03:07 (110)	02:42 (119)
Zone OF1	03:09 (2,024)	03:09 (592)	03:13 (434)	03:05 (473)	03:10 (525)
Zone OF1S	03:16 (2,100)	03:06 (447)	03:16 (506)	03:22 (554)	03:13 (593)
Zone OF2	03:05 (1,561)	03:05 (468)	03:03 (410)	02:55 (356)	03:08 (327)
Zone OF2M	03:10 (425)	02:33 (1)		03:25 (210)	02:58 (214)
Zone OF2N	03:05 (227)	02:24 (49)	03:13 (109)	03:13 (41)	01:57 (28)
Zone OF3	03:00 (2,749)	02:59 (693)	03:03 (625)	03:04 (654)	02:56 (777)
Zone OF3M	03:20 (72)			03:37 (32)	03:02 (40)
Zone OF3NW	03:36 (217)	04:05 (55)	03:21 (47)	03:41 (48)	03:01 (67)
Zone OF4	03:10 (429)	02:47 (83)	03:14 (91)	02:56 (119)	03:15 (136)
Zone OF5	03:12 (2,316)	03:13 (637)	03:13 (728)	03:07 (473)	03:05 (478)
Zone OF5M	03:19 (429)		03:17 (3)	03:35 (225)	03:18 (201)
Zone PF71	02:24 (262)	02:35 (53)	01:47 (57)	02:54 (58)	02:18 (94)
Zone RF31	02:58 (1,572)	02:50 (349)	03:05 (363)	02:44 (412)	03:03 (448)
Zone RF32	02:56 (1,564)	02:58 (314)	02:49 (370)	02:55 (400)	02:56 (480)
Zone RV41	03:08 (978)	03:04 (230)	03:16 (232)	03:16 (268)	03:04 (248)
Zone RV41E	02:51 (28)	01:49 (5)	02:21 (11)	01:46 (6)	02:51 (6)
Zone SF81	03:00 (694)	03:09 (153)	03:17 (140)	02:48 (168)	02:56 (233)
Zone SF82	02:58 (1,114)	02:56 (272)	02:58 (276)	02:52 (276)	03:04 (290)
Zone UF91	03:28 (44)	03:14 (17)	02:59 (13)	03:36 (14)	
Zone WA51	02:43 (1,204)	02:26 (318)	02:47 (253)	03:02 (299)	02:43 (334)
Zone WF61	03:37 (13)	01:24 (2)	03:37 (5)	04:34 (4)	03:02 (2)
Zone WF61E	03:04 (810)	03:04 (175)	02:56 (201)	02:58 (200)	03:19 (234)
Zone WF63	02:59 (780)	03:32 (178)	02:23 (164)	02:53 (188)	02:51 (250)
Zone WF64	03:02 (147)	03:02 (30)	03:08 (26)	02:46 (40)	02:58 (51)
Zone WF64I	03:21 (30)	02:06 (9)	01:12 (6)	02:17 (8)	03:21 (7)
Zone WF66	03:24 (780)	03:30 (158)	03:10 (157)	03:37 (212)	03:10 (253)
Zone WF66W	03:32 (28)	03:32 (10)	01:52 (3)	02:48 (8)	02:55 (7)

**Finding #7:** While the dispatch center uses “rapid” dispatching on critical calls, that time is not tracked. The 90 percent process times reflect the sum of all EMS calls in which the dispatchers ask more questions to determine the needed apparatus to send.

### **2.2.2 Turnout Time**

Turnout time measures the time from resource notification until the resource starts traveling to the scene. The following table shows turnout performance by year.

**Weber County, UT**  
Paramedic Services Delivery Study

**Table 6—Turnout Time Performance by Year**

Zone	Overall	RY 18/19	RY 19/20	RY 20/21	RY 21/22
<b>System-Wide</b>	<b>02:27 (23,757)</b>	<b>02:28 (5,584)</b>	<b>02:27 (5,554)</b>	<b>02:28 (5,998)</b>	<b>02:24 (6,621)</b>
Zone NF21	02:34 (1,809)	02:34 (437)	02:39 (460)	02:37 (413)	02:29 (499)
Zone NF21W	02:15 (9)	02:15 (2)	02:19 (2)	01:43 (4)	01:41 (1)
Zone NF22	02:28 (438)	02:23 (99)	02:32 (111)	02:24 (110)	02:30 (118)
Zone OF1	02:27 (1,901)	02:31 (554)	02:28 (419)	02:26 (446)	02:20 (482)
Zone OF1S	02:28 (1,935)	02:29 (414)	02:24 (466)	02:29 (515)	02:25 (540)
Zone OF2	02:24 (1,506)	02:23 (456)	02:23 (394)	02:32 (341)	02:23 (315)
Zone OF2M	02:20 (415)	01:31 (1)		02:20 (204)	02:21 (210)
Zone OF2N	02:28 (230)	02:36 (49)	02:33 (112)	01:54 (40)	02:20 (29)
Zone OF3	02:32 (2,626)	02:33 (661)	02:37 (598)	02:32 (624)	02:26 (743)
Zone OF3M	02:21 (66)			02:27 (30)	02:18 (36)
Zone OF3NW	02:28 (224)	02:31 (57)	02:17 (50)	02:45 (50)	02:26 (67)
Zone OF4	02:26 (408)	02:24 (79)	02:34 (88)	02:26 (112)	02:25 (129)
Zone OF5	02:22 (2,172)	02:24 (594)	02:22 (679)	02:21 (448)	02:19 (451)
Zone OF5M	02:29 (409)		03:15 (3)	02:35 (221)	02:20 (185)
Zone PF71	02:24 (258)	02:18 (51)	02:27 (55)	02:18 (60)	02:26 (92)
Zone RF31	02:23 (1,484)	02:24 (332)	02:24 (333)	02:22 (396)	02:15 (423)
Zone RF32	02:23 (1,518)	02:29 (309)	02:20 (362)	02:18 (381)	02:25 (466)
Zone RV41	02:21 (920)	02:28 (212)	02:14 (227)	02:22 (244)	02:10 (237)
Zone RV41E	02:50 (24)	02:50 (5)	02:29 (10)	02:52 (3)	01:53 (6)
Zone SF81	02:24 (630)	02:42 (145)	02:20 (124)	02:23 (150)	02:20 (211)
Zone SF82	02:27 (1,059)	02:33 (261)	02:23 (261)	02:29 (263)	02:24 (274)
Zone UF91	02:35 (44)	03:25 (16)	02:35 (14)	01:52 (14)	
Zone WA51	02:25 (1,157)	02:26 (302)	02:23 (247)	02:27 (290)	02:23 (318)
Zone WF61	03:09 (12)	02:42 (1)	03:09 (5)	03:55 (4)	00:42 (2)
Zone WF61E	02:32 (785)	02:35 (172)	02:27 (187)	02:38 (196)	02:22 (230)
Zone WF63	02:20 (769)	02:15 (176)	02:26 (162)	02:18 (181)	02:21 (250)
Zone WF64	02:26 (145)	02:20 (30)	02:32 (25)	02:42 (40)	02:04 (50)
Zone WF64I	02:49 (26)	01:49 (7)	02:49 (5)	03:07 (7)	02:13 (7)
Zone WF66	02:28 (750)	02:29 (155)	02:18 (152)	02:33 (201)	02:30 (242)
Zone WF66W	02:26 (28)	02:01 (7)	01:11 (3)	01:16 (10)	02:37 (8)

**Finding #8:** The Paramedic squad crew turnout times are past a best practice of 2:00 minutes, counted over 24 hours. This time can be improved easily to under 2:00 minutes.

### **2.2.3 Travel Time**

Travel time measures time of resource travel to the scene of the emergency. The following table shows travel time performance by year.

**Table 7—Travel Time Performance by Year**

<b>Zone</b>	<b>Overall</b>	<b>RY 18/19</b>	<b>RY 19/20</b>	<b>RY 20/21</b>	<b>RY 21/22</b>
<b>System-Wide</b>	<b>07:59 (19,830)</b>	<b>07:43 (4,647)</b>	<b>07:51 (4,708)</b>	<b>08:00 (4,968)</b>	<b>08:16 (5,507)</b>
Zone NF21	08:28 (1,447)	07:48 (354)	08:28 (371)	08:14 (332)	09:03 (390)
Zone NF21W	08:00 (5)	04:52 (1)	08:00 (1)	06:21 (3)	
Zone NF22	10:38 (329)	10:47 (78)	10:49 (87)	10:06 (81)	10:54 (83)
Zone OF1	06:19 (1,626)	06:00 (479)	06:05 (350)	06:18 (386)	06:53 (411)
Zone OF1S	05:44 (1,675)	05:44 (363)	05:31 (400)	05:43 (457)	05:56 (455)
Zone OF2	05:55 (1,277)	05:55 (378)	05:54 (341)	05:47 (281)	06:15 (277)
Zone OF2M	07:51 (351)	07:08 (1)		08:01 (171)	07:43 (179)
Zone OF2N	07:14 (195)	07:55 (43)	06:57 (95)	06:03 (33)	06:38 (24)
Zone OF3	07:05 (2,402)	06:45 (609)	06:59 (564)	07:09 (562)	07:20 (667)
Zone OF3M	09:23 (62)			07:29 (26)	09:23 (36)
Zone OF3NW	07:24 (206)	06:21 (53)	06:44 (47)	07:39 (45)	07:42 (61)
Zone OF4	07:21 (341)	06:39 (58)	07:12 (77)	07:19 (98)	07:49 (108)
Zone OF5	06:44 (1,899)	06:47 (510)	06:45 (606)	06:39 (376)	06:35 (407)
Zone OF5M	08:18 (363)		08:01 (3)	07:59 (188)	09:45 (172)
Zone PF71	09:20 (219)	09:04 (46)	07:57 (47)	09:36 (48)	09:17 (78)
Zone RF31	06:23 (1,257)	05:56 (282)	06:23 (278)	06:23 (335)	06:07 (362)
Zone RF32	08:23 (1,249)	07:45 (247)	09:11 (301)	07:36 (315)	08:48 (386)
Zone RV41	07:43 (694)	07:28 (160)	07:39 (173)	07:50 (186)	07:43 (175)
Zone RV41E	10:09 (24)	11:32 (5)	08:24 (8)	09:14 (5)	08:39 (6)
Zone SF81	06:52 (476)	06:52 (106)	06:02 (95)	06:32 (113)	07:20 (162)
Zone SF82	09:34 (814)	09:57 (194)	09:20 (218)	09:34 (185)	09:30 (217)
Zone UF91	10:36 (34)	10:10 (13)	10:36 (12)	10:24 (9)	
Zone WA51	08:09 (807)	07:58 (201)	08:20 (185)	08:11 (209)	08:16 (212)
Zone WF61	11:29 (12)	10:23 (1)	10:05 (5)	12:59 (5)	10:28 (1)
Zone WF61E	08:08 (714)	08:22 (157)	07:41 (174)	08:31 (173)	07:57 (210)
Zone WF63	10:42 (597)	10:39 (144)	10:36 (117)	10:09 (150)	10:56 (186)
Zone WF64	11:13 (92)	10:32 (21)	13:07 (16)	09:09 (22)	11:27 (33)
Zone WF64I	13:27 (11)	14:27 (3)	12:25 (1)	13:27 (4)	10:49 (3)
Zone WF66	09:20 (637)	09:21 (136)	08:44 (134)	08:42 (165)	09:56 (202)
Zone WF66W	13:28 (15)	12:13 (4)	13:08 (2)	13:28 (5)	14:05 (4)



The following is a list of agencies and their abbreviation.

- ◆ NF North View Fire District
- ◆ OF Ogden City Fire
- ◆ PF Plain City Fire Department
- ◆ RF Roy Fire Department
- ◆ RV Riverdale Fire Department
- ◆ SF South Ogden Fire Department
- ◆ UF Weber Fire District Covers
- ◆ WA Washington Terrace Fire
- ◆ WF Weber Fire District

The following table shows less than a 10:00-minute travel time performance for all squads except for Weber Fire District, which is very close to meeting this goal.

**Table 8—Travel Time Performance by Year by Agency**

Agency	RY 18/19	RY 19/20	RY 20/21	RY 21/22
NF	09:08 (433)	09:04 (459)	09:00 (416)	09:31 (473)
OF	06:20 (2,494)	06:33 (2,483)	06:55 (2,623)	07:03 (2,797)
PF	09:04 (46)	07:57 (47)	09:36 (48)	09:17 (78)
RF	07:03 (529)	08:03 (579)	07:14 (650)	08:19 (748)
RV	07:52 (165)	07:40 (181)	07:54 (191)	07:48 (181)
SF	08:32 (300)	08:50 (313)	08:45 (298)	08:42 (379)
UF	10:10 (13)	10:36 (12)	14:11 (9)	
WA	07:58 (201)	08:20 (185)	08:11 (209)	08:16 (212)
WF	09:51 (466)	09:49 (449)	09:40 (524)	10:14 (639)

**Finding #9:** The squad travel times are close to national advisory and clinical best-practice-based goal for arrival of the first Paramedic at 8:00 minutes travel time *when* a first responder arrives first.

**2.2.4 Call to Arrival**

Call to arrival measures time from receipt of the request for assistance until the apparatus arrives on the scene. The following table breaks down call to arrival for emergency incidents by year.

**Table 9—Call to Arrival Performance by Year**

<b>Zone</b>	<b>Overall</b>	<b>RY 18/19</b>	<b>RY 19/20</b>	<b>RY 20/21</b>	<b>RY 21/22</b>
<b>System-Wide</b>	<b>11:29 (24,916)</b>	<b>11:19 (5,819)</b>	<b>11:25 (5,846)</b>	<b>11:28 (6,327)</b>	<b>11:38 (6,924)</b>
Zone NF21	11:55 (1,886)	11:54 (459)	11:52 (480)	11:33 (432)	12:26 (515)
Zone NF21W	14:56 (11)	14:56 (2)	14:26 (3)	13:08 (4)	18:49 (2)
Zone NF22	13:38 (446)	13:53 (103)	13:24 (112)	13:16 (111)	13:43 (120)
Zone OF1	09:55 (2,001)	09:31 (579)	10:12 (437)	09:58 (477)	09:58 (508)
Zone OF1S	09:44 (2,050)	09:44 (432)	09:27 (493)	09:50 (546)	09:44 (579)
Zone OF2	09:49 (1,570)	09:49 (474)	09:40 (407)	09:22 (358)	09:57 (331)
Zone OF2M	11:38 (429)	11:12 (1)		11:47 (213)	11:38 (215)
Zone OF2N	11:17 (235)	10:53 (49)	11:32 (115)	10:33 (41)	10:46 (30)
Zone OF3	10:33 (2,760)	10:33 (685)	10:38 (637)	10:37 (663)	10:27 (775)
Zone OF3M	13:00 (71)			11:09 (31)	13:12 (40)
Zone OF3NW	11:59 (226)	11:04 (57)	12:45 (51)	13:34 (50)	11:19 (68)
Zone OF4	11:08 (427)	10:12 (80)	11:39 (93)	10:59 (120)	11:36 (134)
Zone OF5	10:30 (2,288)	10:42 (620)	10:28 (722)	10:13 (473)	10:30 (473)
Zone OF5M	11:33 (429)		14:33 (3)	11:09 (229)	12:30 (197)
Zone PF71	14:08 (266)	13:43 (54)	13:06 (59)	14:17 (58)	14:23 (95)
Zone RF31	09:54 (1,569)	09:55 (350)	10:01 (357)	09:24 (417)	09:55 (445)
Zone RF32	11:55 (1,580)	11:01 (314)	12:33 (378)	11:22 (402)	12:21 (486)
Zone RV41	11:05 (972)	10:49 (226)	11:20 (237)	11:35 (264)	10:48 (245)
Zone RV41E	13:55 (28)	13:55 (5)	12:25 (10)	11:40 (6)	14:39 (7)
Zone SF81	10:35 (689)	10:10 (153)	09:52 (137)	10:34 (170)	10:52 (229)
Zone SF82	12:27 (1,121)	12:14 (271)	13:02 (280)	12:05 (281)	12:21 (289)
Zone UF91	14:06 (43)	12:16 (16)	14:06 (13)	14:15 (14)	
Zone WA51	11:41 (1,209)	11:25 (318)	12:00 (259)	11:57 (301)	11:32 (331)
Zone WF61	18:10 (13)	13:39 (1)	12:59 (6)	19:24 (5)	14:03 (1)
Zone WF61E	11:46 (823)	11:50 (178)	11:00 (201)	12:39 (204)	11:33 (240)
Zone WF63	14:09 (787)	14:39 (180)	13:32 (164)	13:14 (189)	14:16 (254)
Zone WF64	15:01 (149)	14:01 (31)	15:27 (27)	11:46 (40)	15:13 (51)
Zone WF64I	15:15 (30)	16:33 (9)	12:14 (7)	13:15 (7)	10:32 (7)
Zone WF66	13:07 (785)	13:21 (165)	12:19 (155)	12:50 (213)	13:17 (252)
Zone WF66W	18:56 (23)	17:25 (7)	17:40 (3)	18:52 (8)	19:20 (5)

In summary, response times are represented in the following table.

**Table 10—Response Performance Summary**

Response Component	Best Practice		90 <sup>th</sup> Percentile Performance RY 21/22	Performance Versus Best Practice and Current Goal
	Time	Reference		
<b>Call Processing / Dispatch</b>	1:30 1:00 Critical	NFPA	<b>3:04</b>	<b>+ 0:94</b>
<b>Crew Turnout</b>	2:00 1:00	Citygate NFPA	<b>2:24</b>	<b>+ 0:24</b>
<b>ALS Travel</b>	8:00	NFPA Citygate	<b>8:16</b>	<b>+ 0:16</b>
<b>ALS Call to Arrival</b>	11:30 10:00	Citygate NFPA	<b>11:38</b>	<b>+ 0:08</b>
<b>ALS Category C – Call to Arrival</b>	-	-	<b>11:27</b>	<b>- 0:03</b>

**Finding #10:** The system-wide 9-1-1 call to arrival times for the Paramedic squads, at 11:38 minutes, are very close to a best-practices-based goal of 11:30 minutes. Those few that are not are in very difficult to serve geographic pockets. If rapid dispatch would be measured for acute incidents and turnout times reduced, the systemwide 9-1-1 call to arrival measure could easily decrease by 2:00 minutes.

### 2.2.5 Geographic Travel Time and Incident Density Coverages

Another way to understand the five-squad system is to use geographic mapping to visualize response times and incident density patterns. It is appropriate to understand what the existing squad spacing does and does not cover within travel time goals, if there are any coverage gaps needing one or more additional squads, and where squads are needed.

To analyze squad travel time coverage, Citygate used a geographic mapping tool that measures theoretical travel time over a road network. For this calculation, Citygate used the base map and street travel speeds calibrated to actual fire apparatus travel times from previous responses to simulate real-world travel time coverage. Absent Weber County squad response time goals, Citygate used a best practice time of 8:00-minutes’ travel consistent with positive outcomes in urban/suburban areas.

***Map #1 – General Geography, Station Locations, and Response Resource Types***

Map #1 shows the Paramedic squads’ service area boundary and partner fire station locations. This is a reference map for other maps that follow.

***Map #2 – Risk Assessment: Population Density***

Map #2 shows resident population density across the service area. Population drives EMS incident demand; thus, the areas with higher population density are also typically the areas with higher EMS demand. As the map shows, all the areas with higher density are mostly urban in zoning. Four of the five squads are located in areas with the highest population density to reach the most people in the fewest minutes of travel time. The fifth unit is in the Weber Fire District to service a very large, lightly populated area.

***Map #3 – Distribution: 8:00-Minute Squad Travel Time Coverage***

Map #3 shows the total public road miles in the squad service area that squads should be expected to reach within an 8:00-minute *travel time* assuming the squad is in station and encounters no traffic congestion. Given that a best practice first-due fire engine travel time is 4:00 minutes, an 8:00-minute travel time zone is very large. In Citygate’s experience and opinion, this level of squad coverage is good to very good in areas with more of an urban population density. The western areas are beyond an 8:00-minute travel time; however, this is understandable given the very light development density and fewer public roads.

***Map #4 – All Incident Locations***

Map #5 shows the location of all incidents for the four years from July 2018 through June 2022. As the map shows, incidents occur on nearly all road segments throughout the entire service area. As with the population density plot, the majority of the incidents are in high-population-density areas within 8:00 minutes’ travel of a Paramedic squad.

***Map #5 – Transport Locations***

Map #5 shows the squad incident locations over the four-year study period where the patient(s) needed transport to a hospital. This variation still stays in sync with population density. Had it not, that might have indicated a need for added squads in the more rural areas.

***Map #6 – Incidents Beyond 8:00 Minutes’ Travel – Four Years***

Map #6 shows the location of squad incidents beyond the projected 8:00-minute travel time coverage so that the smaller frequency and locations of these calls can be easily understood. While there is an overall scattering of these incidents, there are two clusters—west of WF63, and just south of NF22.

***Map #6a–d – Incidents Beyond 8:00 Minutes’ Travel by Year***

Map series #6a–d can be a little deceiving regarding the frequency of outer-edge coverage beyond 8:00-minutes’ squad travel on an annual (or even monthly) basis. Thus, each of these maps represents one data year.

***Map #7 – Actual Squad Travel Time by CAD Response Zone***

Map #7 shows, in smaller zones by minutes, the squads’ actual, *not predicted*, travel times. This banding shows the largest population areas are reached in less than 9:00 minutes. Mid-density areas are reached in less than 12:00 minutes. Only a few areas are reached past 13:00 minutes of travel. With the addition of dispatch and turnout times (3:30 minutes together), the outer rural areas receive squad coverage at 16:30 minutes. In Citygate’s experience, this is not an uncommon finding in rural areas with limited road networks.

**Finding #11:** The geographic mapping analysis shows the five Paramedic squads are covering most of the population within an 8:00 minutes’ travel time, consistent with national best practices.

**Finding #12:** There are rural area incidents past 8:00 minutes’ travel, more so in the southwest and northeast service areas.

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### **2.3 PARAMEDIC AND AEMT SKILLS AND DRUG ADMINISTRATION USE**

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To better understand the response time sensitivity needed for the Paramedic squads, Citygate reviewed the clinical severity of the patients treated by both types of responders—the locally distributed fire department AEMT ambulances, and the regional Paramedic squads. Given the narrow separation of skills and drugs used between AEMTs and Paramedics, Citygate wanted to understand how often the care reserved for the Paramedics was actually used.

The agencies provided treatment data for 12 months—from 7/1/2021 to 6/30/2022—for patients treated by the Paramedic squads across 11,588 incidents. This data range also was used to obtain care data from the local fire department AEMT ambulance personnel. In the Countywide patient care data system, every care procedure or medication authorized by a Medical Director is tracked per patient and by the number of times used. While this data does not include the other fire departments providing AEMT or Paramedic care elsewhere in the County, for the Paramedic squad system, it is a large sample given that three squad delivery agencies serve the majority of the population in the county.

The following table shows procedures and skill counts by squad operating agency. The counts differ due to the variances in populations served.

**Table 11—Total Procedures and Medications Administered by Squad Operating Agency – Non-Transport and Transport**

Agency	Procedures	Medications
Ogden	18,184	5,894
Roy	15,453	838
Weber	3,024	804
<b>Total</b>	<b>36,661</b>	<b>7,536</b>

The following table counts the care procedure skills used. The table has four *different* sections.

- ◆ The total of all procedures authorized by certification – AEMT or Paramedic
- ◆ The usage counts *across the entire system*
- ◆ The *Paramedic-only procedures*, separating Ogden from Weber and Roy

**Table 12—Care Procedure Skills**

System-Wide Summary – Procedures		
AEMT Procedures	16	51.6%
ALS Procedures	15	<b>48.4%</b>
Total All Procedures	31	100%
<b>Total Procedures Used</b>	<b>13,506</b>	
AEMT	7,380	54.6%
Paramedic Only	6,126	<b>45.4%</b>
Paramedic-Only Procedures by Area		
Weber/Roy	1,774	<b>29.0%</b>
Ogden	4,352	71.0%

**Finding #13:** While the number of procedures authorized and *administered* is either side of 50/50 percent by caregiver type, the percent used by the Paramedics is 45.4 percent of the systemwide total. However, in Ogden the Paramedic procedure usage is much higher, at 71 percent, than in Weber and Roy at 29 percent.



For medication administration, the following table shows *five different* measures.

- ◆ The total of all medications authorized by certification – AEMT or Paramedic.
- ◆ The usage counts *split into two categories* – *Oxygen and IV Saline* and then all other medications. For preventive reasons, many patients are given oxygen and an IV *in case* medications are later needed if the patients condition materially worsens.
- ◆ The Paramedic and AEMT medications counted *without* Oxygen and IV Saline.
- ◆ The Paramedic and AEMT medications counted *without* Oxygen and IV Saline split into Ogden and Weber and Roy.

**Table 13—Medication Administration**

System-Wide Summary		
AEMT Meds.	25	69.4%
ALS Meds.	11	<b>30.6%</b>
<b>Total All Meds.</b>	<b>36</b>	<b>100%</b>
<b>Total All Medication Administrations</b>	<b>7,536</b>	
O <sup>2</sup> /Saline – All	4,564	60.6%
All Other Meds. w/o O <sup>2</sup> /Saline	2,972	<b>39.4%</b>
Paramedic Only w/o O <sup>2</sup> /Saline	672	22.6%
AEMT	2,300	<b>77.4%</b>
By Area – Paramedic Only w/o O <sup>2</sup> /Saline		
Paramedic Serious Meds. Weber/Roy	180	<b>26.8%</b>
Ogden	492	73.2%

**Finding #14:** The medications authorized for AEMT use are **69.4 percent** of the total medications list including Paramedic ones. Subtracting for the general use of oxygen and saline IVs, only 39.4 percent of all medication administrations were for more serious needs.

**Finding #15:** The overall need for Paramedic level medications is only 22.6 percent of all Paramedic squad administrations.

## **SECTION 3—CONCLUDING ANALYSIS AND RECOMMENDATIONS**

### **3.1 ANALYSIS**

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Overall, the Paramedic squad system is operating as designed; to provide fewer, highly trained Paramedics over a wide area, with longer response times, given the local fire-department-provisioned ambulance personnel’s first responder skills. In recent years, the increased skills up to Advanced EMT in the fire department ambulance programs narrowed the gap to have Paramedics quickly available.

Citygate’s analysis shows that the need for rapid Paramedic skills is infrequent. Some of the medications are needed only a few times per year on a very small number of patients. The AEMT ambulances provide the level of care needed to the majority of the low- to moderate-acuity patients.

However, as in fire services fire crew deployment, the agencies need to provide a level of “standby” service, as each neighborhood should have equity of access to a Paramedic unit’s skills, when needed, even if infrequently. The current system is covering most of the population and incidents. The workload per Paramedic squad is not yet high enough to warrant the immediate addition of one or more squads. The simultaneous demand is not yet excessive (two at a time at 20 percent of all incidents), but all the high-demand areas are in Ogden; when Ogden has two or more incidents, County areas are spread thin at the outer urban and suburban areas.

There is low usage of full Paramedic skills and medicines compared to other systems where Citygate has reviewed clinical use. In Ogden (higher volume) with 30.6 percent of the medicines being reserved to Paramedics, they are only used on 14.1 percent of the incidents. For all field procedures, only 45 percent are Paramedic level. Most urban systems care about Paramedics seeing enough patients to maintain serious skill and medicine usage rates; in other words, there can be too many Paramedics.

### **3.2 RECOMMENDATIONS**

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Considering the analysis in this study, Citygate recommends the following:

**Recommendation #1:** The Paramedic system must evolve. The communities past the core coverage plan of the five Paramedic squads are growing slowly year over year, and that will not soon stop. Discussions need to begin now regarding how and where to increase the number of Paramedics, at whose expense, and for what reason.

**Recommendation #2:** Adopt response time goals, such as:

- 1:30 minutes' call processing / dispatch
- 2:00 minutes' crew turnout
- 8:00 minutes' Paramedic squad travel (11:30 minutes total call receipt to arrival)
- 10:00 minutes' ambulance travel (13:30 minutes total call receipt to arrival)

All at 90 percent reliability.

**Recommendation #3:** Trigger Points for Added Paramedics: Adopt a Paramedic squad unit-hour utilization (UHU) saturation point policy of no more than 30 percent over eight consecutive hours. Limit simultaneous incident demand to three of five units to 25 percent of the time. Beyond either and/or both these two thresholds, added resources are needed.

**Recommendation #4:** Add Paramedic Strategies: The County needs to resolve and choose an option to reinforce 8:00-minute Paramedic travel in the growing, outer-suburban and rural areas. Methods used elsewhere include:

- Adopt slower response time measures system-wide or in light-population-density and call areas; many systems now use a 10:00 minutes or more transport travel time where first-response ALS exists (AEMT use rare).
- Adopt split response time measures for urban, suburban, and rural population densities.
- Add two Paramedic squads; this is expensive and will have low utilization until and unless severe growth occurs past the urban population density areas.

- Move outer-edge ambulances to 1+1—AEMT and Paramedic
  - The added Paramedic is lost to transport downtime.
  - This still adds more Paramedics than are clinically needed.

**Recommendation #5:** Cost Policy Strategies: Most EMS systems are not fully self-supporting on billed revenues due to federal and state payment policies. The County could increase its expense (subsidy) to add outer-area Paramedics, or until the thresholds are crossed to increase the five County squads, allow two to three of the outer-edge fire departments to add Paramedics to one or more ambulances at their local expense as a bridging solution.

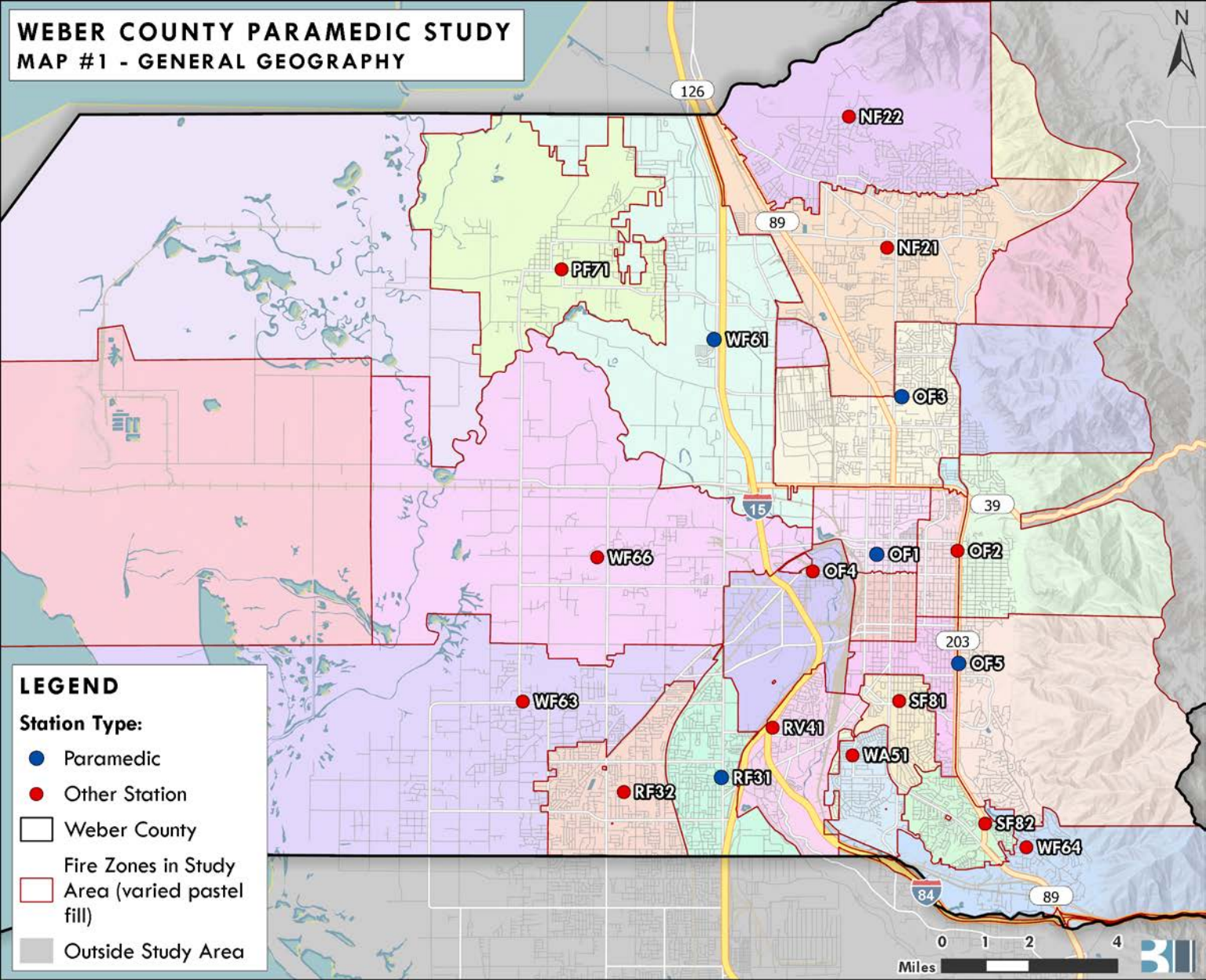
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**APPENDIX A**

**MAP ATLAS**

# WEBER COUNTY PARAMEDIC STUDY

## MAP #1 - GENERAL GEOGRAPHY



**LEGEND**

**Station Type:**

- Paramedic
- Other Station
- Weber County
- Fire Zones in Study Area (varied pastel fill)
- Outside Study Area





# WEBER COUNTY PARAMEDIC STUDY

## MAP #2 - POPULATION DENSITY



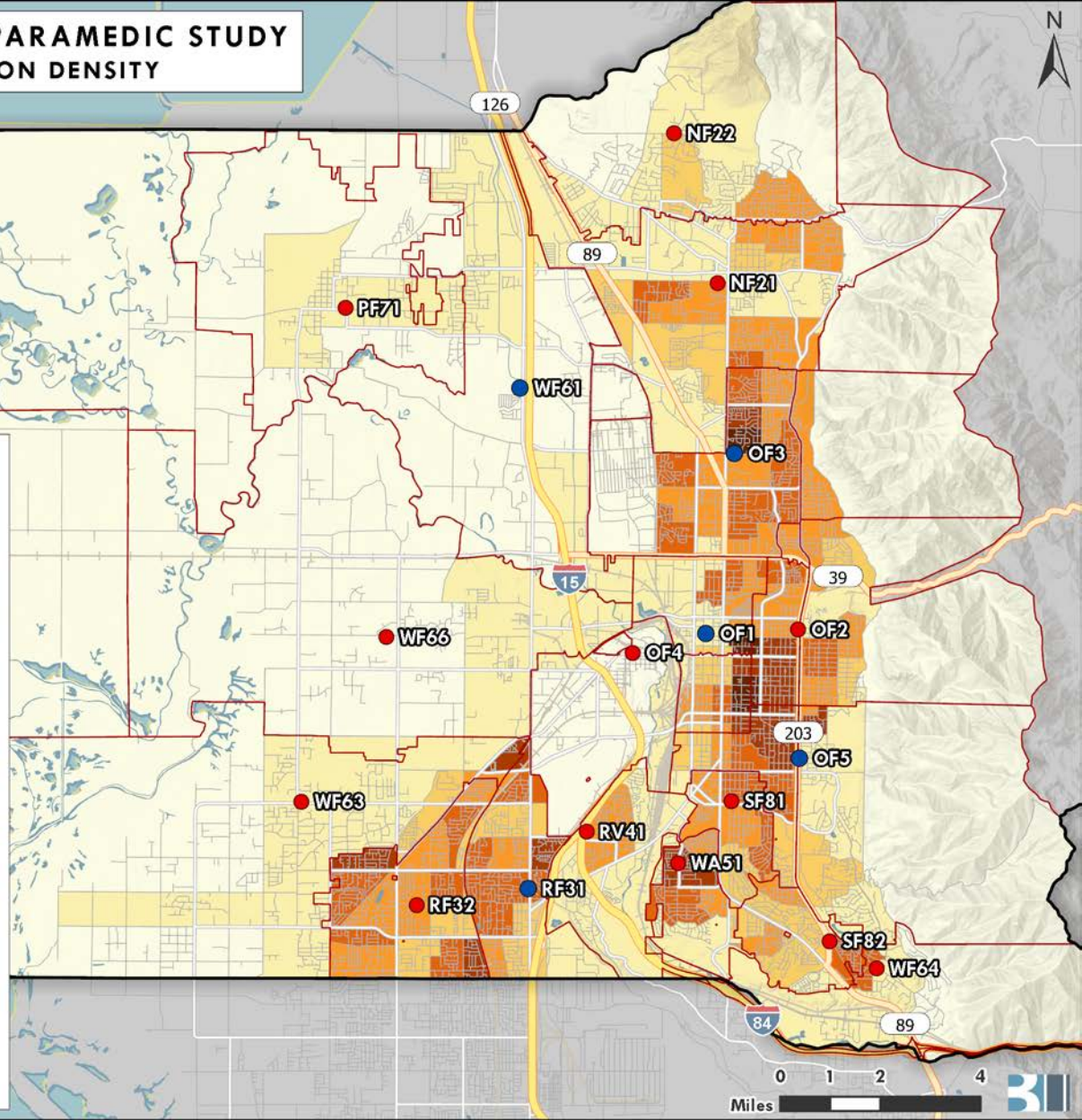
### LEGEND

Population Density (per square mile):

- 700 or Less
- 701 to 2,230
- 2,231 to 3,710
- 3,711 to 5,150
- 5,151 to 6,820
- 6,821 to 9,530
- Over 9,530

Station Type:

- Paramedic
- Other Station
- Weber County
- Fire Zones in Study Area
- Outside Study Area



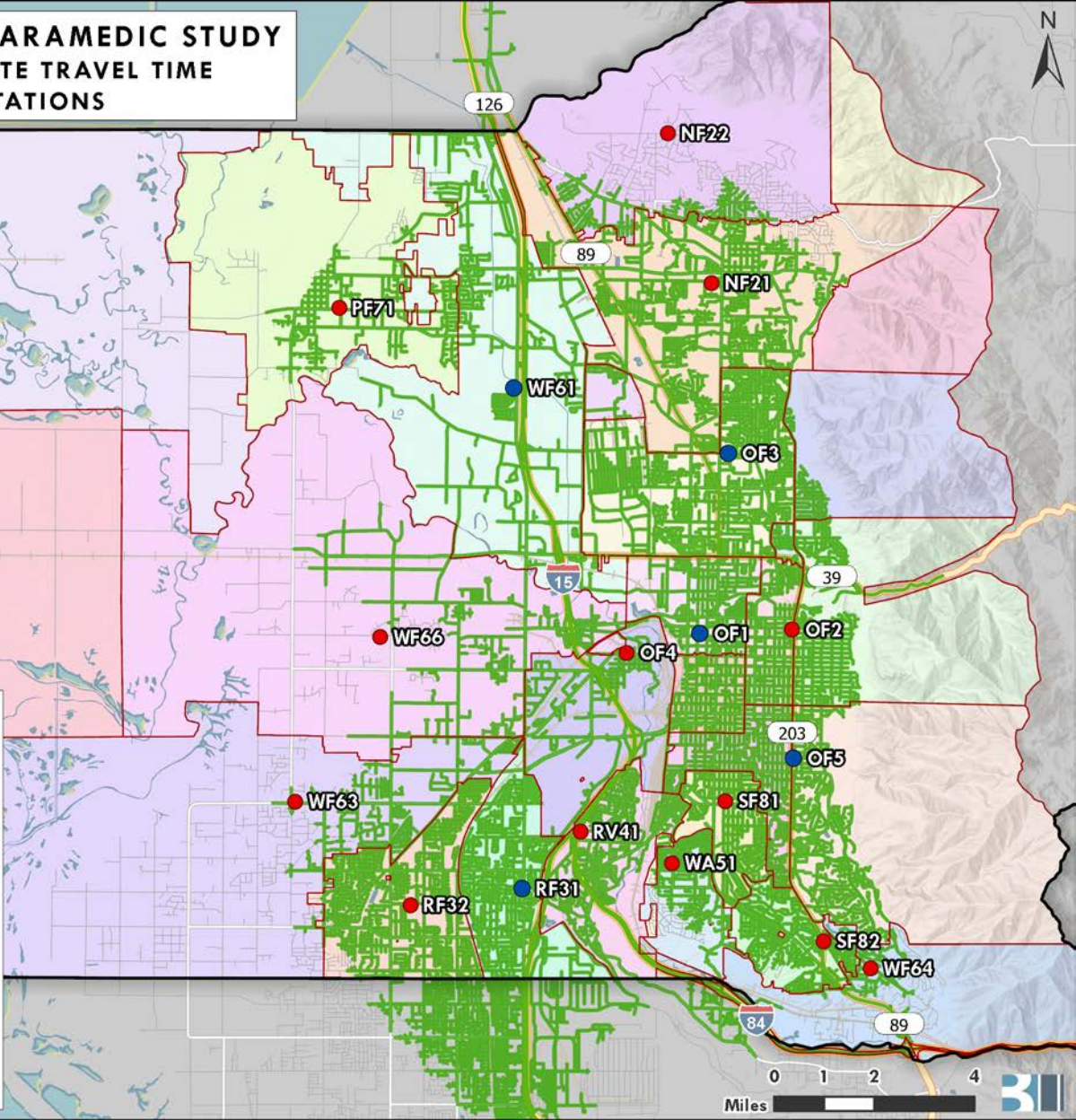


**WEBER COUNTY PARAMEDIC STUDY**  
**MAP #3 - 8:00-MINUTE TRAVEL TIME**  
**FROM PARAMEDIC STATIONS**



**LEGEND**

- 8-min Paramedic Travel Time
- Station Type:**
- Paramedic
- Other Station
- Weber County
- Fire Zones in Study Area (varied pastel fill)
- Outside Study Area





**WEBER COUNTY PARAMEDIC STUDY**  
**MAP #4 - ALL INCIDENTS - 7/1/2018 TO**  
**6/30/2022**



**LEGEND**

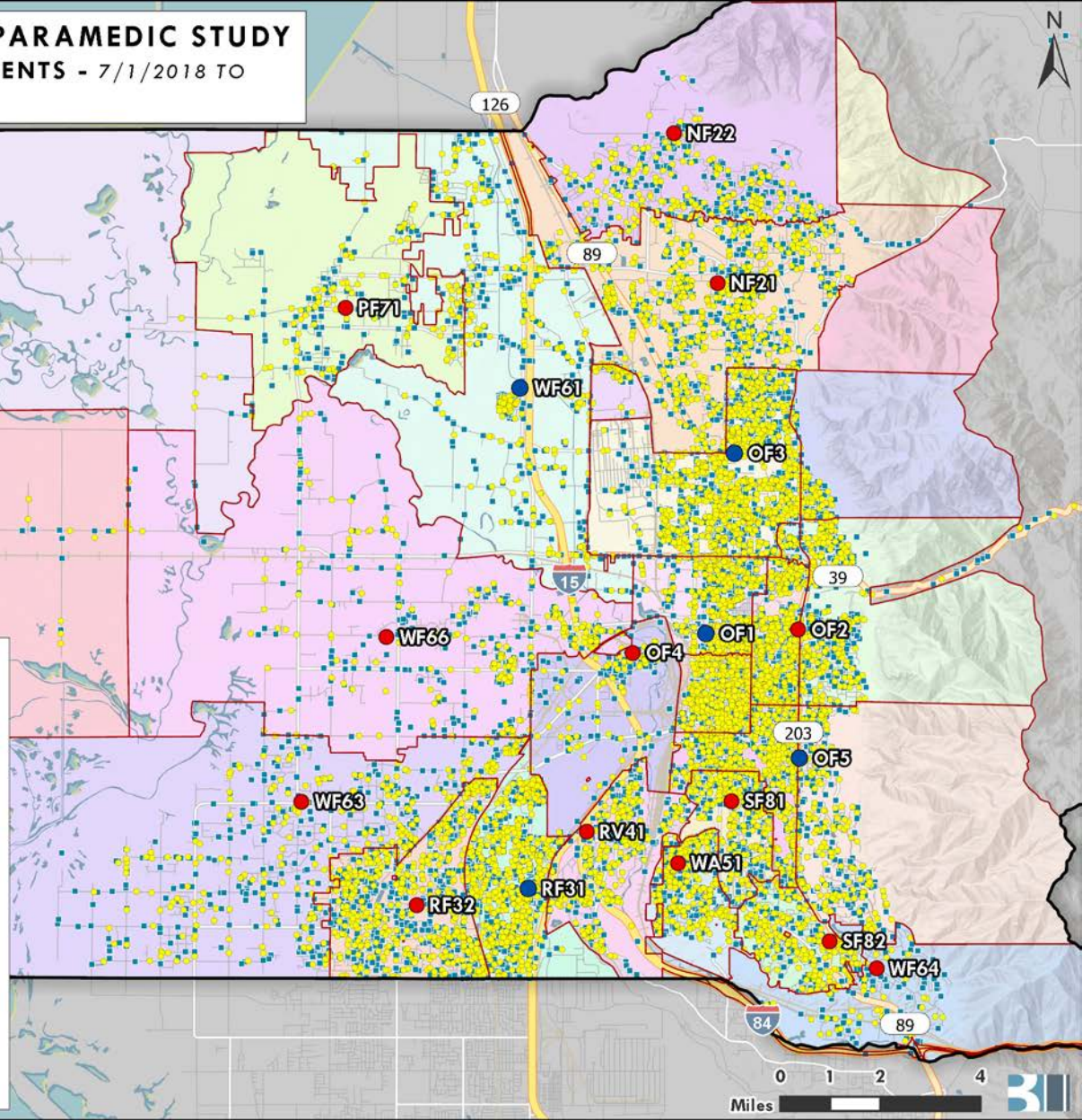
**Incident Type:**

- C
- D/E

**Station Type:**

- Paramedic
- Other Station

- Weber County
- Fire Zones in Study Area (varied pastel fill)
- Outside Study Area





# WEBER COUNTY PARAMEDIC STUDY

## MAP #5 - HOSPITAL ARRIVALS ONLY -

7/1/2018 TO 6/30/2022



### LEGEND

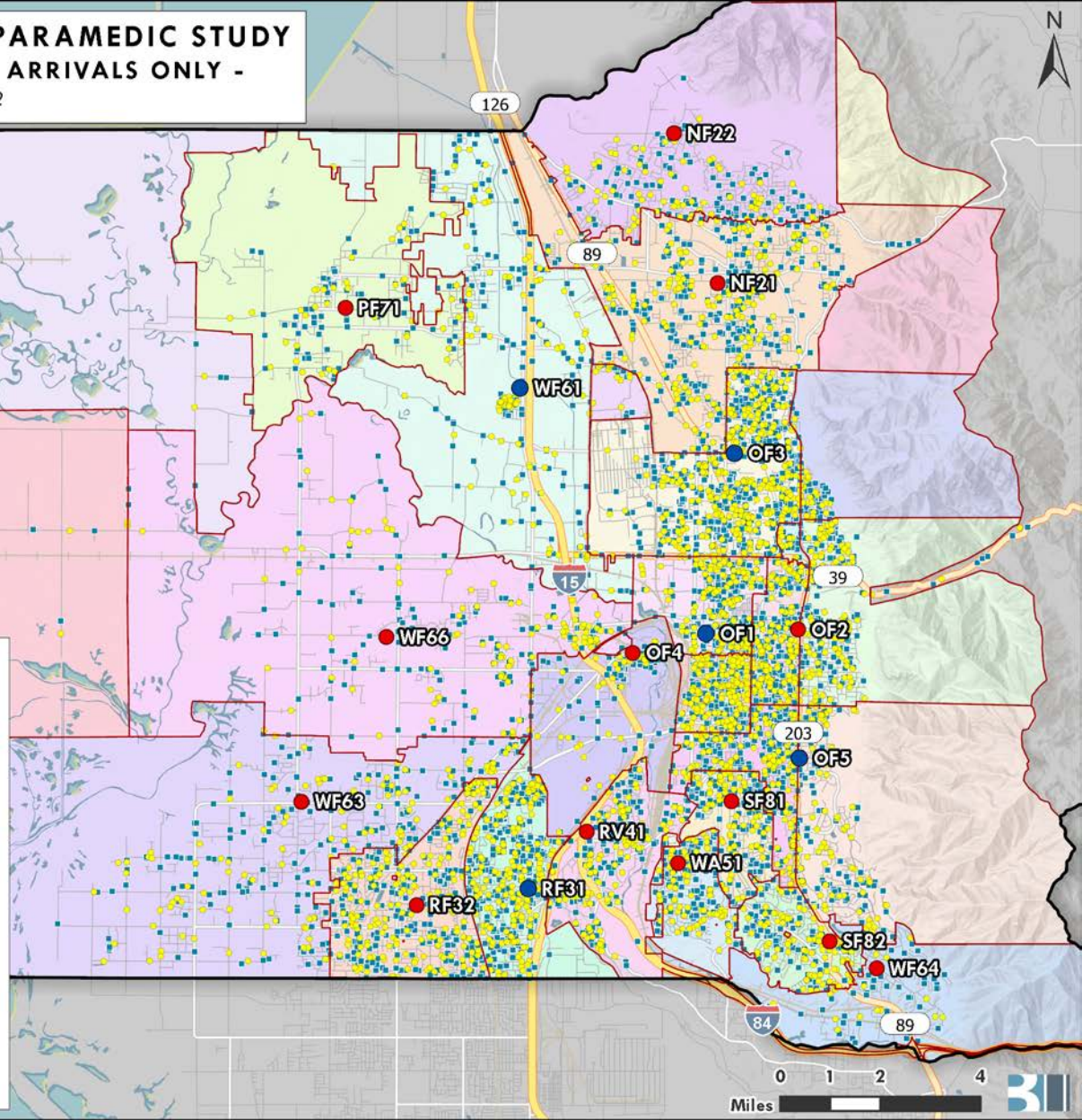
#### Incident Type:

- C
- D/E

#### Station Type:

- Paramedic
- Other Station









- Weber County
- Fire Zones in Study Area (varied pastel fill)
- Outside Study Area

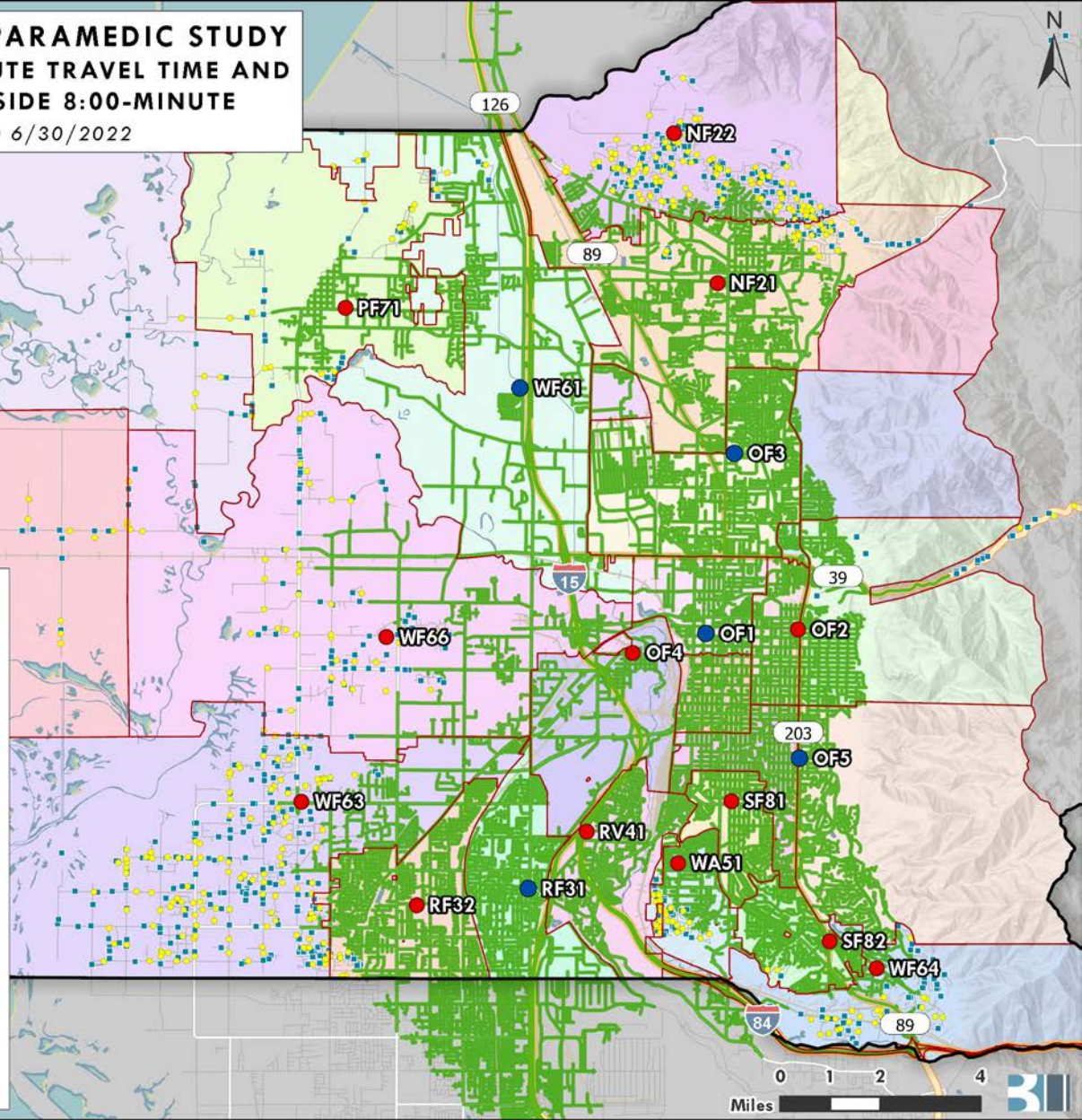




**WEBER COUNTY PARAMEDIC STUDY**  
**MAP #6 - 8:00-MINUTE TRAVEL TIME AND**  
**ALL INCIDENTS OUTSIDE 8:00-MINUTE**  
**TRAVEL - 7/1/2018 TO 6/30/2022**

**LEGEND**

-  8-min Paramedic Travel Time
- Incident Type:**
-  C
-  D/E
- Station Type:**
-  Paramedic
-  Other Station
-  Weber County
-  Fire Zones in Study Area (varied pastel fill)
-  Outside Study Area



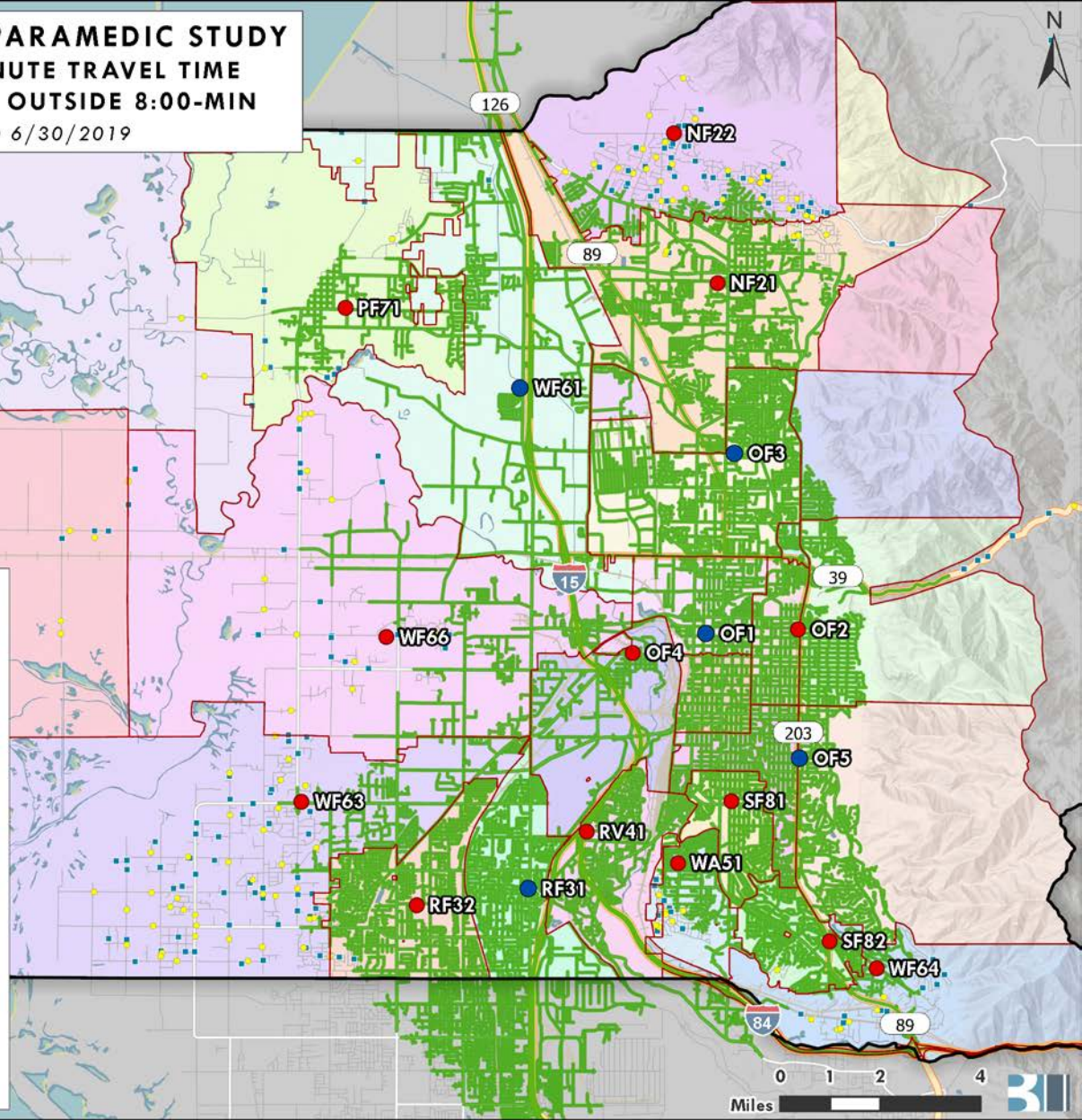


**WEBER COUNTY PARAMEDIC STUDY**  
**MAP #6A - 8:00-MINUTE TRAVEL TIME**  
**AND ALL INCIDENTS OUTSIDE 8:00-MIN**  
**TRAVEL - 7/1/2018 TO 6/30/2019**



**LEGEND**









- 8-min Paramedic Travel Time
- Incident Type:**
- C
- D/E
- Station Type:**
- Paramedic
- Other Station
- Weber County
- Fire Zones in Study Area (varied pastel fill)
- Outside Study Area

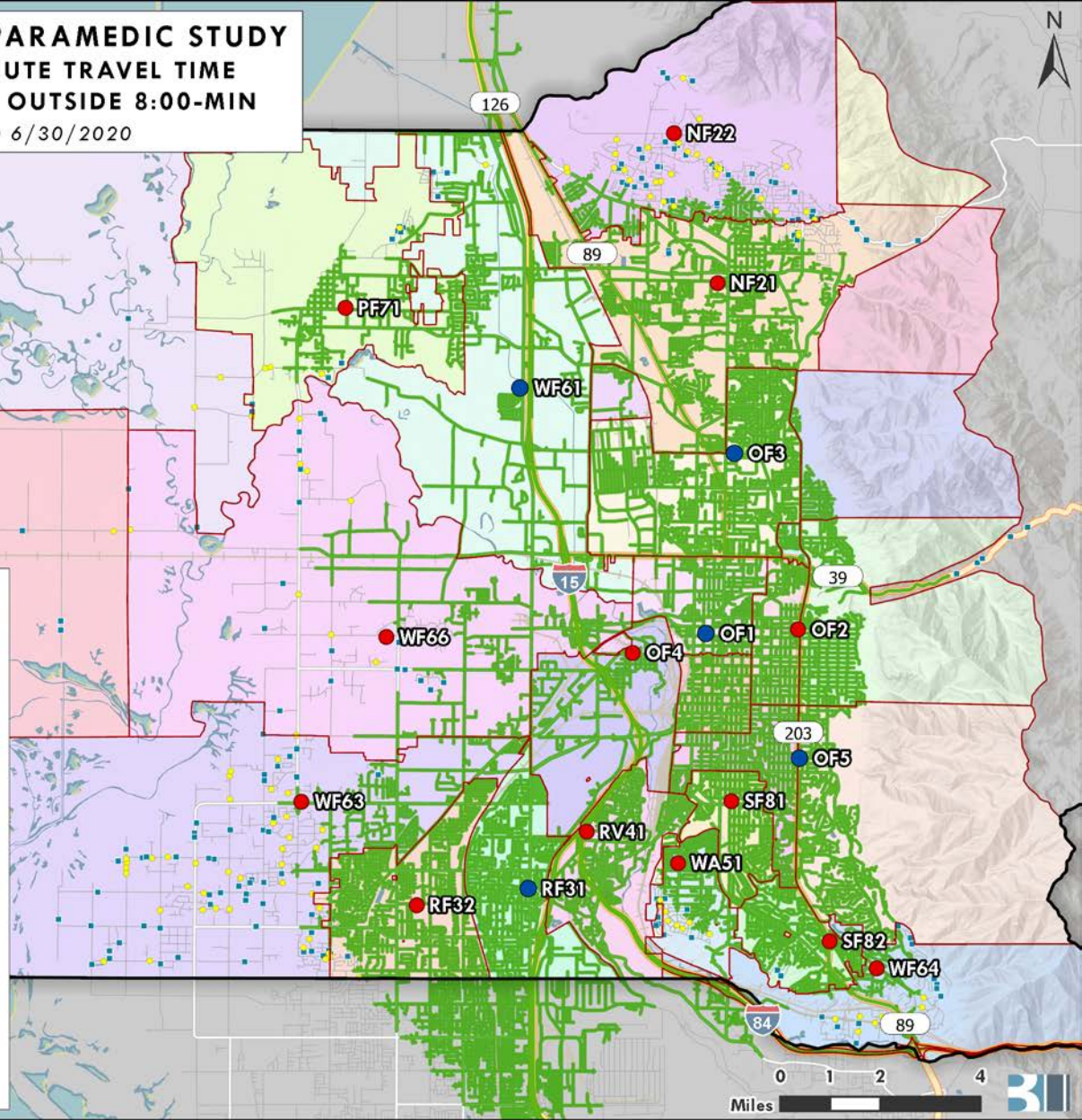




**WEBER COUNTY PARAMEDIC STUDY**  
**MAP #6B - 8:00-MINUTE TRAVEL TIME**  
**AND ALL INCIDENTS OUTSIDE 8:00-MIN**  
**TRAVEL - 7/1/2019 TO 6/30/2020**

**LEGEND**









-  8-min Paramedic Travel Time
- Incident Type:**
-  C
-  D/E
- Station Type:**
-  Paramedic
-  Other Station
-  Weber County
-  Fire Zones in Study Area (varied pastel fill)
-  Outside Study Area

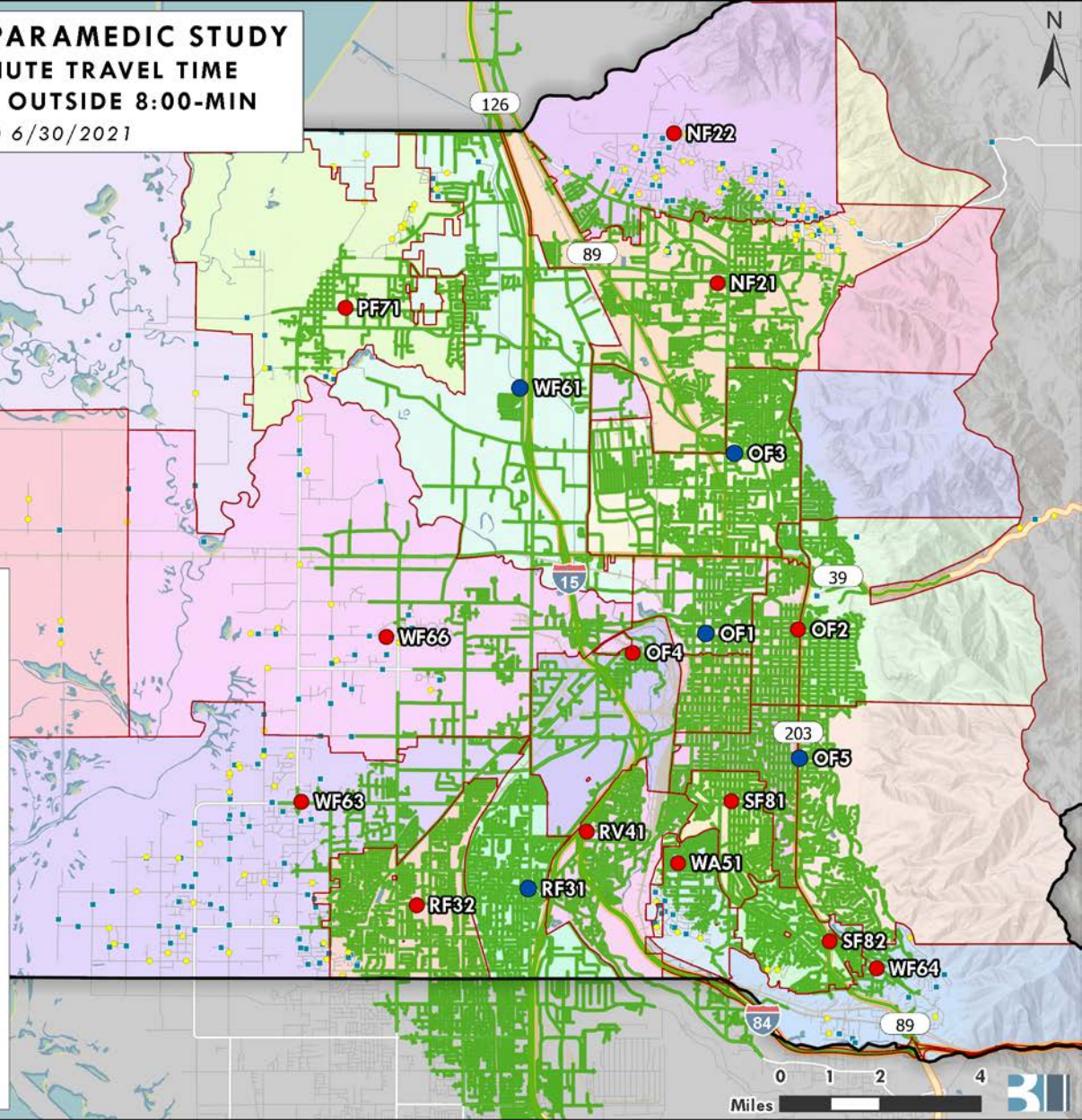




**WEBER COUNTY PARAMEDIC STUDY**  
**MAP #6C - 8:00-MINUTE TRAVEL TIME**  
**AND ALL INCIDENTS OUTSIDE 8:00-MIN**  
**TRAVEL - 7/1/2020 TO 6/30/2021**

**LEGEND**

-  8-min Paramedic Travel Time
- Incident Type:**
-  C
-  D/E
- Station Type:**
-  Paramedic
-  Other Station
-  Weber County
-  Fire Zones in Study Area (varied pastel fill)
-  Outside Study Area



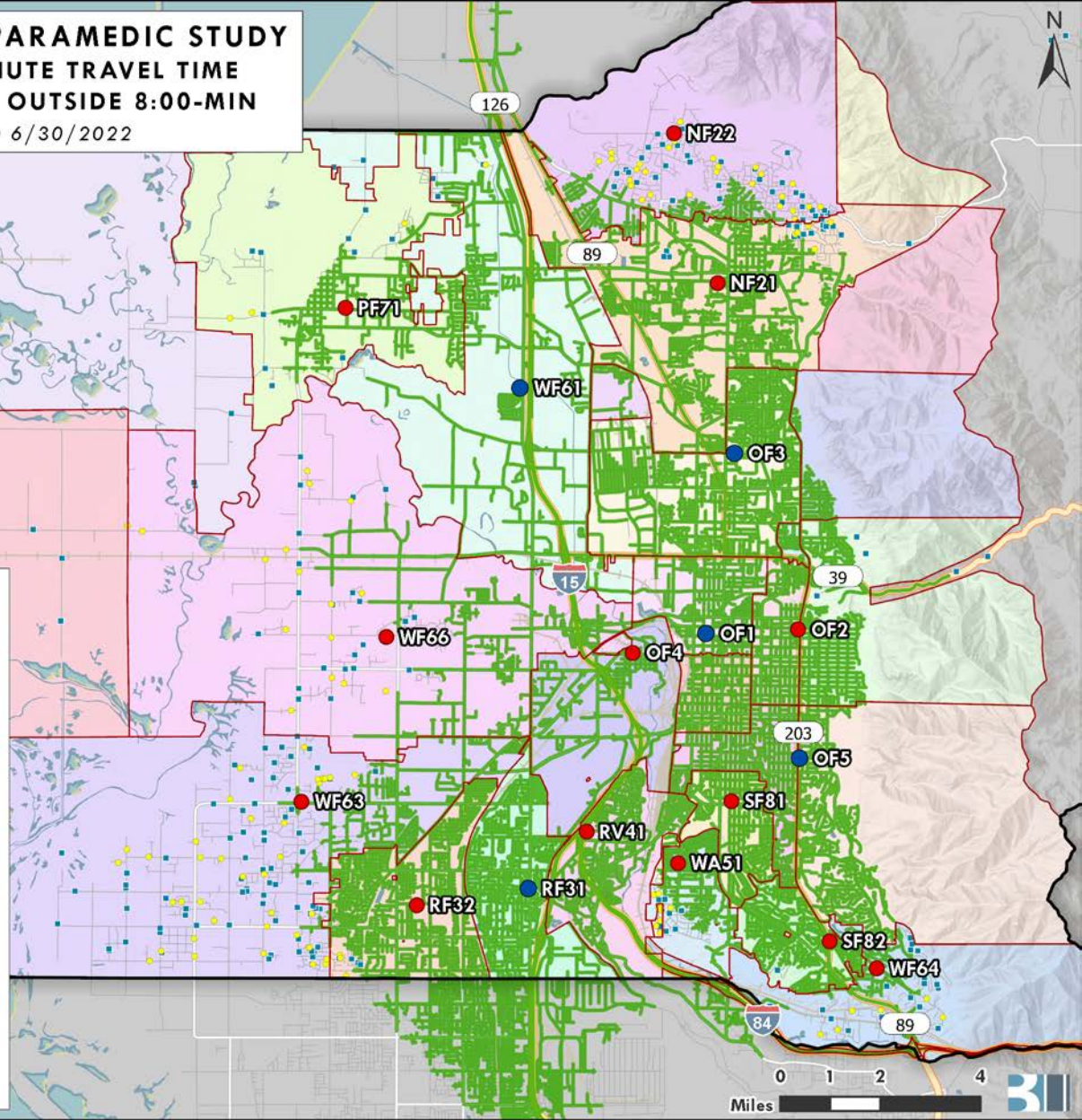


**WEBER COUNTY PARAMEDIC STUDY**  
**MAP #6D - 8:00-MINUTE TRAVEL TIME**  
**AND ALL INCIDENTS OUTSIDE 8:00-MIN**  
**TRAVEL - 7/1/2021 TO 6/30/2022**



**LEGEND**

- 8-min Paramedic Travel Time
- Incident Type:**
- C
- D/E
- Station Type:**
- Paramedic
- Other Station
- Weber County
- Fire Zones in Study Area (varied pastel fill)
- Outside Study Area





**WEBER COUNTY PARAMEDIC STUDY**  
**MAP #7 - RESPONSE ZONE BY TIME AT**  
**WHICH 90% INCIDENT RESPONSE IS**  
**REACHED - 7/1/2018 TO 6/30/2022**



**LEGEND**

**90% Incident Response Time Band:**

- Under 8:59 minutes
- 9:00-10:59 minutes
- 11:00-12:59 minutes
- 13:00-14:59 minutes

**Station Type:**

- Paramedic
- Other Station

- Weber County
- Fire Zones in Study Area (varied pastel fill)
- Outside Study Area

