M E M O R A N D U M

TO: Mayor and Council Members

FROM: Rey Arellano, Assistant City Manager

DATE: July 30, 2021

SUBJECT: Dispatch Equity and Optimization Efficiency Study Final Report

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During the FY 20 budget process, City Council approved funding for a comprehensive review of the equity and efficiency of the Austin Fire Department (AFD) and Austin-Travis County Emergency Medical Services (ATCEMS) healthcare services.

The City Manager's Office developed a scope of work with key stakeholders including leadership from AFD, ATCEMS, AFD and EMS Association Presidents, Equity Office, Office of the Chief Medical Officer (OCMO), and Travis County. After a Request for Proposal (RPF) process, Public Consulting Group Inc. (PCG) was identified as the City's contractor and on September 17, 2020, Council approved a contract for PCG to begin work. Jeff Hayes, Chief of Staff for OCMO, served as the City's project manager and ensured key stakeholders worked closely with the contractor to provide in-depth information and input so that PCG could develop a final report with recommendations for the City to enhance the equity, efficiency, and effectiveness of dispatch.

Since contract execution, PCG evaluated the City's emergency medical system and emergency response related to equity and efficacy of healthcare delivery, impact of Insurance Services Office (ISO) ratings, station locations, and the timeline for bringing on new stations. They utilized evidence-based recommendations, as well as U.S. and international industry standards to conduct a resource allocation assessment, make recommendations regarding the response of and positioning of resources and staffing, and evaluate the locations of AFD and ATCEMS stations to determine if they are located in such a manner as to equitably address demand. In addition, PCG evaluated the effectiveness of prevention community-wide initiatives among AFD and ATCEMS, as well as consistency with Austin Public Health.

During their review, PGC identified a common theme: there is a need for ***Strategic Cooperation, Coordination, Collaboration and Consolidation*.** Attachment A is PCG's Final Report that highlights findings and outlines recommendations intended to address each of the goals of this study. PCG identified a total of 41 recommendations that the City should consider in achieving the desired outcomes of improved health equity, as well as optimization of community emergency response resources.

The final report has been provided to AFD, ATCEMS and OCMO to review and determine whether each recommendation can be accomplished with existing resources or if they will require additional resources and funding to implement. This analysis process may not align with the timeline of the budget process. I will update City Council as we review and better understand next steps.

Prioritized Recommendations

Attachment A of the Report lists each recommendation along with the following information:

- Priority Level
- Implementation Timeline
- Grouping along the following categories:
    - Equity
    - Efficiency
    - Revenue Generation
    - Policy/Operations
    - Labor

Given the number of recommendations, staff will prioritize its effort on recommendations that can benefit both *equity and efficiency*, and *revenue generation*; and that are evaluated at a Priority Level of *medium or higher*. These are listed in the tables on the following page.

Recommendations benefiting equity and efficiency

#	Recommendation	Priority Level	Implementation Timeline
9	Consider conducting facilitated workshops with APH, AFD, ATCEMS and the OCMO to identify areas for cooperation, coordination, and collaboration, and in some instances, consolidation, that would increase efficiency, effectiveness, and enhance health equity community wide.	High	0 - 6 months
31	Become full partners in the Community Health Improvement Plan. The placement of Pop-Up Resource Clinics (PURC) should be coordinated with other community partners, particularly with APH and OCMO, and should consider the demographic findings of Central Health. Create a list of criteria for the placement and scheduling of PURCs, collect & share the data among partners, and leverage the PURCs to launch new collaborative pilot programs.	High	0 - 6 months
32	Commit to the Red Angels Program in a community safety-focused capacity, leaving the medical focus for ATCEMS and its CHP program. Establish key performance indicators (KPI) for the program and adopt a community-focused approach toward developing new initiatives, ensuring all are interlinked & supported by data.	Medium-High	0 - 6 months
34	Form a collaborative work group between OCMO, AFD, ATCEMS, and APH that can evaluate program data, responsibilities, and effectiveness, as well as collaborate on future community risk reduction initiatives.	Medium-High	0 - 6 months
36	Consider the implementation of fire station neighborhood/bystander CPR & bleeding control training programs, APD CPR & AED training, and the integration of a public notification tool/app platform in an effort to increase local community training and cardiac arrest response readiness.	Medium	6 - 12 months
39	Consider initiating 911 telehealth services for low acuity 911 calls utilizing the dispatch center-located Collaborative Care Communications Center (C4) as the navigation point. 911 telehealth services could be provided by the City's advanced practitioners and billed to insurance payers.	Medium	1 - 3 years

Revenue Generation Recommendations

#	Recommendation	Priority Level	Implementation Timeline
14	Revise ATCEMS's Charity Care policy and eligibility determination process to maximize ambulance supplemental payment program (ASPP) revenues.	High	By 9/30/2021
15	Consider reviewing commercial payment data regarding charges and payments by procedure code for commercial payers to ensure accurate reporting and to identify opportunities to maximize revenues.	Medium-High	6 - 12 months
16	Consider implementing significant fee schedule increases for ambulance transport services.	Medium-High	0 - 6 months
11	Consider adding healthcare system finance expertise to the ATCEMS Administration and Finance Department to generate additional revenues through partnerships and other relationships with the Austin-Travis County healthcare community.	Medium	1 - 3 years
13	Review billing practices to identify opportunities to capture revenue for both "treatment, no transport" and allowable ALS-level services.	Medium	0 - 6 months
35	OCMO should follow through with its application process(es) to obtain approval for Medicaid and Medicare billing for supplemental, on-scene services.	Medium	1 - 3 years

For additional information, about the report, please to not hesitate to contact me or Jeff Hayes (Jeff.Hayes@austintexas.gov).

cc: Spencer Cronk, City Manager
CMO Executive Team
Dr. Mark Escott, Chief Medical Officer
Chief of Staff Jeff Hayes, Office of the Chief Medical Officer
Chief Joel G. Baker, Austin Fire Chief
Interim Chief Jasper Brown, Austin-Travis County Emergency Medical Services Chief
Charles Brotherton, Travis County Executive of Emergency Services

Attachment:

A. Public Consulting Group's Final Report

Dispatch Equity & Optimization Efficiency Study

City of Austin, TX

July 2021 Final Report

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

A project of this scope and magnitude cannot be accomplished without considerable assistance from many key stakeholders whose contributions led to the information, findings, and recommendations detailed in this report. Our consulting team extends sincere appreciation to all the professionals who work hard daily and demonstrate dedication, focus, and commitment toward providing equitable response, care, and treatment to all residents and visitors of the City of Austin and Travis County.

Because of the size and complexity of this project engagement, it is not possible to acknowledge each person individually for their contributions; however, there are some key personnel who served as the driving force behind this engagement, and we wish to thank them for their vision of achieving health equity.

We want to sincerely thank Dr. Mark Escott for providing knowledge, insight, and direction to keep the PCG team focused on the City's goals and needs for this study. We would also like to thank Jeff Hayes, the City's Project Manager, for helping to coordinate and provide support throughout the life of the project.

In addition, PCG acknowledges the following departments and specific sections for their continued support and contributions:

- City of Austin, Mayor and City Council Members
- City of Austin, Office of the City Manager
- City of Austin, Office of the Chief Medical Officer
- City of Austin, Assistant City Manager for Public Safety
- City of Austin, Public Information Office
- City of Austin, Office of Finance
- City of Austin, Public Health
- City of Austin Fire Department, Office of the Chief
- City of Austin Fire Department, Command Staff: Operations and Administration
- City of Austin Fire Department, Data Collection and Management
- City of Austin Fire Department, Dispatch Management and Staff
- City of Austin Fire Department, Public Education
- City of Austin Fire Department, Public Information Office
- Austin-Travis County EMS, Office of the Chief
- Austin-Travis County EMS, Chief of Staff
- Austin-Travis County EMS, Command Staff: Operations and Administration
- Austin-Travis County EMS, Finance, Data Collection and Management
- Austin-Travis County EMS, Dispatch Management and Staff
- Austin-Travis County EMS, Public Education
- Austin-Travis County EMS, ATCEMS Employee Association President and Executive Board
- Austin-Travis County EMS, Public Information Office
- AFD Firefighters Association IAFF Local-745 President and Members
- Combined Transport Emergency Communications Center (CTECC)
- Travis County Emergency Service Districts (TCESD), Fire Chiefs and Command Staff

SECTION I: EXECUTIVE SUMMARY

Public Consulting Group LLC (PCG) is pleased to submit this final report summarizing the results of extensive research, fact finding, and analysis of the central questions posed in the Request for Proposal (RFP# 4400 EAD30100) *Dispatch Equity and Optimization Study*. The overarching and complex goals of the project were to:

- Conduct a comprehensive review of the equity and efficiency of the dispatch of emergency medical response related services of the Austin Fire Department (AFD) and Austin-Travis County Emergency Medical Services (ATCEMS) Department.
- Evaluate response times, patient treatment and health equity, and resource utilization on responses to emergency medical services.
- Produce recommendations on the locations of fire suppression and emergency medical resources, timelines, locations for new resources, and the applicability and impact of Insurance Services Office (ISO) ratings.

Project Background

The City of Austin is the 13th largest city in North America, the 11th largest city in the United States, and the 4th largest city in Texas, which is the largest state in the Continental U.S. Austin has a population of just under one million residents but, when combined with Travis County, increases to 2.2 million residents. Austin is projected to be one of the fastest growing urban areas in the U.S. over the next 20 years. Adding to the dynamics of Austin's growing population is the fact that many new residents represent a broad range of ethnicities, cultures, and languages. Austin also boasts a formidable tourism industry hosting several million visitors annually (pre COVID-19 pandemic).

Protecting and serving both residents and visitors to Austin and Travis County are two full-time, career emergency response departments: the **Austin-Travis County Emergency Medical Services Department** and the **Austin Fire Department**. The Austin Fire Department has a very rich 180-year-long history and was formed in the year of 1841. The Austin-Travis County EMS sprang into formation in August of 1966, eventually forming as a stand-alone city department in 1975. Although both AFD and ATCEMS are separate departments with separate missions, both share a common responsibility to protect and serve the residents and visitors of this thriving community.

Since October of 2020, PCG consultants have worked with representatives from both ATCEMS and AFD in addition to the Office of the Chief Medical Officer (OCMO), Austin Public Health (APH), the Office of the City Manager, and many other key stakeholder departments and organizations from the city and throughout Travis County. Over the past seven months, the PCG consulting team observed a common theme from our research efforts, and this central theme forms the basis for many of our findings and recommendations: **the need for Strategic Cooperation, Coordination, Collaboration, and Consolidation.**

Throughout the report, we highlight findings and recommendations designed to address each of the many goals of this study based on the theme of improving cooperation, coordination, collaboration, and consolidation of some programs. The team **identified a total of 41 recommendations** that the City should consider in achieving the desired outcomes of improved health equity, as well as the optimization of dispatching community emergency response resources. The following page lists the recommendations, each of which can be found in clearly marked text boxes throughout the report in corresponding sections. **A matrix organizing these recommendations by category type, priority, and implementation timeline is available in Appendix A.**

Summary of Recommendations:

- **Recommendation 1:** The City should consider establishing the position of Public Safety Director to oversee AFD and ATCEMS.
- **Recommendation 2:** The City should consider having the Chief Medical Officer (CMO) report directly to the City Manager.
- **Recommendation 3:** OCMO and ATCEMS should consider revising the Performance Improvement (PI) program to address clinical care concerns.
- **Recommendation 4:** Consider adding an EMS research function to the OCMO to analyze EMS system data to form evidence-based decisions.
- **Recommendation 5:** Consider adding healthcare finance system expertise to the OCMO to develop revenue strategies related to the provision of expanded physician care and services and ATCEMS advanced care providers.
- **Recommendation 6:** Consider assigning a Health Equity staff member to OCMO to ensure that health equity is achieved in the most vulnerable neighborhoods.
- **Recommendation 7:** AFD should reassess its role and support of EMS delivery from an administrative and operational perspective based on the historical staffing and administrative support of EMS.
- **Recommendation 8:** ATCEMS and OCMO should consider further collaboration to develop a list of routine and ad hoc reports to be provided to OCMO on a regular and at on-request basis.
- **Recommendation 9:** Consider conducting facilitated workshops with APH, AFD, ATCEMS and the OCMO to identify areas for cooperation, coordination, and collaboration, and in some instances, consolidation, that would increase efficiency, effectiveness, and enhance health equity community wide.
- **Recommendation 10:** The OCMO and ATCEMS should obtain the reports and documents produced by APH, Central Health, CommUnityCare, and others to review and analyze for opportunities for CHP focus and deployment.
- **Recommendation 11:** Consider adding healthcare system finance expertise to the ATCEMS Administration and Finance Department to generate additional revenues through partnerships and other relationships with the Austin-Travis County healthcare community.
- **Recommendations 12:** Coordinate data collection and data analysis across APH, AFD, ATCEMS and the OCMO to develop outcome data to be used in EMS delivery decision making.
- **Recommendation 13:** Review billing practices to identify opportunities to capture revenue for both "treatment, no transport" and allowable ALS-level services.
- **Recommendation 14:** Revise ATCEMS's Charity Care policy and eligibility determination process to maximize ambulance supplemental payment program (ASPP) revenues.
- **Recommendation 15:** Consider reviewing commercial payment data regarding charges and payments by procedure code for commercial payors to ensure accurate reporting and to identify opportunities to maximize revenues.
- **Recommendation 16:** Consider implementing significant fee schedule increases for ambulance transport services.
- **Recommendation 17:** AFD should consider the implementation of a cost-recovery program to offset operational costs.
- **Recommendation 18:** AFD and ATCEMS should consider implementing a first-responder fee (FRF) for services provided to non-city of Austin and non-Travis County residents.

- **Recommendation 19:** ATCEMS should consider implementing an ambulance membership program to generate additional revenues and reduce the out-of-pocket expense to Austin-Travis County residents.
- **Recommendation 20:** In collaboration with the labor organizations, consider exploring an alternate staffing model for AFD dispatch that incorporates civilian call takers supervised by sworn, uniformed fire officers.
- **Recommendation 21:** Consider cross-training AFD Dispatch personnel in the medical priority dispatch system (MPDS) to provide back-up capacity to the ATCEMS dispatch center.
- **Recommendation 22:** ATCEMS should consider exploring an alternate staffing model that incorporates civilian call takers supervised by sworn uniformed EMS officers.
- **Recommendation 23:** Consider consolidating fire and EMS dispatch operations as part of the creation of a new Emergency Communications Department employing civilian telecommunicators integrated with sworn AFD and ATCEMS personnel.
- **Recommendation 24:** Develop outcome metrics related to response time performance and patient outcomes.
- **Recommendation 25:** Consider renumbering ATCEMS stations and units in the City of Austin to match the co-located AFD Station.
- **Recommendation 26:** ATCEMS should reevaluate support for special operations teams such as technical rescue, urban search and rescue, and swift/flood water rescue as these functions fall under the operational purview of AFD and other local fire departments; instead, dedicate trained personnel in a supplemental role to the other established programs.
- **Recommendation 27:** ATCEMS should consider reevaluating its current processes for determining optimal deployment of demand units to areas of the City and throughout Travis County that maximize UHUs and relieve demand stress on busier units.
- **Recommendation 28:** Consider implementing strategies to convert some of the high-UHU Medic units into split 12-hour Demand Medic units.
- **Recommendation 29:** Evaluate daily productivity and workflow of ATCEMS's Community Health Paramedicine Program to determine if improvements can be made related to effectiveness and efficiency.
- **Recommendation 30:** Consider a partnership or staff additions of social workers, pharmacist consultants, dieticians, and/or case managers for ATCEMS's CHP program in an effort to broaden the program's capabilities, as well as potentially open future revenue streams through additional billing opportunities.
- **Recommendation 31:** Become full partners in the Community Health Improvement Plan. The placement of Pop-Up Resource Clinics (PURC) should be coordinated with other community partners, particularly with APH and OCMO, and should consider the demographic findings of Central Health. Create a list of criteria for the placement and scheduling of PURCs, collect and share the data among partners, and leverage the PURCs to launch new collaborative pilot programs.
- **Recommendation 32:** Commit to the Red Angels Program in a community safety-focused capacity, leaving the medical focus for ATCEMS and its CHP program. Establish key performance indicators (KPI) for the program and adopt a community-focused approach toward developing new initiatives, ensuring all are interlinked and supported by data.
- **Recommendation 33:** Consider incorporating an electronic/survey-based assessment into pre-appointment options for each encounter and potentially expand visits to virtually via tele-visit platform (which may increase the number of encounters/visits that can be performed, while reducing the travel and operational demands of each encounter).

- **Recommendation 34:** Form a collaborative work group between OCMO, AFD, ATCEMS, and APH that can evaluate program data, responsibilities, and effectiveness, as well as collaborate on future community risk reduction initiatives.
- **Recommendation 35:** OCMO should follow through with its application process(es) to obtain approval for Medicaid and Medicare billing for supplemental, on-scene services.
- **Recommendation 36:** Consider the implementation of fire station neighborhood/bystander CPR and bleeding control training programs, APD CPR and AED training, and the integration of a public notification tool/app platform in an effort to increase local community training and cardiac arrest response readiness.
- **Recommendation 37:** Consider addressing the social determinants of health (SDOH) using Central Health data to guide the development of the CHP program.
- **Recommendation 38:** Consider using one standardized telehealth platform to integrate and expand telehealth services in the ATCEMS dispatch center and with MIH/CP programs.
- **Recommendation 39:** Consider initiating 911 telehealth services for low acuity 911 calls utilizing the dispatch center-located Collaborative Care Communications Center (C4) as the navigation point. 911 telehealth services could be provided by the City's advanced practitioners and billed to insurance payors.
- **Recommendation 40:** Using data analysis, identify "hot spot" areas by zip code that would see the greatest enhancements in healthcare and social services.
- **Recommendation 41:** Consider implementing a tiered deployment model that includes a BLS response component based on the EMD determinant.

SECTION II: METHODOLOGY

The City of Austin issued Request for Proposal (RFP) 4400 EAD3010, *Dispatch Equity and Optimization Study*, on April 13, 2020, and in the Fall of 2020, Public Consulting Group LLC (PCG) was selected to conduct the scope of work. To begin, a contract kick-off meeting was held on October 2, 2020 to introduce staff and team roles, provide an overview of project goals and background information, and discuss schedule of work and milestones. PCG staff included six fire and EMS subject matter experts and additional support from six team members with expertise in EMS finances, data analysis, and project management.

Approach to the Scope of Work

The study targeted three primary areas identified in the RFP, including dispatch and emergency response evaluation, resource allocation assessment, and prevention initiative evaluation. A fourth core component of the RFP focused on outcomes: achieving equitable health outcomes, improving efficiencies and effectiveness of operations, and identifying opportunities to reduce costs and increase revenue. The PCG team kept this focus on outcomes at the center of the analysis and evaluation of each primary area.

To address the comprehensive scope of work, the PCG team interviewed City staff and collected relevant data from the following City departments responsible for EMS delivery as well as other key organizations and stakeholders outside of the City with insight into the focus areas for this study:

- City of Austin, Office of the City Manager
- City of Austin, Office of the Chief Medical Officer
- City of Austin, Equity Office
- City of Austin Fire Department (AFD)
- Austin-Travis County Emergency Medical Services (ATCEMS)
- City of Austin, Public Health
- Combined Transportation and Emergency Communications Center (CTECC)
- Austin Firefighters Association – IAFF Local 975
- Austin Emergency Medical Services Association
- Travis County Emergency Services Districts
- Central Health
- CommUnityCare Health Centers

The PCG team conducted most interviews between November of 2020 and January of 2021. Due to COVID-19 health and safety concerns, all meetings were conducted remotely. The team approached the interviews, data collection, and analysis with an unbiased and open mindset to obtain an accurate perspective of the City's fire, EMS, and public health operations and services, challenges, and opportunities.

Although a comprehensive financial review was not part of the scope of work, the PCG team did conduct a high-level review of the EMS (ATCEMS), fire (AFD), and public health (APH) budgets to understand the City's costs and identify opportunities for revenue maximization.

Dispatch and Emergency Response Evaluation

The PCG team members worked with AFD and ATCEMS to evaluate the City's emergency medical response and dispatch operations. To understand the City's emergency medical response, the team analyzed computer-aided dispatch (CAD) data, response time maps, policies and procedures, as well as reviewed *Optima Predict* scenarios. *Optima Predict* is a software program that applies powerful, discrete event simulation using historical data, allowing you to determine optimal resource and facility locations as

well as understand the financial impact of operational decisions. Project team members also reviewed applicable standards, including those from the National Fire Protection Association (NFPA), Insurance Services Office (ISO), the International Academies of Emergency Dispatch (IAED), and the Commission on Accreditation of Ambulance Services (CAAS), to benchmark the City's performance. The dispatch evaluation included interviews with CTECC, AFD, and ATCEMS dispatch staff, as well as representatives from the surrounding Emergency Service Districts (ESDs) that are dispatched by AFD and ATCEMS.

Resource Allocation Assessment

The PCG team worked with staff members from AFD and ATCEMS, from both labor and management, to understand resource deployment methodologies. Our team of subject matter experts (SMEs) conducted a thorough analysis of the information provided and benchmarked resource deployment with national standards such as NFPA and ISO criteria for AFD and CAAS and IAED standards for ATCEMS. Our analysis included not only physical resources such as fire apparatus and ambulance units but also personnel staffing response resources as well.

Evaluation of Prevention Initiatives

As part of the evaluation of prevention initiatives, the PCG team reviewed data and interviewed staff from ATCEMS, AFD, and APH to assess program effectiveness, efficiency, and outcomes. The project team also examined ways to restructure or modify existing programs to achieve optimization for delivery of critical services to the underserved communities within the City of Austin and Travis County.

Research and Best Practices

The PCG team reviewed literature and reference documents, relied on industry best practices, and conferred with other experts as necessary for all areas of this report. The project team conducted a literature review and researched best practices for delivery of emergency medical services and achieving health equity at the national and international levels. Model programs and agency practices that could be used as a basis for recommendations were identified by the project team. Research included distinguishing like-departments and collecting data for benchmarking based on national standards and industry best practices. The PCG team also researched alternative funding options and provided recommendations on ways for departments to maximize revenue options. The reference materials and best practice resources are included in the bibliography found in Appendix B.

Public Input Survey

With help from the Office of the Chief Medical Officer and the Office of Equity, PCG drafted a survey to ask City of Austin/Travis County residents about their experience and expectations of the City's emergency medical services response. The goal of the survey was to understand the public's expectations for response times, gage the public's opinion on the quality of services provided, and collect feedback for improvement. The survey was translated to Spanish, Vietnamese, Traditional Chinese, and Simplified Chinese. It launched on April 21, 2021 and closed on May 3, 2021. More information about the approach and survey implementation is found in Section VII: Dispatch Evaluation. A copy of the survey and its results are available in Appendix E.

ATCEMS/AFD Communications Center Staff Survey

PGC, in cooperation with both labor and management from AFD and ATCEMS, developed a voluntary and anonymous opinion survey to assess how employees working in the respective dispatch centers felt about their working conditions, work environment, work schedule, level of support, and training. The survey was conducted between April 16, 2021 and May 2, 2021. The survey also provided employees an opportunity to offer open comments regarding the dispatch centers. Between the two dispatch centers (one for AFD and one for ATCEMS), there are a total of 80 employees excluding section managers/chief officers. The PCG project team received a total of 36 responses reflecting 45% of the total workforce. This achieved statistical relevance for the survey and, as such, PCG has published the results in Section VII: Dispatch Evaluation. All comments provided by the employees are included in Appendix D along with a copy of the survey.

Study Limitations

PCG and the other team members involved in this study experienced several limitations. The team could not be onsite with many of the study participants, subject matter experts, officials, or other stakeholders. Barriers included the COVID-19 pandemic (both pre- and post-vaccine availability), lack of data availability, and limitations to public engagement. However, the project team and all individuals involved in conducting this study made strong efforts to overcome limitations by extensively using web conferencing, public surveys, additional experts, and journalistic research techniques to find sources of needed data.

Being onsite allows the consultants to assess an agency's operations and the culture by observing the state of facilities, apparatus, equipment, and the general attitude of employees towards their work and employer. PCG will usually ride-along with fire and EMS crews to get a sense of patient care and the working relationship between the first responder agency and the ambulance transport provider. Although we were not able to make observations onsite, the PCG team was able to get a good sense of the culture of AFD and ATCEMS.

SECTION III: BACKGROUND

Introduction

In issuing the request for proposal (RFP), the City of Austin set out to tackle several key questions and challenges related to dispatch centers and the emergency medical services (EMS) response provided by the Austin Fire Department and Austin-Travis County EMS:

- Is the quality and efficiency of EMS response equitable across the City?
- What can the City do to dispatch emergency medical resources effectively and efficiently?
- Is the current allocation of resources and staffing adequate to meet demand and improve health care equity and patient outcomes?
- How can the City reduce redundancies and improve the impact and efficacy of community-wide prevention initiatives implemented by City departments responsible for EMS delivery (AFD, ATCEMS, and APH)?
- How can the City positively impact equitable health outcomes across the community, promote efficiency and effectiveness of emergency medical service delivery, facilitate compliance with national standards, incorporate best practices, identify opportunities for maximizing revenue, reduce costs, and plan for future growth?

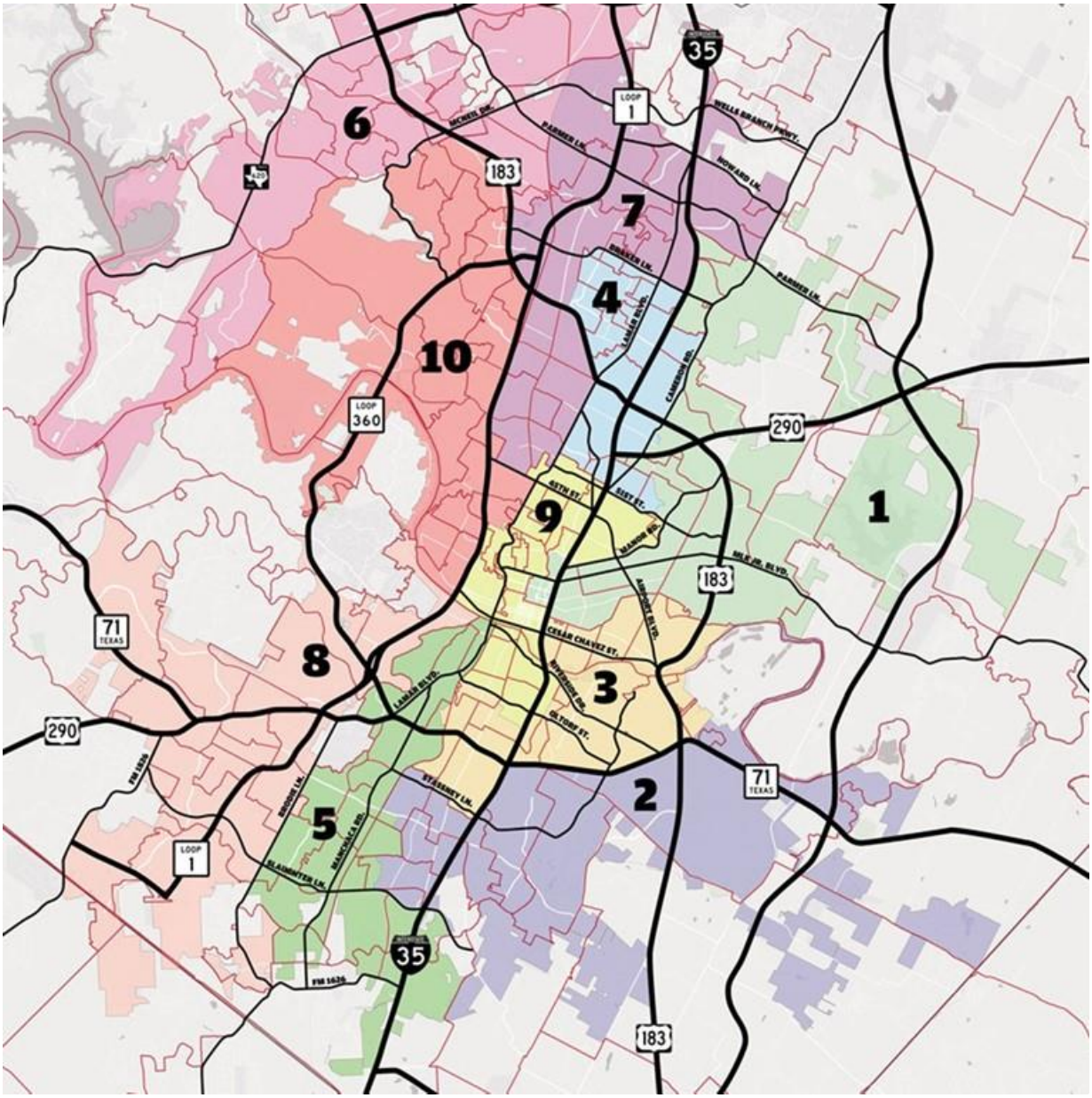
To fully understand the context for this study, it is important to examine the historic, geographic, demographic, and political factors at play. Austin is one of the fastest growing cities in the U.S., yet historically disenfranchised communities and people of color continue to be excluded or marginalized as they experience increasing economic inequality. In 2016, the City created an Equity Office to provide leadership and advance equity in the operations of City departments by providing guidance and access to funding. Juxtaposed against the City's fast-paced population growth (resulting in increased demand for emergency medical services), is a dramatic decrease in tax revenues due to COVID-19 measures as well as revenue constraints imposed by Senate Bill 2, which caps the yearly property tax increases at 3.5%. Given the current and future conditions, identifying opportunities to improve efficiency, effectiveness, enhance revenue, reduce costs, and achieve equitable health outcomes is critical to ensure the sustainability of emergency medical services and to promote the systemic change that will reduce health disparities in the community.

Geography

Austin is the capital city of Texas and the county seat of Travis County, with portions extending into Hays and Williamson counties. Located in the greater Texas Hill Country, Austin is home to lakes, rivers, and waterways, including the Colorado River, Lady Bird Lake, Lake Travis, Barton Springs, McKinney Falls, and Lake Walter E. Long. The city straddles the Balcones Fault, with flat prairies to the east and hills to the west encompassing a total of 326.22 square miles.

The city of Austin is surrounded by four major freeways: Interstate 35 (I-35) to the east, Mopac Expressway (Loop 1) to the west, U.S. Highway 183, which runs northwest to southeast, and Texas Highway 71, which crosses the southern part of the City from east to west. U.S. Highway 290 passes through the city by merging into I-35, becoming part of Highway 71, and then eventually splitting back out into U.S. 290. Several other highways and toll roads near the city are designed to ease traffic congestion. ***Figure 1*** shows a map of the city of Austin that depicts the city council districts, which are identified by number, as well as the highways that intersect the city.

Figure 1: Map of the City of Austin[1]



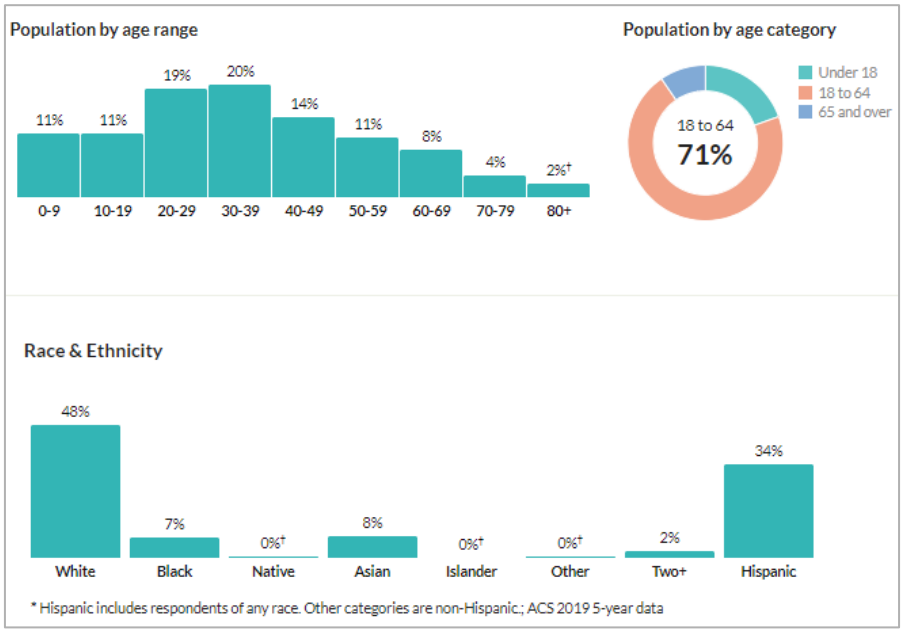
Demographics

The Austin-Round Rock-San Marcos (or Greater Austin) area is a five-county region in Central Texas and is the 29th largest metropolitan area in the nation with more than 2.2 million residents. The U.S. Office of Management and Budget defines the five counties that make up the Greater Austin region as Bastrop, Caldwell, Hays, Travis, and Williamson counties. Other counties are included depending on which governmental agency is reporting. Greater Austin has the 16th largest Gross Domestic Product (GDP) per capita as of the 2019 U.S. Census estimate. The city of Austin is the 11th largest city in the country and the fourth-largest city in Texas. Austin's five largest suburbs are Round Rock, Cedar Park, Georgetown, San Marcos, and Pflugerville.

[1] City of Austin Official Website. (n.d.). *Council District Map.* https://www.austintexas.gov/GIS/CouncilDistrictMap/

Forecasts released by the City of Austin estimate the city's population at 1,026,833 residents. ***Figure 2*** shows data visualizations produced by the Census Reporter using 2019 five-year data from the U.S. Census Bureau's American Community Survey (ACS).

Figure 2: City of Austin Demographics



The list of top ten demographic trends, according to the City of Austin official website, demonstrates the city's complicated history of geographic racial concentrations and its future trajectory. While Austin is a majority-minority city, its rate of racial diversification has slowed due to rising housing costs. These increasing costs have increased the White population of the urban core and negatively impacted the city's communities of color and vulnerable households. The city's Black population continues to decline while the growth of the Hispanic population increases and could come close to equaling the City's White population in the next 25 years. Likewise, the Asian population is doubling every 10 years and is expected to surpass the city's Black population in the next decade.

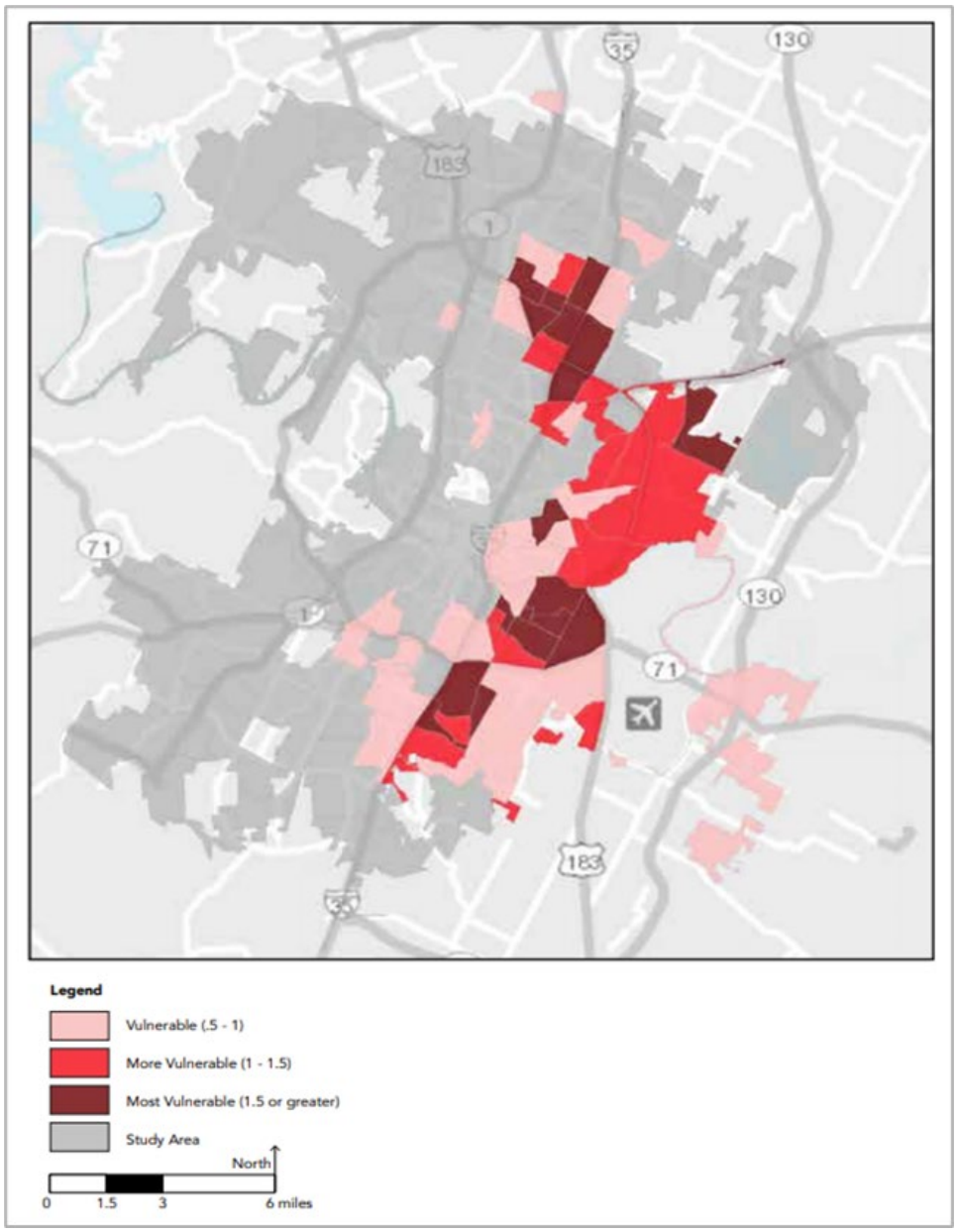
As the Greater Austin area continues to grow, poverty remains an issue for the region. According to the 2020 Demographic Report issued by Central Health, there were at least an estimated 8% of families living in poverty in Travis County, with 14% of households living at or below 200% of the federal poverty level (FPL)[2]. The report also identifies the following highlights that provide relevant context for our analysis with regards to demands for medical services, EMS response, and prevention initiatives:

- Concentrations of poverty remain highest in Austin along the I-35 corridor.
- While poverty numbers remain highest along the I-35 corridor, they are also increasing regionally, particularly in areas adjacent to Travis County.
- Low-income communities in Austin and northwest Travis County report low rates of household vehicle access, with more than one out of every ten households lacking access to a vehicle.
- Areas with high poverty rates also report low rates of employer-based insurance coverage.
- The burden of disease is significantly high in east central Austin and Leander/Jonestown across nearly every chronic condition.

[2] Central Health. (2020, September 4). *2020 Demographic Report.* https://www.centralhealth.net/our-work/2020-demographic-report/

A report commissioned by the City of Austin and conducted by the University of Texas titled *Uprooted: Residential Displacement in Austin's Gentrifying Neighborhoods and What Can Be Done About It*, sheds light into the city's most vulnerable communities who have been impacted by the steep rise in housing costs, most notably in the eastern parts of the city called "the eastern crescent."[3] As shown in ***Figure 3***, this refers to an area shaped like a crescent, or backward "C" that runs north of downtown Austin, outside U.S. Highway 183, following the highway southeast and then due south before bending to the southwest and ending south of downtown. Areas with the largest number of disadvantaged populations are in "the eastern crescent" area and are more likely to have limited access to economic resources and greater health and socioeconomic disparities.

Figure 3: Most Vulnerable Census Tracts (2016) Austin, Texas



[3] Way, H., Mueller, E., Wagmann, J., Hua, A., Adams, A., Armstrong, N., Martin, B., Radke, A., Woods, A., Loney, L., and Byther, K. (2018). *Residential Displacement in Austin's Gentrifying Neighborhoods and What Can Be Done About It.* The Uprooted Project. https://sites.utexas.edu/gentrificationproject/files/2019/09/UTGentrification-FullReport.pdf

The Digital Divide

Access to computers and the internet can impact the delivery of services according to a study published by the Metropolitan Policy Program at the Brookings Institute. The study states that telehealth "is a clear example of how broadband can directly improve health outcomes, especially for those without access to traditional health facilities…With the expanding range of telehealth technologies and a broadband connection, providers can increasingly fill these service gaps, and patients can connect with doctors, manage chronic conditions, and even get prescriptions from home."[4]

When individuals do not have this access, the results of inequity are stark, as demonstrated in this report. While technology companies have been a driving part of Austin's growth over the last several years, internet access continues to be a barrier to people in poverty, thus compounding inequity. A 2018 Digital Inclusion Survey conducted by the University of Texas at Austin's Technology and Information Policy Institute showed that access to the internet is much lower in the eastern-most regions of the city.[5]

Advancing Equitable Health Outcomes

Inequity in the City of Austin has deep roots and can be seen in urban planning as early as 1928. Current affordability challenges have continued to displace communities of color and other marginalized populations. Achieving equity involves the evaluation of, and transformation for, all aspects of a community. Research shows greater health disparities among people of color who are impacted by community-wide problems that contribute to health inequities and are more likely to suffer from chronic conditions such as heart disease, diabetes, and hypertension. For these individuals, rapid access to emergency medical services is key in achieving positive health outcomes.

Future Growth

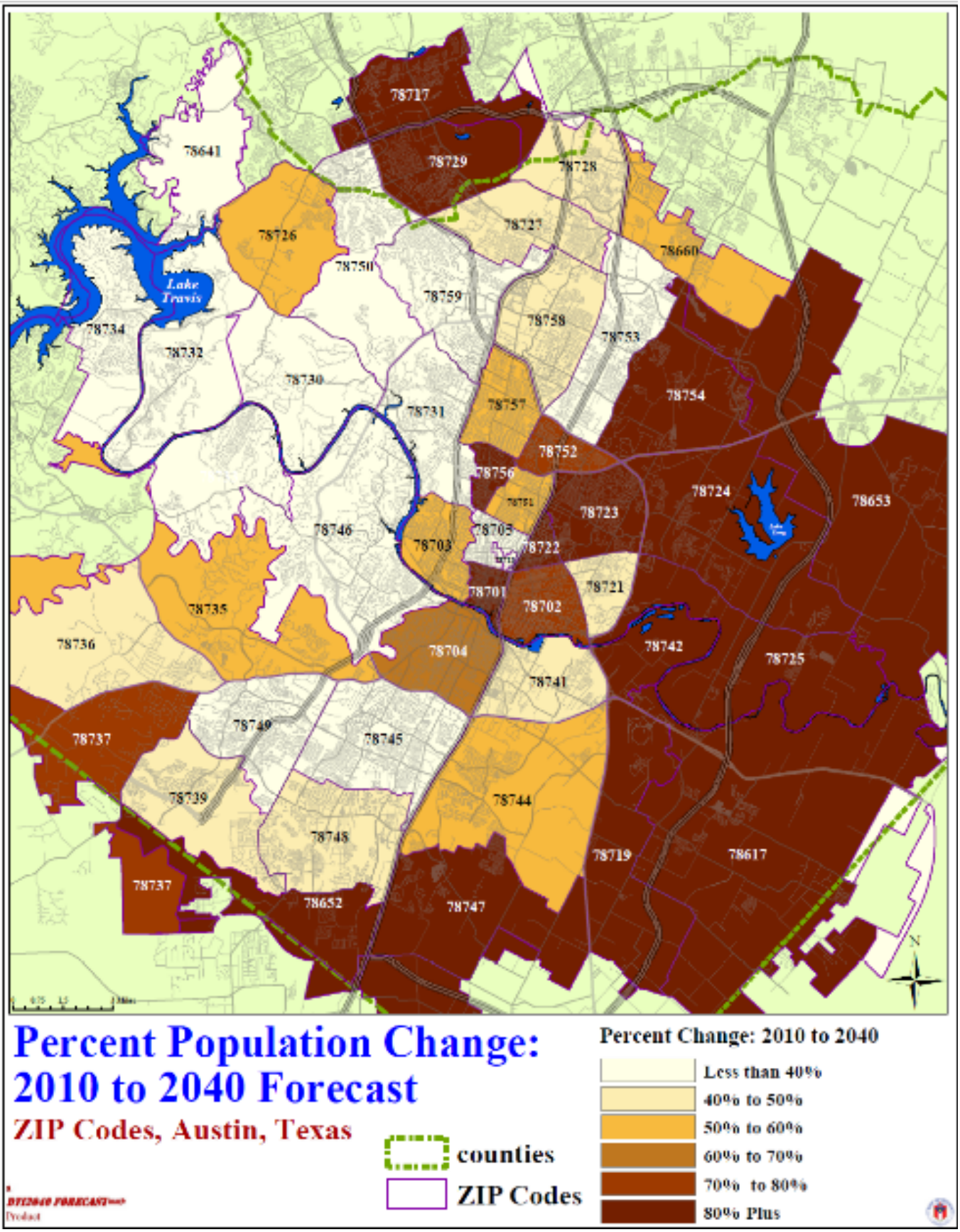
Austin's population grew nearly 30% between 2010 and 2019 according to the Chamber of Commerce, and the area is projected to grow the same amount every decade for the next three decades. As seen in ***Figure 4***, estimates predict a sharp increase in population growth on the east side of Austin through 2040. This growth is partially fueled by many technical workers moving from California to Central Texas. Almost 40 tech companies moved to the area in 2020 according to the Austin Chamber of Commerce, including Oracle, 8VC, and Hewlett Packard Enterprises. Austin's growth may slow while the suburbs will continue to grow according to projections from the Austin Housing and Planning Department, which state that "despite the influx of new companies moving into Austin, the department expects the Austin metro area's population to rise 2.8% in 2021 (to 2,363,245 as of April 1st), down from the 3.05% in 2020. Moving forward, the population is predicted to climb anywhere from 2% to 2.75% through 2050." Statistics from the Austin Chamber of Commerce also show that the region is one of the top three national metro areas that lost the fewest jobs during the pandemic.[6]

[4] Tomer, A., Fishbane, L., Siefer, A., and Callahan, B. (2020, February). *Digital Prosperity: How Broadband Can Deliver Health and Equity to All Communities.* Missouri Broadband Resource Rail. https://mobroadband.org/wp-content/uploads/sites/44/2020/05/Digital-Prosperity-How-Broadband-Can-Deliver-Health-and-Equity-to-All-Communities.pdf

[5] Straubhaar, J., Strover, S., Choi, J., Park, S., Skouras, M., Santillana, M., Du, C., and Mora, A. (2019, August 13). *Digital Inclusion in Austin.* City of Austin Official Website. http://austintexas.gov/sites/default/files/files/Telecommunications/DigitalInclusion/Digital_Inclusion_Final_Report_8.13.2019.pdf

[6] Kerr, B. (2021, March 16). *Job growth and unemployment.* Austin Chamber. https://www.austinchamber.com/blog/03-16-2021-job-growth-unemployment

Figure 4: Austin Population Forecast 2010-2040



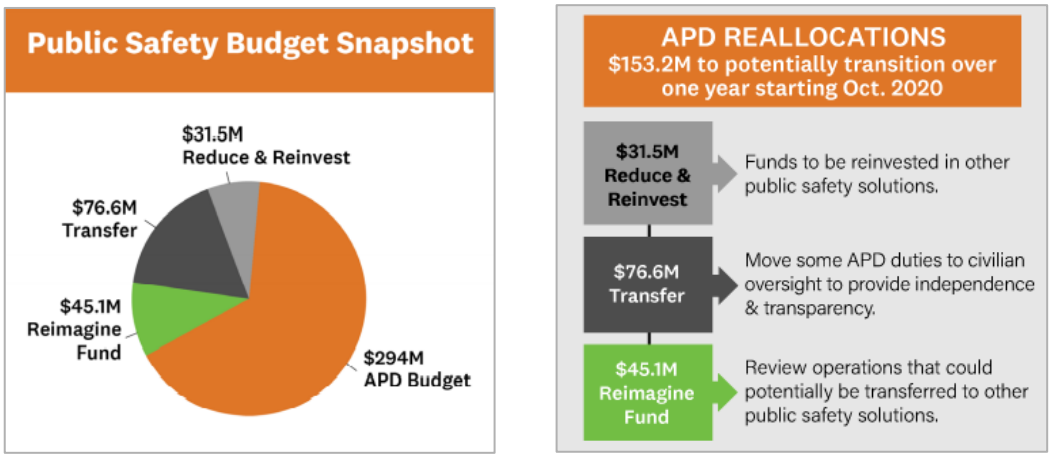
Current Events and Reforms

Events such as the COVID-19 pandemic, the devastating impact of the February 2021 Winter Storm Uri, which left many residents without water or power and strained emergency medical response resources, and the racial injustices that have inspired protests and reforms form the backdrop to our dispatch equity and optimization study.

The Reimagining Public Safety (RPS) initiative originated as the City's response to the nation's crisis of police violence against Black Americans and other minority populations.[7] These historic reforms show the City's commitment toward addressing systemic racism, investing in minority communities to promote access to public safety services, ensuring appropriate and equitable response by City departments, facilitating access to resources, and advancing equal rights. In defining goals and budget priorities for this initiative, the City acknowledges that public safety reforms must go beyond policing.

Reimagining Public Safety redirects funds and positions to alternative public health and public safety initiatives to provide preventative measures. In August of 2020, the City Council approved a 2021 budget which included redirecting $153.2 million in police funding. Below are two snapshots of the changes as shown on the City of Austin's website.

Figure 5: Public Safety Budget Snapshot and APD Reallocations



During FY21 budget discussions, the City Council and the City Manager made significant investments into EMS. In total, the City Council approved the addition of 67 sworn personnel and five civilian personnel, along with additional investments in ambulances and equipment. The City Council also made an additional investment to start the 24/72-hour work schedule a year sooner than the current labor contract outlined. This represents a total investment in EMS of $10 million.

In April 2021, the Austin City Council approved budget amendments for the RPS initiatives, including the creation of a new Emergency Communications Department (ECD) to handle emergency calls.[8] The City also issued the *Austin City-Community Reimagining Public Safety Task Force 2021 Mid-Year Recommendations Report.* The RPS team also pushed for reinvestment of funds to meet other safety, health, and social service needs. An investment of $2.5 million was budgeted in FY 2020-2021 for police, emergency medical services, and the Downtown Austin Community Court, including an Integral Care contract for the Homeless Outreach Street Team (HOST).

[7] City of Austin Official Website (n.d.). *Reimagining Public Safety*. http://austintexas.gov/publicsafety

[8] Reimagining Public Safety Blog. (2021, April 22). *City Council Approves Mid-Year Budget Amendments for Reimagining Public Safety Initiatives.* City of Austin Official Website. https://www.austintexas.gov/blog/city-council-approves-mid-year-budget-amendments-reimagining-public-safety-initiatives

Lastly, the City's recent transition from the Office of the Medical Director to the Office of the Chief Medical Officer (OCMO) allows Chief Medical Officer Dr. Mark Escott the ability to improve coordination of health care and mental care services, as well as strategically align emergency medical services and practices.

SECTION IV: INDUSTRY STANDARDS AND GUIDELINES

Identifying applicable and appropriate benchmarking standards of service, performance, and operations is critical to providing both fire and EMS response to communities. Several national standards were reviewed in detail for determining their relevance to the questions of equity and optimization for the community. An overview of each standard is provided in this section.

National Fire Protection Association (NFPA) Standards

NFPA standards are the most widely used and adopted risk standards throughout the U.S. and even internationally. The standards developed by NFPA are defined as "consensus standards," meaning that each standard is developed by a team of subject matter experts, not just from the fire service industry, but from a wide variety of disciplines from government and private sector industries. Each NFPA standard undergoes a rigorous development, review, and comment period prior to adoption. NFPA standards are updated every three-to-five years. Although NFPA standards are not published as legally binding documents, many NFPA standards are used as templates for legal statutes, laws, and ordinances. Examples of this would be the Fire and Life Safety Code, the National Electric Code, the Respiratory Protection Standard, the Confined Space Standard, and the Hazardous Materials Standards. Each of these standards have been promulgated into law at both federal and state levels.

NFPA 1221: Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems

NFPA 1221 provides the rationale for why AFD uses "seconds" for their time performance benchmarks. *NFPA 1221* establishes the performance criteria for call answering, call processing, and call alerting of the designated response company or unit. *NFPA 1221* is used by ISO when evaluating and rating performance of dispatch centers to determine a community Public Protection Classification (PPC) rating commonly known as an ISO Classification.

NFPA 1300: Standard on Community Risk Assessment and Community Risk Reduction Plan Development

NFPA 1300 details the guidelines and rationale for conducting assessments of various risks for a community such as earthquakes, violent storms, wildfire, etc., and then assessing response capabilities of the emergency services departments against the assessed risks. This provides community leaders with an opportunity to address these risks through the development of Emergency Response Plans and Hazard Mitigation Plans, each of which are mandates by the Department of Homeland Security (DHS) and the Federal Emergency Management Agency (FEMA) through the National Response Framework. *NFPA 1300* also provides guidance on how emergency service departments can analyze data and identify the most common types of emergency incidents responded to. Departments can use this standard to develop strategies for reducing occurrences of these emergencies through public education programs, such as fall prevention for the elderly and bystander CPR classes, as well as direct-action programs, such as smoke detector installation and community-based paramedicine outreach.

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

NFPA 1710 is a key benchmark document because it defines minimum staffing levels and response times for fire and EMS companies. It is based upon a combination of accepted practices and more than 30 years of study, research, testing, and validation. More details on *NFPA 1710* and AFD's compliance to the standard are included in Appendix F.

NFPA 450: Guide for Emergency Medical Services and Systems

NFPA 450 serves as the model template for the design, implementation, and evaluation of emergency medical services systems. The guide also provides guidelines, resources, and recommendations to assist in the development and design of EMS systems.

NFPA Research Foundation

The main objective of the NFPA Final Report published in May of 2016, *Fire Based Mobile Integrated Healthcare and Community Paramedicine (MIH and CP) – Data and Resources*, was to identify where mobile integrated healthcare (MIH) and community paramedicine (CP) are used in the U.S. and determine what information was available from those communities and to help the NFPA Technical Committee on Emergency Medical Services develop a standard relating to fire-based MIH and CP systems.

Commission on Fire Accreditation International (CFAI)

The Commission on Fire Accreditation International (CFAI) provides a self-assessment and evaluation model that enables a fire department to evaluate past, current, and potential future service levels and performance. This allows the department to compare them to fire industry best practices so they may:

- Determine community risk and safety needs and develop community-specific standards of cover.
- Evaluate the performance of the department in relation to the standard of cover.
- Establish a methodology for achieving continuous organizational improvement in relation to the standard of cover.

CFAI supplies tools for a fire department to assess its performance against national standards or locally adopted performance goals. The program is voluntary and does not set standards. A successful process leads to accreditation; compliance reports must be made annually, and the assessment process is repeated every five years. A progressive fire department will be familiar with these and use them to establish response goals and performance measures appropriate for the community and the fire department in a standards of cover document.

Commission on Accreditation of Ambulance Services (CAAS)

The Commission on Accreditation of Ambulance Services (CAAS) provides standards that ensure that high-quality EMS and ambulance transportation services are provided to a community. In addition to the standards, CAAS provides an accreditation program and mechanism where ambulance providers are evaluated by CAAS against the standards.

The standards are very comprehensive but are flexible enough to relate to agencies regardless of size, scope, or service delivery model. There are over 100 standards covering all aspects of ambulance operations. They include standards for agency management; financial management, budgeting, and strategic planning; relations with outside agencies; mutual aid and disaster coordination; community education and relations; human resources and personnel management, hiring, credentialing, training, problem resolution, and performance evaluations; clinical standards; quality improvement; safe operations and risk management; vehicles, equipment, and facilities; and communications/dispatch.

Insurance Services Office (ISO)

The Insurance Services Office (ISO) is an organization that establishes performance and rating criteria for various industries such as the fire service. This performance and rating criteria are then used by insurance company underwriters to help establish premiums for property insurance for both businesses and residential priorities. The tool used by ISO for assessing fire protection is called the Fire Service Rating Schedule (FSRS). The FSRS employs a point grading system from 0 to 105.5 that determines a communities Public Protection Classification (PPC) rating. PPC classes range from ISO Class-1 (highest rating) to ISO Class-10 (lowest rating). Communities with an ISO Class-1 rating receive the most favorable insurance premiums. The ISO rates four categories to determine a PPC rating: 911 communications systems, fire department, water delivery system, and community risk reduction efforts. Austin Fire Department is rated as an ISO Class-1 Fire Department. NOTE: Additional detailed information regarding AFD's ISO rating is provided in Appendix F of this report.

International Academies of Emergency Dispatch (IAED)

The International Academies of Emergency Dispatch (IAED) was formed in 1988 and has developed and maintained advanced protocols for emergency call taking and processing. IAED has provided certification for 70,000 emergency telecommunicators in 50 countries. Their certification programs are science-based and time-tested with an overall goal of reducing the time interval it takes to process 911 calls under extreme emergency conditions.

National Association of EMTs (NAEMT)

The National Association of Emergency Medical Technicians (NAEMT) was founded in 1975 and currently represents over 70,000 career and volunteer EMTs nationwide. NAEMT advocates on behalf of EMS workers on issues including quality patient care, quality improvement of training, education, and certification programs, and support of science-based research and innovation programs.

National Association of State EMS Officials (NASEMSO)

The National Association of State EMS Officials (NASEMSO) is a non-profit organization working to develop a seamless network of state, regional, and local EMS system providers using science-based health care principles, data collection, and evidence-based standards of care for both day-to-day operations as well as major catastrophic events.

International Association of Fire Chiefs (IAFC)

Founded in 1873, the International Association of Fire Chiefs (IAFC) was formed to create a global platform for fire service leadership to exchange ideas, develop future leaders, and to identify and support products, ideas, and services that promote and enhance fire and life safety for communities and fire service personnel.

International Association of Firefighters (IAFF)

The International Association of Firefighters (IAFF) is a labor union representing full-time, career firefighters and EMS personnel in the United States and Canada. Formed in 1918, the IAFF is affiliated with the AFL-CIO and currently has over 316,000 members in 3,200 local affiliate member organizations. The primary mission of the IAFF is to provide support with negotiations improving the wages, benefits, and working conditions for career firefighters as well as support safety initiatives.

State of Texas Fire Marshal's Office (SFMO)

The State Fire Marshal Office (SFMO) was integrated into the Texas Department of Insurance in 1997 under SB 371. The SFMO is headquartered in Austin with offices throughout the State of Texas. The primary mission of the SFMO is to "reduce the loss of life and property through prevention, education, and protection."

Texas Department of State Health Services' Office of EMS/Trauma Systems Coordination

The Texas Department of State Health Services is responsible for management and oversight of the state EMS/trauma systems. This includes establishment of laws and rules, oversight of EMS certifications and licenses for responders, EMS provider agencies, EMS education programs, complaints and criminal history, enforcement actions, funding sources, information regarding line-of-duty deaths, Medical Advisory Boards, and the Governor's EMS and Trauma Advisory Council. State oversight of EMS in Texas is relatively limited. Under Texas law, compliance, regulation, licensure, and enforcement of EMS fall under the purview of the Department of State Health Services' Office of EMS/Trauma Systems Coordination. However, aside from the periodic review of protocols and investigations of complaints, this office primarily serves as a source of expert information and advice for EMS organizations in Texas. Physicians that provide oversight (medical direction) to EMS agencies are also governed by the Texas Medical Board, which regulates the general requirements of off-line medical directors and the number of EMS agencies one can oversee.

SECTION V: CITY DEPARTMENTS RESPONSIBLE FOR EMS DELIVERY

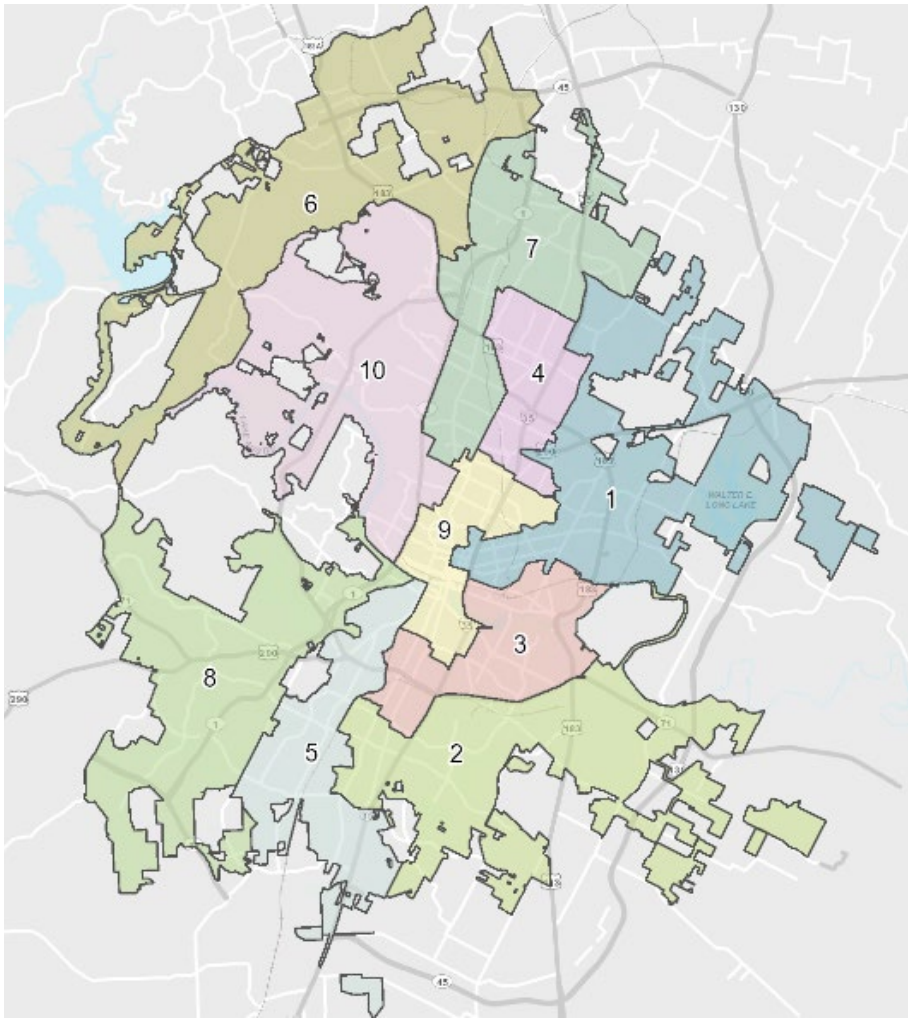
Several key City departments have responsibilities for the delivery and coordination of emergency medical services (including ambulance services) in the City of Austin and Travis County, with the exception of Travis County Emergency Services District No. 2, which is provided by the Pflugerville Fire Department. This section provides important context for the governance structure of the City of Austin and the following departments that play a critical role in the delivery of emergency medical services, including the Office of the Chief Medical Officer (OCMO), Austin-Travis County EMS (ATCEMS), the Austin Fire Department (AFD), and the Combined Transportation Emergency Communications Center (CTECC).

Although not specifically relevant for analysis of dispatch equity and optimization, both AFD and ATCEMS have achieved levels of national accreditation and classifications that reflect positively on their capabilities to effectively deliver emergency medical services to both the city and Travis County. In-depth analysis of AFD's Insurance Services Office (ISO) rating and how this impacts the community are provided in Appendix F.

Austin City Government Structure

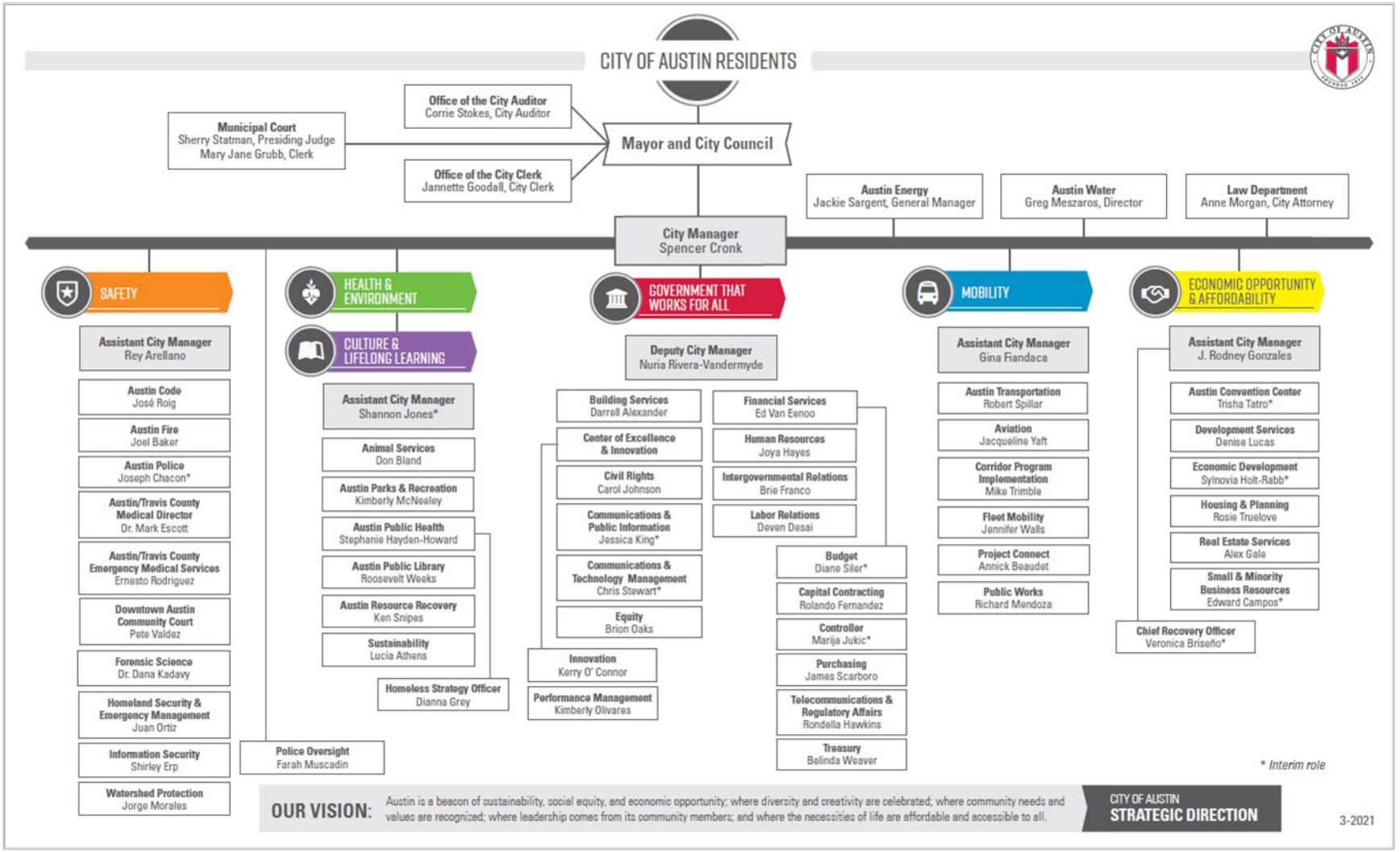
Austin's government structure is comprised of a "council-manager" system. The City Council has eleven seats, including the Mayor, and is officially non-partisan. ***Figure 6*** below shows the ten City Council district boundaries. The council district interactive map as well as a PDF map containing zip codes and City Council district boundaries are available on the City of Austin official website.

Figure 6: Austin Council District Map



Within this system, the Mayor and the City Council carry out all legislative functions of the City and a City Manager is appointed to enact the legislative and policy objectives of the City Council. Duties include deciding on the City budget, local taxes, amendment of laws, and creation of ordinances and policies. The City Manager directly oversees a Deputy City Manager and several Assistant City Managers, each of which are responsible for their own department(s). The City's organizational department chart is provided in ***Figure 7*** and can also be found on the City of Austin official website.

Figure 7: City of Austin Organization Chart



Office of the City Manager

The ultimate responsibility for the delivery of emergency medical services (EMS) provided to the residents and visitors of the City of Austin and areas of Travis County rests with the elected officials of both governmental jurisdictions. The direct responsibility and oversight of EMS delivery and 911 ambulance transportation have been delegated to high-level executive staff members of both organizations. These responsibilities are then further delegated to department heads who lead and manage each of their respective departments based on the mission of the department and in support of the City's overall mission.

For the City, the Assistant City Manager of Safety is responsible for EMS delivery and depends upon the Austin Fire (AFD) Chief, Austin-Travis County EMS (ATCEMS) Chief and the Office of the Chief Medical Officer (OCMO) EMS Medical Director to lead and manage the operations of each separate department. In addition to these department heads, there are seven other department heads who report to the Assistant City Manager of Safety. The span of control, or number of direct reports, for people managers varies from organization to organization. Research also indicates that, in the U.S., the span of control ranges between nine to ten direct reports and, in some companies, can be as many as 12 direct reports.[9]

Representing Travis County's EMS system is the Travis County Executive of Emergency Services. The Office of the County Executive is responsible for ensuring adequate fire services and EMS delivery to Travis County and its residents and visitors. EMS delivery and 911 ambulance transportation in most of Travis County is provided by ATCEMS through a contract with the City of Austin. The County Executive is the primary contact with the City of Austin regarding EMS delivery in the County and monitors and ensures ATCEMS contract compliance. The Travis County Executive of Emergency Services also oversees the Travis County Offices of Emergency Management, the Fire Marshal, Technology and Communications, *STAR* Flight, and serves as liaison for the Travis County Commissioners Court with the Medical Examiner's Office and the emergency services districts (rural fire departments) throughout the County.

Findings

Based on the consulting team's observations, documents reviewed, and data collected and analyzed, PCG will offer several recommendations towards achieving dispatch optimization and achieving health equity in relation to the delivery of emergency medical services in the City and portions of Travis County. The first recommendation is that the City create a position for a **Public Safety Director** to increase cooperation, coordination, and collaboration between the Austin Fire Department, Austin Public Health, Austin-Travis County EMS, and the Office of the Chief Medical Officer. The Public Safety Director will report to the Assistant City Manager of Safety and the AFD and ATCEMS Chiefs would report to the Public Safety Director.

> **Recommendation 1:**
> The City should consider establishing the position of Public Safety Director to oversee AFD and ATCEMS.

The rationale for this recommendation is primarily based on findings listed below. Additional details regarding these findings are provided in the various sections of this report.

- There is minimal cooperation, coordination, and collaboration between services and programs provided by AFD, ATCEMS, and APH.
- AFD and ATCEMS compete for resources and do not appear to coordinate service delivery or budget requests.
- ATCEMS duplicates services already provided by AFD (i.e., special rescue teams, drone program).

[9] Harris, D. (2019, September 11). *What's the Optimal Span of Control for People Managers?* Quantum Workplace. https://www.quantumworkplace.com/future-of-work/whats-the-optimal-span-of-control-for-people-managers

- AFD employees are presenting opportunities for a service level upgrade to advanced life support (ALS) patient care, however, it is uncertain what the oversight structure and potential collaboration and/or conflict points may be with respect to ATCEMS operations.
- The OCMO and ATCEMS appear to have differing perspectives regarding ATCEMS operations versus medical oversight and medical direction.
- The ability for the OCMO to access EMS data to conduct scientific research regarding EMS delivery is limited by ATCEMS which results in a lack of outcome-based decision making concerning the delivery of emergency medical services.
- The current Assistant City Manager's span of control includes ten department heads reporting directly to this position. ATCEMS and AFD need the expedited access and critical oversight which will come with a new Public Safety Director that can focus on the issues listed above, as well as several other immediate concerns.
- ATCEMS's current Charity Care policy is resulting in millions of dollars of unpaid ambulance transports which could be reimbursed through the Ambulance Supplemental Payment Program.

Office of the Chief Medical Officer (OCMO)

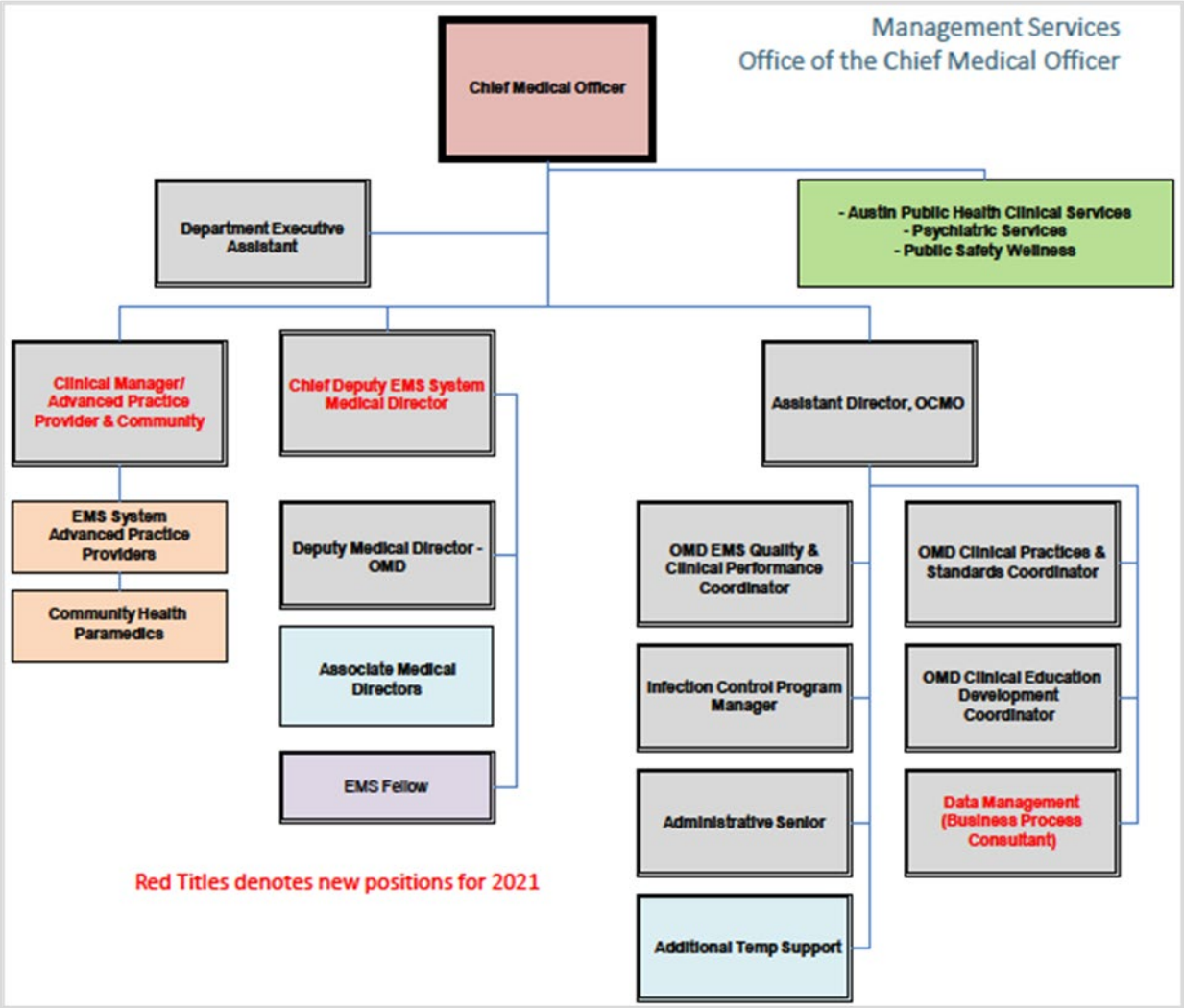
The Office of the Chief Medical Officer (OCMO) for the City of Austin is responsible for comprehensive medical oversight of all clinical care provided in the EMS system. The EMS system is comprised of 27 organizations with more than 2,000 individual providers and includes the emergency medical technicians (EMT) and paramedics employed by the AFD and ATCEMS. The EMS system also interfaces with 17 hospitals within the EMS service area.

In the past, medical oversight was managed by the Office of the Medical Director (OMD); however, in FY21, the Office of the Chief Medical Officer (OCMO) was created to provide strategic alignment across departments related to the City of Austin's health care and mental health services, including APH, AFD, and ATCEMS. In addition, it is the intent of the City to expand the community's access to physician care and services.

The responsibility for medical oversight and direction for EMS resides in the OCMO. Additional enhancements to the OCMO will continue in FY22 in anticipation of opportunities for providing physician care to the most vulnerable. These enhancements have the potential to be funded by new reimbursement models piloted by the Center for Medicare and Medicaid Service (CMS) through its Emergency Triage, Treatment, and Transport Initiative (ET3) as ATCEMS is actively participating in the ET3 pilot project.

Figure 8 shows the new OCMO table of organization.

Figure 8: Office of the Chief Medical Officer Organization Chart Spring 2021



OCMO Roles and Responsibilities for EMS Delivery

Prior to the transition from the OMD to the OCMO, the OMD website listed simple mission, vision, and values statements, which are listed below:

- The mission of the Office of the Medical Director is to define, support, and advance our clinical practice of medicine for the EMS System.
- The OMD's vision is to improve the quality of life in our community by providing the tools for delivering professionally competent care and advancing the science of medicine.
- The OMD's values are to be patient-centered, system-oriented, innovative through science and data, and leaders by example.

The OCMO is one of the most important and critical departments in regards to protecting the population's health, as seen most recently in the City and Travis County's response to COVID-19. The OCMO can also, in the interest of the population's health, improve the delivery of healthcare throughout the community in an equitable manner by effective and efficient utilization of the AFD and ATCEMS resources. EMS delivery to the City of Austin and Travis County residents can be

Recommendation 2:
The City should consider having the Office Chief Medical Officer (OCMO) report directly to the City Manager.

more efficient and effective if there was significant cooperation, coordination, and collaboration between the three departments. With the shift from OMD to the City's Chief Medical Officer, there is potential to transform the delivery of EMS, improve patient outcomes, provide health equity in the most vulnerable areas, reduce community risks, and ultimately improve the community's quality of life. The City of Houston made a similar transition many years ago when the EMS system medical director was also designated as the City's Chief Health Officer. Currently the Austin Chief Medical Officer reports to the Assistant City Manager (ACM) of Safety along with nine other department heads. The Chief Medical Officer should have regular access to the City Manager given the enormous amount of responsibility vested in the office.

One of the primary responsibilities of the OCMO and the designated Medical Director is to provide medical direction and medical oversight of the EMTs and paramedics employed by AFD and ATCEMS. Texas Administrative Code (TAC) Chapters 773, 25, 157, and 197 address the operations of an EMS system in Texas, as well as the duties and responsibilities of the Medical Director. According to Title 3, Section 157.001 of the Texas Occupations Code, the state gives licensed physicians the authority to "delegate medical practice" to persons under their supervision who are properly qualified and trained. There are minimal restrictions to the scope of practice the medical director can delegate to paramedics.

ATCEMS and the OMD have had differing opinions regarding the role of the Medical Director, including operational issues related to EMS delivery, ATCEMS's implementation of new programs, and the direction of existing programs like the Community Health Paramedic (CHP) program. As part of the labor management process in 2018, a *Service agreement between the City of Austin EMS Department and the Office of the Medical Director* was developed to address the roles and responsibilities of each department as well as address concerns raised by the Austin EMS Association. OCMO staff members who were interviewed did not believe the agreement was adhered to by ATCEMS leadership. Based on our interviews, research, and review of documents, we believe ATCEMS underutilizes, undervalues, and rarely consults the OCMO for their opinion regarding the Department's organizational structure, performance improvement program, training and education programs, or any other aspect of the Department's operations unless they are mandated or directed by laws, regulations, or a higher authority (i.e., Assistant City Manager or above). Interviews with OCMO Medical Directors and staff confirms this observation. Feedback from the Medical Directors when asked what they would do to improve the EMS delivery system are summarized below:

- AFD and ATCEMS should train together daily on patient care issues, not just in MCI joint training.
- ATCEMS should provide the EMS training and continuing education to the AFD EMT personnel on a more frequent basis.
- A mobile training team should provide EMS training to AFD and ATCEMS.
- Additional staff should be added to the performance improvement (PI) program and the program should be revised.
- Paramedics should meet with the EMS Medical Director once a quarter.

The OCMO does not have the authority to implement any of the above suggested enhancements to the EMS system. The OCMO may have additional clout reporting to the City Manager and influence to implement suggestions that are efficient and effective.

The Medical Directors we interviewed were concerned about the clinical quality of care provided by individual paramedics that they are responsible for. Collectively the Medical Directors were not comfortable with the current performance improvement (PI) process administered by ATCEMS. The OCMO and ATCEMS should collaborate and revise the PI program so that it meets the concerns regarding clinical care and design it to educate, not discipline, employees.

Recommendation 3:
OCMO and ATCEMS should consider revising the Performance Improvement (PI) program to address clinical care concerns.

The recent restructuring of the OCMO will enhance the oversight of the overall EMS system with the addition of the Chief Deputy EMS System Medical Director. The new Clinical Manager responsible for Advanced Practice Providers and Community Health Paramedics can provide organization, structure and direction to the EMS system's advanced providers and the Community Health Paramedics (CHP). PCG would suggest that consideration be given to adding a research function to the OCMO, if one has not recently been implemented. Austin collects various data and makes it available to the public through dashboards on the City's website. ATCEMS's computer-aid dispatch (CAD) system and the EMS records management system (RMS) collect and store detailed data related to the EMS system's performance. This data can be analyzed and used to make evidence-based or outcome-based decisions regarding current and future EMS programs provided by AFD and ATCEMS. ATCEMS currently has a robust team of data analysts and IT staff with various titles that analyze data and produce reports. Consultants were told by OCMO representatives and emergency service district (ESD) chiefs that the data and its data analysis are not shared easily by ATCEMS.

Recommendation 4:
Consider adding an EMS research function to the OCMO to analyze EMS system data to form evidence-based decisions.

The advantage of data analysis and sharing within the EMS industry and local community allows for better evaluation of efficiency processes, including financial/billing operations. The expansion of physician care and services, as well as the utilization of advanced care paramedics and CHPs, increases the Medical Director's ability to expand the scope of practice and the agency's use of telehealth and telemedicine services, which are all services that can be reimbursed from insurance providers including Medicare, Medicaid, commercial/private insurance, and other subsets (i.e., Workers' Compensation, automobile insurance policies, etc.). However, there are certain federal requirements that must be met to receive revenues from Medicare and Medicaid. Due to the many complexities of healthcare billing and the changing landscape around it, PCG recommends that the OCMO consider adding expertise to its team to develop revenue strategies related to expanded care opportunities and services within its oversight.

In addition to billable services that can be offered under the OCMO, there are opportunities for additional revenues through contracts with the community healthcare system, including the hospital networks, public clinics, and private clinics. According to ATCEMS leadership, ATCEMS participated in the Texas Delivery System Reform Incentive Program (DSRIP) led by Central Health with representation from the Austin hospitals, Community Care and Integral Care from 2012 to 2018. Under this program, ATCEMS received reimbursement for meeting established DSRIP goals. ATCEMS personnel and the OCMO advanced providers can improve access to healthcare and enhance health equity in the most vulnerable communities through collaborative opportunities such as this. The OCMO should consider adding healthcare finance expertise to the OCMO to maximize revenue opportunities as well as to ensure a robust billing and collections process is established.

Recommendation 5:
Consider adding healthcare system finance expertise to the OCMO to develop revenue strategies related to the provision of expanded physician care and services and ATCEMS advanced care providers.

Austin Public Health

The primary authoritative source of public health services within the City of Austin is Austin Public Health (APH). In May of 2016, APH earned national accreditation from the Public Health Accreditation Board (PHAB). This milestone is official recognition that Austin Public Health meets or exceeds the rigorous public health standards established by the non-profit, non-governmental PHAB.

APH protects residents from infectious diseases and environmental threats and educates individuals about the benefits of healthful behaviors in avoiding chronic disease. Its services span across the spectrum of care including providing immunizations, shelter, food, clothing, job assistance; high blood pressure and diabetes screenings, and providing nutritional support. They also offer community outreach and education on topics related to diabetes management, tobacco cessation, and injury prevention, along with emergency preparedness functions respective to local disasters. Many of these services are closely related to those offered by either ATCEMS or AFD, but this listing does not comprise a conclusive listing of the entity's

comprehensive services. Section IX of this report further elaborates some of the flagship and highlight programs of each respective entity.

APH's vision is that "everyone will have an optimal quality of life, health, and well-being." Its mission promotes that it will work to "prevent disease, promote health, and protect the well-being of all." These facets are accomplished through strengthening collaborations and building new partnerships; protecting the community from environmental and health hazards; promoting community-wide wellness, preparedness, resiliency, and self-sufficiency; and through preventing illness, injury, and disease.

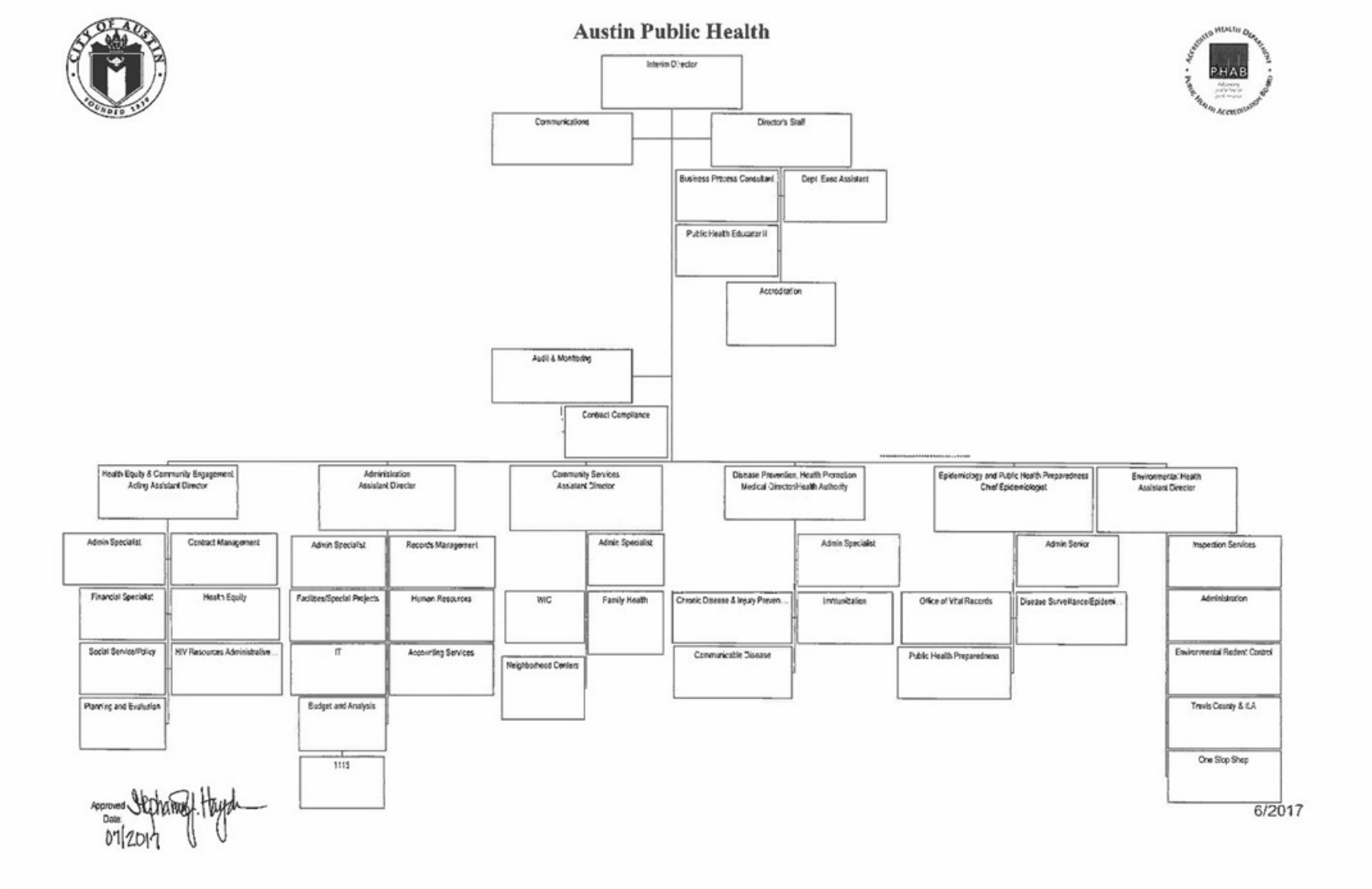
Within the context and comparison of services related to outreach and community risk reduction, APH supports two primary programs that transverse over the same influence of AFD and ATCEMS: Health Equity and Chronic Disease and Injury prevention.

> **Recommendation 6:**
> Consider assigning a Health Equity staff member to OCMO to ensure that health equity is achieved in the most vulnerable neighborhoods.

The focus of APH's Health Equity Unit and program works to provide community-based programs and services to ensure all residents can reach their full health potential, no matter their race, ethnicity, gender, age, sexual orientation, immigration status, or income level. Identifying health disparities amongst different demographics, residency locations, and populations allows APH the ability to focus its efforts toward improving resource availability, access to care, and prevention support that otherwise might be outside of their reach. Avenues for support include mobile testing clinics, chronic disease screening, employment support, promoting healthy lifestyles, maternal and infant outreach, and other forms of community engagement and outreach programs. This available level of support is exemplified by APH's organizational chart, which is shown in ***Figure 9*** and can also found on the City's official website.

There are several opportunities and areas where collaboration with AFD and ATCEMS can enhance APH's vision of "an optimal quality of life, health, and well-being" throughout the community. The most obvious is the sharing of information and data that each agency collects to identify areas of economy of scope.

Figure 9: Austin Public Health Organization Chart



Combined Transportation Emergency Communications Center (CTECC)

The Combined Transportation Emergency Communications Center (CTECC) brings together state, county, and local government communication functions under one umbrella to consolidate and share services as well as improve regional cooperation and coordination between the City of Austin (a managing partner for the Center), Travis County, the Texas Department of Transportation, and the Capital Metropolitan Transportation Authority. Its five primary focus areas are:

- Shared center for 911 call taking and dispatching
- Mobile Data Computers (MDC) and a shared Computer-Aided Dispatch (CAD) system
- Regional Transportation Management System
- Shared Emergency Operations Center (EOC)
- Shared regional two-way radio system

All 911 emergency incidents in the City of Austin and Travis County are received, processed, and dispatched from this single facility. The center processes over one million 911 calls and text messages annually. The facility serves as the primary Public Safety Answering Point (PSAP) for the Austin Police Department (APD) and the Travis County Sheriff's Office (TSO). The Austin Fire Department (AFD) and Austin-Travis County Emergency Medical Services (ATCEMS) communications centers are considered secondary PSAPs. Non-emergency operations performed from the facility include traffic monitoring and control for both the Texas Department of Transportation (TxDOT) and the Austin Transportation Department (ATD).

The facility also houses the Emergency Operations Center (EOC) for the Capital region and is activated for region-wide, large-scale disasters such as the recent ice storms (in 2021) and major flooding events which the Capital region experiences frequently. The EOC is configured with 54 work stations and has several breakout rooms for meetings during large-scale emergencies, declared disasters, and major community events.

According to the Office of the City Auditor in a February 2020 audit report of the 911 Operations Center, the City of Austin, in FY-2020, contributed $29 million dollars between the three city departments (APD, AFD, and ATCEMS) and provides approximately 330 staff members to support the operations at the facility. In email conversations with the Executive Director of the CTECC, he stated that each agency funds their employees and associated costs (e.g., uniforms, equipment) directly and that those costs are not reflected in the CTECC budget.

The CTECC also provides dispatching and operational support for the following:

- Fire dispatching for 12 Emergency Service Districts
- Dispatching for eight additional jurisdictions through mutual aid agreements
- Dispatching seven Travis County ESD full-time ambulances
- Aeromedical dispatch and flight following for Travis County STARFlight
- Travis County Sheriff dispatch operations provides dispatching to five smaller police departments and five Travis County Constable precincts part-time and as needed

The CTECC is approaching 20 years of operations and those involved with administration and management of the facility have, over the past several years, noted and addressed challenges with the facility. One of these challenges is that each of the partner agencies are outgrowing the facility. An example of this was shown in 2018 as CapMetro relocated three of its dispatch positions to an alternate facility due to inadequate space for the positions at the CTECC.

Operationally, the separation of dispatch services through primary and secondary PSAPs within the CTECC creates potential inefficiencies. To achieve **maximum dispatch optimization** for 911 emergency medical

incidents would require the consolidation of the AFD and ATCEMS dispatch functions, as both serve as separate secondary PSAPs. This will not only improve dispatch and response to emergency medical incidents, but it will also save millions of dollars in the future. This issue is addressed later in the report.

Austin Fire Department (AFD)

History of AFD

The Austin Fire Department was first established in 1841 as a seven-man fire protection group sanctioned by the City Council. The group was not formally trained or equipped to function as a traditional fire department during this era and fire protection services were considered inadequate for the time period. It wasn't until 1858 that the City organized Hook N' Ladder Company #1 with a Seagrave trussed-ladder truck equipped with a rear tiller and drawn by a team of three specially-trained horses. To apply water on a fire, AFD members initially used wooden buckets, though shortly after they converted to the preferred round-bottom leather buckets. At that time, the City still lacked a formal method for alerting company members of a fire and had to rely on citizens calling out "FIRE!" followed by pistol shots and the ringing of church bells.

In 1866, the City Council appointed Austin's first career Fire Chief, C.F. Millett, who served three years in the position. That same year the City Council authorized the installation of eight cisterns expressly for the purpose of providing water for firefighting efforts. In 1868, the department received the first "fire engine" which was pulled by hand from the fire hall to the location of the fire.

Over its 160-year history, the department has maintained steady growth along with the city, adding stations, apparatus, and personnel commensurate with call volume, service demands, and industry changes.

AFD Today

The Austin Fire Department of today is a diametrically opposite organization from the one formed in 1841. On January 1, 2017, AFD received a Public Protection Classification (PPC) rating of "1" from the Insurance Services Office (ISO), which is the highest rating a fire department can receive. To put this into context as it relates to Texas, there are 2,555 fire departments in the State of Texas. Of these, 14 have an ISO Class-1 rating, which places AFD in the top-tier of professional fire service organizations in Texas as well as nationally, as there are only 411 fire departments in the U.S. which have achieved this rating. A more comprehensive description of the ISO rating system and how AFD achieved this rating can be found in Appendix F of this report.

Services Provided

Besides the primary mission of structural firefighting, AFD provides response resources to the full spectrum of emergencies typically found under fire departments nationally, such as response to:

- Traffic/Motor vehicle collisions
- Hazardous materials response at the Technician/Specialist level
- Confined space rescue
- Swift/Flood water rescue to include a Dive Team response
- Airfield rescue firefighting (ARFF)
- High-Angle/Technical rope rescue
- Explosive/Bomb Squad response
- Cause and origin investigation, including accelerant detection K-9 support
- Wildland Urban Interface (WUI) firefighting

Each of these disciplines requires response personnel to have extensive training, continuing education, and certifications to operate in such situations. Every category listed represents a major operational, administrative, and fiscal commitment by the department to provide response resources for an all-hazards

delivery service model. Fire departments that provide these services do so based on needs within the community, due to the number of responses annually to each emergency type listed, and on a community needs assessment analysis.

Where AFD dramatically differs from all major metropolitan fire departments in Texas, and to a large extent with those across the U.S., is in their approach and commitment to EMS (medical responses). According to the AFD 2020 Annual Report, the department responded to a total of 89,797 requests for service, of which 62,611, or approximately 70%, were EMS (medical) in nature. In spite of these facts, our observation is that AFD has minimal administrative support regarding EMS function, which represents the greatest percentage of their service demands in the City of Austin.

Recommendation 7:
AFD should reassess its role and support of EMS delivery from an administrative and operational perspective based on the historical staffing and administrative support of EMS.

In the past, the number of staff assigned to the EMS function has varied from one person to six. Currently, four staff are assigned to EMS but there is no guarantee that will continue as personnel filling these positions in previous years have had to be reassigned to a fire station during times of financial stress. The AFD organizational chart does not include an EMS division; rather, it includes "Medical Operations" under the Risk Management Division at the bottom of the organizational chart. In comparison, the EMS function on the organizational charts of Dallas, San Antonio, El Paso, and Houston fire departments appear to indicate a higher commitment to EMS overall. This is not stated as a criticism of AFD, but rather is reflective of the fact that ATCEMS is the primary EMS provider and AFD plays a supporting role. The reason this issue of support and commitment is raised here, is that there is interest among some of the AFD employees, including the IAFF Local, to utilize the paramedics that are currently employed by AFD in some capacity. Currently AFD firefighters that have paramedic credentials can assist ATCEMS personnel at the scene of an ALS patient, but they do not provide ALS prior to the ambulance's arrival. If the AFD were to provide advanced life support services, they would need to increase the administrative support for EMS operations and would need to work closely with the OCMO in the development of an ALS delivery model. Regardless, the required continuing education, quality and compliance, and local credentialing requirements to maintain an effective first response medical operation, BLS or ALS, of such volume and scale necessitates robust administrative attention.

Response Statistics

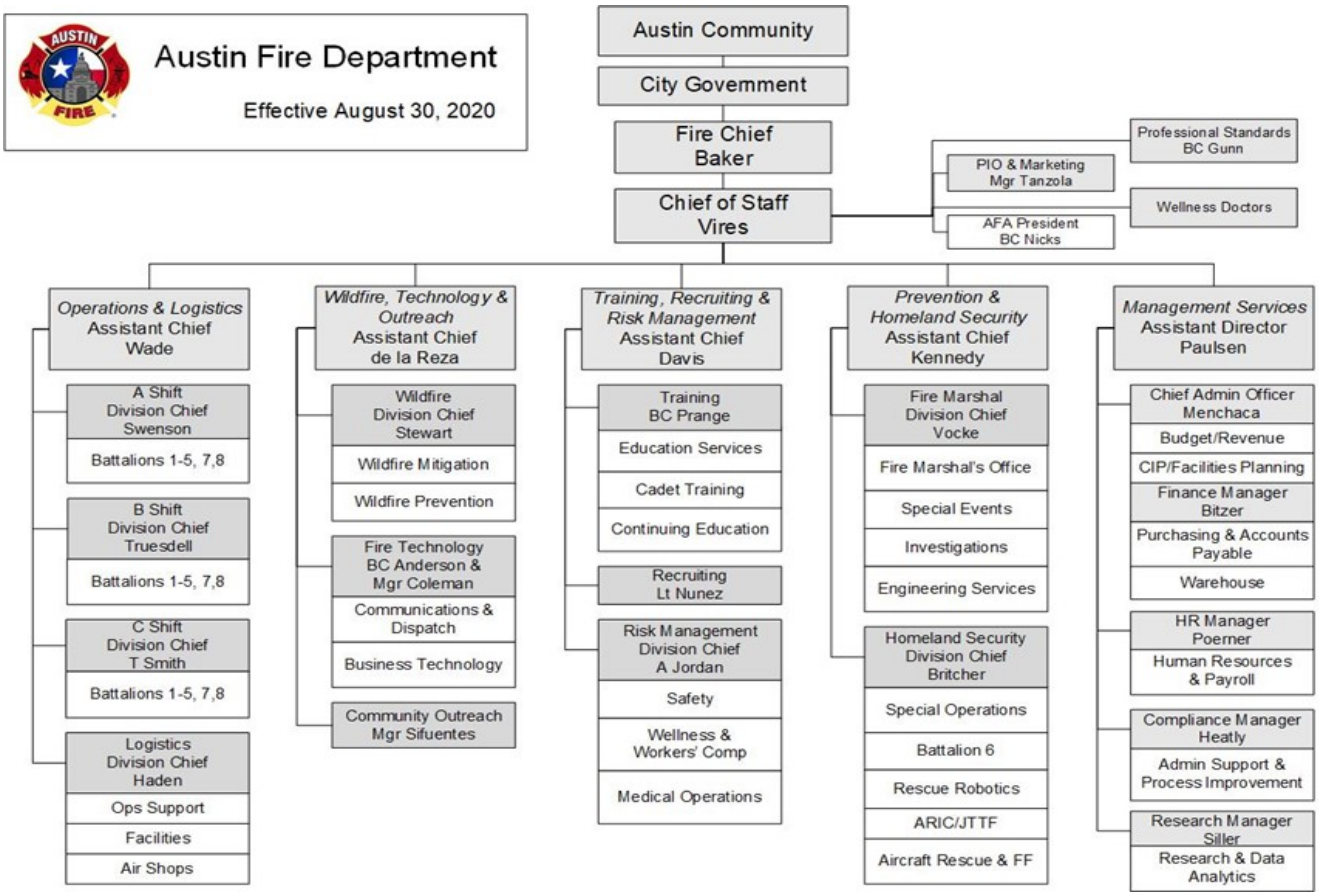
In 2020, the department received and responded to a total of **89,797** incidents within the City of Austin. ***Table 1*** below reflects a breakdown of the number and types of incidents responded to.

Table 1: City of Austin Call Types

Call Type	Dispatched	Found
Structure Fire	1,001	712
Vegetation	605	327
Fire - Other	3,622	1,472
Medical	62,611	45,352
HazMat/Haz Conditions	2,375	1,717
Rescue	664	294
Other Type	18,919	39,923
Totals	**89,797**	**89,727**

AFD's major programs are listed in the Austin Fire Department's organizational chart below in ***Figure 10***.

Figure 10: Austin Fire Department Organization Chart

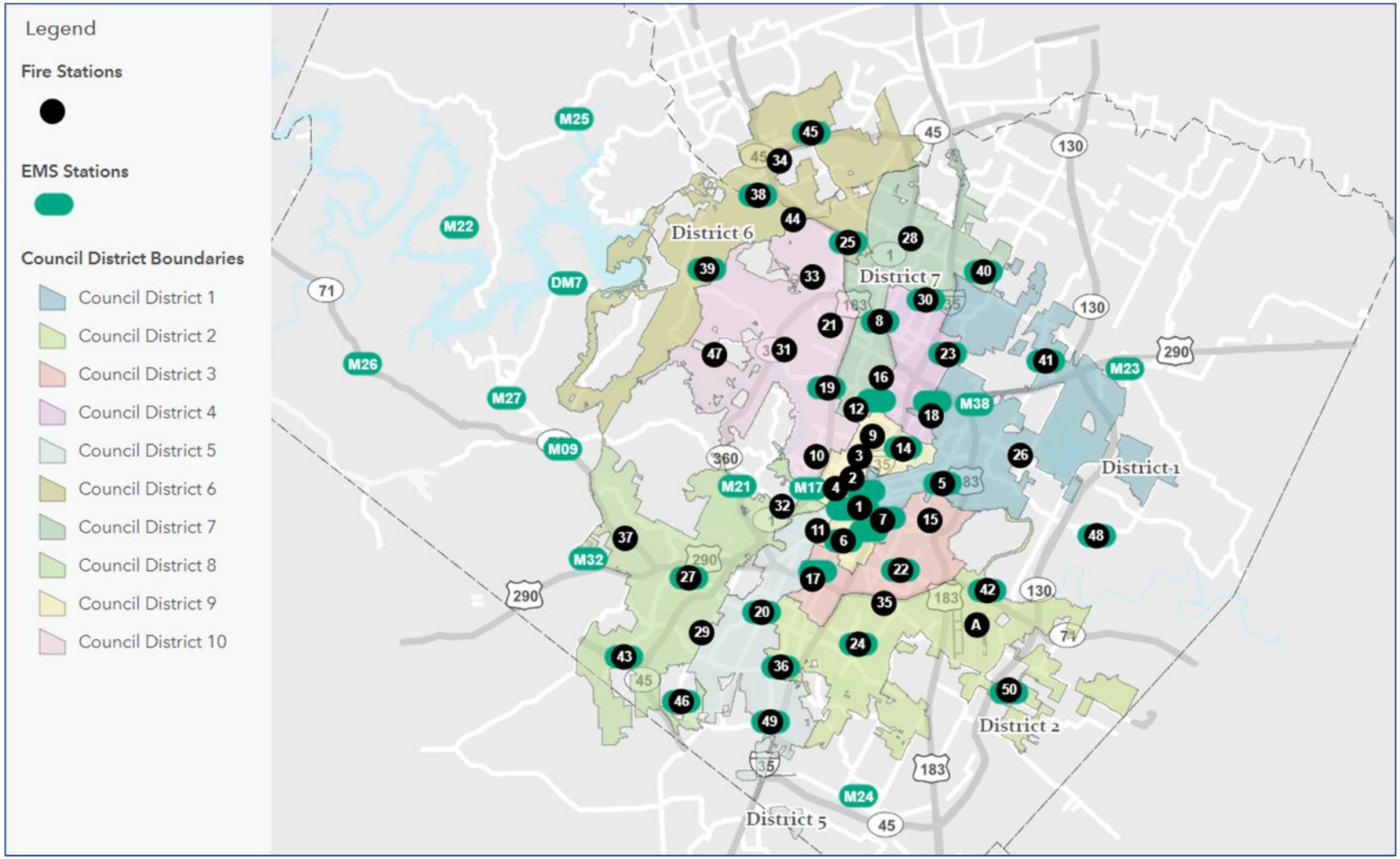


AFD Staffing/Numbers of Personnel:

- 1,220 uniformed personnel
- 131 civilian personnel
- 60 cadets (new-hire personnel undergoing training to become firefighters)

The map in ***Figure 11*** shows the locations of all current AFD fire stations by City of Austin Council District.

Figure 11: Map of Current AFD and ATCEMS Station Locations



Austin-Travis County Emergency Medical Services (ATCEMS)

History of ATCEMS

Within the City of Austin and Travis County, the origin of pre-hospital care and transport of the sick and injured seems to have its initial roots in 1957. Brackenridge Hospital was owned and operated by the City of Austin and was the primary receiving hospital for patients. The City Council approved formation of a "zone" system that employed use of Austin PD dispatchers to send "ambulances" to collect sick or injured patients. These transport units responded from funeral homes and mortuaries located throughout the City and were, in fact, hearses. At that time in 1957, these were ideal vehicles because they were long enough to accommodate the crude gurneys that were used to "stretch-out" the patient in the back of the vehicle.

For Austin, the process for transporting patients was put to the test on August 1, 1966 when the City experienced the University of Texas clock tower mass shooting, an act of domestic terrorism. An event like this had never occurred in the U.S. and it shocked not only Austin city leaders but also the rest of the nation into addressing the fact that many of the victims could have survived had they been transported to definitive care sooner. In the after-action review of the incident, city leaders were confronted with the reality that they were grossly unprepared to contend with any incident type that inflicted mass casualties.

In 1967, the Austin City Council signed a contract with Austin Ambulance Service to provide both emergency and non-emergency transport services throughout the City. This action was shortly followed by City Council signing a franchise agreement with Austin Ambulance Service.

Over the period between 1967 and 1973, multiple efforts were undertaken across the nation, including Austin, to put programs and services in place to meet the provisions of the 1966 National Highway Safety Act (NHSA). These actions included the establishment of minimum standards for ambulances as well as development of training curricula for the newly identified position of Emergency Medical Technician (EMT). Between 1970 and 1973, pilot studies were conducted in Los Angeles, Seattle, and Miami to provide Advanced Life Support (ALS) care in the pre-hospital setting. This was the beginning of the Paramedic level of certification.

Over the course of 1975, the Austin City Council began forming a standalone municipal department to provide pre-hospital care at the basic life support (BLS) level. It is unclear as to why EMS was not integrated into the Austin Fire Department, as this type of integration existed in the other major metropolitan communities in Texas and in many other U.S. communities. Regardless of this difference, PCG does not believe that combining AFD and ATCEMS field operations is a cost effective or feasible recommendation. However, PCG has identified several program areas where AFD and ATCEMS should consolidate their efforts to gain greater efficiencies, reduce program costs, and improve equitable delivery of services. These recommendations will be discussed in greater detail later in this report.

ATCEMS began operating on January 1,1976 with seven ambulances and 32 employees. Even though the City of Austin had a population of over 300,000 residents at the time, Austin EMS only responded to an estimated 5,500 incidents per year. In 1977, Austin EMS executed an interlocal agreement with Travis County to provide EMS response throughout the County.

Between 1977 and 1997, Austin EMS employed a tiered response system staffing both BLS and ALS units. This ended in 1997 when Austin EMS converted to an all-advanced life support service (ALS). In 2000, the department rebranded and became known as Austin-Travis County EMS.

ATCEMS Today

Presently, ATCEMS is considered a municipal, third-service EMS pre-hospital provider. It is staffed by ALS personnel with at least one ALS provider and one BLS provider. ATCEMS provides ambulance service to both the City of Austin and throughout Travis County (except TCESD2 service area), covering 1,189 square miles in size and a population of over 2.2 million residents. ATCEMS's response coverage area also includes portions of Williamson and Hays counties. This service area encompasses an additional 18 cities and 13 emergency service districts (ESDs).

ATCEMS is accredited by the Commission on Accreditation of Ambulance Services (CAAS) and its dispatch center achieved Accredited Center of Excellence (ACE) status in 2000 from the International Academies of Emergency Dispatch (IAED). ATCEMS was the first department in Texas to achieve this accreditation. This places ATCEMS and its dispatch operations at the CTECC among the top tier of EMS agencies nationally and internationally. ATCEMS has held these performance accreditations for more than a decade.

The FY 2021 approved budget for ATCEMS reflects a substantial increase over the FY 2020 budget of $93,068,228. The FY 2021 budget approved by the City Council is $102,002,968, which is an increase of nearly $9 million over the FY 2020 budget. This change was due to a reduction of the Austin Police Department budget because of the "Reimagine Public Safety" initiative. The increase for ATCEMS will add 14 additional community health paramedic (CHP) personnel, as well as three full-time ambulances with 12 full-time employees (FTEs) per ambulance and three reserve ambulances. Also included in this additional funding are 12 new positions for the Communications Division: four Communications Clinical Specialists and eight Clinical Specialists to support the C4 consult line. One additional Command District Chief that requires five FTEs was also funded.

Services Provided

The term "third-service" refers to the addition of EMS to the traditional governmental services of police and fire. ATCEMS is classified as a third-service EMS provider, not a fire-based EMS service, private, or for-profit service provider (e.g., Acadian Ambulance, American Medical Response - AMR). Although there are other third-service providers around the country, this model is the least common type of provider.

ATCEMS is the designated primary EMS provider for the City of Austin, most of Travis County, and sections of Williamson and Hays Counties. Within the City of Austin, ATCEMS is supported and/or augmented by Austin Fire Department, which is dispatched to ALS-level calls (priority one through three) to ensure more critical patients receive care and treatment as rapidly as possible. AFD responds to these calls with EMTs and provides basic life support (BLS) level care.

ATCEMS utilizes an international system known as the Medical Priority Dispatch System™ (MPDS®) to classify and prioritize EMS 911 calls. When a person calls 911 and states they have a medical emergency, the call is transferred to the ATCEMS dispatch center from the Austin Police Department call taker. Once the ATCEMS call taker determines the primary complaint and obtains the address of the incident, emergency response units from ATCEMS are dispatched and, if needed, AFD is also dispatched at the same time. The call taker continues with a series of questions to determine the severity of the problem and additional information gathered regarding the patient is provided to the responders. In Austin and Travis County, EMS calls are prioritized one through five with one being the most critical and five being the least. ATCEMS provides a single-tier response model, meaning that all response units are staffed by ALS providers which are typically certified or licensed paramedics. This means that regardless of the call priority level an ALS unit responds, provides care, and, if necessary, provides transportation to a protocol-designated hospital, which may include the closest hospital or emergency department facility, or a specialty care center for specific types of patient emergencies.

Response Statistics

As previously noted, ATCEMS is the primary EMS response department for both the City of Austin and throughout Travis County. ***Table 2*** shows ATCEMS's 2020 call volume by priority type.

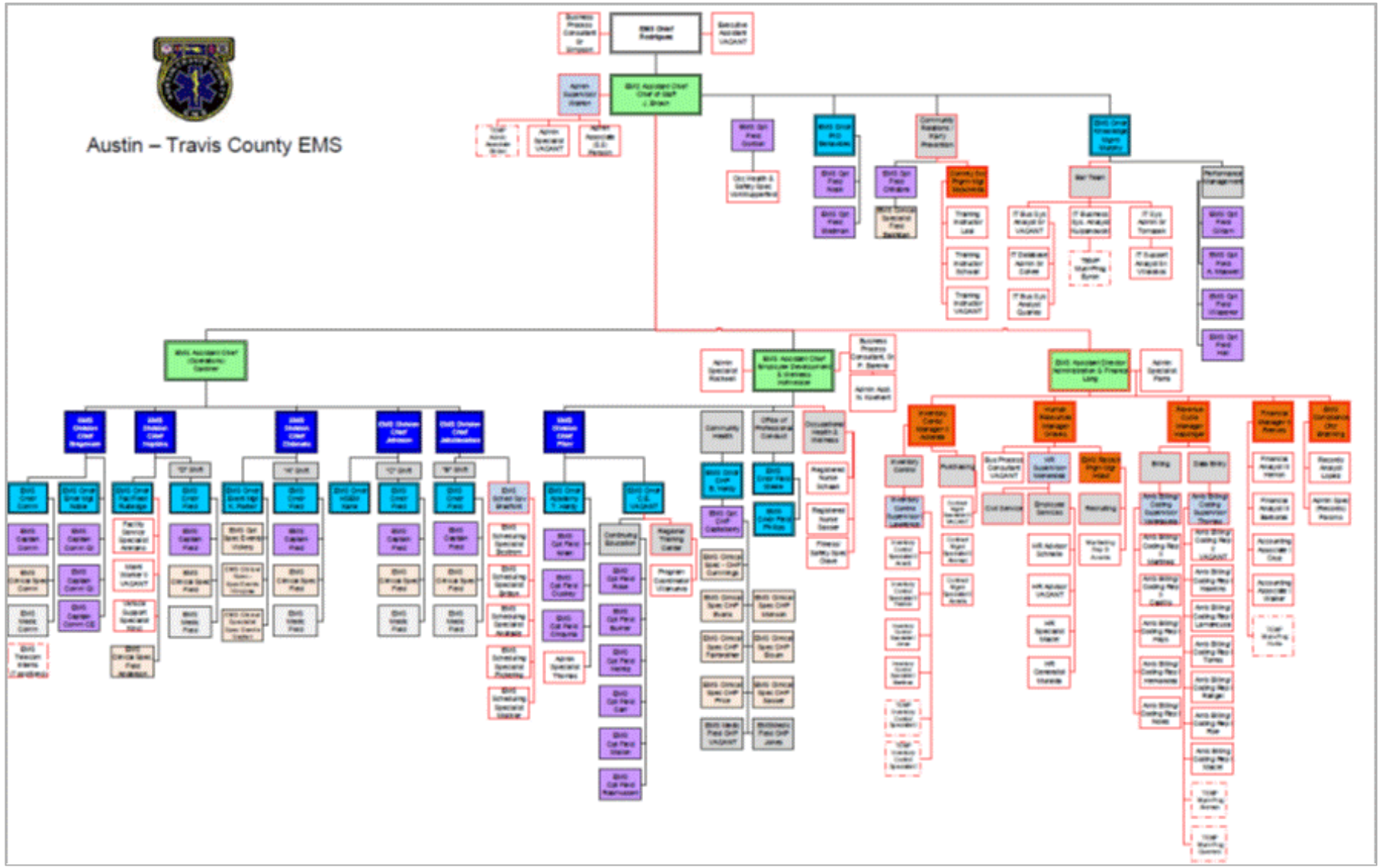
Table 2: ATCEMS 2020 Call Volume for the City of Austin and Travis County

City of Austin 2020 Calls by Priority		Travis Co. 2020 Calls by Priority	
Priority 1	7,455	Priority 1	1,040
Priority 2	22,227	Priority 2	3,754
Priority 3	25,683	Priority 3	3,198
Priority 4	34,969	Priority 4	5,038
Priority 5	14,221	Priority 5	1,646
Total Calls	**104,555**	**Total Calls**	**14,676**
Total All Calls		**119,231**	

ATCEMS reports that of the calls listed above, 69.9% of all calls in the City of Austin resulted in patient transport and 68.8% of all calls in Travis County resulted in patient transport.

The ATCEMS organization chart in ***Figure 12*** shows the size of the department. ATCEMS is comprised of four divisions: Office of the Chief, Administration and Finance, Employee Development and Wellness, and Operations. Detailed breakdowns of the ATCEMS organizational chart are found in Appendix C.

Figure 12: ATCEMS Organization Chart



Each of the four divisions in the organization chart for ATCEMS are further separated into specific focus areas, demonstrated in ***Table 3***.

Table 3: Division Focus Areas

Office of the Chief	Administration and Finance	Employee Development and Wellness	Operations
• Community Relations Team • Business Analysis and Research Team • Safety • Public Information Office (PIO)	• Accounts Payable, Billing and Records • Financial Monitoring • Payroll • Purchasing and Supply • Human Resources • Recruiting and onboarding	• Academy • Continuing Education • Clinical Practices/Training • QA/QI • Community Health Paramedicine (CHP) • Collaborative Care Communications Center (C4)	• Field Operations • Communications (CTECC) • Special Operations • Special Events • Fleet • Facilities

ATCEMS Staffing/Numbers of Personnel

ATCEMS has an authorized staffing level of 776.5 full-time employees (FTEs) with an additional 62 FTE positions approved in the FY 2021 budget. Current staffing is outlined below:

- 643 sworn/uniformed personnel
- 81.50 civilian
- 52 cadets

Observations and Recommendations

The delivery of emergency medical services in the City of Austin and portions of Travis County is provided primarily by the Austin-Travis County EMS (ATCEMS) department and is supplemented the Austin Fire Department (AFD) in a non-transport capacity. In addition to interviewing the Assistant City Manager overseeing ambulance services and the County Executive, PCG also interviewed the department heads or their designated representatives for AFD, ATCEMS, APH, and the OCMO. Additional staff members from both AFD, ATCEMS, and the OCMO were interviewed as well as the leaders of both labor groups. Additional interviews were conducted with fire chiefs from the surrounding emergency service districts that rely on AFD or ATCEMS for dispatch services.

To carry out the data collection, interviews, and analysis, the PCG team interacted closely with all the departments responsible for coordination and delivery of emergency services identified in the above sections. The team identified specific findings and recommendations related to the operations and services for each of the departments that are documented in the sections that follow.

Overall findings and recommendations related to departmental coordination and collaboration are outlined below.

Inter-Departmental Coordination and Collaboration

As our team progressed through the project engagement, we began to develop the impression that each of the departments (APH, OCMO, AFD and ATCEMS) provide high quality services to the community. However, our analysis and findings revealed patterns that each department operates in a silo and that, based on our findings and observations, there are obvious deficiencies with regards to inter-departmental cooperation, coordination, and collaboration. Several of these findings are listed in the following page.

- There is minimal to no collaboration between ATCEMS, AFD, APH, and OCMO regarding the City's overall vision and goals for the provision of physician care and services to increase health equity.

Recommendation 8:
ATCEMS & OCMO should consider further collaboration to develop a list of routine and ad hoc reports to be provided to OCMO on a regular and at on-request basis.

- ATCEMS and AFD have community outreach programs that could, with better cooperation, coordination, and collaboration, mutually benefit one another but information sharing and working together on projects is rare.
- AFD and ATCEMS have overlapping programs (mission creep) and present the appearance to outside observers as being in competition with each other rather than working together.
- ATCEMS gives the appearance of keeping OCMO and APH at an arms distance rather than working hand-in-glove to develop outreach programs focusing on health equity, particularly with underserved communities.
- All departments do an exceptional job at collecting data but rarely share data and reports from data with each other. There is not a coordinated approach to the use of data.

Recommendation 9:
Consider conducting facilitated workshops with APH, AFD, ATCEMS, and the OCMO to identify areas for cooperation, coordination, and collaboration, and in some instances, consolidation, that would increase efficiency, effectiveness, and enhance health equity community wide.

External Agency Coordination and Collaboration

The external agency relationships that ATCEMS has with organizations that can enhance the delivery of EMS and other community healthcare services throughout the response area are not fully developed based on our interviews and observations. Several detailed reports based on thorough analysis of the healthcare needs of the community are available through Austin Public Health, Central Health, and CommUnityCare. This information alongside enhanced collaboration with these agencies can guide the Community Health Paramedicine (CHP) program and target the most vulnerable areas of Austin and Travis County. By obtaining the reports and documents developed by APH, Central Health, CommUnityCare, and others, as well as reviewing their own data, ATCEMS and OCMO can focus on improving health inequity in other areas of Austin besides the homeless and substance abusers.

Recommendation 10:
The OCMO and ATCEMS should obtain the reports and documents produced by APH, Central Health, CommUnityCare, and others to review and analyze for opportunities for CHP focus and deployment.

ATCEMS leadership mentioned collaboration regarding specific needs or problems that need to be addressed (i.e., HIV/AIDS testing or case management, outreach related to IV drug use, etc.). They also said that there is quite a bit of collaboration and coordination with these agencies to address homelessness in the City of Austin. ATCEMS stated that they routinely work with APH's Homeless Strategy Officer and staff. ATCEMS participates in the Homeless Outreach Street Team (HOST) such as the Housing-Focused Encampment Assistance Link (HEAL) initiative. ATCEMS also stated that they work with CommUnityCare and their street medicine team that also serves the homeless. Many, if not most, of CHP's clients are also clients of CommUnityCare. ATCEMS assists with coordinating care as needed with their providers, case managers, social workers, and others

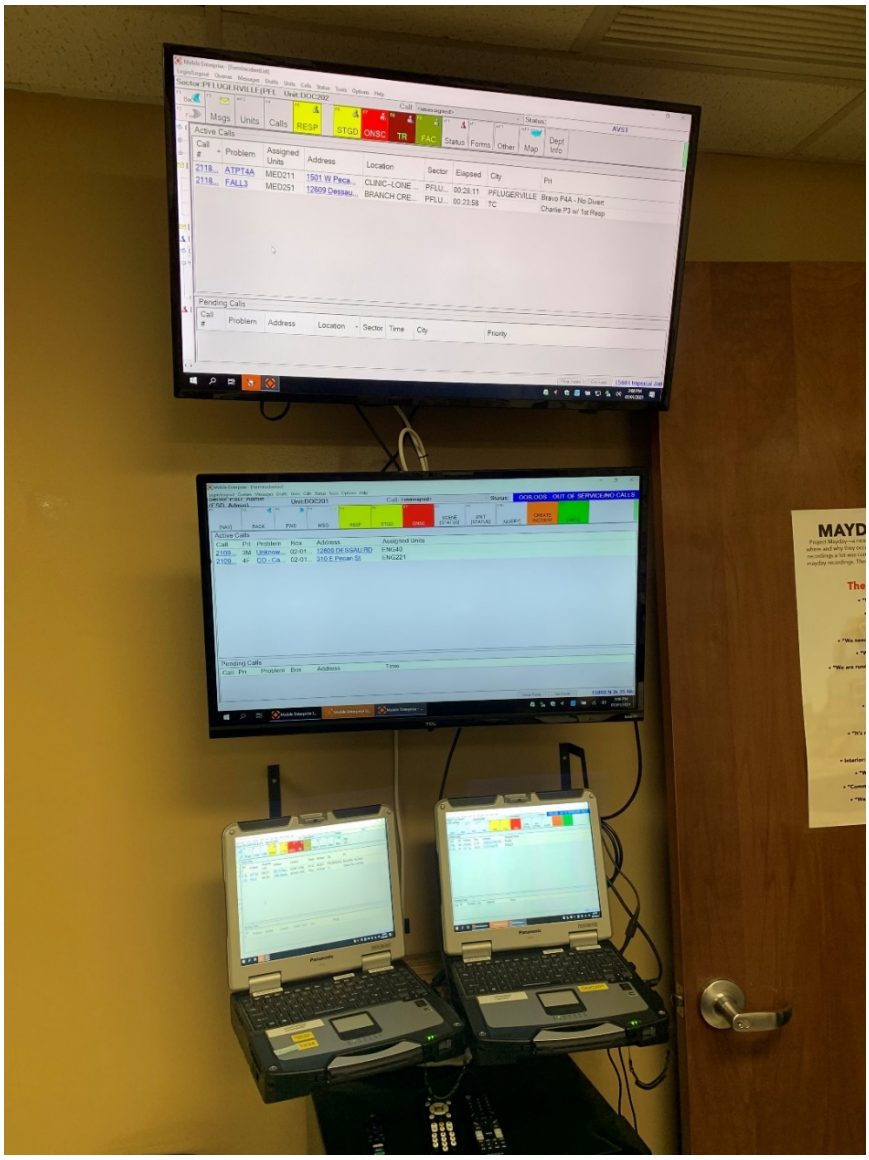
Relationships with Emergency Service Districts

During interviews with leadership from three of the ESDs, there were common concerns expressed regarding frustrations with how AFD and ATCEMS interacts on an administrative, operational, and fiscal level. Some of the ESDs made comments that if they are responding into the City of Austin that ESDs must conduct operations in the same manner as AFD does, staff apparatus/units the way AFD does, and respond

with the same number and type of apparatus as AFD does. Given the fact that some of these organizations are paying either AFD, ATCEMS, or both for dispatch services, the relationship appears to be less of a mutually beneficial partnership and more directed and mandate driven.

Although the City uses a single computer-aided dispatch (CAD) system, fire and EMS are segregated in the system. Field units are either in the EMS view or fire view on their mobile computer terminal (MCT) depending on the type of call that is being responded to. ESDs that provide both EMS and fire response may contract with both AFD and ATCEMS for dispatch services. ESD Battalion Chiefs that want to view both fire and EMS activity in their jurisdictions have two MCTs, one for EMS and one for fire, see ***Figure 13*** below. ATCEMS chose not to use the same station alerting system as AFD (Locution) resulting in duplicated station alerting systems, one for EMS and one for fire. The ESDs also have duplicated fire station alerting systems and several other expensive components related to having two segregated dispatch operations. Some of the ESDs expressed that they are limited in implementing new technologies because of the current dispatch configurations used by AFD and ATCEMS. In addition, getting service for ESD equipment or changes to ESD response configurations specific to their jurisdiction has been challenging. The needs of the ESDs are secondary to AFD and ATCEMS needs, which are addressed first. This has resulted in long delays for ESD requests.

Figure 13: Example of MCT Multiple View



Relationships with the Health Care System

Austin and Travis County have tremendous medical resources, including hospital networks, public and private clinics, major healthcare insurance providers, nursing schools, and medical school programs. There appear to be some relationships established with WellCare and some of the CommUnityCare clinics. These were formed primarily because the ET3 pilot program mandates these types of relationships for the alternative destination component. As previously mentioned, efforts related to this were made, and even accomplished, from 2012 through 2018 through the Delivery System Reform Incentive Program (DSRIP). This was led by Central Health with significant representation from the hospitals, CommUnityCare, and Integral Care. Additional efforts have been made since then to engage the hospitals and even some Medicaid/Medicare MCOs about partnering with ATCEMS to prevent hospital readmissions. The hospitals and the MCOs have never responded to ATCEMS with any serious interest in pursuing a partnership that could result in reimbursement of services.

Recommendation 11:
Consider adding healthcare system finance expertise to the ATCEMS Administration and Finance Department to generate additional revenues through partnerships and other relationships with the Austin-Travis County healthcare community.

ATCEMS leadership stated that the CHP staff works with the Austin hospital's staff, CommUnityCare, Integral Care, and others. They also mentioned that ATCEMS has representation on larger leadership teams and workgroups in the community. Representation on the Psychiatric Stakeholders Committee, Behavioral Health Service Continuum Advisory Board, the Texas Health and Human Services Substance Use Disorder (SUD) workgroup, and several small care coordination teams were specifically mentioned.

There are opportunities to generate additional revenues from Austin's healthcare providers and improve healthcare delivery. The addition of healthcare finance expertise ATCEMS may be able to open the doors to additional reimbursements.

AFD and ATCEMS EMS Data Collection and Analysis

The City, overall, is excellent at collecting data, analyzing that data, and sharing it with the public through dashboards on the City's websites and other means. Additional data does not appear to be shared across departments and any data analysis is department specific. For example, part of the EMS Medical Director's mission is scientific research. Without full access to ATCEMS and AFD data related to EMS delivery, there is not much research that can be done.

A significant amount of data is collected within each department but not routinely shared or used across departments. The City of Austin has great transparency with data dashboards and a strong website presence containing a multitude of information available to the public. The use of the data collected by AFD and ATCEMS should be readily available to the OCMO for research purposes and to assess the EMS system's performance, including individual paramedics to ensure high quality clinical care.

Recommendations 12:
Coordinate data collection and data analysis across APH, AFD, ATCEMS, and the OCMO to develop outcome data to be used in EMS delivery decision making.

APH Office of Equity

A recommendation was previously made to add a Health Equity Liaison to the OCMO to ensure ATCEMS and AFD can focus their efforts on the most vulnerable communities. Equitable access needs to be assured from the very top of the organization and must be integrated throughout each service and program that provides emergency medical and extended care services to the community. Performance indicators and desired outcomes need to be defined. Appendix G includes an example of the general framework for performance indicators and incorporates health equity concerns.

SECTION VI: FINANCIAL ANALYSIS

Like most cities across the country, the City of Austin is facing increasing financial pressure because of budget constraints and increasing demand due to population growth. A memorandum released by the City on April 16, 2021 projects a $23.3 million dollar budget deficit for FY 2022, and the deficit is expected to continue to grow to over $70 million dollars in the next five years.[10] The City's ability to generate revenue is constrained by a 3.5% tax cap to property tax increases per year. Property tax revenue is the City's largest source of income, with revenue from sales tax representing the second largest source of revenue. The City has also experienced a significant drop in sales tax revenue due to the COVID-19 pandemic. In addition, the U.S. Census Bureau figures released on May 4, 2021 indicate that the City is one of the fastest growing major metropolitan areas in the country. Identifying efficiencies, cost reductions, and revenue opportunities is essential to addressing these financial challenges and ensuring the sustainability of services.

A comprehensive financial review was not part of the scope of work, however, the PCG team conducted a high-level review of the EMS, Fire, and Austin Public Health budgets to understand the City's costs and identify opportunities for revenue maximization.

Budget Analysis

PCG reviewed and analyzed the FY 2020-2021 approved budget for the following City of Austin departments: EMS, Fire, and Austin Public Health. A summary of each department budget is provided in the following subsections. In our approach to the budget analysis, we looked at growth of the department budgets over the FY 2018-2021 span, and we performed scenario analysis to demonstrate where those budgets would have been if the annual increases would have been capped at 3.5% across each department. PCG understands that the 3.5% tax cap pertains to the City's overall budget, not necessarily at the department level, and that the City has discretion over the budget amount of each department and can increase or decrease them. As shown below, the budgets for each of the departments grew at rates higher than 3.5%.

- 5.34% - Emergency Medical Services
- 3.70% - Fire
- 12.87% - Public Health

This is not necessarily an indictment of the growth in budgets, but rather an observation that if each of these three departments had been held to a 3.5% growth cap, this likely would have created significant constraints on the operations of each department. Fortunately, the 3.5% tax cap does not prohibit these critically important departments from receiving budget increases greater than 3.5%. It nevertheless is a useful exercise to understand how a highly restrictive cap *could* impact spending at department levels. If the 3.5% cap had been followed from FY 2018-2021, the FY 2021 budget amounts would have been quite different. The differences for each of the three departments is highlighted in ***Table 4*** below.

Table 4: Department Expenditures – FY 2021 Scenario Analysis for 3.5% Cap*

Program	Actual	With 3.5% Cap	Difference
Emergency Medical Services	$ 96,896,126	$ 91,909,214	$ 4,986,912
Fire	$ 215,186,200	$ 213,932,214	$ 1,253,986
Austin Public Health	$ 103,014,803	$ 79,667,632	$ 23,347,171

* Assumes growth capped at 3.5% since FY18

[10] Lang, K. (2021, April 16). *Five-Year Financial Forecast Memorandum*. City of Austin Official Website. http://www.austintexas.gov/edims/pio/document.cfm?id=358534

In the EMS and fire departments, we found that approximately two-thirds of the budgeted dollars were for Operations. Assuming that all the costs for these front-line emergency services were necessary and reasonable costs, it can be expected that any significant limits to budget growth could have a detrimental effect on the access and quality of emergency services. Growth in Operations was slightly lower than overall growth in department budgets; we found 5% and 2% average growth rates for EMS and fire operations, respectively.

For Public Health, the Social Services Contracts program had the greatest budget increase. Between FY 2020 and FY 2021, this program had an increase of nearly 29%, or $11.5 million.

Detailed tables showing the annual budget increases for each department are provided in the following sections. For EMS, the primary focus of this study, we took a deeper dive into the expenditures at the program and budget category levels.

Emergency Medical Services

As noted above, for EMS we found that the overall budget increased at an average rate of approximately 5.3% over the period of FY 2018-2021. The growth rate, in terms of dollars, was most evident for Operations. ***Tables 5-7*** below summarize EMS growth by program.

Table 5: Emergency Medical Services – Expenditures by Program, FY 2018-21

Program	2017-18	2018-19	2019-20	2020-21
Billing Services	$ 1,683,640	$ 1,775,617	$ 1,985,033	$ 2,231,035
Community Relations and Injury Prevention	$ 676,191	$ 637,425	$ 810,451	$ 752,006
Emergency Communications	$ 5,347,782	$ 5,567,691	$ 5,983,238	$ 6,499,245
Employee Development and Wellness Operations	$ 2,577,994	$ 2,657,382	$ 2,990,934	$ 2,895,549
Operations	$ 54,018,343	$ 56,738,882	$ 59,725,072	$ 62,665,910
Safety and Performance Improvement	$ 2,079,740	$ 2,090,246	$ 2,276,125	$ 2,325,749
Support Services	$ 5,261,720	$ 5,528,629	$ 5,677,045	$ 5,803,940
Transfers, Debt Service, and Other Requirements	$ 11,251,435	$ 12,983,119	$ 13,620,330	$ 13,722,692
Total	**$ 82,896,845**	**$ 87,978,991**	**$ 93,068,228**	**$ 96,896,126**

Table 6: Emergency Medical Services – Percentage of Total Expenditures by Program, FY 2018-21

Program	2017-18	2018-19	2019-20	2020-21
Billing Services	2.03%	2.02%	2.13%	2.30%
Community Relations and Injury Prevention	0.82%	0.72%	0.87%	0.78%
Emergency Communications	6.45%	6.33%	6.43%	6.71%
Employee Development and Wellness Operations	3.11%	3.02%	3.21%	2.99%
Operations	65.16%	64.49%	64.17%	64.67%
Safety and Performance Improvement	2.51%	2.38%	2.45%	2.40%
Support Services	6.35%	6.28%	6.10%	5.99%
Transfers, Debt Service, and Other Requirements	13.57%	14.76%	14.63%	14.16%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Table 7: Emergency Medical Services – Annual Percentage Change by Program, FY 2018-21

Program	2017-18	2018-19	2019-20	2020-21
Billing Services	-	5.46%	11.79%	12.39%
Community Relations and Injury Prevention	-	-5.73%	27.14%	-7.21%
Emergency Communications	-	4.11%	7.46%	8.62%
Employee Development and Wellness Operations	-	3.08%	12.55%	-3.19%
Operations	-	5.04%	5.26%	4.92%
Safety and Performance Improvement	-	0.51%	8.89%	2.18%
Support Services	-	5.07%	2.68%	2.24%
Transfers, Debt Service, and Other Requirements	-	15.39%	4.91%	0.75%
Total	**-**	**6.13%**	**5.78%**	**4.11%**
Average		**5.34%**		

In addition to reviewing the EMS expenditures by program, we looked at the budget by the primary budget categories. ***Tables 8-9*** summarize the expenditures by budget category for FY 2016-2020.

Table 8: Emergency Medical Services – Expenditures by Budget Category, FY 2016-20

Budget Category	FY16	FY17	FY18	FY19	FY20	FY16-FY20 % Change
Salaries & Benefits	$ 58,525,559	$ 63,941,334	$ 64,569,859	$ 65,375,770	$ 68,636,054	17.28%
Contractual	$ 9,245,692	$ 16,877,936	$ 18,613,554	$ 20,284,175	$ 21,374,928	131.19%
Commodities	$ 3,595,716	$ 3,813,014	$ 3,932,508	$ 3,913,770	$ 4,034,571	12.20%
Expense Refunds	$ (513,300)	$ (1,156,050)	$ (1,107,000)	$ (1,393,016)	$ (1,410,016)	174.70%
Non-CIP Capital	$ 275,580	$ 309,777	$ 303,803	$ 335,577	$ 415,074	50.62%
Transfers	$ 7,126,709	$ -	$ 7,027	$ 13,868	$ 17,617	-99.75%
Total	**$ 78,255,956**	**$ 83,786,011**	**$ 86,319,751**	**$ 88,530,144**	**$ 93,068,228**	**18.93%**
Annual Percentage Increase	**-**	**7.07%**	**3.02%**	**2.56%**	**5.13%**	**4.44%**

Table 9: EMS – Percentage of Expenditures by Budget Category, FY 2016-20

Budget Category	FY16	FY17	FY18	FY19	FY20
Salaries & Benefits	75%	76%	75%	74%	74%
Contractual	12%	20%	22%	23%	23%
Commodities	5%	5%	5%	4%	4%
Expense Refunds	-1%	-1%	-1%	-2%	-2%
Non-CIP Capital	0%	0%	0%	0%	0%
Transfers	9%	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

As expected, nearly 75% of the budget was allocated to personnel costs. Most typically, one would assume that changes in personnel costs would drive overall budget needs. EMS personnel costs grew at an average rate of 4% over the five-year span. However, contractual costs comprising 23% of the budget, have been the biggest driver in the increase in overall costs. The appearance of increased contractual costs may be due more to changes in accounting procedures – the increases were driven by intra/inter-departmental costs – rather than true increases in costs to the unit of government.

Analysis at the level of expenditure by program was limited with this study. While the initial budget data received did not include expense line item by program, we were able to ascertain that most of the changes in the overall budget were related to increases in the Operations program. Because Operations comprised nearly 65% of the total budget, this program drove overall costs.

Incremental increases to Billing Services costs were also noted. Billing costs increased an average of 10% annually. Understandably, there may have been increased costs related to technology or staffing for billing services, but the collections percentage remained steady at about 30% of billed charges over the FY 2016-2020 period. There does not appear to have been a significant increase in billing performance since this investment.

A further dive into line-item expense analysis at the program level could provide further insight on the budget drivers.

Austin Fire Department

As we found with EMS, Emergency Operations (response) comprised about two-thirds of the operating budget. Transfers, Debt Service, and other requirements were the second largest expenditures by program, followed by Emergency Prevention, Operations Support, and Support Services.

The program that saw the most significant increase in appropriations between FY 2018-2021 was Emergency Prevention. In fact, the budget for Emergency Prevention increased by 70% in that time span. The percentage change in Emergency Prevention is impacted by the One Stop Shop budget (1.70M) and

activities being consolidated with the Prevention budget (9.87M) in FY 2021. Taking this into consideration the increase in Emergency Prevention is closer to 45%.

Operations Support and Support Services also increased at a higher rate (16% and 11%, respectively) than Fire/Emergency Response, which only increased a total of 6% in four years.

The number of full-time employees (FTEs) for AFD has increased at about 1.5% per year over the FY 2018-2021 span. This is just slightly higher than the FTE increase that we found with EMS.

Details of the AFD expenditures by program are shown in ***Tables 10-12***.

Table 10: Fire – Expenditures by Program, FY 2018-21

Program	2017-18	2018-19	2019-20	2020-21
Emergency Prevention	$ 9,871,127	$ 11,190,238	$ 12,294,231	$ 16,816,327
Fire / Emergency Response	$ 134,059,609	$ 134,529,493	$ 140,673,868	$ 142,762,690
One Stop Shop	$ 1,699,675	$ 2,031,253	$ 2,208,226	$ -
Operations Support	$ 14,276,283	$ 14,574,028	$ 15,702,581	$ 16,503,731
Support Services	$ 11,468,893	$ 11,020,284	$ 10,162,564	$ 12,766,243
Transfers, Debt Service, and Other Requirements	$ 21,579,013	$ 26,039,021	$ 24,660,005	$ 26,337,209
Total	**$ 192,954,600**	**$ 199,384,317**	**$ 205,701,475**	**$ 215,186,200**

Table 11: Fire – Percentage of Total Expenditures by Program, FY 2018-21

Program	2017-18	2018-19	2019-20	2020-21
Emergency Prevention	5.12%	5.61%	5.98%	7.81%
Fire / Emergency Response	69.48%	67.47%	68.39%	66.34%
One Stop Shop	0.88%	1.02%	1.07%	0.00%
Operations Support	7.40%	7.31%	7.63%	7.67%
Support Services	5.94%	5.53%	4.94%	5.93%
Transfers, Debt Service, and Other Requirements	11.18%	13.06%	11.99%	12.24%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Table 12: Fire – Annual Percentage Change by Program, FY 18-21

Program	2017-18	2018-19	2019-20	2020-21
Emergency Prevention	-	13.36%	9.87%	36.78%
Fire / Emergency Response	-	0.35%	4.57%	1.48%
One Stop Shop	-	19.51%	8.71%	-100.00%
Operations Support	-	2.09%	7.74%	5.10%
Support Services	-	-3.91%	-7.78%	25.62%
Transfers, Debt Service, and Other Requirements	-	20.67%	-5.30%	6.80%
Total	-	**3.33%**	**3.17%**	**4.61%**
Average		**3.70%**		

Of the three departments that PCG reviewed, fire (AFD) had the highest budget ($215 million) but the lowest average growth rate (3.7%).

Austin Public Health

As opposed to AFD, which had a relatively low growth rate, investment in Austin Public Health increased dramatically (nearly 20%) in the FY 2018-2021 period. At the program level, there was a 29% increase in Social Service Contracts between FY 2020 and FY 2021. There was a $1.9 million increase (35%) in Health Equity and Community Engagement in the most recent budget year. Also of note, Reimagining Public Safety redirected funds and positions to alternative public health and public safety initiatives to provide preventative measures. In August of 2020, the City Council approved a 2021 budget included redirecting $153.2 million in police funding.

Details for Austin Public Health are shown in ***Tables 13-15.***

Table 13: Austin Public Health – Expenditures by Program, FY 2018-21

Program	2017-18	2018-19	2019-20	2020-21
Community Services	$ 4,579,466	$ 5,134,263	$ 4,757,321	$ 5,165,449
Disease Prevention & Health Promotion	$ 7,326,227	$ 7,731,714	$ 8,361,531	$ 7,749,239
Environmental Health Services	$ 5,281,705	$ 5,591,783	$ 5,974,984	$ 6,438,263
Epidemiology and Public Health Preparedness	$ 1,755,186	$ 1,930,607	$ 2,028,882	$ 2,612,807
Health Equity and Community Engagement	$ 2,388,396	$ 3,406,642	$ 5,528,034	$ 7,440,603
Homeless Services Division	$ -	$ -	$ -	$ 1,116,168
One Stop Shop	$ 290,938	$ 227,844	$ 279,411	$ -
Social Services Contracts	$ 34,039,198	$ 36,588,138	$ 39,854,516	$ 51,378,666
Support Services	$ 7,621,607	$ 9,949,569	$ 8,758,124	$ 10,154,273
Transfers, Debt Service, and Other Requirements	$ 8,572,917	$ 9,332,703	$ 10,550,962	$ 10,959,335
Total	**$ 71,855,640**	**$ 79,893,263**	**$ 86,093,765**	**$ 103,014,803**

Table 14: Austin Public Health – Percentage of Total Expenditures by Program, FY 2018-21

Program	2017-18	2018-19	2019-20	2020-21
Community Services	6.37%	6.43%	5.53%	5.01%
Disease Prevention & Health Promotion	10.20%	9.68%	9.71%	7.52%
Environmental Health Services	7.35%	7.00%	6.94%	6.25%
Epidemiology and Public Health Preparedness	2.44%	2.42%	2.36%	2.54%
Health Equity and Community Engagement	3.32%	4.26%	6.42%	7.22%
Homeless Services Division	0.00%	0.00%	0.00%	1.08%
One Stop Shop	0.40%	0.29%	0.32%	0.00%
Social Services Contracts	47.37%	45.80%	46.29%	49.88%
Support Services	10.61%	12.45%	10.17%	9.86%
Transfers, Debt Service, and Other Requirements	11.93%	11.68%	12.26%	10.64%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Table 15: Austin Public Health – Annual Percentage Change by Program, FY 2018-21

Program	2017-18	2018-19	2019-20	2020-21
Community Services	-	12.11%	-7.34%	8.58%
Disease Prevention & Health Promotion	-	5.53%	8.15%	-7.32%
Environmental Health Services	-	5.87%	6.85%	7.75%
Epidemiology and Public Health Preparedness	-	9.99%	5.09%	28.78%
Health Equity and Community Engagement	-	42.63%	62.27%	34.60%
Homeless Services Division	-	0.00%	0.00%	100.00%
One Stop Shop	-	-21.69%	22.63%	-100.00%
Social Services Contracts	-	7.49%	8.93%	28.92%
Support Services	-	30.54%	-11.97%	15.94%
Transfers, Debt Service, and Other Requirements	-	8.86%	13.05%	3.87%
Total	**-**	**11.19%**	**7.76%**	**19.65%**
Average		**12.87%**		

Billing and Cost Analysis

ATCEMS billing data was presented at a high level, but it provided some opportunity for a review of the agency's payor mix and collection rates. Billing analysis from FY 2016-2020 is summarized below in ***Tables 16-17***.

Table 16: Payor Mix: Amount Billed

Payor	FY16	FY17	FY18	FY19	FY20
Commercial Insurance	$ 14,844,834	$ 13,816,331	$ 12,649,371	$ 11,930,901	$ 10,563,288
Medicare	$ 23,556,578	$ 22,106,977	$ 21,515,476	$ 20,733,284	$ 17,512,920
Medicaid	$ 9,205,160	$ 9,084,981	$ 8,557,479	$ 8,332,690	$ 7,783,324
Uninsured	$ 22,465,002	$ 24,621,605	$ 23,803,844	$ 25,745,906	$ 25,136,812
MAP	$ 4,933,007	$ 5,021,508	$ 5,546,212	$ 6,534,858	$ 5,213,797
Uninsured (Charity Care Eligible)	$ 30,308	$ 22,795	$ 17,124	$ 8,797	$ 6,129
Total	**$ 75,034,889**	**$ 74,674,197**	**$ 72,089,505**	**$ 73,286,435**	**$ 66,216,269**

Table 17: Payor Mix: Amount Collected

Payor	FY16	FY17	FY18	FY19	FY20
Commercial Insurance	$ 10,265,517	$ 9,627,462	$ 8,913,433	$ 8,601,736	$ 7,000,358
Medicare	$ 9,217,984	$ 8,811,254	$ 9,162,168	$ 9,128,394	$ 7,745,789
Medicaid	$ 2,566,442	$ 2,467,999	$ 2,196,962	$ 2,033,799	$ 1,896,620
Uninsured	$ 1,461,355	$ 1,720,351	$ 1,821,125	$ 1,931,291	$ 1,354,397
MAP	$ -	$ -	$ -	$ -	$ -
Uninsured (Charity Care Eligible)	$ 18,532	$ 10,753	$ 7,887	$ 4,874	$ 3,398
Total	**$ 23,529,829**	**$ 22,637,819**	**$ 22,101,574**	**$ 21,700,093**	**$ 18,000,562**
Key Statistic: Collection %	**31.36%**	**30.32%**	**30.66%**	**29.61%**	**27.18%**

ATCEMS primarily bills incidents at four levels of service: BLS, ALS-1, ALS-2, and “treatment, no transport” (TNT). We commend ATCEMS for recognizing the benefit of billing for “treatment, no transport.” Doing so allows the city to capture additional revenues while still maintaining the appropriate level of service and not inundating emergency departments with unnecessary visits from patients who could be effectively treated for low acuity incidents and released on scene. In fact, the percentage of billable instances was shown to rise in each of the last four years and has effectively doubled from 8% to 17% since 2016. We believe there is further opportunity to explore for the billing of “treatment, no transport” incidents.

In addition to showing the aptitude to treat and release more patients on the scene, data showed that ATCEMS billed at the ALS level less frequently than many other departments in Texas and around the country. ATCEMS’s ALS rate of 54% of all transports is well below the threshold of 80-90% that could trigger additional scrutiny through federal audits for Medicare. The counts for levels of service and key statistics are provided below.

Table 18: Count of Levels of Services (by Procedure Code Billed)

Level of Service	FY16	FY17	FY18	FY19	FY20
A0427 (ALS-1)	41,692	40,599	40,806	43,877	37,809
A0433 (ALS-2)	454	608	434	592	538
A0429 (BLS)	40,567	41,113	36,818	35,541	32,303
A0998 (Treat, no transport)	7,098	9,250	9,474	11,055	14,923
Total	**89,811**	**91,570**	**87,532**	**91,065**	**85,573**

Table 19: Key Statistics for Level of Service

Level of Service	FY16	FY17	FY18	FY19	FY20
Key Statistic: ALS %	**51%**	**50%**	**53%**	**56%**	**54%**
Key Statistic: TNT %	**8%**	**10%**	**11%**	**12%**	**17%**
Key Statistic: Transport %	**92%**	**90%**	**89%**	**88%**	**83%**

One caveat to the remaining billing analysis is that we recognized that the "trip" data provided by ATCEMS also included trips (transports) as well as "treatment, no transport" instances. This could slightly skew some of the collections data figures as it is expected that the "treatment, no transport" collection rate would only be a fraction of the collection rate for actual transports.

Table 20: Payor Mix: Billable Incidents by Payor

Payor	FY16	FY17	FY18	FY19	FY20
Commercial Insurance	22,585	21,936	21,029	21,432	19,051
Medicare	25,257	23,800	23,075	22,279	19,303
Medicaid	10,066	9,949	9,412	9,107	8,508
Uninsured	24,458	27,467	26,985	29,832	32,274
MAP	5,512	5,717	6,245	7,470	6,293
Uninsured (Charity Care Eligible)	55	45	31	15	12
Total	**87,933**	**88,914**	**86,777**	**90,135**	**85,441**

**Inclusive of transports and treatment, no transport.*

Table 21: Payor Mix: Percentage of Total Billable Incidents by Payor

Payor	FY16	FY17	FY18	FY19	FY20
Commercial Insurance	25.68%	24.67%	24.23%	23.78%	22.30%
Medicare	28.72%	26.77%	26.59%	24.72%	22.59%
Medicaid	11.45%	11.19%	10.85%	10.10%	9.96%
Uninsured	27.81%	30.89%	31.10%	33.10%	37.77%
MAP	6.27%	6.43%	7.20%	8.29%	7.37%
Uninsured (Charity Care Eligible)	0.06%	0.05%	0.04%	0.02%	0.01%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Looking at the payor mix, it was surprising to see that uninsured comprised 38% of the total; this is quite high. We would anticipate that the actual uninsured mix would have been in the 25-30% range for Travis County. Also of concern, the uninsured percentage has increased in each of the last four years. During the same period, there was a decrease in the commercial insurance, Medicare, and Medicaid payors. Whether this is due to a true increase in uninsured transports for ATCEMS or simply a failure to effectively identify third-party payors at the same rate as the prior year, it is concerning because uninsured transports result in the lowest return in collections. Perhaps another less concerning explanation for the rising percentage of uninsured incidents is that the rise in uninsured is tied to more treatment, no transport charges that are not covered by Medicare, Medicaid, or some commercial payors.

Tables 22-23 highlight the percentage of total collections by payor and the average payment per trip for each payor.

Table 22: Payor Mix: Percentage of Total Collections by Payor

Payor	FY16	FY17	FY18	FY19	FY20
Commercial Insurance	43.63%	42.53%	40.33%	39.64%	38.89%
Medicare	39.18%	38.92%	41.45%	42.07%	43.03%
Medicaid	10.91%	10.90%	9.94%	9.37%	10.54%
Uninsured	6.21%	7.60%	8.24%	8.90%	7.52%
MAP	0.00%	0.00%	0.00%	0.00%	0.00%
Uninsured (Charity Care Eligible)	0.08%	0.05%	0.04%	0.02%	0.02%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Table 23: Payor Mix: Average Payment Per Trip

Payor	FY16	FY17	FY18	FY19	FY20
Commercial Insurance	$ 455	$ 439	$ 424	$ 401	$ 367
Medicare	$ 365	$ 370	$ 397	$ 410	$ 401
Medicaid	$ 255	$ 248	$ 233	$ 223	$ 223
Uninsured	$ 60	$ 63	$ 67	$ 65	$ 42
MAP	$ -	$ -	$ -	$ -	$ -
Uninsured (Charity Care Eligible)	$ 337	$ 239	$ 254	$ 325	$ 283
Total	**$ 268**	**$ 255**	**$ 255**	**$ 241**	**$ 211**

As expected, the uninsured collection rate was lower than what is shown for the other payors. We would typically see a collections rate of no more than 1-2% on average for true self-pay (uninsured) claims. This collections rate can vary across providers, but even those with aggressive collections policies and procedures rarely collect more than $10-20 on average for uninsured transports. It appears that ATCEMS is collecting at a rate of $42 per transport; this is a remarkable accomplishment.

Overall gross collections for ATCEMS were down nearly $4M between FY 2019 and FY 2020. This was the most significant decline in collections in the FY 2016-2020 period. The collections rate of 27% in FY 2020 was also the lowest seen in the five-year period. Gross collections and the overall collections percentage are shown in ***Table 24.***

Table 24: Payor Mix: Amount Collected

Payor	FY16	FY17	FY18	FY19	FY20
Commercial Insurance	$ 10,265,517	$ 9,627,462	$ 8,913,433	$ 8,601,736	$ 7,000,358
Medicare	$ 9,217,984	$ 8,811,254	$ 9,162,168	$ 9,128,394	$ 7,745,789
Medicaid	$ 2,566,442	$ 2,467,999	$ 2,196,962	$ 2,033,799	$ 1,896,620
Uninsured	$ 1,461,355	$ 1,720,351	$ 1,821,125	$ 1,931,291	$ 1,354,397
MAP	$ -	$ -	$ -	$ -	$ -
Uninsured (Charity Care Eligible)	$ 18,532	$ 10,753	$ 7,887	$ 4,874	$ 3,398
Total	**$ 23,529,829**	**$ 22,637,819**	**$ 22,101,574**	**$ 21,700,093**	**$ 18,000,562**
Key Statistic: Collection %	**31.36%**	**30.32%**	**30.66%**	**29.61%**	**27.18%**

As part of our analysis of the billing data, we compared ATCEMS's collections rate with other large urban providers in Texas, including the City of Dallas, the City of Houston, and MedStar (Tarrant County). ATCEMS's overall collections percentage was steady at 27-31% of charges over the FY 2016-2020 period. This is better than MedStar at 25% and significantly better than Dallas and Houston, at 17% and 18% respectively. However, it should be noted that ATCEMS' average charges were also significantly less than these three other agencies.

Also, of note is ATCEMS's extremely low average collection for commercial insurance claims. ATCEMS collected only $367 per commercial claim, which is less than 50% of what Dallas, Houston, and MedStar collected. On a provider-by-provider look, the commercial insurance average collections numbers stack up as shown below.

- MedStar: >$900
- Dallas: >$750
- Houston: >$700
- ATCEMS: <$400

Table 25 and 26 show the financial group statistics for ATCEMS and the peer group.

Table 25: ATCEMS Summary by Financial Group, FY 2020

Payor	# of Trips	Transport Mix	Gross Charges	Average Charges	Payments	Collections %	Average Collection Rate
Medicare	19,303	23%	$ 17,512,920	$ 907	$ 7,745,789	44%	$ 401
Medicaid	8,508	10%	$ 7,783,324	$ 915	$ 1,896,620	24%	$ 223
Insurance	19,051	22%	$ 10,563,288	$ 554	$ 7,000,358	66%	$ 367
Facility Contract / Other	6,293	7%	$ 5,213,797	$ 829	$ -	0%	$ -
Bill Patient	32,286	38%	$ 25,142,940	$ 779	$ 1,357,795	5%	$ 42
Private Pay		0%	$ -	$ -	$ -		$ -
Grand Totals	**85,441**		**$ 66,216,269**	**$ 775**	**$ 18,000,562**	**27%**	**$ 211**

Table 26: Dallas, Houston, and MedStar Summary by Financial Group, FY 2019

Payor	# of Trips	Transport Mix	Gross Charges	Average Charges	Payments	Collections %	Average Collection Rate
Medicare	129,441	36%	195,674,734	$ 1,512	45,674,958	23%	$ 353
Medicaid	62,629	17%	101,180,035	$ 1,616	16,844,550	17%	$ 269
Insurance	46,394	13%	53,592,766	$ 1,155	37,193,437	69%	$ 802
Facility Contract / Other	8,680	2%	11,279,245	$ 1,299	4,951,954	44%	$ 571
Bill Patient	113,067	31%	168,625,611	$ 1,491	1,752,657	1%	$ 16
Private Pay	3,298	1%	4,284,583	$ 1,299	381,800	9%	$ 116
Grand Totals	**363,509**		**$ 534,636,974**	**$ 1,471**	**$ 106,799,357**	**20%**	**$ 294**

Fee Schedule Comparisons

We also compared the average base fees (ALS and BLS) and average cost per billable transport (cost/trip) with 15 other providers across the U.S. and Texas. The sample consisted of data readily available to PCG through Medicaid cost reporting projects and included the following Texas municipal EMS agencies: Houston, Dallas, El Paso, and Corpus Christi. Also included were MedStar (TX), Boston EMS (MA), and EMSA (OK), which are all third service EMS agencies with similar transport counts to ATCEMS.

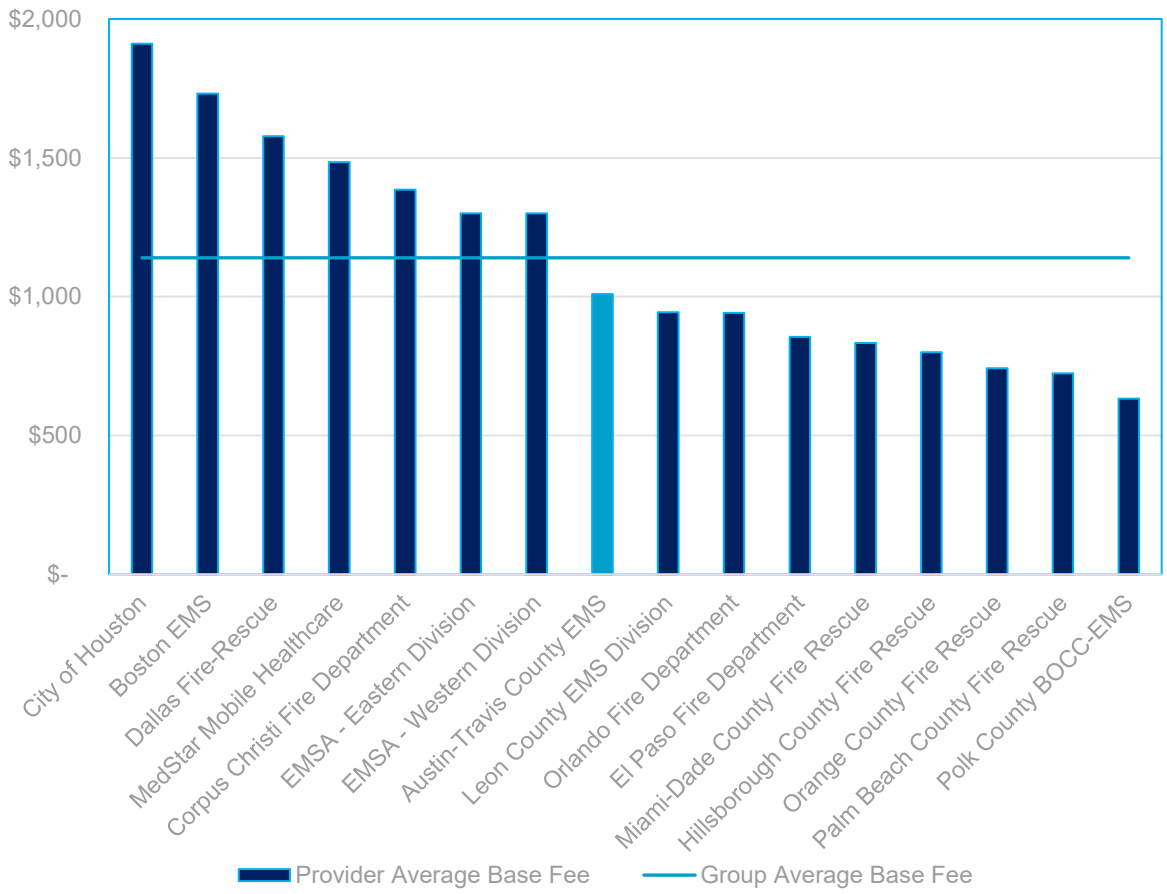
The average base fee for the group was $1,140. ATCEMS's average fee of $1,009 was 11% lower than the average. Among the Texas EMS agencies in the sample, ATCEMS's charges were less than every provider other than El Paso. Comparisons of the average base fee for ATCEMS and the peer group are represented in ***Figure 14.***

Recommendation 13:
Review billing practices to identify opportunities to capture revenue for both "treatment, no transport" and allowable ALS-level services.

Table 27: Comparison of Cost/Trip and Fees for ATCEMS and Similar Agencies

State	Provider	Trip Count	Cost/Trip	A0427 - ALS1	A0429 - BLSE	A0433 - ALS2	A0425 - Mileage	Average Base Fee
TX	City of Houston	137,577	$ 2,236	$ 1,911	$ 1,911	$ 1,911	$ 15	$ 1,911
MA	Boston EMS	86,570	$ 1,033	$ 1,615	$ 1,385	$ 2,192	$ 26	$ 1,731
TX	Dallas Fire-Rescue	76,327	$ 2,463	$ 1,578	$ 1,578	$ 1,578	$ 15	$ 1,578
TX	MedStar Mobile Healthcare	119,549	$ 399	$ 1,485	$ 1,485	$ 1,485	$ 15	$ 1,485
TX	Corpus Christi Fire Department	27,480	$ 1,664	$ 1,385	$ 1,385	$ 1,385	$ 15	$ 1,385
OK	EMSA - Eastern Division	81,846	$ 431	$ 1,300	$ 1,300	$ 1,300	$ 12	$ 1,300
OK	EMSA - Western Division	86,036	$ 435	$ 1,300	$ 1,300	$ 1,300	$ 12	$ 1,300
TX	**Austin-Travis County EMS**	**70,650**	**$ 1,371**	**$ 1,011**	**$ 941**	**$ 1,076**	**$ 14**	**$ 1,009**
FL	Leon County EMS Division	29,869	$ 711	$ 861	$ 725	$ 1,246	$ 15	$ 944
FL	Orlando Fire Department	22,105	$ 4,648	$ 978	$ 761	$ 1,087	$ 13	$ 942
TX	El Paso Fire Department	43,772	$ 2,085	$ 855	$ 855	$ 855	$ 15	$ 855
FL	Miami-Dade County Fire Rescue	69,681	$ 5,605	$ 800	$ 800	$ 900	$ 15	$ 833
FL	Hillsborough County Fire Rescue	51,683	$ 2,687	$ 800	$ 800	$ 800	$ 12	$ 800
FL	Orange County Fire Rescue	68,186	$ 2,255	$ 879	$ 524	$ 823	$ 13	$ 742
FL	Palm Beach County Fire Rescue	70,550	$ 3,562	$ 670	$ 670	$ 830	$ 14	$ 723
FL	Polk County BOCC-EMS	73,418	$ 1,023	$ 600	$ 600	$ 700	$ 9	$ 633
	Average		**$ 2,040**	**$ 1,130**	**$ 1,060**	**$ 1,220**	**$ 10**	**$ 1,140**

Figure 14: Average Base Fee Comparison for ATCEMS and Similar Agencies



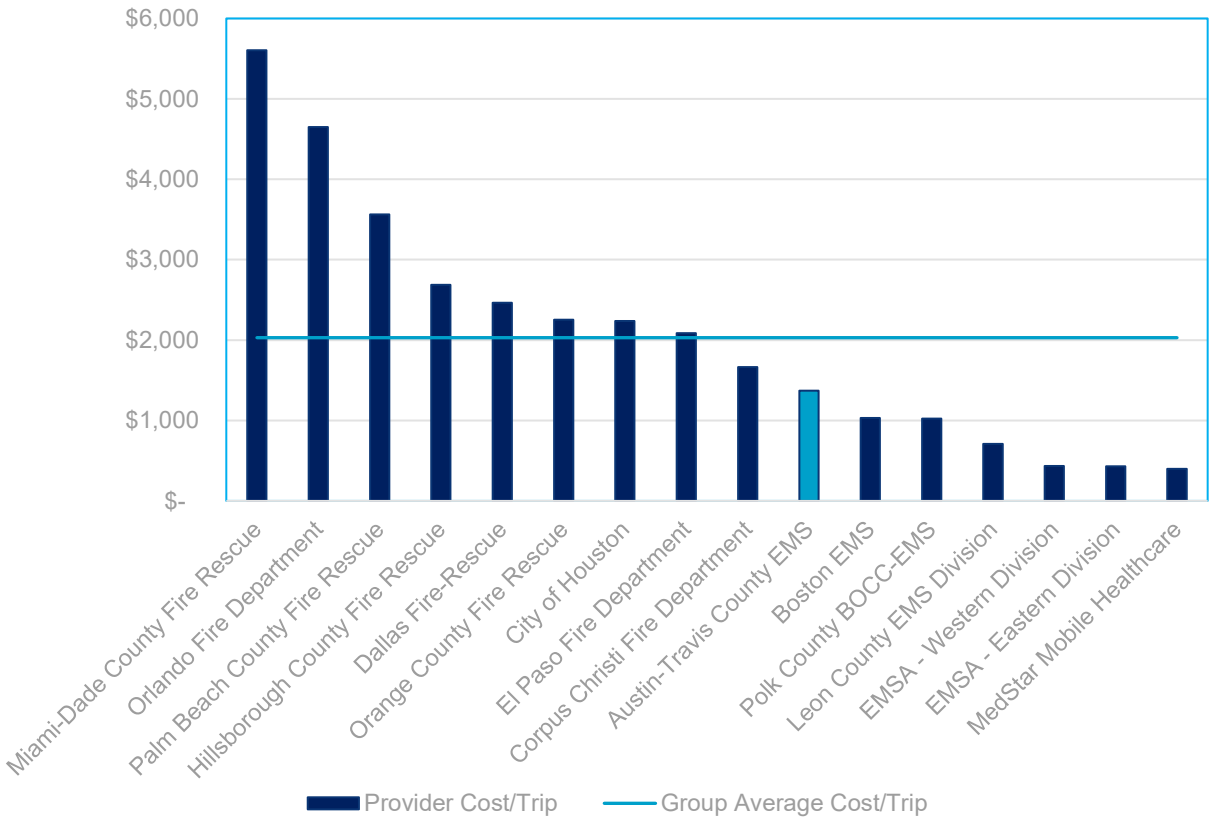
San Antonio Fire Department data was not included in this sample, but we found that ATCEMS's average charge was in line with SAFD's base fees of $1,000. ATCEMS charges $2 more per mile than SAFD.

Cost/Trip Comparisons

Average cost/trip for the sample group was $2,030, but this average was skewed because of the fire-based providers in the sample. Average cost/trip for the group of third-service EMS agencies was only $772.

ATCEMS's average cost/trip of $1,371 was 32% lower than the overall average in the full sample, but ATCEMS had the highest cost/trip among the third service agencies. In fact, ATCEMS's cost/trip was more than 75% higher than the average for the seven third-service agencies in the sample. ATCEMS's cost/trip was more than $300 higher per trip than Boston EMS.

Figure 15: Average Cost/Trip Comparison for ATCEMS and Similar Agencies



In looking at a larger sample of 250 providers from Colorado, Iowa, Florida, Massachusetts, Missouri, Oregon, Texas, and Washington, we found an average cost/trip of $4,000. Obviously, ATCEMS's cost/trip of $1,371 paled in comparison to the average cost/trip of the broader sample. See ***Figure 15.***

The fire-based EMS agencies in the sample drive the overall higher average, but it is clear that ATCEMS had a higher cost structure than many other third-service agencies. Some of this difference could be explained in how the data was captured. Most cost/trip figures were calculated through the Medicaid cost report while ATCEMS cost/trip was calculated using 2021 budget and response data.

Another obvious difference is the size of the service areas for each of the third-service agencies (ATCEMS - 1,300 sq. mi., MedStar - 436 sq. mi., Boston EMS - <100 sq. mi.). Obviously, a larger service area requires more personnel and apparatus to maintain appropriate coverage. In the ***Figures 16-17*** that follow, we isolated the cost and fee comparisons for third service EMS agencies.

Figure 16: Average Base Fee Comparison for ATCEMS and Other Third Service EMS Agencies

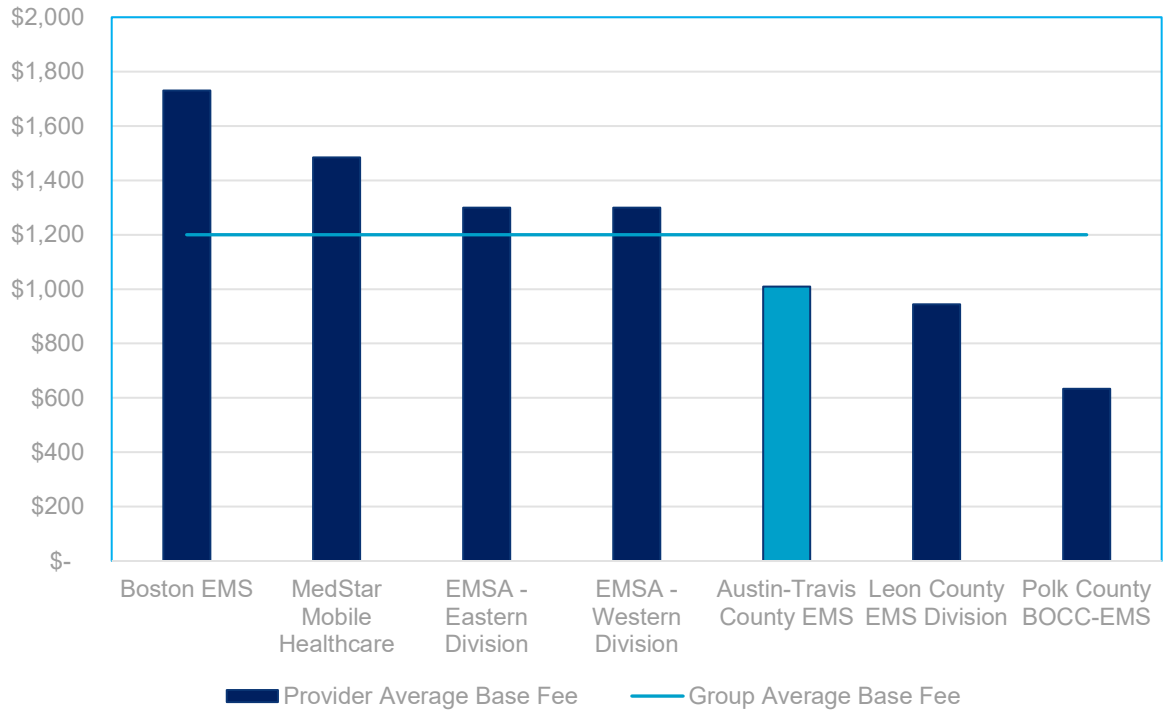
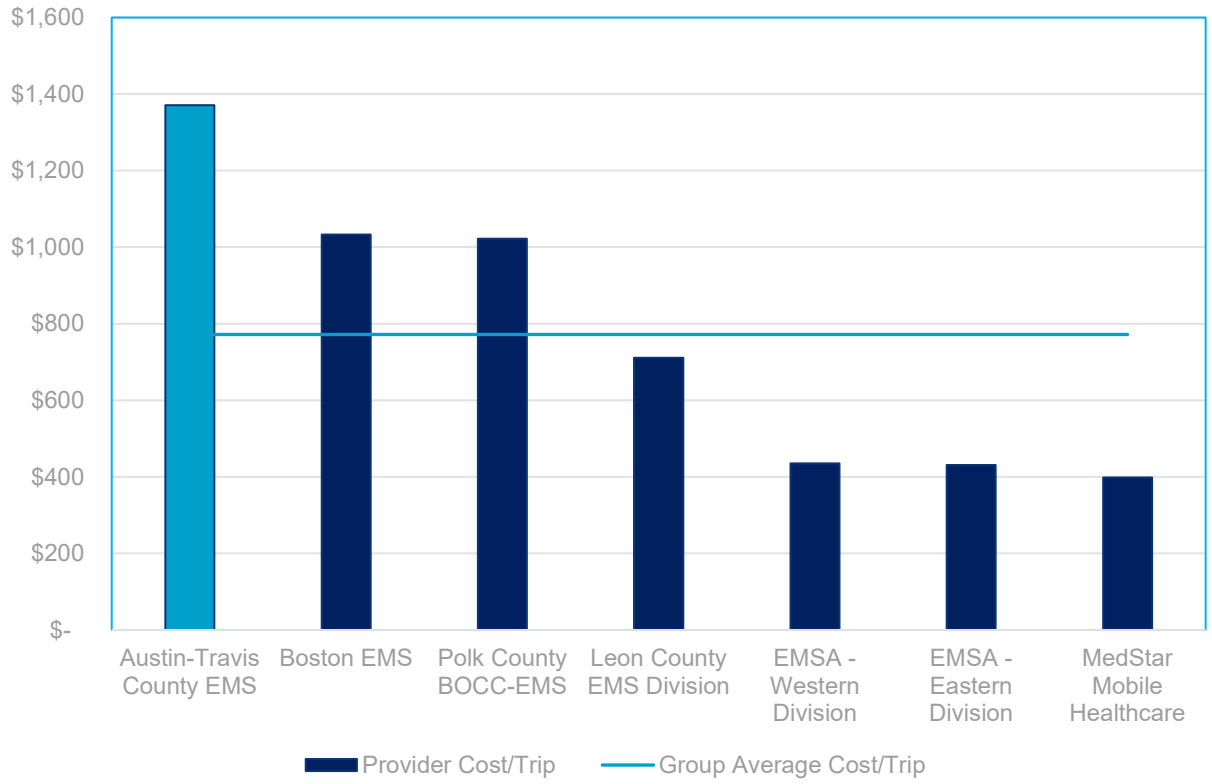


Figure 17:Cost/Trip Comparison for ATCEMS and Other Third Service EMS Agencies



Revenue Maximization Opportunities

Optimizing Ambulance Supplemental Payment Program Revenues

PCG worked with Austin-Travis County EMS and the Texas Health and Human Services Commission (HHSC) to develop and gain federal approval for the Ambulance Supplemental Payment Program (ASPP) in 2009. This cost-based reimbursement opportunity was the first of its kind in the country and became a model for other states. In 2012, PCG advocated for ambulance services to be included in the 1115 (Uncompensated Care) Waiver opportunity that expanded ASPP funding to include Medicaid Managed Care and uninsured transports. When CMS imposed funding limitations, including restricting reimbursement to charity care only as of October 1, 2019, PCG began developing alternative strategies to preserve this vital funding stream for public ambulance services in Texas.

Between FY 2016-2019, the City's budget data showed revenues of approximately $25M through the ASPP funding stream. **However, it appears that ATCEMS may now be leaving a significant amount of money on the table.** Under the current Charity Care policy, ATCEMS claimed for less than $1.4M in ASPP revenues for the FY 2020 reporting period. At the time that the billing data for this study was supplied to PCG, ATCEMS had written off only about $6,000 in charity care, as shown in ***Table 28***.

In order for ATCEMS to continue to maximize revenues from the ASPP, the Charity Care policy and eligibility determination processes should be revised. The primary limitations with ATCEMS's current policy include the following:

- Charity care is only available for patients with income up to 200% Federal Poverty Level (FPL). Affordable Care Act (ACA) subsidies are available for households with income up to 400% FPL. This is a reasonable cutoff for charity care as well.
- ATCEMS adheres to a sliding scale, as shown below. A sliding scale not only provides complexity to charity care determination and write-off procedures, but it limits how much can be written off for as much as half of the uninsured trips.
    - 100% AGI falls below the 125% FPL
    - 75% AGI falls below the 150% FPL
    - 50% AGI falls below the 175% FPL
    - 25% AGI falls below the 200% FPL
- Relying solely on a patient application process to identify eligible charity care claims is not feasible. The return rate for patient applications for charity care is extremely low (less than 5%). It is possible to enhance the charity care conversion rate by also including a propensity to pay solution. This would allow ATCEMS to use income data discovered through a credit bureau to proactively apply charity care to eligible accounts. The conversion rate through a propensity to pay solution could be 90% or higher, depending on the completeness of patient data.

Recommendation 14:
Revise ATCEMS's Charity Care policy and eligibility determination process to maximize ambulance supplemental payment program (ASPP) revenues.

Table 28 details the scenarios of the adoption of a revised charity care policy and propensity to pay solution.

Table 28: Scenario Analysis for Ambulance Services Supplemental Payment Program

DESCRIPTION	FY20 ESTIMATE	FY21 ESTIMATE
% of FPL Eligible for Charity Care	0-200% FPL	0-400% FPL
Sliding Scale?	Sliding Scale	Full Charity Care up to 400% FPL
Mechanism for Charity Care Determination	Patient Application	Patient App / Propensity to Pay Solution
Total Uninsured Charges	$ 25,142,940	$ 25,142,940
Percentage of Total Uninsured Charges	0.02%	85.00%
Eligible Charges	$ 6,129	$ 21,371,499
Assume Cost Charge of 100%	100%	100%
Eligible Costs	$ 6,129	$ 21,371,499
FMAP	67.09%	67.09%
Settlement (before "haircut")	**$ 4,112**	**$ 14,338,139**
Settlement assuming 25% haircut	**$ 3,084**	**$ 10,753,604**
Settlement assuming 50% haircut	**$ 2,056**	**$ 7,169,069**
Settlement assuming 75% haircut	**$ 1,028**	**$ 3,584,535**

The most difficult number to predict in the table above is the “haircut”, which is the proportional decrease to all ambulance provider ASPP payments. In the best-case scenario, there is no more than a 25% haircut applied (there is not expected to be a haircut for FY 2020) and ATCEMS could realize as much as $10-14M in ASPP revenues. In the conservative worst-case scenario, and closer in line to historical data from the FY 2018 and FY 2019 ASPP cost reporting cycles, the haircut is closer to 75% and ATCEMS may only receive $3-4M annually. The bottom line is that transformation of the charity care eligibility determination process will likely result in a minimum of $3-4 million in additional funds each year. The cost to obtain such funds would be minimal. All costs associated with charity care and ASPP cost reporting could be incorporated into a comprehensive ASPP agreement wherein the City would only pay a vendor a portion of the revenues successfully recovered through the ASPP. The consultants have been working with several EMS providers in Texas to assist them with sustainable cost-effective transformations of the charity care process.

Re-examining Average Commercial Rate

PCG is currently working with HHSC and other stakeholders on reestablishment of a Medicaid Supplemental Payment Program based on a statewide Average Commercial Rate (ACR). This program recently went live, with the first round of data for FY 2019 and FY 2020 due to HHSC on May 5, 2021.

In the Billing and Cost Analysis section above, we noted ATCEMS’s low average collection for commercial insurance claims. ATCEMS collected on average $367 per commercial claim, or less than 50% of what Dallas, Houston, and MedStar collected.

For the recently introduced ACR program for Medicaid, it will be critical that ATCEMS is able to accurately report commercial charges and payments by procedure code for commercial payors. ATCEMS and other participating providers have a direct impact on the upper payment limit for the ACR program. If a provider is under/over-reporting commercial payments, it will impact the supplemental payments available to all providers participating in the program.

Recommendation 15:
Consider reviewing commercial payment data regarding charges and payments by procedure code for commercial payors to ensure accurate reporting and to identify opportunities to maximize revenues.

Rules and the reporting mechanism for the ACR program were finalized in April 2021 and data was due shortly thereafter. Preparations to begin ACR reporting for FY 2021 should be implemented during the summer of 2021 to ensure sufficient time for data collection. PCG has found that many providers have difficulties with pulling the correct payment data reports required for the ACR program. The ACR require that payments be reported by procedure code, and this may necessitate changes in current payment

application processes (i.e., software development). In the long term, the financial benefits of participation in the ACR program will far outweigh the initial implementation effort.

In addition to re-examining commercial payment data for the goal of being prepared for the Medicaid ACR program, ATCEMS likely needs to review the data to ensure revenue maximization. If the commercial payments are truly 50% or less than what their peers are paid, this should be addressed with commercial payors. Again, it is likely that a significant part of this discrepancy is due to the inclusion of lower charge "treatment, no transports" in the data, but this warrants a more in-depth review.

Fee Schedule Adjustment

The City has some of the lowest fees of any large urban providers in the state of Texas. ALS and BLS base rates increased by $110, according to Ordinance 20200812-002, adopted by City Council in August 2020.

- ALS1 - $1,011
- ALS2 - $1,076
- BLS - $941

Recommendation 16:
Consider implementing significant fee schedule increases for ambulance transport services.

Even with the recent increase, it appears that these fees are at least 25% less than they should be and are not set up to optimize transport revenues. The internal assessment of costs and charges signals the need for a fee increase, and an external assessment of other agencies in Texas leads to the same conclusion. Austin's charges are comparable to San Antonio's charges, but are significantly less than the charges for the cities of Dallas, Fort Worth, and Houston. The cost of service and regional comparisons of fees for other ambulance providers point to the need for the City to increase fees by 25% or more.

While PCG recognizes that it may not be politically feasible to advance another rate increase at this time, the delta between cost and charge warrants consideration of an increase. With data from the above cost-of-service analysis and the ASPP cost report, the City could easily demonstrate the need to place charges more in line with the current costs. Generally speaking, costs and charges should be close to equal, although it is recognized that no provider will ever be able to capture 100% of charges through billing and collections activities. A significant number of charges will be written off each year. Revenues for patients that qualify for Medicaid and/or Medicare are limited to the fee schedules set by the state and federal government, and these payments typically cover no more than 25-50% of the charges. However, increasing rates could potentially impact some self-pay accounts and it could give the agency more bargaining power for increasing commercial payments as well.

Additional Revenue Opportunities

Cost Recovery Programs and First Responder Fees

Emergency response departments have several options for recovering operating costs incurred for various emergencies. These include hazardous materials incidents where the responsible party can be billed for personnel, apparatus, and consumables. Many departments will also bill insurance companies for motor vehicle accidents, particularly if the accident involves commercial vehicles such as trucking companies and charter bus lines. Insurance companies for private passenger vehicles can also be billed for services if use of specialized extrication equipment is required and if the accident involves non-residents. There are several national-level companies that specialize in cost recovery for these types of emergencies, most of which extract a small percentage of the total amount recovered. Using

Recommendation 17:
AFD should consider the implementation of a cost-recovery program to offset operational costs.

such companies increases revenues as they are typically less expensive than having internal finance department staff with limited experience handle such cost recovery efforts.

Both AFD and ATCEMS can establish a first responder fee (FRF) program to charge non-residents for use of emergency response services. These fees for service are specific to non-residents of the City of Austin and Travis County. Given the number of conferences and considerably large entertainment events held or even hosted by Austin annually, first responder fees are an ideal program to off-set operating costs at these large events. FRFs are specifically intended to provide the department revenues from non-residents. Fees can be structured in such a way that the department or a third party on behalf of the department bill the service user's insurance, and in certain circumstances, the remaining balance can be either collected from the user or in hardship circumstances can be written off. Under either scenario the departments are generating revenues for services they are currently not collecting.

Recommendation 18:
AFD and ATCEMS should consider implementing a first-responder fee (FRF) for services provided to non-City of Austin and non-Travis County residents.

Ambulance Membership Programs

Many EMS departments, particularly in the Pacific Northwest where ambulance membership programs were first introduced, use these programs as a means of generating revenue on an annual basis and are proven to be highly beneficial to certain population groups within a community. This may be particularly true for residents experiencing chronic health conditions requiring frequent use of the 911 system and frequent ambulance trips to the hospital emergency department. By paying an annual membership fee, residents are granted use of the EMS transport and care services without receiving a bill from the provider for cost over and above what insurance, Medicare, or Medicaid, reimburses. Overall membership numbers are typically based on the level of advertising a department is willing to commit to achieve a level where the program generates sufficient revenue to cover basic program costs. These types of programs can also be tied directly into community risk reduction programs such as bystander CPR, in-home injury prevention programs, and management of chronic illness such as diabetes, respiratory conditions like COPD and asthma, and hypertension.

Recommendation 19:
ATCEMS should consider implementing an ambulance membership program to generate additional revenues and reduce the out-of-pocket expense to Austin-Travis County residents.

SECTION VII: DISPATCH EVALUATION

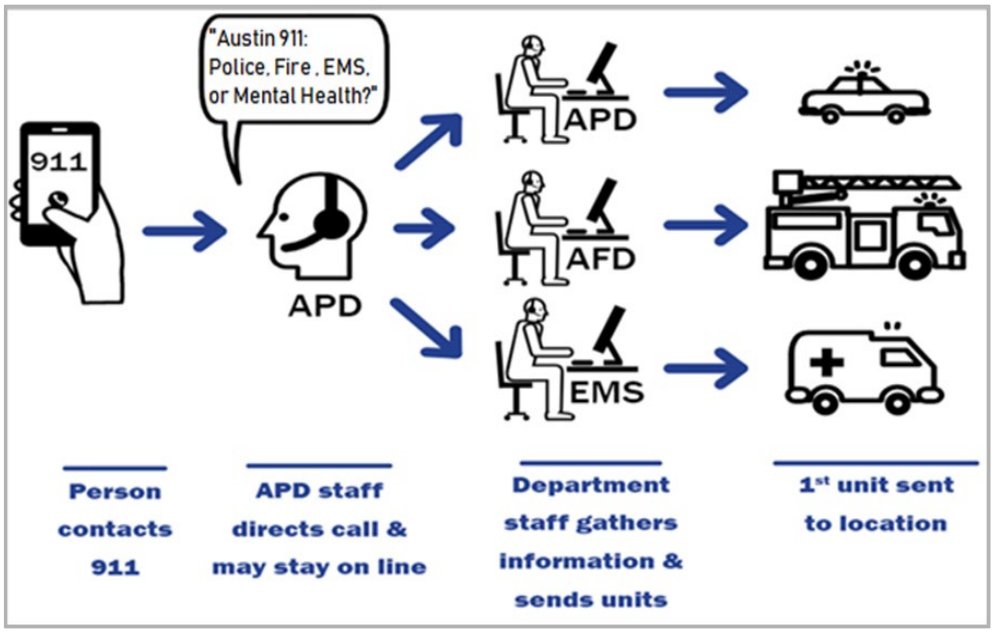
Austin Fire Department (AFD) and Austin-Travis County EMS represent two of the five member partners that comprise the Combined Transportation Emergency Communications Center (CTECC) facility partnership. As previously mentioned in the CTECC overview section, the Austin Police Department (APD) and Travis County Sheriff's Office (TCSO) serve as the primary Public Safety Answering Point (PSAP) while AFD and ATCEMS dispatch operations serve as the secondary PSAPs. The CTECC does have a local back-up center in the event that the CTECC ceases to function for any reason, but this facility lacks the capabilities and capacity the CTECC facility has. Current plans have all 911 communications re-routed to the 911 PSAP in San Antonio until the backup facility can be brought online. The CTECC management is currently in the planning phase of incorporating a secondary facility as the existing facility has exceeded operational capacity and does not contain space for the expanding needs of the current member agencies.

As the primary Public Safety Answering Points, APD and TCSO receive all 911 calls and rapidly assess which department needs to further process the call by asking the following question: *"Police, Fire, Medical, or Mental Health?"* As soon as the caller answers this question the call is either immediately transferred to AFD or ATCEMS or remains with APD or TCSO dispatch if it is law enforcement related. At this point, different priorities and processes on call taking and information gathering are utilized depending on the specific public safety departments mission.

Each emergency response department (e.g., law enforcement, fire, EMS) has mission-specific protocols and specific data that their respective call takers (telecommunicators) need to gather prior to sending the appropriate response resource to provide aid, assistance, and/or intervention. Once a call taker gathers all of the required information from the caller, the dispatcher takes over the call and the appropriate resource(s) are dispatched.

A City Auditor Report from February 2020 regarding 911 Operations in Austin identified issues with the transfer process and monitoring time interval for these inter-agency transfers as illustrated below. The graphic in ***Figure 18*** has been adapted to include a mental health services option, a requirement implemented in February 2021 as part of the Austin CARES initiative. More information about the Austin CARES program and recommendations identified by the Meadows Mental Health Policy Institute for Texas (MMHPI) is found on the April 2021 City of Austin Reimagining Public Safety Quarterly Update.

Figure 18: Call Transfer Graphic Provided in the City Auditor Report



The February 2020 Auditor Report recommended that the three public safety departments work together to develop a new performance measure that reflects the entire experience of 911 users. This measure would demonstrate the amount of time it takes from when a 911 call is made to when the appropriate resources arrive on scene. This recommendation was listed as "DISAGREE" by the Assistant City Manager for Public Safety. In their response to the report, the City stated that there are limitations to the "Solacom system design and ownership of the system" that prevent AFD and ATCEMS from capturing the time interval between APD's phone pickup and transfer to either AFD or ATCEMS. According to the City response to the audit report, the Solacom telephony software system design is technologically unable to measure this time interval. The Solacom system is owned by the Capital Area Emergency Communications District (CAECD) through funding provided by the State Legislature for 911.

Austin Fire Department Dispatch Overview

The Austin Fire Department's dispatch center receives calls that are transferred from the initial APD call taker when a caller asks for fire services. The call is processed by an AFD call taker and is then dispatched to the appropriate fire department units or emergency service district (ESD) by an AFD radio dispatcher. When AFD is needed to respond to an EMS incident, the incident information is electronically transferred from ATCEMS's CAD system to the AFD system, and the dispatch is completed automatically. All information specific to the incident is sent to the appropriate AFD or ESD unit's mobile data computer (MDC).

AFD's call-processing and dispatching processes are guided by *NFPA 1221 Standard for the Installation, Maintenance, and use of Emergency Services Communications Systems.* A statement in a City Auditor report regarding the CTECC mentions that the National Emergency Number Association (NENA) target of answering 911 calls in 10 seconds or less is important, but it is not the sole national standard followed and adopted by fire service 911 dispatch centers. It should be noted that the NENA target is not the standard used by the Insurance Services Office (ISO) when rating departments to determine their Public Protection Classification (PPC). ISO exclusively uses *NFPA 1221* for this portion of the evaluation.

AFD Dispatch Staffing

Each AFD dispatch shift consists of nine personnel: one Fire Lieutenant (Shift Supervisor), two Fire Specialists (Dispatch Leads who can also act as Shift Supervisor when the Lieutenant is off), and six Firefighters. AFD is the only agency whose call taker and dispatcher personnel work 24-hour shifts. This means that the CTECC/AFD must provide living quarters (dormitory, kitchen, and shower facilities) that are ADA (Americans with Disabilities Act) compliant for AFD personnel.

To incentivize frontline AFD personnel to accept an assignment to the dispatch center, the department administration and labor group negotiated a work-shift schedule that closely mirrors that of line firefighters with one noted exception. Personnel assigned to the AFD dispatch center work 24-hours on duty and 72-hours off, line firefighters work 24-hours on duty and then 48-hours off duty. Just as with line fire company assignments, dispatch personnel are afforded the opportunity to sleep during their work shift. However, there is *no guarantee this will happen, particularly during periods of heavy call volume* such as the recent ice storm where personnel worked continuously during the calamity with minimal breaks taken.

AFD dispatch personnel are divided into companies just as line personnel. When reviewing the organizational chart below, half of on-duty personnel are working, and half are in break periods during non-peak demand periods (8:00PM to 7:00AM). This ensures constant coverage for 911 call taking and dispatching. At any point in time the center begins to experience an increase in 911 call activity, personnel who are in their break period are recalled to the dispatch floor and begin processing 911 calls and dispatching emergency resources.

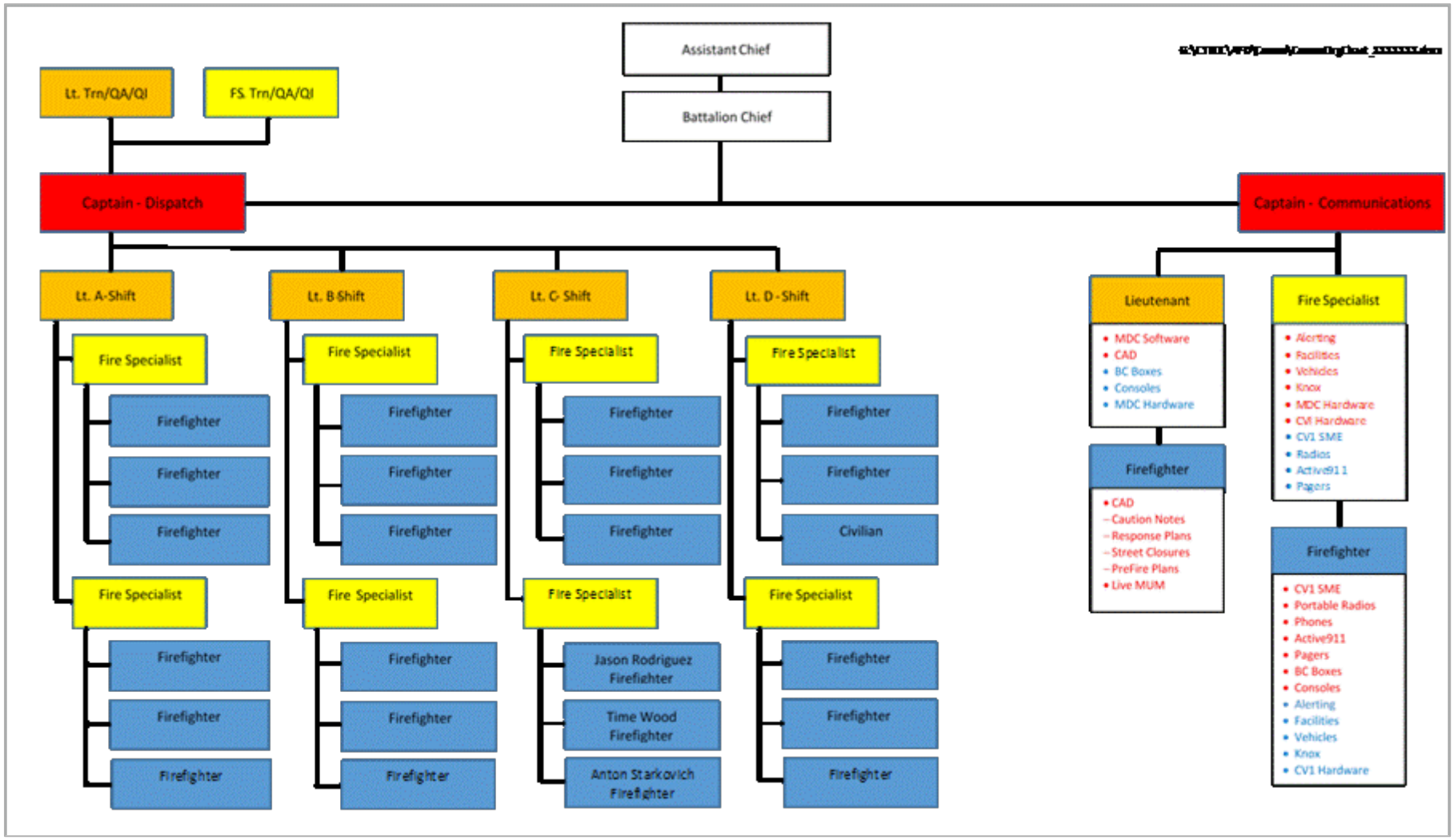
Outside of Texas, use of sworn uniformed personnel to perform call taking and dispatcher functions is uncommon. The City of Los Angeles Fire Department (another ISO Class-1 fire department) employs a model very similar to AFD as do the other major fire departments in Texas who are also ISO Class-1 fire departments. A significant number of fire service organizations across the country, however, employ civilian call takers and dispatchers.

Recommendation 20:
In collaboration with the labor organizations, consider exploring an alternate staffing model for AFD dispatch that incorporates civilian call takers supervised by sworn, uniformed fire officers.

In addition to the 36 AFD personnel who serve as call takers and dispatchers, there are uniformed personnel assigned to administrative positions within AFD dispatch. There are two Captains; one is responsible for all the personnel and operational issues of the center and the other is responsible for the technological aspects of the dispatch center, such as phone systems, CAD system, software, and hardware. The Captain over the Communications Center supervises four additional personnel; one Lieutenant, one Fire Specialist, and two Firefighters. These positions are responsible for overseeing and maintaining all the technology equipment and vehicles assigned to the AFD dispatch center. The Captain over dispatch operations supervises two additional personnel: one Lieutenant and one Fire Specialist. Both positions are assigned to the training functions for all personnel assigned to the call taker and dispatcher positions. All AFD dispatch operations, administration, and technology functions are managed and supervised by a Battalion Chief.

The organizational chart on the following page reflects where and how each of the AFD positions are assigned at the CTECC.

Figure 19: AFD Dispatch Organizational Chart



Training for AFD Dispatch Personnel

Before an AFD member can apply for a position in the dispatch center, they must have a minimum of three years of firefighting experience with the department. However, this minimum requirement can be waived if an AFD member has prior fire or EMS dispatch experience. AFD's dispatch training programs meet the standards of national organizations such as the *National Fire Protection Association (NFPA), the National Emergency Number Association (NENA),* and the *Association of Public-Safety Communications Officials (APCO) International*.

Upon being selected for assignment to AFD dispatch, the employee must attend an initial 60-day training period. During this period, the employee works a traditional 40-hour work week, Monday through Friday, and is assigned to a training supervisor. Once the employee has successfully completed all the required tasks, they are then assigned to one of the four dispatch shifts. The employee is also provided a *Task Book* which they have 30 days to complete while still working under the supervision of their shift training officer. During this period, the employee functions only as a call taker.

Upon successful completion of this portion of the training, the employee can now begin training as a radio dispatcher. The total training process for a newly assigned AFD member takes an average of six months. All AFD personnel assigned to the CTECC are required to complete these processes. Fire Specialists, Lieutenants, and Captains receive additional training in systems operations but also in supervising firefighters performing the call taker and dispatcher functions. Currently, fire dispatch employees are not trained in the medical priority dispatch system (MPDS) that ATCEMS utilizes for its calls. During periods of high call volume, cross-training within this function could be beneficial and would allow for efficient collaboration of the two agencies' resources.

Recommendation 21:
Consider cross-training AFD dispatch personnel in the medical priority dispatch system (MPDS) to provide back-up capacity to the ATCEMS dispatch center.

There is also a continuing education/training requirement as well. According to the AFD Dispatch Manager (Battalion Chief) each shift undergoes training that simulates loss of the primary center. The Dispatch Manager is tasked with transitioning over to the back-up center and re-initiating all computer and phone systems to resume call taking and dispatching of AFD resources from that location. Each shift must perform this function three times per year. In addition, there are monthly training programs to cover changes and/or modifications to procedures or processes.

AFD Dispatch Operations

For both AFD and ATCEMS, the dispatch center personnel spend more time processing the calls on the front end of an incident and less time once the unit has been dispatched. This is because from the moment a call is dispatched to the time the unit clears from an incident, most communications are handled through the response unit's MDC or very short radio bursts on handheld radios.

AFD units also use MDCs for a good deal of their communications with dispatch, however, when AFD units are on-scene, there is much more direct radio traffic between the dispatcher(s) for the duration of an incident. Another important aspect of dispatcher and field unit interaction with AFD is that in the case of working structure fires, wildland fires, technical rescues, or hazardous materials incidents, it is not at all uncommon for an incident to require direct radio interactions with multiple dispatchers.

AFD Dispatch Technology

AFD uses a variety of software integrated with the CAD that supports the mission and assists with response. This includes mapping software, move-up software (DECCAN), and radio management software. AFD has little to no control of any of the 911 software purchased by the CAECD. During interviews with AFD and ATCEMS dispatch managers, it was indicated that a process is currently underway to issue an RFP to upgrade or replace the CAD system.

Austin-Travis County Emergency Medical Services Dispatch

ATCEMS Dispatch Overview

ATCEMS is accredited through the *Commission on Accreditation for Ambulance Services* (CAAS) and its dispatch operations must meet each of the provisions of *Section 300 – Operations Section* of the CAAS guidelines. ATCEMS maintains CAAS and ACE (Accredited Center of Excellence) accreditations and this reflects the departments overall commitment towards meeting the highest standards set by the EMS industry. During multiple interviews and when conducting background research for this section, consultants observed and validated that ATCEMS places great emphasis on accreditation standards listed above as part of their dispatch operations. ATCEMS dispatch leadership provides exceptional data analysis internally to validate performance.

ATCEMS Dispatch Staffing

Like the other five agencies operating out of the CTECC, ATCEMS provides call taking and dispatch functions 24/7 year-round. However, unlike AFD, ATCEMS personnel assigned to the call taker and dispatcher functions do not work 24-hour tours of duty. ATCEMS staffing for the dispatch center is based on 12-hour shift rotations.

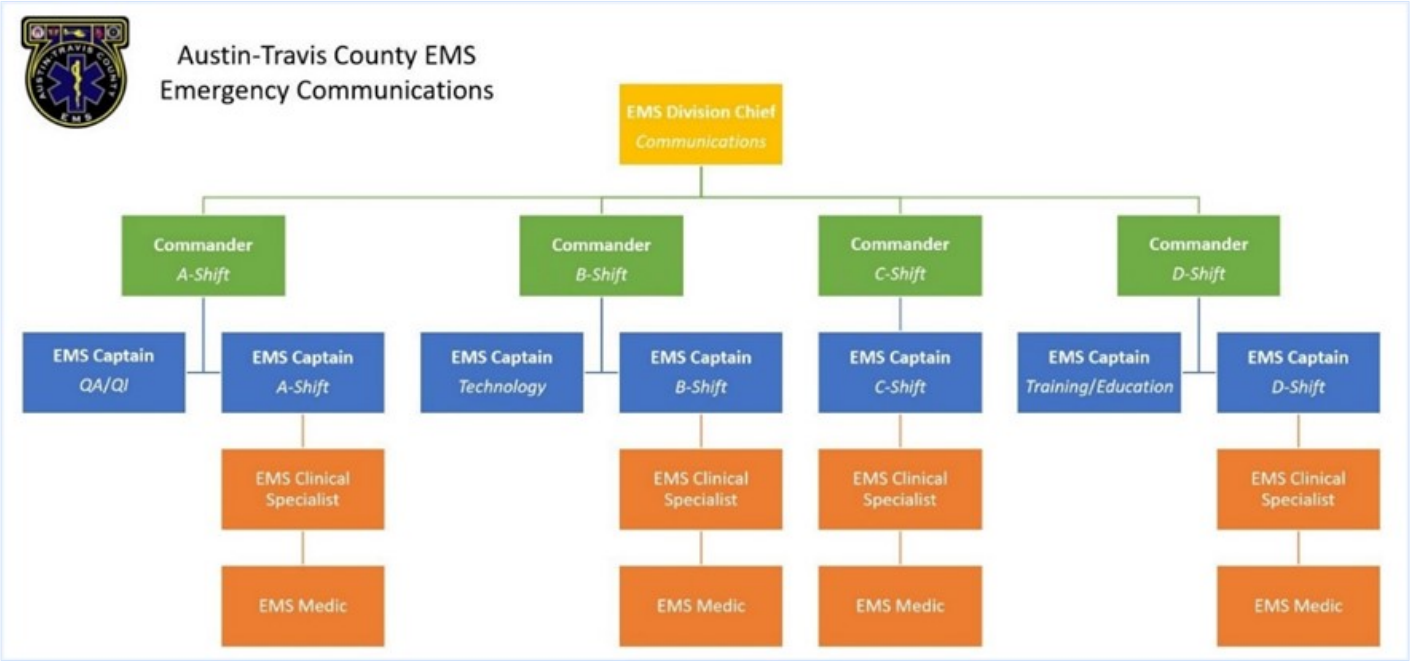
Each shift consists of nine personnel; a typical shift is staffed by six personnel on-duty at any given time. Four personnel are assigned to the call taker function while the other two are assigned to the dispatcher function. Three of the four shifts are supervised by a Commander supported by two Captains. One Captain is a supervisor for dispatchers and call takers and the second Captain is assigned to administrative duties, which include quality assurance (QA), technology, and training/education. The C-Shift does not have a position for an administrative Captain. All ATCEMS dispatch staff are sworn uniformed members of ATCEMS and are certified as Texas EMS providers. ***Figure 20*** shows the ATCEMS Dispatch Organization Chart.

Recommendation 22:
ATCEMS should consider exploring an alternate staffing model that incorporates civilian call takers supervised by sworn uniformed EMS officers.

PCG used an online tool, Erlang Calculator, to determine that the appropriate number of telecommunicators needed for the current call volume experienced by ATCEMS is a total of 11 personnel per shift.[11] New positions were allocated in the FY 2021 budget moving staffing closer to the number needed to meet the demand.

[11] Call Centre Helper. (2021). *Erlang Calculator - for Call Centre Staffing (Online Version 5.0).* https://www.callcentrehelper.com/tools/erlang-calculator/

Figure 20: ATCEMS Dispatch Organization Chart



ATCEMS Dispatch Training

ATCEMS personnel assigned to the dispatch center must meet minimum criteria and complete both basic and advanced training before they function as a call taker or dispatcher. About half of ATCEMS personnel assigned to the dispatch center are either certified or licensed EMT-Paramedics. Dispatch personnel must attend and complete a 10-week initial training program that includes training in the use of the Medical Priority Dispatch System (MPDS). This system was developed by an emergency medicine physician and is proven to minimize errors in determining a caller's "chief medical complaint" when calling 911. Call takers must strictly follow the call-type matrix when processing 911 calls so that the correct level of resource can be dispatched and units respond in the most appropriate manner (emergency, lights and siren vs. non-emergency, no lights and siren). The secondary aspect of the initial training program focuses on use of the computer-aided dispatch (CAD) systems, phone systems, and use of the various radio systems employed by both ATCEMS and AFD.

Once an employee has completed the initial training program, they are assigned to a shift and are supervised by a Captain/Field Training Officer (FTO). This aspect of the training is conducted one-on-one with the FTO functioning as a call taker. The focus for the first week is to ensure the new employee can type and talk simultaneously with a 911 caller. The remaining elements of the training are still under direct supervision of the FTO but are more self-paced. Although the training is designed to take as long as nine months, most employees complete all required elements in an average of seven months.

All ATCEMS dispatch personnel must also attend and complete continuing education to maintain their MPDS certification as well as their Texas EMS certification or license.

ATCEMS Dispatch Operations

ATCEMS dispatch personnel currently handle a high volume of call demand. They dispatch, communicate with, and record the activity of 39 EMS Medic units, up to seven "peak" ATCEMS units, and monitor radio traffic from other ATCEMS activity, including the community health paramedics (CHP). In addition, radio traffic for AFD and ESDs is monitored during all EMS incidents.

ATCEMS call takers follow a well-researched procedure to obtain the most useful information needed when talking with 911 callers (referencing MPDS). Initial answers direct the call taker to more specific questions. This additional information assists in the identification of the most time-sensitive emergencies, which then

allows emergency services providers and other services (e.g., fire department, animal control, utility companies) to be dispatched as additional information is obtained. For EMS, lower priority calls can be managed with a queue and dispatched as resources become available.

ATCEMS Dispatch Technology

Appropriately utilized emergency medical dispatch (EMD) software and technology provide data that can be used to tailor the response to an EMS incident. ATCEMS reviews this information to determine the best deployment strategy. Almost all 911 EMS requests in Austin are assigned an EMD response determinant or code by the ATCEMS dispatch personnel. These EMD call takers ask a series of specific, protocol-driven questions related to the patient's symptoms to assign response determinants, which correlate to the general type and urgency of the patient's complaint (i.e., chest pain, fever, difficulty breathing, back pain). In conjunction with the OCMO, the determinants can then be assigned an evidence-based, locally approved response level and resources that are likely necessary to effectively address the patient's medical need.

ATCEMS uses the same CAD system as AFD, and the CADs are integrated but segregated. Responders are either in the fire module or the EMS module depending on the call type. ATCEMS also uses DECCAN Live Move Up software to obtain a real-time view of emergency resources to support dispatch in making critical decisions. In conjunction with the CAD system, the Live Move Up software keeps dispatchers aware of resource statuses, locations, and availability with visual and statistical information available.

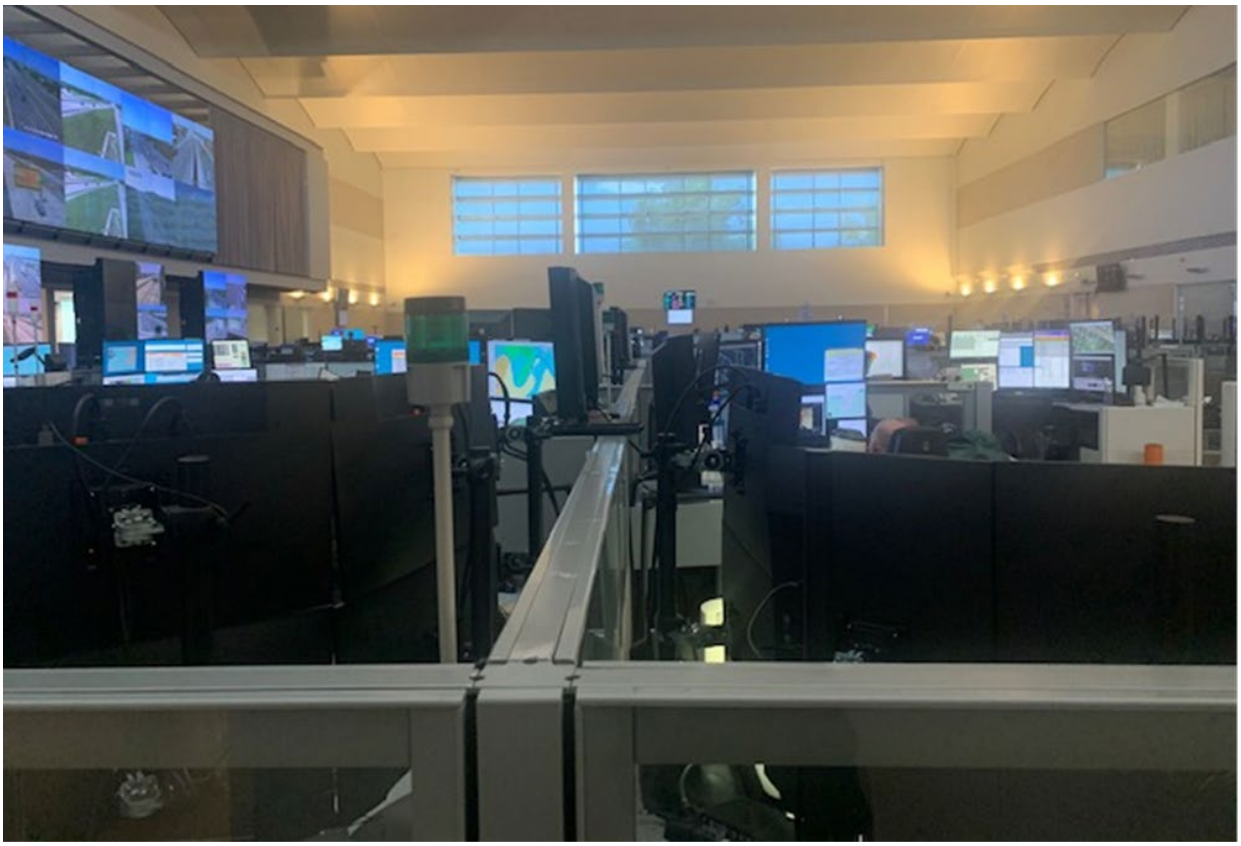
Observations and Recommendations

Overall, both the AFD and the ATCEMS dispatch centers provide a high-level of service appropriate for each department's operations. Both AFD and the ATCEMS dispatch operations meet and exceed national industry standards and both agencies hold accreditation status in the emergency services industry: ISO for AFD and CAAS/ACE for ATCEMS.

Operating two separate dispatch centers in the City, one for fire and one for EMS, is exceedingly costly. The use of sworn uniformed firefighters and sworn uniformed EMS certified personnel also increases the cost of operating these dispatch centers. The use of 24 hour shifts by AFD also contributes to higher costs.

Throughout this engagement there have been multiple comments made by both AFD and ATCEMS personnel regarding "the wall" that represents the physical barrier between the two dispatch centers, see ***Figure 21*** in the following page. Although personnel from both AFD and ATCEMS dispatch expressed that they "liked" their counterparts on a personal level, it was made clear that from a workload, work schedule, and inter-discipline process perspective that there is a contentious relationship between dispatch staff members from both departments.

Figure 21: Dispatch Center Wall



One example given occurred when one party yelled at the other: “are you going to answer that call or what?” Other comments included dispatchers refusing to answer a radio call because the field unit used an incorrect procedural designation. These types of examples cannot be ignored. The anonymous comments made by dispatch staff as part of the dispatch staff survey provide even further insight into the relationship between the two departments. Dispatch personnel comments are included in Appendix D.

Based on interviews, a review of documents, policies and procedures, and dispatch survey comments, cooperation, coordination, collaboration, and, to a certain extent, effective communications between the two dispatch operations needs significant improvement.

Achieving Maximum Dispatch Optimization

Achieving maximum dispatch optimization as it relates to delivery of EMS for both the City of Austin and Travis County would, based on our analysis, require consolidation of the fire and EMS dispatch operations. This would include personnel, the CAD platform, hardware, software, equipment, and all capital equipment. Consolidation would eliminate the need for transferring 911 calls, improve effectiveness and efficiency, enhance service delivery, as well as significantly reduce the operating costs.

PCG fully understands in making this recommendation that such a change is not something the City can undertake unilaterally. The City must meet, confer, and negotiate with each labor organization to bargain the impact such action requires. After extensive interviews with representatives from both labor and management from AFD and ATCEMS, our analysis is that no matter how clear and uncontested our findings are, undertaking this recommendation would be a long and difficult process.

The fear of one department attempting to consolidate or take over the other has been a concern for decades and has been expressed to our team by multiple employees from both departments. However, our analysis is that it is in the best interest of the City to initiate the processes necessary to consolidate dispatch operations. Our team believes that long-term benefits include significant savings in personnel costs, greatly

improved efficiencies in processing and dispatching of response resources, and improvements to workspace arrangements at the CTECC.

Recommendation 23:
Consider consolidating fire and EMS dispatch operations as part of the creation of a new Emergency Communications Department employing civilian telecommunicators integrated with sworn AFD and ATCEMS personnel.

On April 22, 2021, the City Council approved four agenda items related to Reimagining Public Safety. This action included mid-year budget amendments and decoupling activities. Item #20 is a comprehensive budget amendment regarding the Austin Police Department (APD), which includes the creation of the new Emergency Communications Department. The accompanying budget amendment reallocates 222 civilian full-time employee (FTE) positions out of APD as well as $16,085,640 out of the Decouple Fund into a new Emergency Communications ECD budget. This is the first step in an extensive process to establish an independent Emergency Communications Department to address public health and mental health issues. The creation of this department could take up to a year or longer according to the City. This action may provide the opportunity to explore the possibility of adding a consolidated fire and EMS dispatch operation as part of the creation of a new Emergency Communications Department, employing a combination of civilian employees and sworn uniformed employees from AFD and ATCEMS.

Dispatch Technology Upgrades and Enhancements

Our analysis of the dispatch software and associated equipment identified several areas that we classify as impediments for the emergency service districts (ESDs) that are dispatched by both AFD and ATCEMS. For example, ESD Battalion Chiefs need dual mobile data computers (MDCs) to know the status of both their fire and EMS units at the same time. Another issue is the dual alerting systems in fire stations where AFD and ATCEMS have separate alerting systems within the same building. Analysis as to the cost of maintaining these dual systems is far outside the scope of this project but, given the experience, knowledge, and backgrounds of our SMEs, we can say with confidence that this represents considerable expense to all stakeholders currently relying on dispatching services, including the City. During interviews with ESD leaders, comments were made regarding their inability to view the status of their response resources or even receive notifications regarding major response events when attending meetings, training, or conferences. ESD Chiefs are unable to implement some technological enhancements because of the current state of technology and the need for separate systems that would integrate into both dispatch centers.

In reviewing the February 2020 City Auditor report, the Assistant City Manager over Public Safety pointed out that because the “Solacom system design and ownership” either limits or even restricts AFD or ATCEMS from addressing system deficiencies, such as call transfer time intervals, it is at best problematic.

Another example of inefficiency our team identified concerns the impediment of dealing with multiple city departments to accomplish upgrades or new installations of communications equipment for ESDs. For example, if an ESD needs to have an MDC installed in a response unit, they may deal with up to five city and county departments, each of which mandate that the requesting agency write a justification report explaining in detail the need for the purchase, installation, or programming of the device. These departments include:

- City of Austin Fire Department Communications Division
- ATCEMS Communications Division
- City of Austin Communications and Technology Management Division (CTM)
- City of Austin Public Safety Program Management
- City of Austin Wireless Communications Services Division
- Travis County Emergency Services (Radio Subscription holders)

Factoring in the total number of response resources throughout the City and County, this problem grows exponentially. It is nearly impossible to calculate just the administrative staff time in cost and hours to process the number of work requests. This is one area we recommend the City and County closely evaluate.

Another example of challenges to enhancing automatic and mutual aid both within Travis County and neighboring counties is the cultural mindset of both AFD and ATCEMS. This can best be described as the "big-kid-on-the-block" culture. Our team interviewed representatives from multiple ESDs and in each interview we received comments that all ESDs for both fire and EMS are expected to conduct operations, dispatch the same number and type of resources, and provide the same staffing on apparatus and units as AFD does. This directed cultural mindset of "our way or the highway" is creating both fractures and friction with other counties and certainly with the Travis County ESDs. One example of this is a memo recently issued by AFD stating that if an ESD shares a border with City, then they must use the same "Box-Alarm Assignment" currently used by AFD when responding into the City of Austin. This means that an ESD must deploy four engine companies, two ladder companies, a rescue company, and two chief officers to a residential structure fire in the City of Austin. Many of the ESDs simply lack the number of resources and may not have the fiscal ability to staff all their apparatus the way AFD does.

Our analysis of these administrative and operational inefficiencies, impediments, and barriers regarding technology and systems are concerning enough to be considered safety hazards to citizens, telecommunicators, first responders, and even administrators. Given the City's effort to reimagine public safety, now is the time to address these issues and challenges.

Additional Dispatch Technology Upgrades and Enhancements

Our team of SMEs represent a broad spectrum of experiences and emergency response disciplines ranging from local to federal government, public to private sector EMS providers, and even international experience. The following information is intended to present the City and County with information regarding current technologies, equipment, and operations for consideration and/or adoption.

Responses for People, Not Just Addresses

Most CAD systems, like the one used by ATCEMS, can flag addresses with information like gate access codes, address hazards (i.e., the presence of animals or hazardous materials), or the history of calls at that address. This may be adequate for a public safety agency that wants to know specifics about a building at an address (such as a fire department); however, EMS agencies take care of people. As such, the real value of a CAD is being able to flag people, as opposed to addresses. For example, the MedStar system in Fort Worth is paid to not only respond and transport people to the hospital, but they are also paid to navigate patients enrolled in special programs to healthcare settings other than an emergency department. Their CAD could flag the patient's address so that a specialized response to facilitate that navigation could be dispatched to the address, but what happens when the patient needs an ambulance, and they are not at the flagged address? An opportunity would be lost. Similarly, suppose there are multiple people living at an address, but only one of the residents is enrolled in the special program. If only the address is flagged, every response to that address would get the specialized response, even if the response is for someone not enrolled in the special program, resulting in a waste of the specialized response.

MedStar's CAD flags people, not just addresses. This way, even if the patient is not at home and accesses 911, a specialized response can be activated to the person, even when they are at a restaurant, or a grocery store, or even in a vehicle crash. This facilitates the specialized response to the person, regardless of where they are. Similarly, if 911 is activated for a person who resides with the specially enrolled patient – but it is not the specially enrolled patient – the tailored response is not sent since the 911 call at that address is not for the specially enrolled patient.

Real-Time Traffic Routing

Most public safety CADs will identify the closest units and route these units to the location of the response using existing road networks, which are updated periodically as road conditions and status change. However, traffic patterns change at a moment's notice. Crashes, disabled vehicles, and changes in commuting patterns can change traffic patterns quickly. These dynamic changes are accounted for in most

public safety-style CAD systems. Newer CAD systems take advantage of real-time traffic patterns, employing the use of the HERE database, which is used by applications such as WAZE and Google Maps to provide real-time routing to responding or transporting ambulances. These systems route units around congested traffic areas to respond to calls or to transport patients to the hospital.

Additionally, these systems can change the recommended assignment of response units to select the unit that can arrive most quickly, which is not always the unit that is geographically closest to the scene. For example, if the closest unit would have to negotiate a traffic jam on I-35 to get to the scene, a unit that is a little farther from the scene without any traffic delays could provide a faster response. In this case, the CAD will assign the unit farther away due to the projected response time.

The AFD leadership is in the process of determining updates for the CAD and is planning to include this technology.

Use of Handheld Devices

Most public safety CADs rely on vehicle mounted mobile computer terminals (MCT) for computer interface. Data related to the call is sent to the MCT (or MDC) and the responding unit activates buttons on the MCT during the response. Newer CAD technology uses handheld devices to accomplish the same interface. These devices can be placed in a cradle in the vehicle for charging purposes, but easily dismounted and brought with the crew into the scene. This not only facilitates a more dynamic computer interface with the CAD but adds a layer of real-time communication through voice or text messaging with the communications center without relying solely on portable radio technology. It also provides an integrated handheld option for additional technology such as telemedicine. For some EMS agencies, these handheld devices provide not only an essential communication link with their communications center but also a platform for telemedicine applications, which makes the process very easy for the field staff. This has reduced the amount of radio traffic to nearly zero, which is safer for the EMS system providers and essentially eliminates any patient privacy concern related to on-air radio traffic that can be monitored by anyone with a radio scanner application or device.

AFD is exploring a pilot project to utilize handheld devices after they obtain the appropriate user licensures.

ATCEMS and AFD Communications Center Staff Survey

Due to COVID-19 restrictions and risks, the PCG team was unable to visit the Combined Transportation Emergency Communications Center (CTECC) in person to gain a deeper understanding of how dispatch processes work in real time, view the overall work environment, and witness the collaboration/coordination between departments. To address this constraint, the PCG team conducted a voluntary, anonymous survey to seek the opinions of those who work in the dispatch environment and possess in-depth knowledge about the systems and processes employed by both departments (AFD and ATCEMS) specific to call answering, call processing, and dispatching of emergency response resources. The survey was conducted between April 16, 2021, and May 2, 2021. Appendix D has a full copy of the survey and a list of comments received.

Analysis of Results

There were 36 total responses to our anonymous survey, which equates to 45% of the total combined workforce between AFD and ATCEMS. Of the total number of responses, 14 responses (39%) were received from AFD staff and 22 responses (61%) from ATCEMS staff, as shown in ***Figure 22***. For both fire and EMS departments, responses are representative of various ranks, including Medics, Specialists, Firefighters, Lieutenants, and Captains. ***Figures 23-24*** show the rank and position of AFD and ATCEMS respondents. 50% of respondents worked in their departments for one to five years.

Figure 22: Breakdown of EMS/Fire Respondents

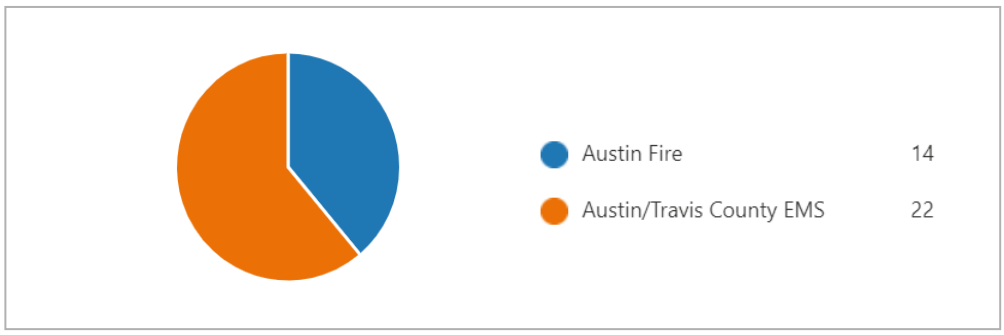


Figure 23: Rank and Position of AFD Respondents

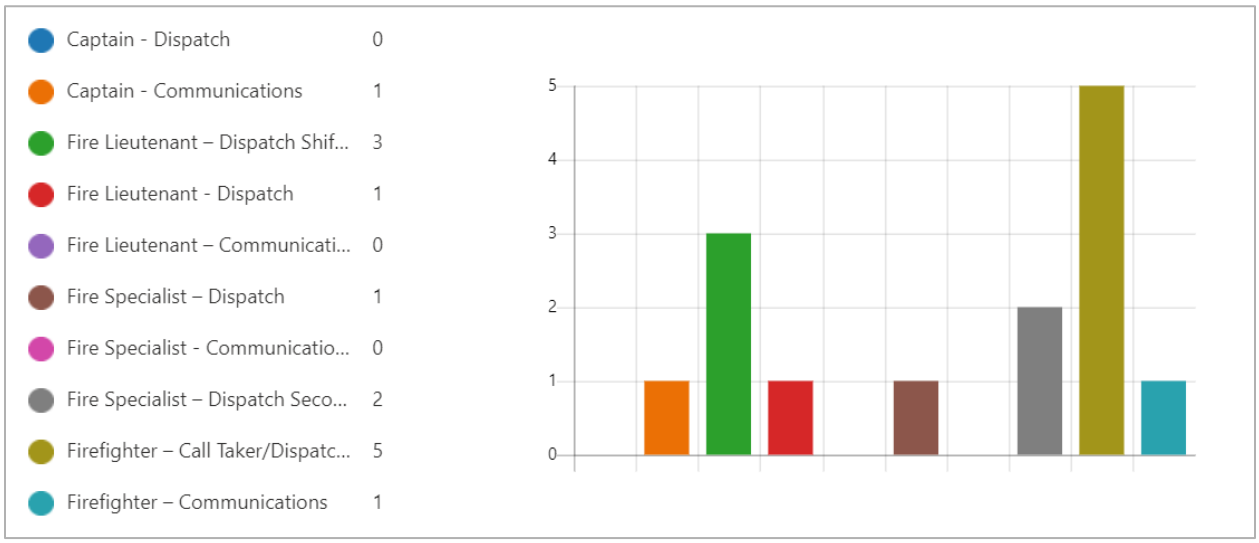
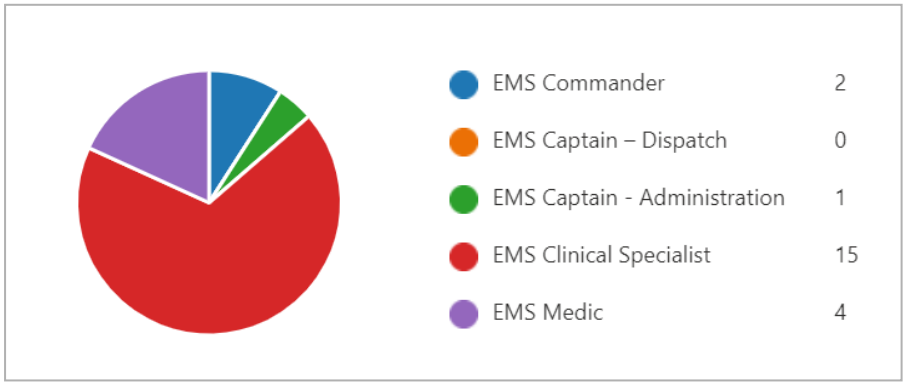
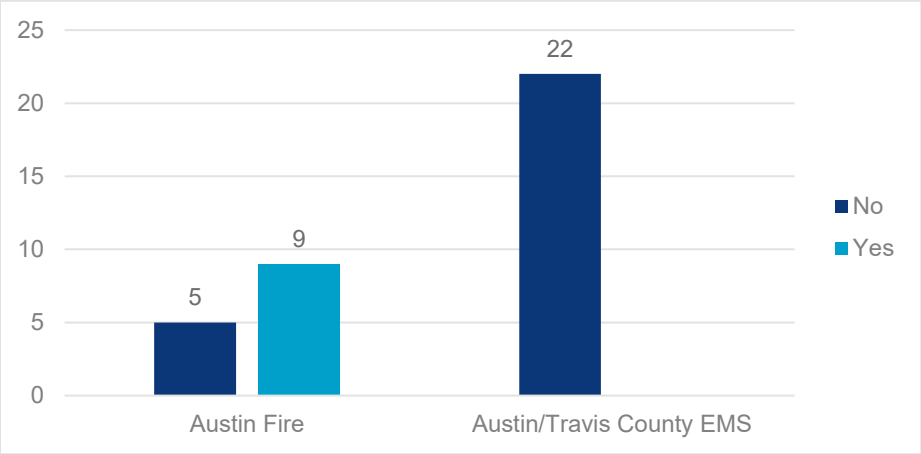


Figure 24: Rank and Position of EMS Departments



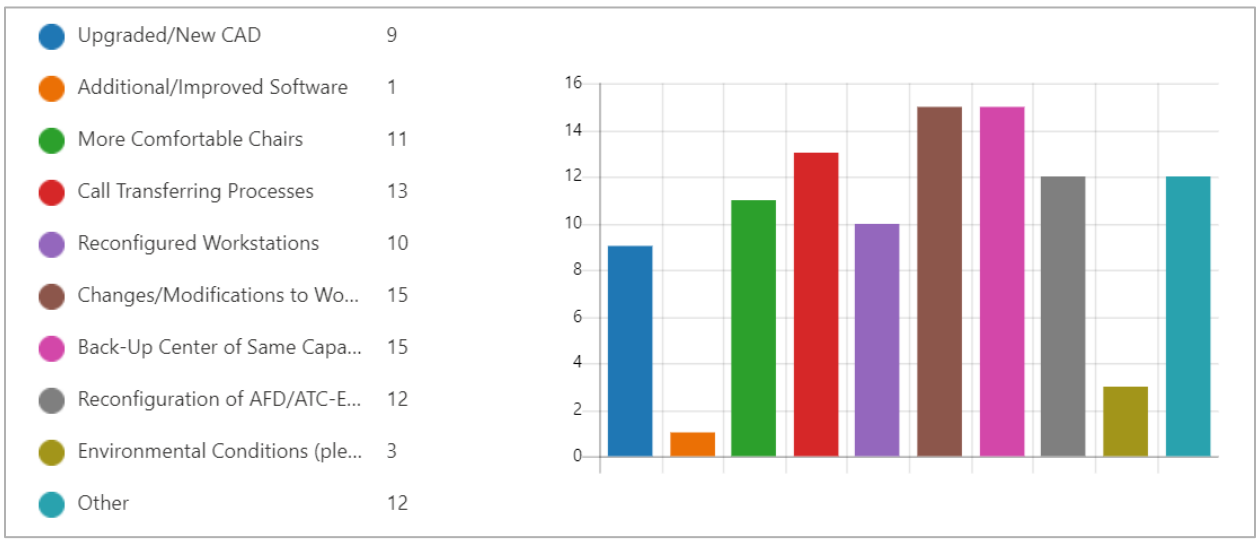
Of the 36 total responses, 27 answered “No” when asked “Do you believe your dispatch operation is adequately staffed?” When analyzed between AFD and ATCEMS departments, all 22 ATCEMS responses indicated that their dispatch operation was not adequately staffed. Five AFD respondents believed their dispatch operation was not adequately staffed, while nine were satisfied with the level of staffing. The breakdown of these responses is provided in ***Figure 25***.

Figure 25: Analysis by Department – Are Dispatch Operations Adequately Staffed?



When respondents were asked to choose three changes (preferred enhancements) that they would make to their current dispatch operation, the three most popular choices were "Back-Up Center of Same Capacity/Quality as CTECC," "Changes and Modifications to Work Schedule," and "Call Transferring Process." Additional details regarding these responses are outlined in ***Figure 26***.

Figure 26: Preferred Enhancements/Improvements to dispatch operations



In examining this data further by departments, ATCEMS respondents highly prioritized Changes/Modifications to Work Schedule. In comparison, AFD respondents prioritized Back-Up Center of Same Capacity/Quality as CTECC as demonstrated in ***Figures 27-28.***

Figure 27: Preferred Changes by ATCEMS Staff

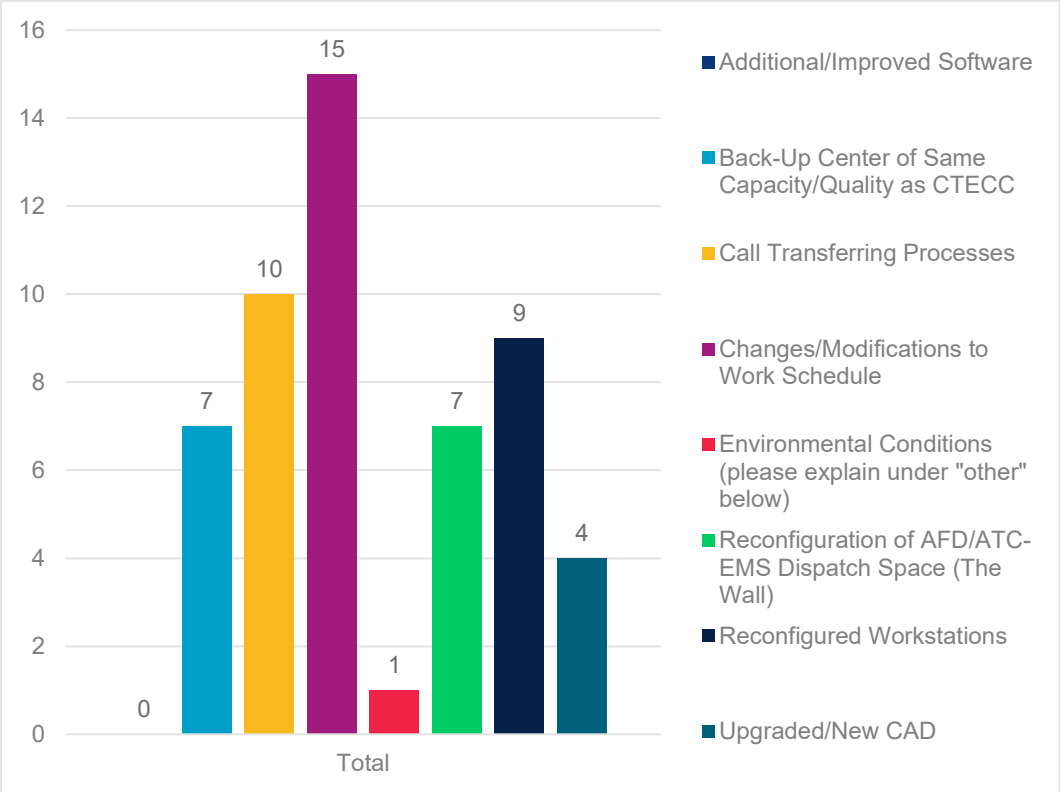
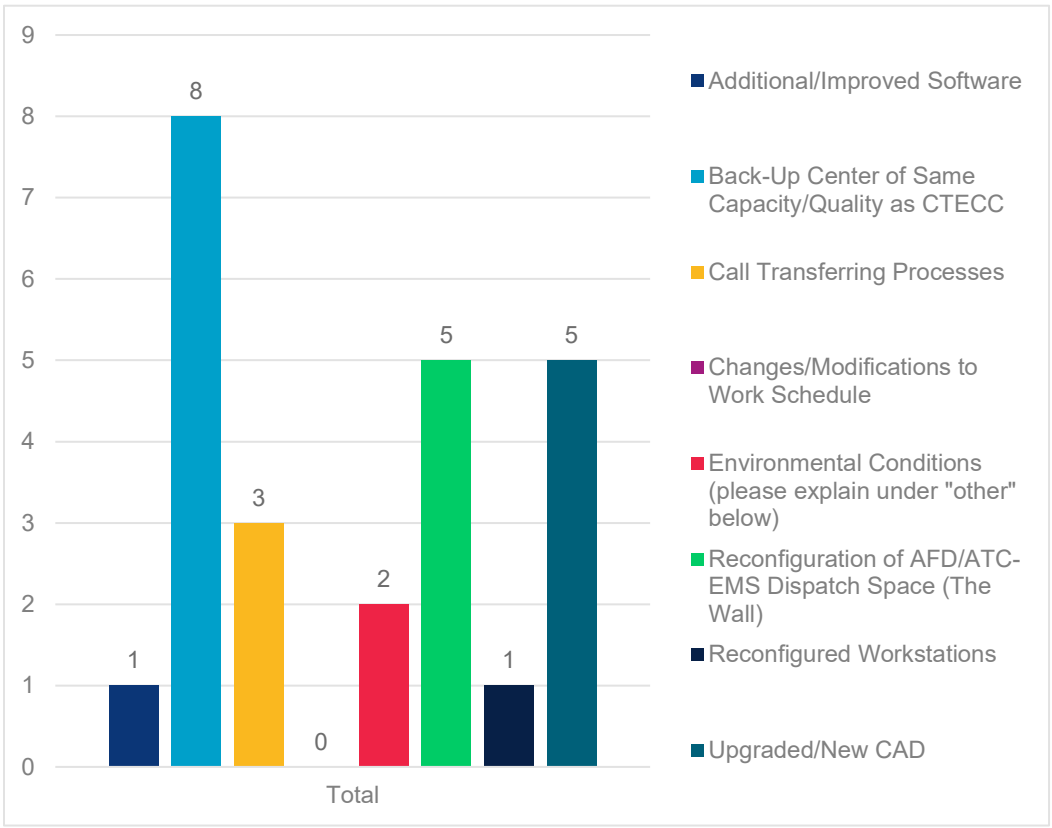


Figure 28: Preferred Changes by AFD Staff



Respondents were also provided the opportunity to give suggestions to improve or enhance the working processes between AFD and ATCEMS dispatch operations; these are found in Appendix D. Common answers from ATCEMS respondents included wanting AFD dispatch to be more reliable, eliminating "the wall," for EMS dispatchers to stop having to "pick up the slack" of AFD, and wanting to remain as two separate departments. Similarly, AFD respondents expressed concerns about using the CAD system more, wanting to remain two separate departments, eliminating "the wall," and a disconnect between the two departments due to different protocols and rules.

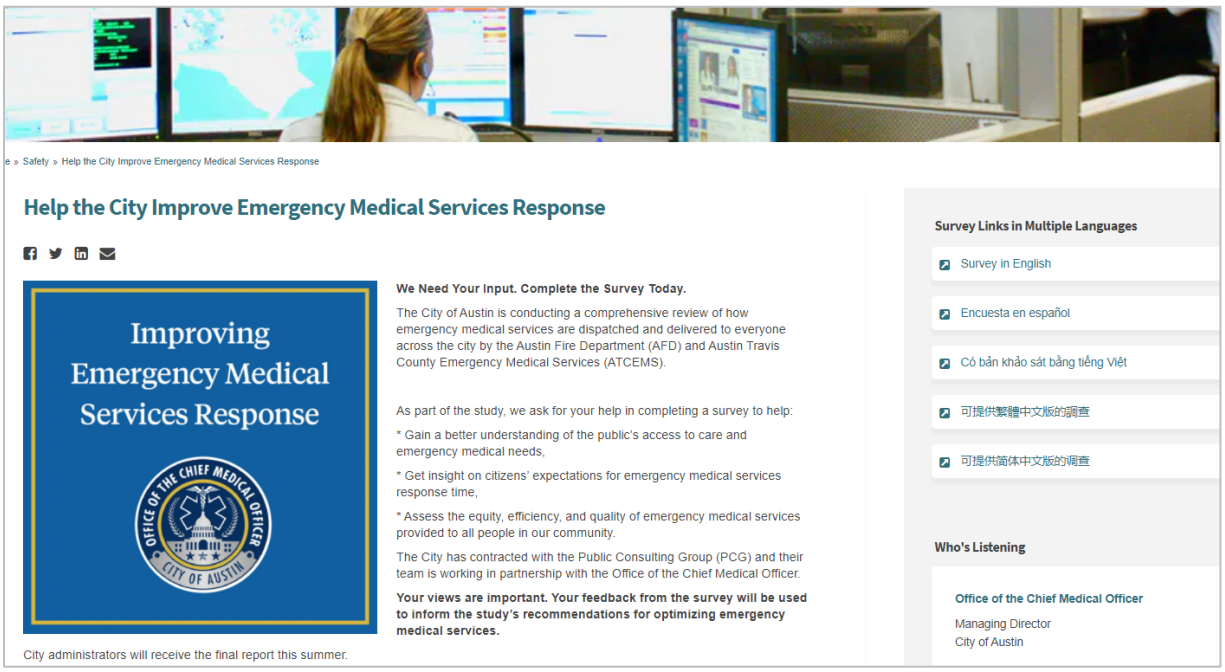
In summary, while both departments are experiencing staff shortages, all ATCEMS respondents indicated staff shortages while only slightly less than half of AFD respondents did. Both departments are adequately trained and given resources to perform their duties. ATCEMS respondents would prioritize changing work schedules, while AFD respondents would prioritize improving back-up center capacity and quality improvement. Both departments expressed concern in the working relationship between the two departments. Survey responses from both departments highlighted the disconnect between the two departments and the physical wall separating them that impedes their work, both physically and metophorically.

Public Input Survey: Improving Emergency Medical Services Response in the City of Austin/Travis County

Obtaining public input from City of Austin/Travis County residents was an important component of this emergency medical services response evaluation. The survey set out to understand the public's expectations for response time, obtain information about the public's perception of the quality of the EMS response services by AFD and ATCEMS, and collect feedback for improvement. The survey was drafted by PCG with input from the Office of the Chief Medical Officer and the Office of Equity. To maximize participation and provide survey access to speakers of languages other than English, the survey was translated to Spanish, Vietnamese, Traditional Chinese, and Simplified Chinese.

The City of Austin's Public Information Office (PIO) created a Speak Up, Austin! page to host the survey and coordinated outreach efforts with other City departments, including ATCEMS, AFD, APH, and the OCMO. Since each City department has their own public information office and coordinates their own outreach efforts, marketing materials and the survey link were provided to the PIOs in each department. ***Figure 29*** shows a screenshot of the original Speak Up, Austin! survey landing page.

Figure 29: Screenshot of the Speak Up, Austin! Page



The survey launched on April 21, 2021 and closed on May 3, 2021. An example of the public input survey, as well as a summary of survey results, can be found in Appendix E. The short window for survey implementation and the challenges in survey outreach efforts with the City yielded low levels of participation. Due to the low number of responses received, the PCG team was unable to conduct the level of detailed analysis necessary to reach meaningful conclusions. More information needs to be gathered to better analyze zip code/geographic issues and ethnic/racial disparities. Based on survey responses, the PCG team was able identify the following themes:

- Many respondents said that EMS services arrive on-time or earlier than expected.
- The majority of respondents said that both fire and EMS services provide high quality care.
- It is notable that many respondents are open to “treatment, no transport” options or transportation to alternative treatment facilities during a non-life-threatening medical situation.
- While many people can drive their own cars or have friends and family to drive them, more information should be gathered on smaller populations that rely on public transportation or 911 calls to get medical care, as well as those who do not have access to care.
- The survey respondents did not include enough people of color perspectives.

SECTION VIII: RESOURCE ALLOCATION ASSESSMENT AND EMERGENCY RESPONSE EVALUATION

Analysis of both AFD and ATCEMS shows that both departments are well-resourced and well-staffed for services provided. Station locations meet response demands for most areas within the city limits of Austin for both AFD and ATCEMS. Exceptions to this observation are outlying areas of the City to the extreme east, southeast, and south. Reasons for this observation are that those areas lack essential infrastructure elements that mandate construction of stations, such as residential housing developments, businesses, improved roadways, fire hydrants, adequate utilities, and other infrastructure considerations.

AFD and ATCEMS Response Times

As mentioned in the City Auditor Report on 911 Communications, both AFD and ATCEMS track and monitor their response times very closely. Both departments have internally developed mapping programs and/or processes to provide stakeholders with reports on response time performance. However, our team believes that response time should not be the central focus on response performance. Both departments have dedicated teams to collect, collate, analyze, and disseminate response data specific to response times. Our finding is that both departments should place greater focus on data collection of patient outcomes, arrival of responders at the patient's location, and initiating interventions. We recommend that both departments work closely with the OCMO to determine which metrics the departments should focus on regarding response performance and desired measurable outcomes.

Recommendation 24:
Develop outcome metrics related to response time performance and patient outcomes.

Figure 30 is an AFD Standards of Coverage map showing the response polygons. The ATCEMS CY 2019 Standard of Coverage map is shown in ***Figure 31***. Standards of Coverage refers to the agency's deployment of emergency response resources and the agency's response time performance goals. The various shades of green on the maps in the following pages indicate that the agency is meeting their response time performance goals and the other shaded colors are areas that need improvement.

Figure 30: AFD Standards of Coverage "Response Area Polygons"

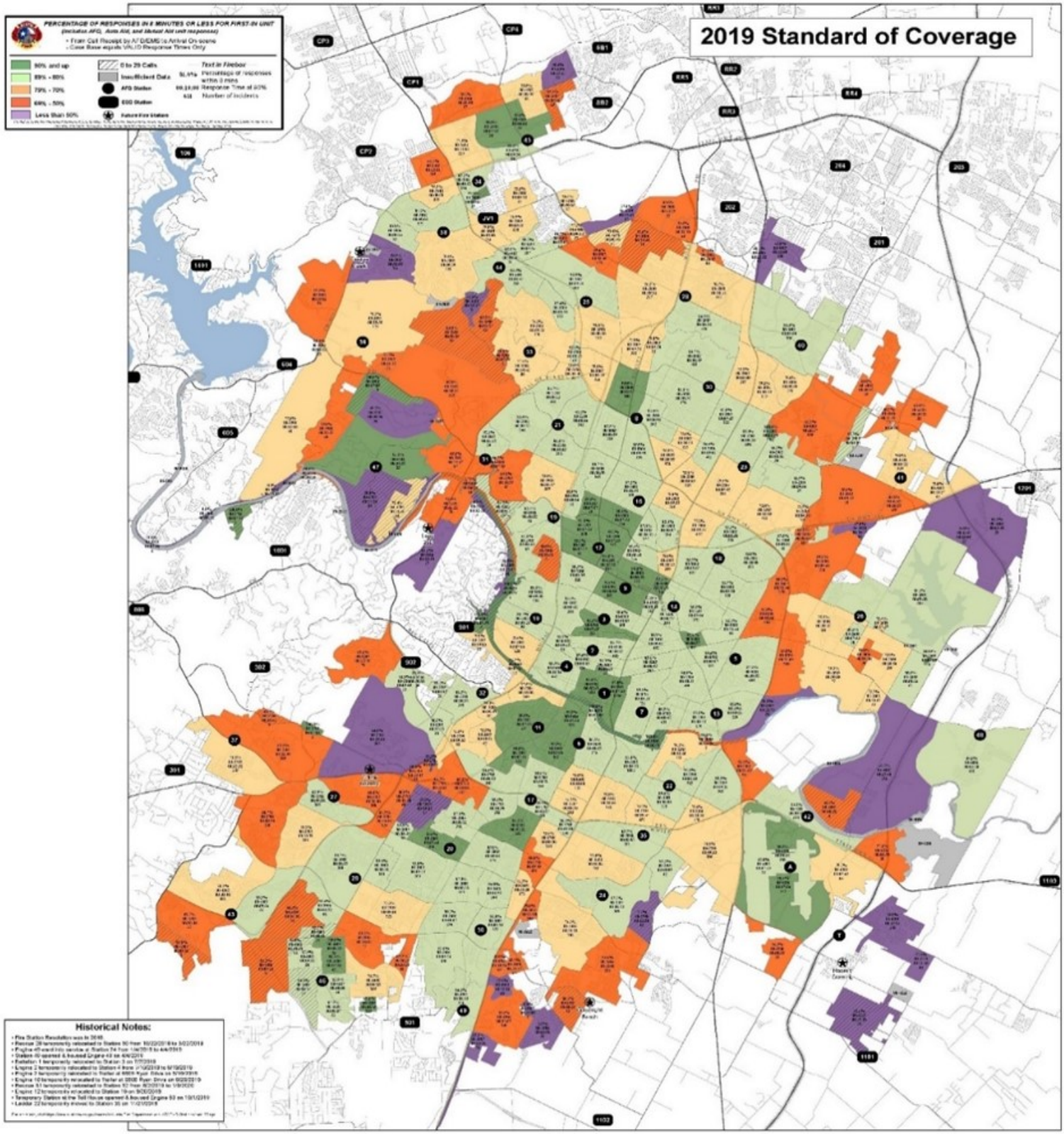
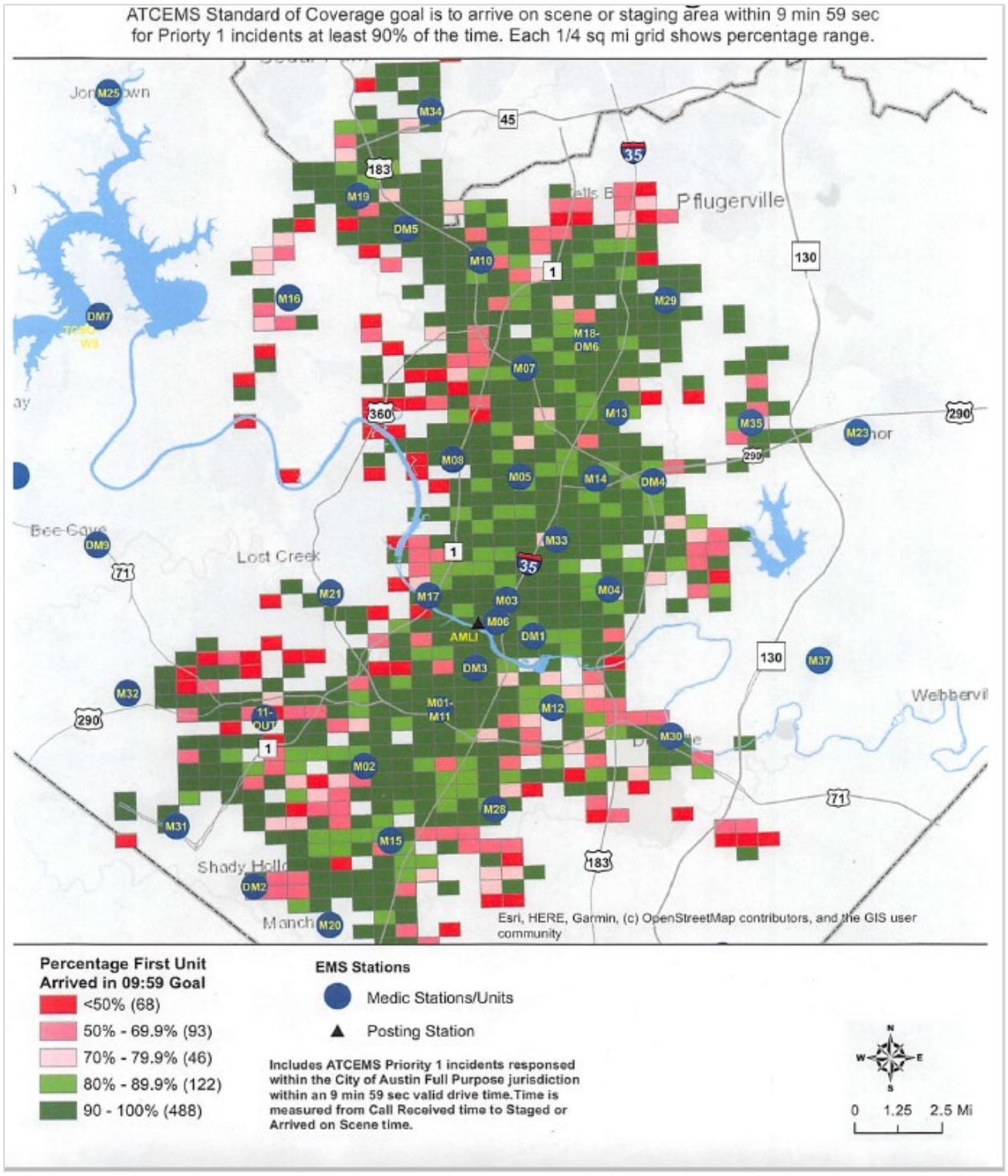


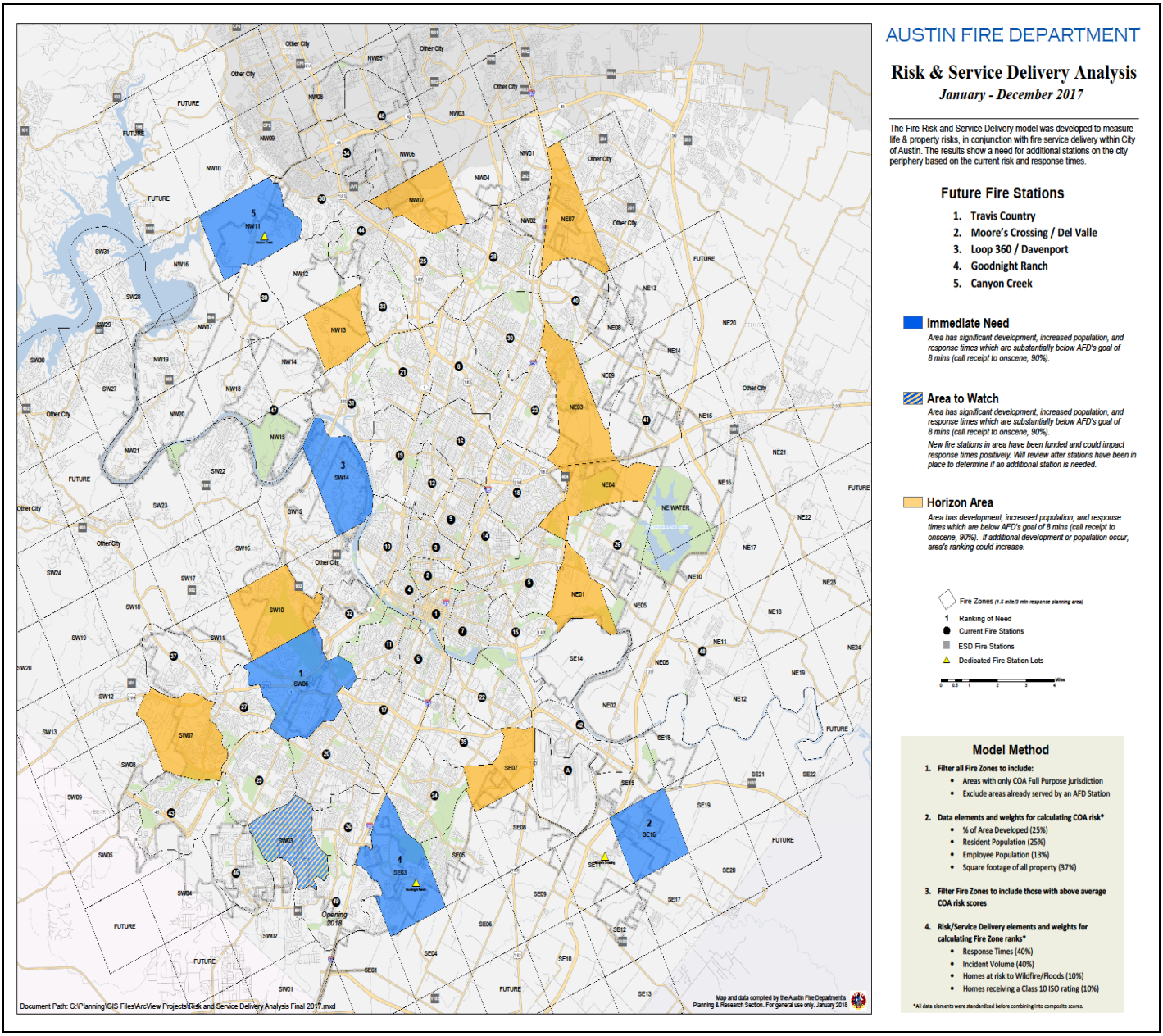
Figure 31: Austin-Travis County Emergency Medical Services CY 2019 Standard of Coverage



AFD and ATCEMS Resource Allocation Present and Future

Although build-out areas of the City have sufficient resource allocations, there remain areas of the City that experience longer-than-expected response times. ***Figure 32***, produced by the AFD research and data management team, maps the location of all current AFD fire stations as well as proposed locations for future fire stations. The map also identifies areas of the City that AFD has already determined will require fire stations at some point in the future based on infrastructure buildout and service demands.

Figure 32: AFD Current and Projected Fire Station Locations



AFD Resource Deployment

The Austin Fire Department has positioned their emergency response resources and fire stations located throughout the City of Austin, including:

- 49 Strategically Located Fire Stations
- 47 Engine Companies

- 13 Aerial/Ladder Truck Companies
- 4 Heavy Rescues *(Includes Hazardous Materials Response)*
- 12 Wildland/Brush
- 8 ARFF *(Aircraft Rescue Firefighting)*
- 7 Battalion Chiefs (6 Operations BCs and 1 Special Operations BC)

ATCEMS Resource Deployment

ATCEMS currently has their resources deployed in three configurations from 43 strategically located EMS Stations in the City and Travis County.

- Demand Medic Units
- Medic Units at Standalone EMS Stations
- Medic Units at Co-Located EMS Stations with AFD

Currently 39 Medic Units are staffed 24/7 and assigned to stations with one Medic Unit sharing a station. There are six Demand Units staffed for 12 hours assigned to a station with one Demand Unit sharing a station.

The number and type of resources deployed includes:

- 39 Medic Units (24-hour Shift Units)
- 7 “Peak” Demand Medic (DM) Units (12-hour Shift Units)
- 4 Community Health Paramedic (CHP) Units
- 7 Area Command Field Supervisors

Demand Units are ambulances that work in 12-hour shift increments and operate from post locations throughout the City and County based on system call demand. Standalone stations are fixed facilities housing single medic units. Co-located medic units are housed at AFD fire stations distributed throughout the City of Austin but can also be co-located at one of the Travis County ESD fire stations as well. ***Table 29*** lists the three response configurations used by ATCEMS, station location relative to Council District, and the station numbering of ATCEMS standalone and co-located stations.

Table 29: City Council District ATCEMS Unit Locations

Council District	DM Unit	Stand Alone	Co-Located
District-1	N/A	M-3	FS-5 / M-4
			FS-41 / M-35
District-2	N/A	M-28	FS-36 / M-15
			FS-42 / M-30
			FS-50 / M-36
District-3	DM-4	M-1	FS-22 / M-12
	DM-1		
District-4	N/A	M-14	FS-8 / M-7
			FS-23 / M-13
			FS-30 / M-30
District-5	N/A	N/A	FS20 / M-2
			FS 49 / M-20
District-6	N/A	N/A	FS-25 / M-10
			FS-38 / M-19
			FS-39 / M-16
			FS-45 / M-34
District-7	DM-6	M-5	FS-40 / M-29
District-8	N/A	N/A	FS-27 / M-11
			FS-43 / M-31
			FS-51 / M-40
District-9	DM-5	M-33	FS-1 / M-6
			FS-6 / DM-3
District-10	N/A	M-17	FS-19 / M-8

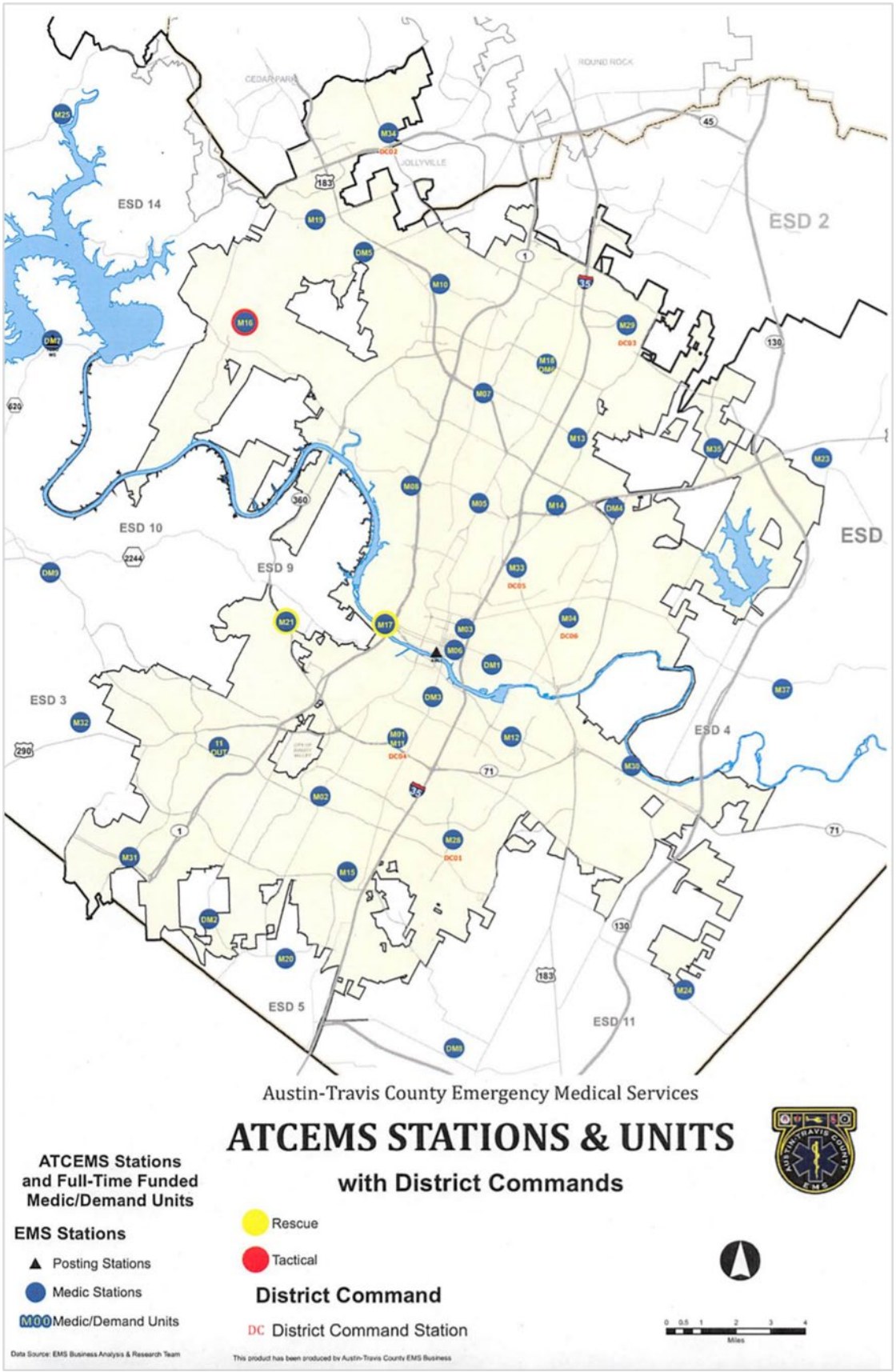
One fact that was noteworthy to the PCG team is that co-located stations for EMS and fire had separate station numbers for each agency displayed on the outside of the building, with the exception of one where the co-located medic unit has the same numerical designation as the fire station (FS-30 / M-30 in District-4). The rationale for the different numbering is not clear but illustrates the point that AFD and ATCEMS are two separate agencies.

Recommendation 25: Consider renumbering ATCEMS stations & units in the City of Austin to match the co-located AFD Station.

The numbering could be confusing to the public driving by and might be mistaken for an address. An example of the numbering is shown in ***Figure 33***. Although the separate station numbering system may seem metaphorical just as "the wall" in dispatch does, our findings conclude that this also represents the physical separation of the two departments and the personnel assigned to each of these stations. ***Figure 34*** shows a map of the standalone and co-located EMS stations as well as the EMS Districts and locations of Demand Units.

Figure 33: Example of EMS and AFD Numbering

Figure 34: ATCEMS Stations and Unit Locations



**Stations M09, M22, M26, and M27 are not shown on the map above.

ATCEMS Resources (Units/)

Over the past several years for a variety of reasons, ATCEMS has expanded services beyond traditional EMS to include training ATCEMS personnel in the following specialties:

- Drone Operations
- Bike Medic
- Motorcycle Medic
- APD Tactical Medic
- Austin Motor Speedway Rescue
- Swift/Flood Water Rescue Team
- Technical Rescue Team (participation in Texas US&R Task Force-1)
- Special Event Teams (Note: these teams are not considered in the normal, daily staffing matrix of the department)

We recommend that ATCEMS reexamine its funding and use of these special operations teams as these present an unnecessary redundancy in resources when compared to those operated by AFD. Our team believes that ATCEMS's use of fiscal resources to fund purchase of equipment such as drones, swift/flood water rescue, technical rope, and US&R equipment far exceeds their primary mission of EMS delivery. Not only is this equipment extremely costly, but the greatest expense incurred by the department comes in the form of initial and on-going certification training of personnel to maintain these resources. Cost for such resources can run into several hundred-thousand dollars annually, but more importantly, they are outside the scope of an EMS department. The fire department is already providing these services and they are well within the scope of response for AFD and the Travis County ESDs. Consideration, however, could be placed on providing additional, supplemental training within these disciplines to various ATCEMS members. These members could function in a supplemental role to the other established programs, rather than ATCEMS having its own dedicated team and cache of equipment.

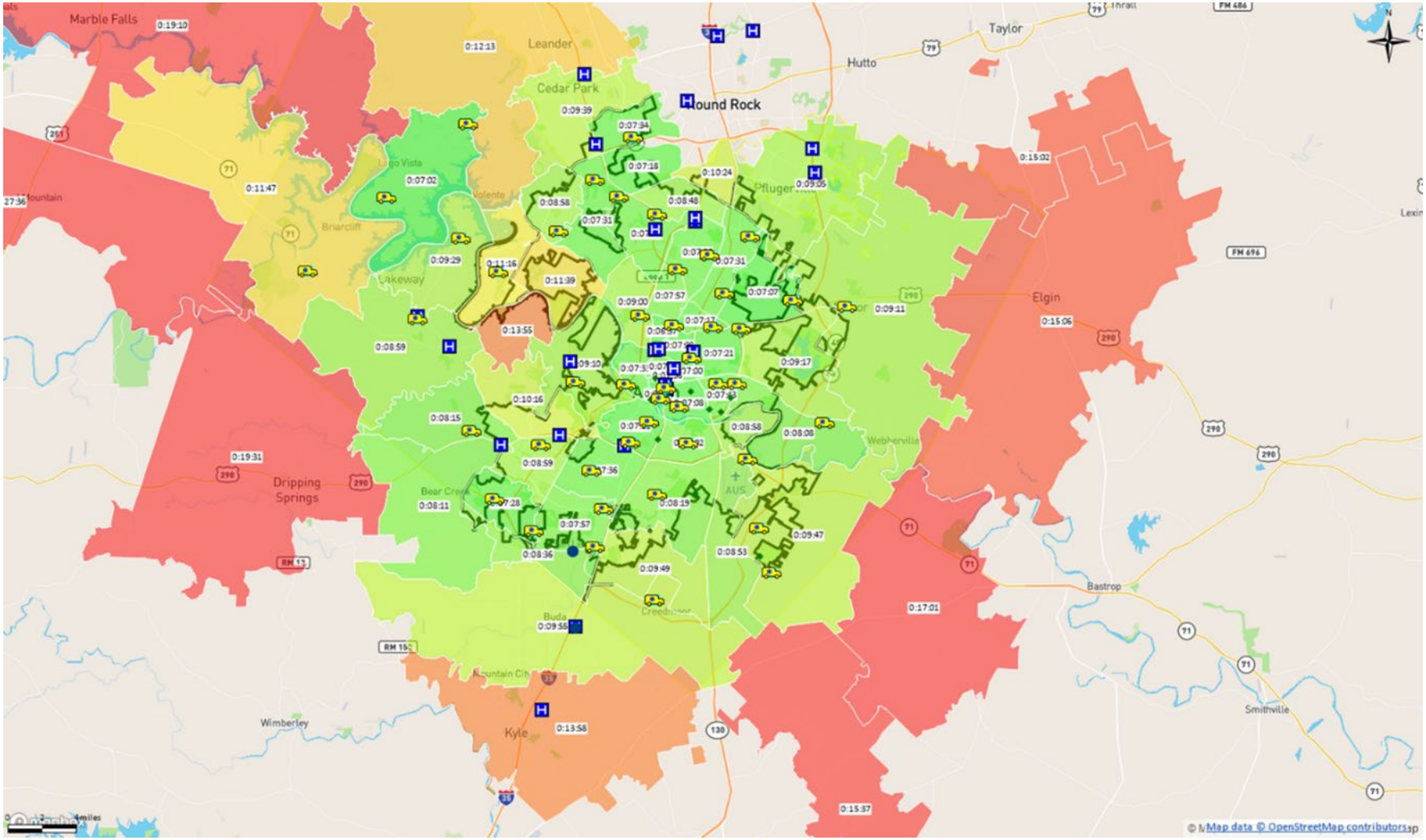
Recommendation 26:
ATCEMS should reevaluate support for special operations teams such as technical rescue, urban search & rescue, and swift/flood water rescue as these functions fall under the operational purview of AFD and other local fire departments; instead, dedicate trained personnel in a supplemental role to the other established programs.

Emergency Response Evaluation

From the perspective of service delivery, both AFD and ATCEMS are typical of large municipal emergency response departments. Communities of this size, in terms of both population and land area, require large response forces to meet their stated missions as well as service demands. What sets Austin apart from the other major metropolitan cities in Texas is the fact that Austin, at some point in the past, made the decision to provide emergency services with two separate departments.

Figure 35 shows response time performance for all EMS Priority 1-3 incidents responded to by ATCEMS medic units. Areas highlighted in dark green reflect areas where response times of eight minutes or less were met 90% of the time. Lighter green areas indicate response times between eight to nine minutes. Areas shaded in orange and red reflect extended response times well outside performance target goals; however, these areas are also classified as rural, have considerably lower population density, are more difficult to reach, and/or have considerably less call demand. In concise terms, response time performance in the highest demand areas of the City and County meet and even exceed performance targets.

Figure 35:ATCEMS 2019 Response Times Performance Map - P1-P3 Incidents



Our research, analysis, findings, and recommendations do not support fully integrating AFD and ATCEMS into a single response organization. That process would prove to be overwhelming and take decades to fully realize. However, our team has identified several areas where AFD and ATCEMS can and should improve their cooperation, coordination, and collaboration to improve operational and administrative efficiencies, and in doing so, significantly enhance their effectiveness in service delivery as well as significantly reduce costs to provide these services.

Current and Future Fire and EMS Station Locations

The PCG team also evaluated the current and future location of fire and EMS stations related to the effectiveness or optimal distribution of both AFD and ATCEMS station locations. PCG enlisted assistance from the R1 *Optima* team to carry out simulations using *Optima Predict* software. *Optima Predict* is a comprehensive, state-of-the-art software-based program that employs simulation-based planning solutions designed specifically for emergency services. The program considers key performance indicators such as response times for different types of vehicles/apparatus, time-of-day traffic conditions, road conditions, and response profiles (emergency vs. non-emergency).

Working with *Optima Predict* staff, our team consulted with both labor and management from AFD and ATCEMS and developed multiple response and resource deployment scenarios to assess response performance. This section of the report will provide detailed analysis and graphic representations for each scenario type presented in this report as well as our findings and results from these scenarios.

ATCEMS currently uses *Optima Live* as a performance assessment tool for resource deployment and determining optimal placement of their units. AFD does not use *Optima Predict* nor *Optima Live* but has developed a series of “Standards of Coverage” (SoC) maps that are, in our assessment, highly effective in predicting response time performance for all AFD stations and response resources. This mapping and performance tool employs what AFD designates as “response area polygons” (RAP) which show response time performance by both area zip codes but also by council district (see ***Figure 30***). AFD response time performance is published by the department in its annual report. Additional information on AFD’s SoC and response area polygons is contained in Appendix F.

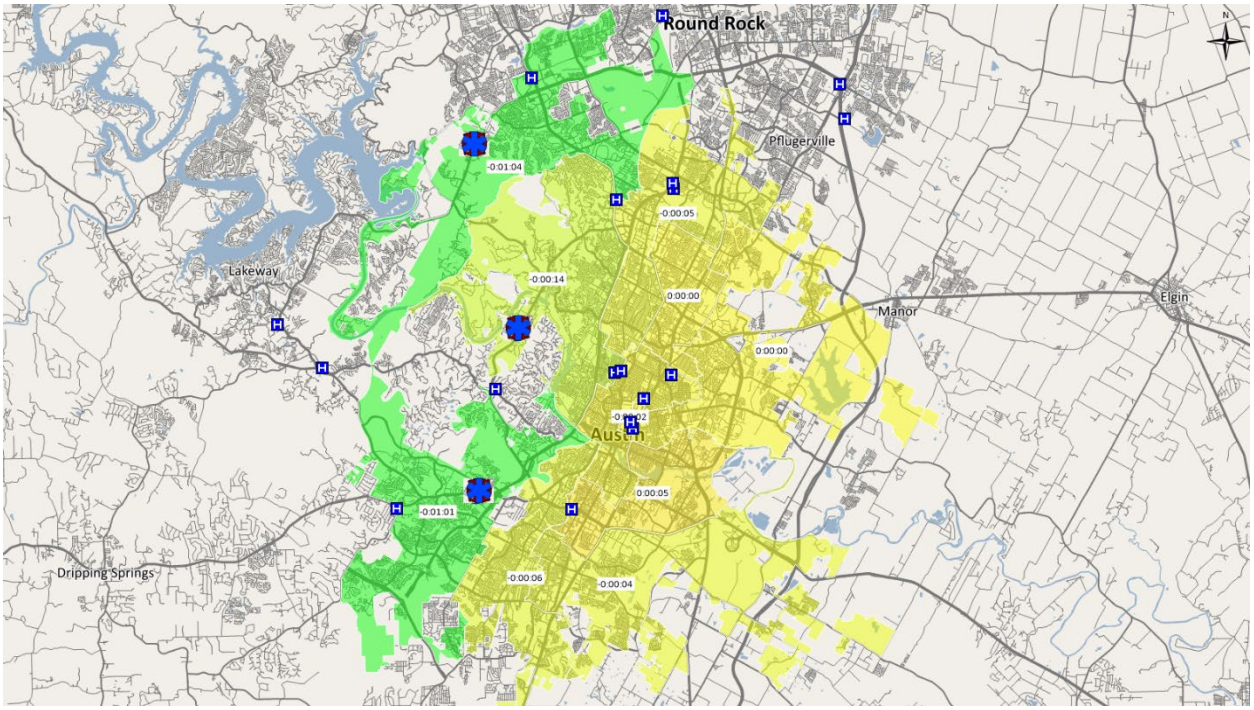
Optima Scenario A – Impact of New Stations

Scenario A demonstrates response performance for both AFD and ATCEMS resources that will be assigned to three of the new joint fire/EMS stations planned for the areas listed below. The three stations analyzed did not include the Goodnight Ranch at the request of AFD. These stations are depicted with icons in ***Figure 36*** on the west side of Austin.

- Canyon Creek
- Davenport Ranch
- Travis Country

The assumption made for this scenario is that each station will be staffed with a new AFD **Engine Company** and a new ATCEMS **Medic Unit**. Both resources will be in service 24/7/365.

Figure 36: New Fire/EMS Station Locations



By adding the additional fire/EMS stations identified on the map it shows a substantial improvement with response times for AFD units in Council District 6 and District 8 (shaded in green on ***Table 30)***.

Table 30: AFD Time Response Performance – New Station Additions (High Priority Incidents)

Measures		City Council District									
	System	1	2	3	4	5	6	7	8	9	10
Average Current	5:08	5:07	6:01	5:03	5:15	5:04	5:30	5:12	5:33	4:17	5:01
Average Scenario	5:05	N/C	N/C	N/C	N/C	N/C	5:02	N/C	5:04	N/C	4:56
Median Current	4:58	5:03	5:50	4:55	5:10	4:57	5:16	5:02	5:28	3:50	4:57
Median Scenario	4:56	N/C	N/C	N/C	N/C	N/C	4:53	N/C	4:56	N/C	4:52
90th % Current	7:06	6:52	8:05	7:04	7:01	6:49	7:44	7:22	7:53	6:01	5:42
90th % Scenario	7:01	N/C	N/C	N/C	N/C	N/C	7:03	N/C	7:08	N/C	N/C

Metric Calculation: Call Received to First AFD Unit On-Scene (MM:SS)
N/C = No Change

Figure 37 shows a graphic representation of substantial improvement in response times noted in Council District 6 and District.

Figure 37: AFD Median Performance Comparison by City Council District

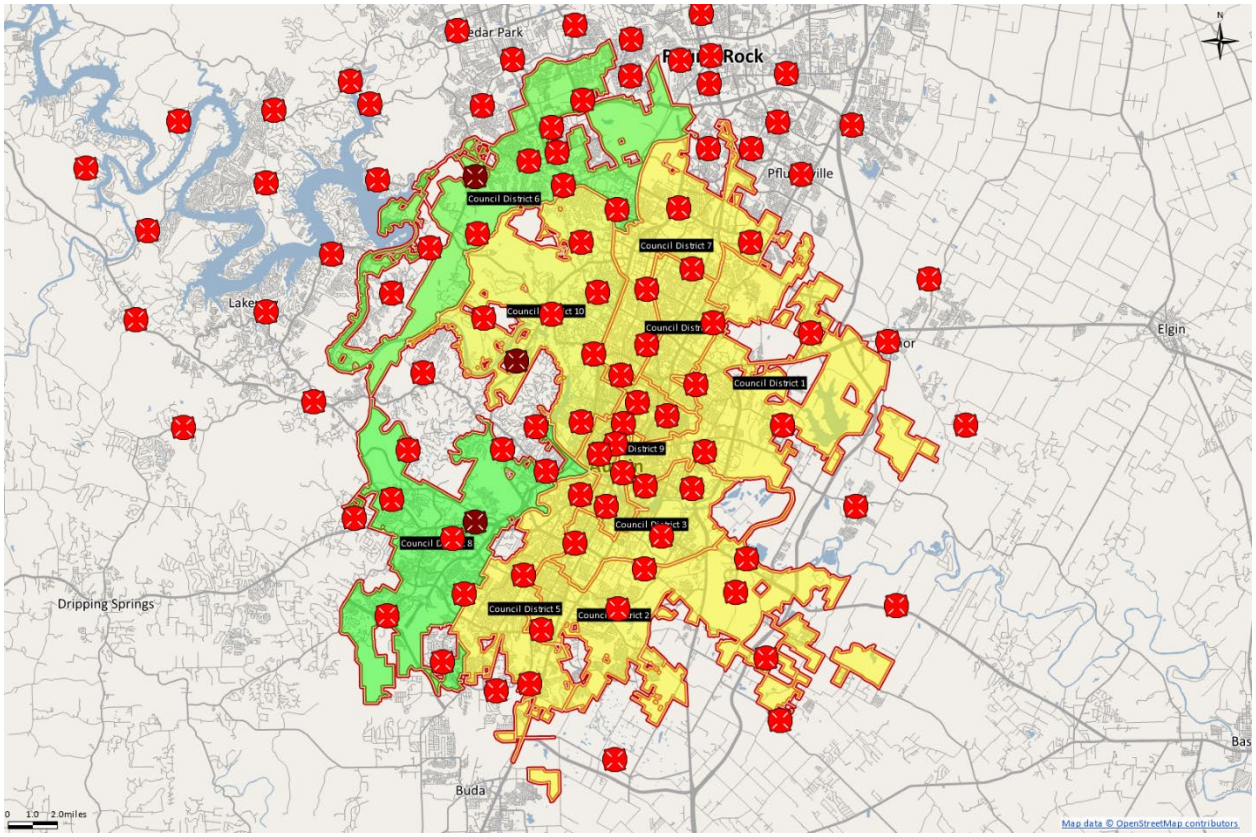


***Table 31:* ATCEMS Response Performance – New Stations (Priority 1 and 2 EMS Incidents)**

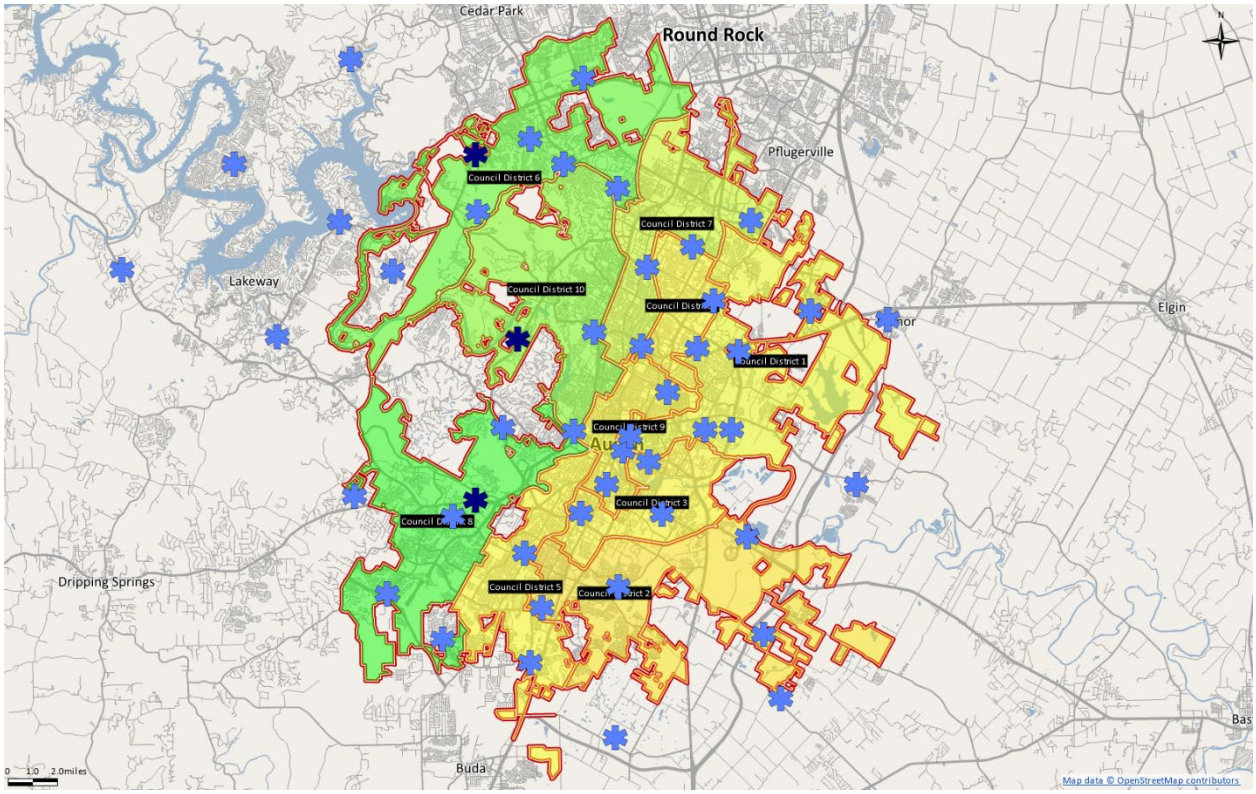
Measures	City Council District									
	System	1	2	3	4	5	6	7	8	9	10
Average Current	6:53	6:49	7:49	6:50	6:42	7:19	7:24	6:56	7:47	5:36	7:21
Average Scenario	6:48	N/C	N/C	N/C	N/C	N/C	6:58	6:48	7:21	N/C	7:04
Median Current	6:41	6:43	7:38	6:48	6:40	7:12	7:09	6:45	7:45	5:17	7:21
Median Scenario	6:37	N/C	N/C	N/C	N/C	N/C	6:47	6:36	7:16	N/C	6:58
90th % Current	9:49	9:45	10:54	9:38	9:15	10:19	10:21	9:46	10:42	7:29	10:24
90th % Scenario	N/C	N/C	N/C	N/C	N/C	N/C	9:51	9:33	10:15	N/C	9:49

Metric Calculation: Call Received to First ATCEMS ALS Unit On-Scene (MM:SS)
N/C = No Change

Table 31 above shows the response time improvements (shaded in green) in Council Districts 6, 7, and 8, and District 10.

Figure 38 shows a graphic representation of the improvement in ATCEMS response times noted in Council District 6, 7, and 8 with additional improvement noted in District 10. Essentially, the entire area west of the MoPac Expressway benefits from the new stations and associated resources as related to EMS response time performance. ATCEMS response time improvements are more widespread geographically than AFD.

Figure 38: ATCEMS Median Performance Comparison by City Council District



Green: Substantive Performance Improvement, Yellow: No Substantive Change in Performance

In ***Table 32****, Optima* shows the current workloads for ATCEMS and AFD response resources reflected in percentage of an assigned work-shift.

AFD units and ATCEMS Medic Units work 24-hour shifts **(10% of 24-hours = 2.4/Hrs.),** whereas ATCEMS Demand Units work 12-hours shifts **(10% of 12-hours = 1.2/Hrs.)**. The addition of new resources into the system for both AFD and ATCEMS has a positive impact on the workload of resources within the system. The largest improvements are seen in the ATCEMS Demand Units, especially those located on the western side of the system.

Table 32: Scenario Workloads (Percentage)

Unit Agency and Type	Current Workload	Scenario Workload
ATCEMS – Demand Unit	33.16	25.67
ATCEMS – Medic Unit	33.68	29.71
AFD – Engine Company	9.68	9.14
AFD – Ladder Company	3.63	3.53
AFD – Quint Company	6.59	5.89
AFD – Rescue Company	6.29	6.20

Optima Predict Scenario B – AFD First Response to EMS Call Priorities 1-5

This scenario examines the performance impact of broadening AFD's first response role to include all Priority 3, 4, and 5 EMS incidents. This is in addition to the current response to EMS Priority 1 and 2

incidents and select Priority 3 incidents based upon ATCEMS unit response time estimation at dispatch. No changes have been made in other AFD response plans or ATCEMS response plans

EMS Priority 1 and 2 Incidents

There was no change in the performance of EMS Priority 1 or 2 incidents attributable to the additional responses added to AFD. First Unit Arrival (either AFD or ATCEMS) remained at an average of 4:52, a median of 4:45, and a 90th percentile of 6:50. ALS unit arrival was also unchanged for these incidents.

EMS Priority 3, 4, and 5 Incidents

First Unit Arrival was markedly improved across the City of Austin. The addition of a first response unit to all Priority 3, 4, and 5 incidents decreases the response times by approximately 2 minutes at the average, 1.5 minutes at the median, and almost 4 minutes at the 90th percentile. The full performance assessment is detailed in ***Table 33*** below.

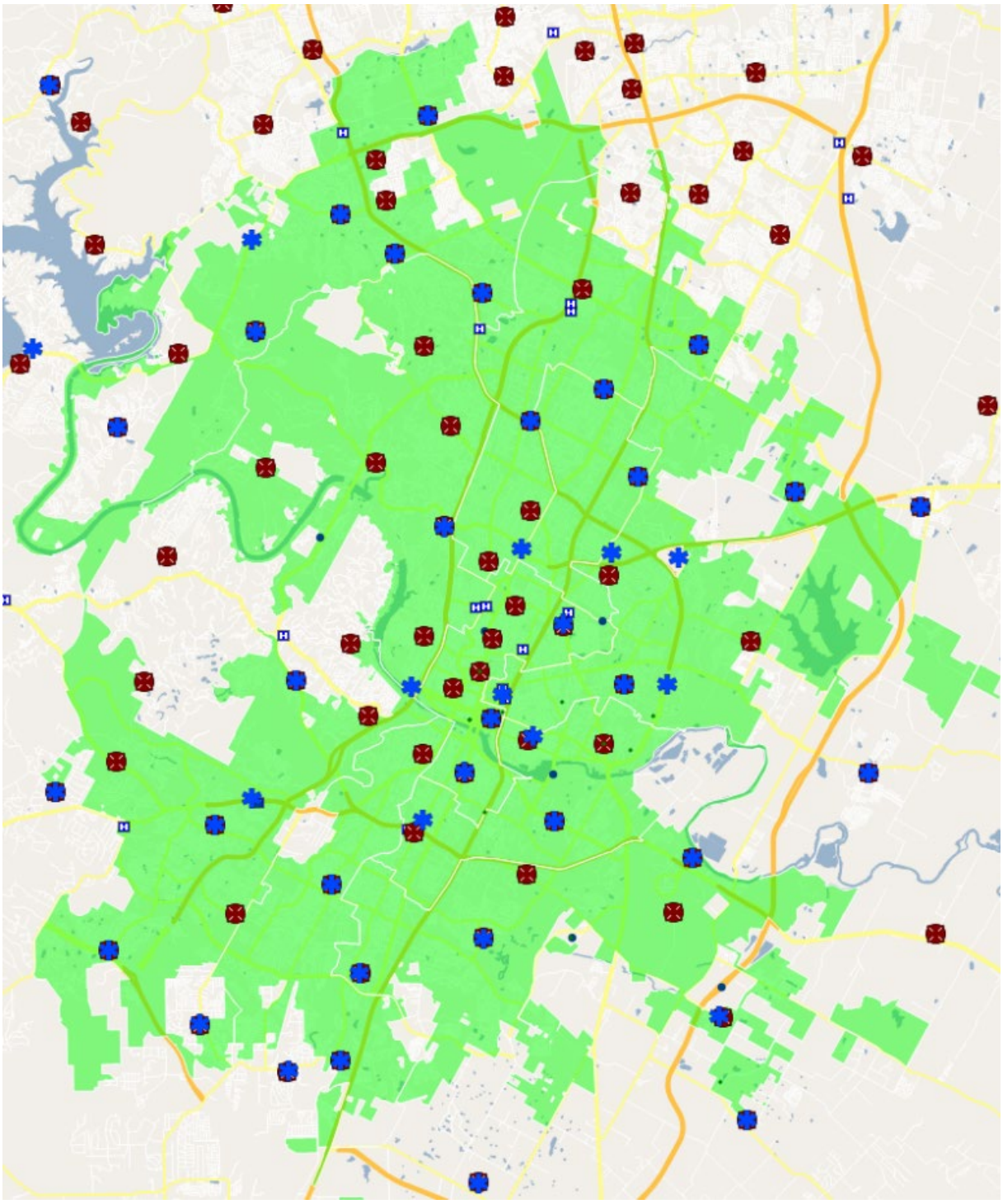
Table 33: First Unit Response Performance – AFD Response to All EMS P3, P4, and P5 Incidents

Measures		City Council District									
	System	1	2	3	4	5	6	7	8	9	10
Average Current	7:37	7:36	8:47	7:29	7:49	7:50	7:42	7:37	8:33	6:31	7:49
Average Scenario	5:33	5:34	6:35	5:28	5:47	5:37	5:51	5:41	6:16	4:30	5:36
Median Current	6:51	6:43	7:55	6:42	7:10	7:02	7:06	6:55	7:56	5:58	7:05
Median Scenario	5:22	5:23	6:19	5:17	5:35	5:27	5:43	5:28	6:04	4:19	5:28
90th % Current	11:45	11:56	13:19	11:36	11:48	12:04	11:34	11:34	12:51	9:35	12:07
90th % Scenario	7:59	7:52	9:08	7:48	7:59	7:51	8:20	8:15	8:56	6:31	7:55

Metric Calculation: Call Received to First Unit On-Scene (MM:SS)
N/C = No Change

Figure 39 shows the current location of all AFD and ATCEMS resource locations. The color shade of green shows that if AFD were to respond to all priority 3, 4, and 5 incidents it will have a marked reduction in response times throughout the City of Austin. However, ***Table 34*** shows that workloads for all AFD units will increase considerably. ALS unit arrival was also slightly improved in this scenario. Average response time decreases by 13 seconds, median response time decreases by 4 seconds, and the 90th percentile response time decreases by 28 seconds across the system. The gains were seen consistently across all City Council Districts.

Figure 39: First Unit Arrival Median Performance Comparison by City Council District



Green: Substantive Performance Improvement, Yellow: No Substantive Change in Performance.

In addition to the improvement in response time performance reported above, there was also a substantive increase in workload for AFD primary response units (Engine, Ladder, Quint, and Rescue). This change is driven by the **increased** number of EMS P3, P4, and P5 incidents responded to by AFD (14,142 versus 73,342). The noted changes are detailed in ***Table 34***.

Table 34: Scenario Workloads (Percentage)

Unit Agency and Type	Current Workload	Scenario Workload
AFD – Engine Company	9.68	15.97
AFD – Ladder Company	3.63	7.15
AFD – Quint Company	6.59	11.15
AFD – Rescue Company	6.29	8.08

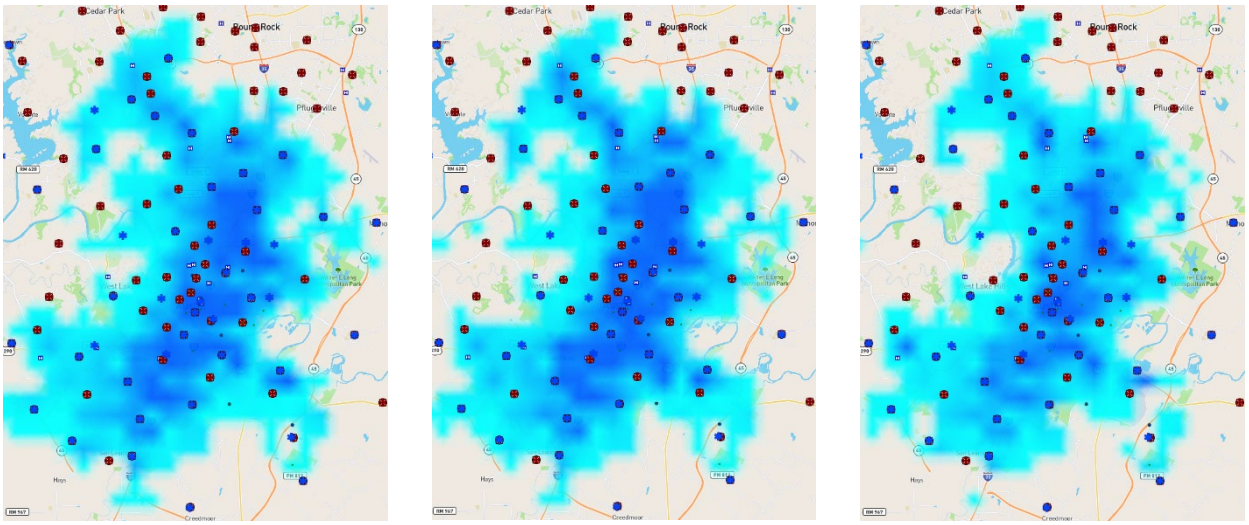
The increase in workload for all unit types is significant. When individual units are examined, the workload for nine engine companies breaks the 20% "busy" threshold with values ranging from 20.44% to 28.33%. No Ladder, Quint, or Rescue units broke the 20% barrier.

Optima Predict Scenario C – AFD Initial Response to EMS Priority 4 and Priority 5 Incidents, ATCEMS Response for Transport or ALS Only

Currently, ATCEMS responds to all EMS Priority 4 and 5 incidents with the Austin Fire Department only responding to a select subset. During 2019, this resulted in 7,266 responses by AFD units. This scenario examines the system impact if AFD were to be the primary responder to all EMS P4 and P5 incidents within the City of Austin with ATCEMS responding only if requested for advanced life support or transportation of the patient. The scenario is configured to initially assign an AFD unit to the incident (using the current assignment method for EMS incidents) and then assign an ATCEMS unit only if the original call resulted in a transport of the patient. A two-minute delay was included from the time the AFD unit arrived until the time the ATCEMS unit was dispatched for those transport incidents.

The distribution of EMS P4 and P5 incidents across the City of Austin is illustrated below in ***Figure 40.*** The distribution of EMS P1 and P2 (highest level medical emergencies) is provided for comparison.

Figure 40: Geographic Incident Distributions



L: Priority 1 and 2, C: Priority 4, R: Priority 5. Deeper color indicates increase incident activity

There is no substantive variability in the distribution of EMS P4 or P5 incidents when referenced against the higher priority emergency calls within the EMS system.

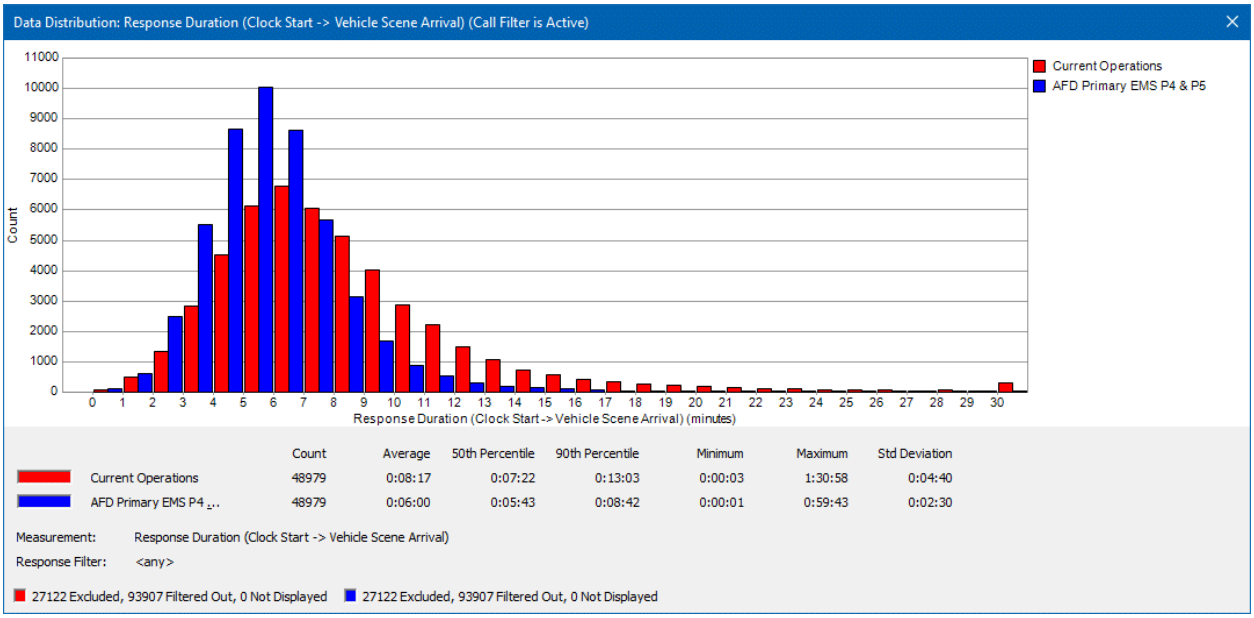
As identified in ***Table 35***, First Unit Arrival was markedly improved across the City of Austin. The proposed response approach decreases the response times by approximately than two minutes at the average, 1.5 minutes at the median, and almost 5 minutes at the 90th percentile. The full performance assessment is detailed below.

Table 35: First Unit Response Performance – AFD Primary Response to EMS P4 and P5 Incidents

Measures		City Council District									
	System	1	2	3	4	5	6	7	8	9	10
Average Current	8:17	8:16	9:33	8:10	8:24	8:45	8:20	8:15	9:25	6:55	8:37
Average Scenario	6:00	6:05	7:01	5:48	6:13	6:02	6:19	6:11	6:45	4:52	6:06
Median Current	7:22	7:15	8:37	7:17	7:35	7:51	7:28	7:23	8:49	6:10	7:53
Median Scenario	5:43	5:48	6:35	5:31	5:57	5:45	6:01	5:51	6:24	4:37	5:50
90th % Current	13:03	13:09	14:36	13:03	13:03	13:24	13:00	12:49	14:16	10:32	13:20
90th % Scenario	8:42	8:35	9:56	8:22	8:29	8:39	9:17	9:03	9:40	7:13	8:35

Metric Calculation: Call Received to First Unit On-Scene (MM:SS)
N/C = No Change

Figure 41: Distribution of First Unit Arrival Response Time



In addition to the improvement in response time performance reported in ***Figure 41***, there was also a substantive change in workloads for resources in both AFD and ATCEMS. This change is driven by the **increased** number of incidents responded to by AFD (7,266 → 48,979) and the **decreased** number of responses assigned to ATCEMS (48,325 → 28,648). The noted changes are detailed in ***Table 36*** below.

Table 36: Scenario Workloads (Percentage)

Unit Agency and Type	Current Workload	Scenario Workload
ATCEMS – Demand Unit	33.16	34.52
ATCEMS – Medic Unit	33.68	28.32
AFD – Engine Company	9.68	14.61
AFD – Ladder Company	3.63	6.35
AFD – Quint Company	6.59	10.17
AFD – Rescue Company	6.29	8.16

The increase in workload, especially for Engines, is significant. When individual units are examined, the workload for nine engine companies breaks the 20% 'busy' threshold with values ranging from 20.44% to 28.33%. No Ladder, Quint, or Rescue units broke the 20% barrier.

Optima Predict Scenario D – Impact of Deploying a Medical Response Unit (MRU) at Select Stations

This scenario was requested by AFD and examines the impact of deploying a Medical Response Unit (MRU) at select, high-activity-level AFD stations to supplement the existing units already staffed. An MRU would be a light apparatus (pickup or SUV) that would be staffed by two AFD personnel. These units would be staffed full-time in addition to the existing engine, ladder, quint, and/or rescue units assigned to that station. MRUs would assume the role of primary response unit for EMS incidents within the station's initial response area. Suppression incidents would continue to be dispatched using the existing unit assignment methodology.

To evaluate the impact of an MRU, this scenario adds an MRU at Stations 8, 17, 18, and 22. These stations currently house the four busiest engine companies within AFD. As an initial evaluation of the concept, the logistical feasibility of these stations accommodating another apparatus and associated personnel was not incorporated. Additional scenarios can be conducted to accommodate alternate locations, but the impact will be representative.

There was no substantive change in performance at the system or station area level for either EMS or suppression incidents. This was consistent across all priorities. This finding is not unexpected as the stations all currently include both an engine company and a ladder or quint. This means that an improvement in response time, especially for EMS incidents, would require a third simultaneous incident within the station's initial response area.

The workload impact is substantial for the units assigned to the stations modeled. The workload of engine and ladder/quint companies decreased dramatically. Together, the MRUs responded to more than 8000 EMS incidents over the 1-year modeling period. The specific workload impacts are illustrated in ***Table 37***.

Table 37: Scenario Workloads (Percentage)

Unit	Current Workload	Scenario Workload
AFD – E08	15.69	9.10
AFD – E17	18.24	10.80
AFD – E18	19.73	9.52
AFD – E22	12.49	5.12
AFD – LAD08	6.33	4.34
AFD – QNT17	8.30	5.20
AFD – QNT18	8.59	4.50
AFD – LAD22	2.66	1.32
AFD – MRU08	N/A	10.03
AFD – MRU17	N/A	12.13
AFD – MRU18	N/A	15.87
AFD – MRU22	N/A	9.45

Optima Predict Scenario E– Impact of a Centralized Deployment Methodology on System Functions (EMS Example)

This scenario examines the feasibility and impact of transitioning the current ATCEMS, station-based resource deployment approach to a centralized deployment approach. This was mentioned as a specific area of exploration within the study construct in the original RFP.

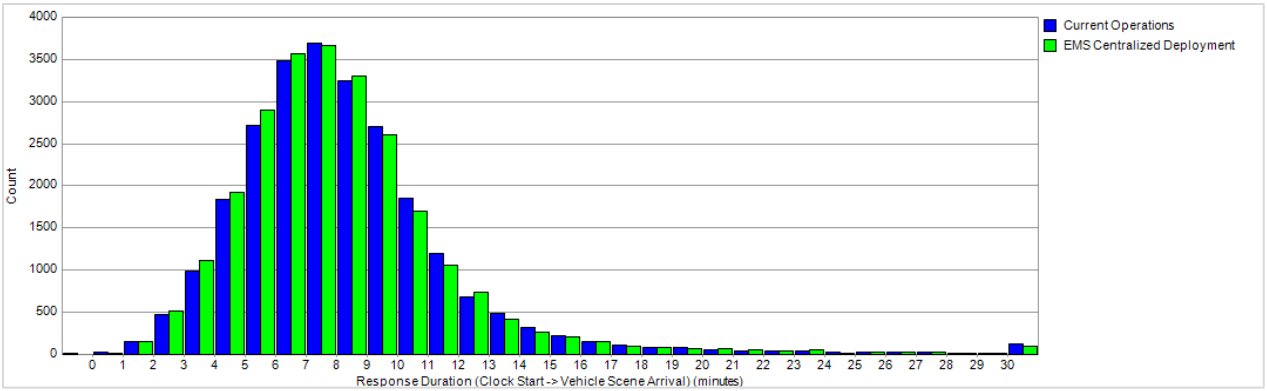
To evaluate this, a single area of the system was chosen to evaluate the performance impact of transitioning to this approach. The southeast area of the City of Austin was chosen as it has the worst current performance and was easy to segment into a group of Medic Units that could be transitioned into a central deployment approach. The structure of the centralized approach was as follows:

The central deployment location is EMS Station 30 (located across from Austin Bergstrom International Airport). The units incorporated into the model are M12, M24, M27, M28, M30, M36, and M37.

Shift patterns were modified to reflect a 12-hour day/night shift duration with shift change off-sets to prevent all resources from being at the deployment location simultaneously. This approach allows for a more robust deployment methodology by allowing these resources to deploy to any regional station/deployment location as needed. This is not realistic using a 24 hour shift due to the potential for chronic fatigue.

Figure 42 shows that centralized deployment locations provide little to no benefit to the overall system. Performance remained consistent at the system level. There was a slight improvement in advanced life support unit performance in the area encompassing Council Districts 2 and 3, with response time to all priorities improving by 10 seconds at the average, 8 seconds at the median, and 8 seconds at the 90th percentile.

Figure 42: Data Distribution: Response Duration (Clock Start to Vehicle Scene Arrival)*



** Region(s) Council District 3, Council District 2*

Workload remained consistent, with no substantive changes in the current distribution. If a more aggressive deployment approach was used, it would be expected that a normalization of workload would take place, as units are routinely moved to varying locations as part of redeployments or after clearing a previous assignment/incident (see ***Table 38***).

Table 38: Scenario Workloads (Percentage)

Unit	Current Workload	Scenario Workload
ATCEMS – M12	45.05	44.01
ATCEMS – M24	20.24	20.03
ATCEMS – M27	5.46	5.34
ATCEMS – M28	33.20	34.96
ATCEMS – M30	33.42	33.37
ATCEMS – M36	26.61	28.12
ATCEMS – M37	22.22	24.49

Operational Considerations

The transition of ATCEMS operations to a centralized model is possible but has a broad range of impacts that must be understood and taken into consideration. Given the limited benefit demonstrated by this initial modeling review, the impact on operational, cultural, and human factors must be given serious consideration prior to any decision to substantively change the system model.

Key factors requiring consideration include:

- Shift Duration – ATCEMS is currently primarily deployed using a 24-hour shift duration. This type of shift depends upon EMS personnel having a location in which they can, when not busy, eat meals and get rest. Transitioning to a centralized deployment methodology would require a transition to a non-24-hour shift duration, which would also require a change in the labor agreement. Shift durations in deployment-based systems are typically eight, ten, or 12-hour models.
- Infrastructure Investment – Centralized deployment approaches for EMS require specialized 'make ready' facilities that can accommodate the logistical aspects of transitioning the physical EMS vehicles between crews. These facilities need to be large (accommodating drive-in/drive-out capability), have substantial logistics/warehousing space for required supplies, have advanced vehicle cleaning facilities, and accommodate personnel space for personnel effects and shift start/end activities. It is also desirable that some level of mechanical maintenance be possible within the facility. This type of facility would need to be constructed and, given the geography of Travis County, it is likely that several would be required to achieve reasonable deployment distances at shift start/shift end.
- Human Factors – Transitioning an EMS system from station-based to centralized deployment impacts every aspect of the system and the personnel. The relationships between EMS Communications and Field Operations changes and the relationship with first responder agencies becomes more transactional as EMS crews operate in different areas with different first response units throughout the course of their shifts. Fatigue is also a substantial concern as deployment-based systems tend to result in EMS personnel spending most of their shift within the vehicle when not assigned to an incident.

Strategies exist to mitigate all the noted considerations and there are examples world-wide of large, complex EMS agencies using various forms of centralized, or even regionalized, deployment structures. The common factor, however, is that these systems have been designed at a foundational level to operate in this manner. Further analysis would be required to determine if a change in the existing system would generate sufficient benefit to undertake the cultural transformation required as well as the additional investment in specialized facilities.

AFD and ATCEMS EMS Demand

Both AFD and ATCEMS are the primary EMS response organizations for both Austin and Travis County. ATCEMS also provides response to portions of Williamson and Hays Counties. AFD is classified as an "all-hazards" response department with EMS incidents accounting for approximately 70% of their total responses. Both departments also provide direct support for surrounding ESDs by providing dispatching services as well as automatic and mutual aid response for all incident types.

ATCEMS response demand is 100% EMS and can be best distinguished as the following response types:

- 911 Emergency Response
- Non-Emergency (Priority 5, some Priority 4, Treat and Release)
- Community Health Paramedicine (CHP)
- Telehealth (C4)

Both departments are staffed and resourced to meet response demands with AFD responding exclusively from strategically located fire stations or fixed locations. The ATCEMS deployment model uses a combination of fixed-location Medic units and Demand Medic units which are relocated or "posted" around the City and County based on increases in call demand.

Our analysis of both departments concludes that the most efficient and effective ways to achieve true optimization of EMS delivery is to improve their cooperation, coordination, and collaboration. This observation is not based solely on response to incidents but also includes all aspects of 911 call answering, call-processing, and dispatching of resources. Each of these elements play a critical role in meeting the system demands in both the City of Austin and Travis County and can be achieved by combining dispatch operations.

Another means of addressing system demand is for both departments to better coordinate and collaborate their current public education and community risk reduction efforts. Greater emphasis should be placed on programs such as bystander CPR, use and access to AEDs, use of AFD and ATCEMS stations for neighborhood wellness clinics, and education programs addressing health issues for under-served populations such as blood pressure, heart health, strokes, diabetes, and proper nutrition. Such programs can greatly improve equity outcomes to these under-served neighborhoods.

AFD Demand Review

AFD's 2020 Annual Report indicates that the department responded to a total of 89,797 responses for the year. Of these total responses, 62,611 were classified as EMS. However, the department also identifies that 45,352 are listed as "found". Our interpretation of this data means that of the 62,611 EMS incidents dispatched, only 45,352 were actual EMS incidents with the remaining number being classified as "other." "Other" simply means that when the unit arrived on-scene of the incident they were dispatched to, they encountered something "other" than what they were dispatched to. Even though the call was correctly triaged as a medical call, it could be something as simple as the patient left the scene, or the unit was cancelled enroute to the scene. Also classified as "other" are responses for hazardous materials incidents, special rescue incidents, lift assistance, and other non-fire, non-EMS incidents. Currently, AFD responds to all Priority 1 and 2 EMS classified responses, along with some Priority 3 incidents. AFD does respond to some of the lower acuity calls (Priority 4 and 5) if ATCEMS units are either unavailable or have extended response times.

Information provided by AFD identified the three most common responses throughout 2017-2019, which are shown in ***Table 39***.

Table 39: Most Common CAD Responses 2017-2019

2017	
CAD Problem	**# of Incidents**
Traffic Injury P-4F	6,929
Traffic Accident P-3F	6,869
Chest Pain P-2	6,709
2018	
CAD Problem	**# of Incidents**
Traffic Accident P-3F	10,399
Chest Pain P-2	7,026
Respiratory P-2	7,006
2019	
CAD Problem	**# of Incidents**
Traffic Accident P-3F	11,473
Respiratory P-2	7,924
Chest Pain P-2	7,154

The response information provided above demonstrates the importance of AFD being assigned as the primary response department for traffic accidents due to the multiple hazards first responders can

encounter at such incidents. Even though traffic incidents can be classified as Priority 4 or 5 from an EMS perspective, AFD response is essential because of the need for the following: extrication equipment, potential for fire from leaking fuel tank(s), disconnecting the vehicle battery to prevent accidental deployment of vehicle airbags, or dealing with hazards posed by all-electric vehicles. However, the single most important rationale for having AFD as the lead department at traffic accidents is positioning of large fire apparatus to provide scene safety and protection for law enforcement and EMS personnel who are focusing on specific tasks such as accident investigation (APD) and patient care (ATCEMS).

Even though medical emergencies like chest pain and cardiac respiratory arrest are classified as ALS level emergencies, having AFD respond – even at the BLS level – ensures the patient receives immediate care and intervention that is proven to save lives. This includes use of automated external defibrillators (AED), basic airway management treatment, and/or interventions such as oxygen therapy.

Table 40 shows the total number of incidents AFD responded to in 2020 as well as the number of EMS related incidents responded to broken down by City Council District.

Table 40: Total Number of AFD and EMS Related Incidents in 2020

Council District	Total Calls	EMS	% of EMS
District-1	10,248	7,993	78%
District-2	9,237	7,020	76%
District-3	10,599	7,949	75%
District-4	9,117	6,929	76%
District-5	7,926	5,945	75%
District-6	5,599	3,975	71%
District-7	9,320	5,965	64%
District-8	4,571	3,017	66%
District-9	10,630	5,953	56%
District-10	5,603	2,970	53%

Our analysis shows that the greatest demand for response services for both “all call types” as well as EMS incidents occurs primarily in Council Districts east of I-35, north of downtown, and towards the south end of the City. The AFD leadership is considering the deployment of four “Medical Response Units” to areas of the City where EMS demand is greatest: specifically, Council Districts 1, 2, 3, 4 and the portion of 9 that extends east of I-35. The *Optima Predict* scenarios support this concept and that adding these units will not only improve response times to critical areas but will also reduce demand on the busiest AFD engine companies.

We believe the department has multiple options for staffing these units. One option would be to split the firefighters from either ladder or quint companies in multi-unit stations to respond to the EMS incidents rather than the larger, more costly-to-operate fire apparatus. Another option would be for the department to reassign current AFD personnel who are certified paramedics to these units. The department would not need to equip the units with ALS equipment; however, if the patient condition warranted, the AFD medics could use the ATCEMS ALS equipment once the transport unit arrives.

Another way for AFD to provide effective service is to reduce demand in each of these areas through comprehensive community risk reduction programs such as the Red Angels Program (RAP). When established, the Red Angels Program was designed to reduce low acuity calls and calls that were more suited for non-emergency services by 2%. Our team has provided thorough analysis of this program in Section IX.

ATCEMS Demand and UHU Review

Next to response times, one of the most common metrics analyzed in the EMS industry is Unit Hour Utilization (UHU). This metric divides the amount of calls a unit responds to (numerator) by the total number of hours it is staffed and either available for a call, actively on a call, or otherwise eligible within the response matrix (denominator). The result is a static representation of a system’s productivity, as each call is considered to last one hour in duration. This may not be an accurate reflection for all response/transport

systems as other considerations may play into a unit's productivity throughout its total shift (e.g., posting, training, public outreach, non-transport standby events). While, arguably, this is not the most comprehensive and all-inclusive representation of a system's performance, additional multipliers can be added to a standard UHU to better reflect a unit's time-on-task with respect to responses. This can be done by multiplying the UHU by the average hours of duration (dispatch-to-available, time-on-task) per call and adding time considerations, such as unit posting or dynamic movement, to provide coverage for other depleted areas or zones. As the management of data continues to evolve within the EMS industry, UHU remains a common metric by which we compare units to one another.

With respect to this metric, a common benchmark UHU value of 0.25-0.35 is considered as average or normal. Below average values are 0.15-0.24, while above average values commonly rate between 0.36-0.45. A UHU of greater than 0.45 is often interpreted as high and may indicate a system need for additional unit coverage to avoid personnel burnout.

Using data provided by ATCEMS*,* an analysis of its UHU between both its 12-hour Demand Medic (DM) units and its 24-hour Medic (M) units shows a disproportionate system where some units are ranked with low (< 0.15) UHUs, while others are ranked with high (> 0.45) UHUs (see ***Table 41***). Variabilities like this present opportunities for dynamic operational changes with respect to unit locations, posting frequency, or even double-unit station deployment models. Outlined below are both standard and modified UHUs, which factor in posting UHUs per unit, over both a three-year period (CY 2018-2020) and recent year period (CY 2020 only). Of note, it is presumed that each call lasts approximately one hour from dispatch-to-available (return to available) status. It can be noted that such verified timeframe data was not able to be obtained to accurately reflect a more comprehensive UHU analysis; however, preliminary raw data received did reflect an average call duration time of approximately one hour.

Table 41: Standard and Modified UHU Values

	STANDARD UHU		MODIFIED UHU		
UNIT	2020 UHU	3-YEAR UHU	2020 UHU	3-YEAR UHU	RANKING*
DM01	0.44	0.25	0.22	0.25	Above Average
DM02	0.34	0.16	0.17	0.16	Average
DM03	0.50	0.28	0.25	0.28	High
DM04	0.40	0.22	0.20	0.22	Above Average
DM05	0.36	0.18	0.18	0.18	Above Average
DM06	0.48	0.24	0.24	0.24	High
DM07	0.18	0.08	0.09	0.09	Low
M01	0.43	0.45	0.43	0.45	Above Average
M02	0.42	0.44	0.42	0.44	Above Average
M03	0.46	0.51	0.46	0.51	High
M04	0.41	0.43	0.41	0.43	Above Average
M05	0.41	0.44	0.41	0.44	Above Average
M06	0.50	0.57	0.50	0.57	High
M07	0.46	0.47	0.46	0.47	High
M08	0.30	0.34	0.30	0.34	Average
M09	0.16	0.20	0.16	0.20	Below Average
M10	0.37	0.38	0.37	0.38	Above Average
M11	0.28	0.34	0.28	0.34	Average
M12	0.43	0.47	0.43	0.47	Above Average
M13	0.43	0.43	0.43	0.43	Above Average
M14	0.44	0.47	0.44	0.47	Above Average
M15	0.38	0.40	0.38	0.40	Above Average
M16	0.16	0.18	0.16	0.18	Below Average
M17	0.28	0.33	0.28	0.33	Average
M18	0.38	0.39	0.38	0.39	Above Average
M19	0.28	0.27	0.28	0.28	Average
M20	0.25	0.27	0.25	0.27	Average
M21	0.19	0.23	0.19	0.23	Below Average
M22	0.06	0.06	0.06	0.06	Low
M23	0.20	0.19	0.20	0.19	Below Average
M24	0.12	0.13	0.12	0.13	Low
M25	0.04	0.06	0.04	0.06	Low
M26	0.07	0.07	0.07	0.09	Low
M27	0.07	0.07	0.07	0.07	Low
M28	0.36	0.37	0.36	0.37	Above Average
M29	0.32	0.32	0.32	0.32	Average
M30	0.31	0.35	0.31	0.35	Average
M31	0.11	0.14	0.11	0.14	Low
M32	0.08	0.10	0.08	0.10	Low
M33	0.36	0.39	0.36	0.39	Above Average
M34	0.18	0.18	0.18	0.18	Below Average
M35	0.20	0.20	0.20	0.20	Below Average
M36**	0.09	0.13	0.09	0.13	Low
M37	0.17	0.17	0.17	0.17	Below Average
M38***	0.06	(None)	0.06	(None)	Low

** Ranking based on Modified UHU – 2020 Data*
*** Data based on 2016, 2017, and 2020 tracked data; no data available for 2018 and 2019*
**** Only 2020 data available*

An analysis of this data points out that the average UHU of 12-hour-staffed Demand Medic (DM) units was 0.39, which is considered above average. This is productive to the system, as the purpose of these "demand" units is to enter the system during higher periods of call volume and provide some form of relief from the busier 24-hour staffed Medic (M) units. However, there are ten 24-hour staffed (Medic) units that have a higher UHU than the Demand Medic units (equating to greater than 25% of the total 24-hour Medic units). As such, future operational focus should be directed toward trying to "level out" UHUs amongst 24-hour Medic units by having 12-hour Demand Medic units intercepting many of their daytime calls (and nighttime, when available), as 98.6% of the system's UHUs are higher during the daytime hours. An additional option to help provide around-the-clock coverage in a "demand" fashion is to convert some of the "high" 24-hour Medic units to "double-12-hour" Demand Medic units (meaning that one is staffed from 07:00-19:00, while the other is staffed from 19:00-07:00, as an example). ***Table 42*** reflects the rankings of Demand Medic units, Medic units, and the ATCEMS system with respect to its UHU data.

Recommendation 27:
ATCEMS should consider reevaluating its current processes for determining optimal deployment of demand units to areas of the City and throughout Travis County that maximize UHUs and relieve demand stress on busier units.

Table 42: Unit and System UHU Ranking Comparison

Unit Type	LOW UHU #	LOW UHU %	BELOW AVE UHU #	BELOW AVE UHU %	AVE UHU #	AVE UHU %	ABOVE UHU #	ABOVE UHU %	HIGH UHU #	HIGH UHU %
Demand (7)	1	14%	0	0%	1	14%	3	43%	2	29%
Medic (38)	9	24%	7	18%	7	18%	12	32%	3	8%
SYSTEM	**9.5***	**23%***	**7***	**17%***	**7.5***	**18%***	**13.5***	**33%***	**4***	**9%***

(NOTE: System values factor the Demand units equating to 0.5 units per day, considering their only 12-hour staffing)
(NOTE: Percentages are approximations based upon a maximum cumulative value of 100% per row)

Reflections of ***Table 42*** indicate that the ATCEMS system may be disproportionately staffed, but not seemingly under-staffed, with the total amount of its units. Nearly two-thirds of its staffed ambulances are within a low-to-average UHU range, while the remaining third are either in the above average or high UHU ranking. As outlined earlier, options may exist to convert some of the high-UHU Medic units into split 12-hour Demand Medic units to decrease the shift workload and decrease the risk of burnout due to less downtime and potential over-working. Considering the system's approximate 70% transport rate (based on 2020 data; 73% based on 3-Year, 2018-2020 data), it becomes clearer that the UHU values are reflective of the system's performance and productivity. As such, analysis of the UHU data can help guide ATCEMS into the future as it seeks options for station and unit placement and overall system staffing levels.

Recommendation 28:
Consider implementing strategies to convert some of the high-UHU Medic units into split 12-hour Demand Medic units.

It is worth noting that discussions with ATCEMS administration have revealed that many of the lower UHU Medic and Demand Medic units are a result of contractual staffing obligations in stations/regions throughout the County. Their lower call volumes, combined with increased distance from City or more internally located resources, is a driving factor behind why their UHU values are considered low or below average. It is understood that without these resources strategically located in these more distant/low-volume areas, it would result in a longer response time for other more optimally-UHU-allocated resources to respond. In considering this, PCG believes that opportunities still exist within the ATCEMS operational system to better balance the workload of some high UHU units by following our recommendations of converting many 24-hour units into dual 12-hour units. Regarding the lower UHU (outlying) units, there exists an opportunity to afford crews a chance to rotate to these stations to provide periods of system or scheduled rest, in an effort to avoid career burnout.

SECTION IX: PREVENTION INITIATIVE EVALUATION

General Overview

Existing within the City of Austin's community-wide health, safety, and population care prevention efforts are three primary entities: Austin Fire Department (AFD), Austin-Travis County EMS (ATCEMS), and Austin Public Health (APH). While many additional community care resources, special taxing district entities, volunteer organizations, educational institutions, healthcare entities, and stakeholder organizations also exist within the same public health and safety arena, the focus of this evaluation is targeted toward the flagship and vision/mission-oriented programs represented by the three entities. Overall consistencies, opportunities for further collaboration, and potential redundancies that may exist within the context of each entities' public health/safety programs and initiatives were assessed as part of prevention initiative evaluation efforts.

Further evaluated and emphasized within this general overview is the community-wide, holistic concept of community risk reduction (CRR) that both fire and EMS agencies are beginning (or continuing) to embrace. CRR, as defined by *NFPA 1300*, is a "process to identify and prioritize local risks, followed by the integrated and strategic investment of resources to reduce their occurrence and impact." It is a "process to help communities find out what their risks are and develop a plan to reduce the risks viewed as high priority."[12] This concept, while having its roots within the context of fire departments and fire prevention programs, is expanding with its applicability and practicality into the EMS industry. EMS often pairs with fire departments as a division within its department's services, or as a stand-alone concept that can be embraced within the context of mobile integrated healthcare (MIH) or community paramedicine (CP) programs within EMS agencies. Just as fire departments are commonly identified as public safety organizations, EMS agencies, too, identify with such a label and classification, along with being correlated to public health.

It has been said that "EMS is at the intersection of public safety, healthcare, and public health."[13] Rightfully so, it is fair for all entities to embrace a collaborative, holistic model of service that focuses on the needs of the community as it evaluates its own individual programs and initiatives, as well as its collaborative ones. Community risk reduction focuses on "reducing the risk of injury, illness, chronic needs, and system abuse. It focuses on promoting positive health, resource availability, outreach and education."[14] The evaluation of each of the aforementioned entities will focus on prevention initiatives through the lens of a community risk reduction mindset, and how further collaboration can strengthen both the individual programs and initiatives as well as the collective system and continuum of care offered by the AFD, ATCEMS, and APH.

Austin Public Health: Health Prevention Initiatives

The primary authoritative source of public health services within the City is Austin Public Health (APH). APH protects residents from infectious diseases and environmental threats as well as educates individuals about the benefits of healthful behaviors in avoiding chronic disease. Its services span across the spectrum of care to include providing immunizations, shelter, food, clothing, and job assistance as well as screenings for high blood pressure, diabetes, and other disease processes. APH also provides nutritional support, outreach and education on topics related to diabetes management, tobacco cessation, and injury prevention, and emergency preparedness functions respective to local disasters. APH supplies more services in relation to prevention activities than those offered by either ATCEMS or AFD but this does not comprise a conclusive listing of the entity's comprehensive services.

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[12] National Fire Protection Association. (n.d.). *Community Risk Reduction (CRR)*. NFPA. https://www.nfpa.org/News-and-Research/Resources/Community-RiskReduction#:~:text=What%20is%20Community%20Risk%20Reduction%20%28CRR%29%3F%20As%20defined,to%20reduce%20the%20risks%20viewed%20as%20high%20priority

[13] Caffrey, S. (2019, December 2). *What EMS Leaders Need to Know About Public Health.* EMS1. https://www.ems1.com/ems-management/articles/what-ems-leaders-need-to-know-about-public-healthlOKjSWsmoXXyA4rv/#:~:text=It%20has%20been%20said%20that%20EMS%20is%20at,their%20communities%2024%2F7%20with%20staff%2C%20vehicles%20and%20equipment

[14] Nowak, T. (2020, August 11). *Community Paramedicine as EMS's CRR Program*. EMS1. https://www.ems1.com/ems-products/community-paramedicine-software/articles/community-paramedicine-as-emss-crr-program-HNKsP7DCi6QYjjQR/

APH's vision is that "everyone will have an optimal quality of life, health, and well-being." Its mission promotes that it will work to "prevent disease, promote health, and protect the well-being of all." These facets are accomplished through strengthening collaborations and building new partnerships, protecting the community from environmental and health hazards, promoting community-wide wellness, preparedness, resiliency, and self-sufficiency, and through preventing illness, injury, and disease. Within the context and comparison of services related to outreach and community risk reduction, APH supports two primary programs that intersect the same influence of AFD and ATCEMS: Health Equity and Chronic Disease and Injury prevention.

The focus of APH's Health Equity Unit and program works to provide community-based programs and services to ensure all residents can reach their full health potential, no matter their race, ethnicity, gender, age, sexual orientation, immigration status, or income level. Identifying health disparities amongst different demographics, residency locations, and populations allows APH the ability to focus its efforts toward improving resource availability, access to care, and prevention support that otherwise might be outside of their reach. The APH Health Equity Unit offers support in the form of mobile testing clinics, chronic disease screening, employment support, promoting healthy lifestyles, maternal and infant outreach, and other types of community engagement and outreach programs.

Correlating with its screening and preventative measures is the Chronic Disease and Injury Prevention (CDIP) program offered by APH. CDIP works to promote health and quality of life throughout the region by working within the community to prevent and control disease. Chronic diseases that are specifically targeted include heart disease, cancer, stroke, diabetes, and hypertension, among others. Within this program, risk factor management and the promotion of healthy living are emphasized for improving one's quality of life.

In conjunction with the Austin Tobacco Prevention and Control Coalition and the Central Texas Diabetes Coalition, efforts are dedicated toward improving individual behaviors and the systems and environments in which people live so that healthier living is easier to achieve. The injury prevention portion of the CDIP program is also robust in its offerings, as its goal is to improve public health by taking actions to prevent injuries before they happen. Listed below is an outline of their injury prevention initiatives.

- **Safe Sleep for Infants** – Coalition comprised of hospitals, clinics, and community organizations working to eliminate the tragic deaths of infants while sleeping.
- **Child Passenger Safety** – Car seat inspections and safety evaluations for children as passengers in vehicles, in partnership with ATCEMS.
- **Vision Zero** – Aiming to reduce traffic crash deaths and serious injury to zero by 2025 by providing educational and promotional activities to reduce traffic fatalities and serious injuries.
- **Bicycle Safety** – Promoting bicycle safety in order to increase its level of safety as a mode of transportation within the community.
- **Distracted Driving** – Promoting Austin's hands-free ordinance that prohibits the use of all electronic hand-held devices while operating a vehicle or bicycle.
- **Fall Prevention** – Partnering with local agencies to deliver a comprehensive training program called "Stepping On" for seniors.
- **Drowning Prevention** – Promoting pool and water safety, especially for children, to decrease the risk of drowning through heightened awareness of at-home risks of potential drowning hazards.
- **Suicide Prevention** – Collaborating with Central Texas Suicide Prevention Coalition to identify trends and research and implement best practice methodology in suicide prevention for the region.

Collaborating partners with APH include but are not limited to the Texas Department of State-Health Services-Safe Riders Program, Texas Department of Public Safety-Safe Gun Storage, Austin-Travis County EMS, Austin Public Works Department, Austin Transportation Department, Travis County Child Fatality Review Team, Austin Safe Kids Coalition, Travis County Office of the Medical Examiner, Ghisallo

Foundation, and Central Health. Within the partnerships of the Central Health network are collaborative efforts with Community Care Health Center, Sendero Health Plans, Community Care Collaborative, and the University of Texas at Austin.

Austin-Travis County EMS: Health Prevention Initiatives

There are four Pillars of Excellence outlined by the ATCEMS: People, Quality, Finance, and Service. Correlating with an excerpt from their mission statement, to "improve the health of the community," there is a clear ambition by the organization to be a key player within the community risk reduction space with respect to its prehospital, public safety roots.[15] The four pillars establish the framework for Austin-Travis County EMS's culture and operational effectiveness and when the efforts within each of the four pillars are executed well, the positive outcome is growth and sustainability.

Community Outreach

At the forefront of ATCEMS's community outreach effort is its injury prevention program. Facets within this program include a safe baby academy, car seat safety checks, a senior home safety program, CPR training, and safety presentations. Recruitment and support efforts within their outreach program include school visits, an EMS youth program, EMS recruiting, and standby medical services. Initiatives are further listed below:

- **Safe Baby Academy** – A free, three-hour class providing education and hands-on practice for child passenger safety, safe sleep practices, home safety, infant CPR training, and choking awareness.
- **Car Seat Safety Checks** – Offering free car seat inspections every month, as well as free booster seats to families in need.
- **Senior Home Safety Program** – A free home safety assessment identifying potential risks and hazards for slips, trips, and falls in the home environment.
- **CPR Training** – Offering both community-based Hands-Only™ CPR and healthcare provider-based BLS Provider CPR training credentialed through the American Heart Association and ATCEMS's regional training center.
- **Safety Presentations** – Safety presentations on a variety of topics, such as heat safety awareness, first aid basics, lightning safety, emergency preparedness, and senior safety.
- **School Visits** – Including career day attendance, on-duty crews visit preschools, elementary, and middle schools for events like Community Helper Days, and crews explain their role in the community while also displaying their equipment and apparatus.
- **EMS Youth Program** – Exemplified through its Explorer Post program, teens and young adults can learn about careers in EMS through classes, community service, and ambulance ride-along experiences.
- **EMS Recruiting** – High school health and science class discussions guiding interested students toward becoming an EMT and working within an emergency medicine environment.

Community Health Paramedic (CHP) Program

Leading ATCEMS's innovation efforts in community risk reduction is its Community Health Paramedic program. Beginning in 2006, the Community Health Paramedic (CHP) program was developed to serve individuals who call 911 for non-emergent problems or conditions that could be better addressed by other services than an emergency ambulance and hospital emergency department. Examples of such services may include a primary care physician, mental health professionals, or urgent care centers. The drive of this program was also derived from the need for collaboration between ATCEMS, local hospitals, clinics, mental health entities, and law enforcement agencies. The need to assess and develop new ways of providing

[15] City of Austin Official Website (n.d.). *About Us.* Austin-Travis County EMS. http://www.austintexas.gov/department/about-us-0

more individualized and intensive services to reduce an individual's reliance on the 911 emergency system was becoming more apparent. Discussions within this respect lead to the development of multiple partnerships between ATCEMS and many additional stakeholder organizations within the community, focused on offering alternative services to such populations in need whether underserved, related to their chronic illnesses, or based upon their high-utilization status. ATCEMS has limited success in developing these partnerships, especially with the hospital systems.

The mission of the CHP program is to "improve the health equity and healthcare options for underserved and vulnerable populations in Travis County through innovative utilization of the unique skills and talents of our Community Health Paramedics, in order to help individuals proactively and preventatively manage their healthcare needs." The premise behind the CHP program, much like the premise of other MIH/CP programs, is not to substitute a relationship with a primary care physician or other form of individual care; rather, it is to supplement that care through additional resources that individuals might not otherwise be aware of or able to access with their own means.

Today's CHP program is staffed by fourteen providers and one Commander (with a growing staff anticipated throughout 2021) who work to address health related needs and problems of the community. Examples of these include taking care of non-emergent medical problems, getting patients established with a primary care physician, or referring individuals to other services available to them within the community. CHP team members often communicate and collaborate with various healthcare and social care workers, such as physicians, nurse practitioners, social workers, case managers, and other community law enforcement officers. Through this collaboration, the goal of the CHP program is to connect people with the education and resources needed to prevent local emergency departments from being their source of primary care and to reduce hospital readmissions through appropriate preventative care. This practice is often referred to within the industry as "diversion," which is not to be misconstrued with the act of ambulances transporting patients to different facilities based upon the active stress/volume of the transport/receiving system. In financial terms, this is also referred to as "cost avoidance." In conjunction with additional local resources such as CommUnityCare, Integral Care, Central Health, and other stakeholders, collaborative efforts are in place to remove barriers to population health care.

Within the context of daily operations and appointments, typically between the hours of 08:00-18:00 each day, CHP providers meet with individuals in their homes, on the streets, at shelters, or in other locations where the individual may be reliably available to meet. While working with the individual, CHP providers assess their physical and mental health, identify essential medical needs, and develop a patient care plan focused on addressing the needs of the whole person while navigating them toward obtaining appropriate care. Such patients often reside within one of the following sub-programs, which better identifies and characterizes their individual risk factors and needs: High-Utilizer Program, Incarcerated Program, Opioid Response Program, Re-Admission Prevention Program, and/or a Homeless Initiative Program. The actual contact numbers produced by the CHP program, moreover, appear underwhelming considering the program's age (tenure of existence) and its overall longevity of existence (and therefore, opportunity to enhance), as outlined in ***Table 43***.

Table 43: Review of Cases and Individual Encounters for the CHP Program

YEAR	CASES	Annual % Change	INDIVIDUALS ENTERED INTO RECORDS	Annual % Change	INDIVIDUAL CONTACTS	Annual % Change	Contacts per Case	Contacts per Individuals	Contacts per 11** FTE Staff
2016	763	-----	1375	-----	2481	-----	3.3	1.8	225.5
2017	633	- 17.0%	1491	+ 8.4%	2060	- 17.0%	3.3	1.4	187.3
2018	587	- 7.3%	1753	+ 17.6%	2167	+ 5.2%	3.7	1.2	197.0
2019	415	- 29.3%	1857	+ 5.9%	4379	+ 102.1%	10.5	2.3	398.1
***2020**	132	- 68.2%	1618	- 12.9%	3315	- 24.3%	25.1	2.0	301.4

**2020 Results may not reflect the projected historical trends due to the impact of COVID-19.*
***Staffing of 11 FTE based on 2020 reported numbers.*

A review of a similar program based in Manatee County, Florida, which as of 2019 serves an estimated population of 403,000 individuals (compared to Travis County's estimated 2019 population of 1,274,000 individuals), produced widely different results in terms of its contacts per FTE staff, which is only three – compared to ATCEMS's 11 (which was based on 2020 data and staffing) (see ***Table 44***). [16] Such results may spark an opportunity for the ATCEMS CHP program to evaluate its daily productivity and workflow in terms of how it makes contacts with individuals, including time durations and zoning or assignment patterns.

Recommendation 29:
Consider evaluating daily productivity and workflow of ATCEMS's Community Health Paramedic program to determine if improvements can be made related to effectiveness and efficiency.

Table 44: Review of Manatee County Community Paramedicine Program Encounter

YEAR	CASES	Annual % Change	INDIVIDUALS ENTERED INTO RECORDS	Annual % Change	INDIVIDUAL CONTACTS	Annual % Change	Contacts per Case	Contacts per Individuals	Contacts per 3 FTE Staff
2020	721	-----	1328	-----	2563	-----	3.6	1.9	854.3

Addressing the community's chronic disease management and social determinants of health, beyond its homeless initiatives, is the Community Health Paramedic (CHP) program's focus on scene responses, opioid alerts, high-utilizer care, re-admission prevention, and general healthcare system navigation cases. This includes the navigation and care continuum involvement for citizens suffering from chronic illnesses which may result in hospital re-admission. Focused details respective to this aspect of the CHP program, however, are limited in detail on the agency's website, as the focus of their public attention seems to be directed toward its homeless outreach initiatives. Data also seems absent respective of recidivism rates for both hospital readmission and return to ambulance transport (911 use) rates. Overall program effectiveness cannot be adequately tracked or benchmarked if items like recidivism, transport diversion impact, and other transport- and financial-related elements are not reported.

[16] Manatee County EMS. (2020, November 10). Annual Report. Manatee County. https://www.mymanatee.org/UserFiles/Servers/Server_7588306/File/Departments/Public%20Safety/Emergency%20Medical%20Services/MCEMS%20FY%202020%20Annual%20Report.pdf

Recommendation 30:
Consider a partnership or staff additions, of social workers, pharmacist consultants, dieticians, and/or case managers for ATCEMS's CHP program in an effort to broaden the program's capabilities, as well as potentially open future revenue streams through additional billing opportunities.

The CHP program's Homeless Initiative seeks to provide healthcare options and health equity for persons experiencing homelessness in the community. As part of this program, one CHP provider is assigned as part of the Homeless Outreach Street Team (HOST), which proactively addresses population needs in the downtown area. Another CHP provider is assigned to Targeted Homeless Outreach Response (THOR) activities, which addresses the needs of homeless people outside of the downtown area and focuses on areas with large 911 call volumes or public involvement. Similar collaborative efforts are in place with the program's Street Med Collaboration, which is a joint effort between CHP and the Street Med team within CommUnity Care clinics. This group brings primary care directly to people in homeless encampments by conducting assessments, writing and delivering prescriptions, arranging medical funding, and addressing various additional needs of the individuals within the locations.

Another element of the ATCEMS CHP collaborative efforts is the Pop-Up Resource Clinic (PURC). Considering the mobile intent behind the CHP providers, utilizing 911 system CAD and population health data to identify geographic regions where underserved and high-utilization resources are often deployed presents an opportunity to introduce a proactive approach toward providing community care. As such, establishing PURCs allow CHP and partnering Central Health resources to provide direct care to individuals, such as full medical examinations, prescription access, mental health care, and access to the County's Medical Access Program (MAP).

Recommendation 31:
Become full partners in the Community Health Improvement Plan. The placement of Pop-Up Resource Clinics (PURC) should be coordinated with other community partners, particularly with APH and OCMO, and should consider the demographic findings of Central Health. Create a list of criteria for the placement and scheduling of PURCs, collect & share the data among partners, and leverage the PURCs to launch new collaborative pilot programs.

ATCEMS does partner with Central Health and APH staff and others and will establish a PURC in targeted areas with homeless populations. The City of Austin and its City Council members have focused on the homeless population mostly. The PURC program can be expanded into other areas of the community where access to healthcare is impeded.

Austin Fire Department Prevention Initiatives

From the perspective of public education, community outreach, or community risk reduction (CRR), the Austin Fire Department provides many of the traditional fire service programs that communities and stakeholders have come to anticipate from career fire departments. Falling under the CRR concept umbrella, each prevention- and outreach-focused program or initiative is designed to reduce the risk of fire damage and harm to both the citizens and the community (occupancies) as a whole.

- **Smoke Detector Installation** – According to the NFPA[17], three of five fire deaths occurred in homes without functioning or installed smoke detectors. This has inspired many fire department outreach programs to both offer and install smoke (and sometimes combination smoke and carbon monoxide) detectors in residences throughout their communities. Austin's 2019 Annual Report indicates that AFD installed 3400 smoke detectors in over 700 residences. Of note, the U.S. Census Bureau reported over 380,000 households in the City of Austin (2015-2019). This equates to an installation percentage of less than 0.002% of the City's total residences (with unknown data outlining the percentage of residences that already have functioning smoke detectors). It should be

[17] Ahrens, M. (2021, February). *Smoke Alarms in US Home Fires*. National Fire Protection Association. https://www.nfpa.org/News-and-Research/Data-research-and-tools/Detection-and-Signaling/Smoke-Alarms-in-US-Home-Fires

noted that the State of Texas and the City of Austin does require smoke detectors in single family homes.

- **Fire Safety Trailer** – A multi-functional education tool utilized by AFD is their fire safety trailer which, prior to COVID-19, had been used frequently to promote various home safety training, fire extinguishment training, and vulnerable population fire prevention outreach initiatives throughout the City, particularly in areas of the community with economically-disadvantaged populations.
- **Exit Drills in the Home (EDITH)** – This program focuses on teaching how to exit one's home when a detector is activated or there is smoke or low visibility as well as the importance of establishing a family meeting point once outside of the residence.
- **Kitchen Fire Extinguishment** – As a leading cause of residential fires, cooking safety and kitchen fire extinguishment is emphasized for all ages to prevent grease fires and other incidents caused by unattended cooking practices.

Red Angels Program

The Red Angels Program (RAP) came about because of a tragic loss within the Austin Fire Department. Devon Coney, a young man who grew up in Austin and spent his life dreaming of becoming an Austin firefighter, entered the AFD recruit academy and suffered a medical emergency in the summer of 2018. Tragically, Devon did not survive this event. The AFD wanted to honor his dedication and commitment to the department and the community, so the Red Angels Program was formed. Around this same time in 2018, AFD was experiencing an increase in lower priority medical and non-medical calls to 911 from four communities: Dove Springs, Del Valle, Windsor Hills, and Colony Park.

The AFD classified the number of 911 calls for non-emergency services in these areas as either a misuse or improper use of the 911 system by residents requesting assistance for both medical and non-medical purposes. The department believed that with proper outreach and education, it could reduce the number of low priority responses by as much as two percent. The focus of the program would be to conduct enhanced in-home visits by a team consisting of AFD uniformed personnel and registered nurses from Concordia University and Austin Community College School of Nursing. Each team consists of six personnel and provides information on the 211 and 311 systems and other available City services, flood and wildfire safety, how to perform basic vital sign assessments (including pulse, blood pressure, respiratory rate, and blood glucose levels), and the additional AFD prevention initiatives.

According to the AFD program manager, neighborhoods are targeted and canvased during the week and residents who opt to receive the in-home visit are scheduled for an appointment with a specific time slot. Each visit lasts approximately 30-45 minutes and is scheduled on Saturdays between the hours of 10:00 AM and 2:00 PM.

As conceived, this is an innovative approach to community risk reduction (CRR) because it targets specific at-risk population groups including the medically fragile, people with special needs, and people with barriers to the access of healthcare which include the very young and the elderly. The RAP has a specific set of goals and objectives including achieving zero fire deaths, reduction of unnecessary 911 calls, and the distribution and installation of smoke detectors. The program is designed to enhance interactions with residents who are afraid of and/or mistrust uniformed personnel, residents who believe they cannot, or are unaware of how to, access basic services for critical

Recommendation 32:
Commit to the Red Angels Program in a community safety-focused capacity, leaving the medical focus for ATCEMS and its CHP program. Establish key performance indicators (KPI) for the program and adopt a community-focused approach toward developing new initiatives, ensuring all are interlinked & supported by data.

health-related issues, and residents who reside in conditions that the department has identified as at-or-near-poverty levels. With a specific target of reducing low acuity 911 calls by 2% and greater percentages over a five-year period, the department has laid the foundation for a suitable community risk reduction and comprehensive community outreach program.

In terms of data management, little (if any) further information regarding the services offered is tracked related to each encounter. The program manager also stated that teams do not retain personal health information for individuals assessed during the visits due to HIPAA restrictions. However, if the teams encounter individuals with significant health issues during their assessments, then the individual is directed to either the closest emergency department or urgent care center for further evaluation (or in emergency instances, ATCEMS is requested for potential treatment and/or transport).

Recommendation 33:
Consider incorporating an electronic/survey-based assessment into pre-appointment options for each encounter and potentially expand visits to virtually via tele-visit platform (which may increase the number of encounters/visits that can be performed, while reducing the travel and operational demands of each encounter).

For any community risk reduction program to remain successful, it requires both dedication and agency support. Considering the population size and anticipated growth of the City, this means that dedicated resources should be allocated toward the general oversight of this program, along with its daily or weekend operations. Further efficiency elements may be able to be adopted, such as the utilization of electronic/survey-based assessments that can be completed prior to one's scheduled appointment. This may decrease some of the time required to gather basic information, as it can already be completed prior to their arrival. The utilization of some form of tele-visit technology could also be implemented into the program, allowing for teams to virtually visit with residents and perform a walkthrough of their residence, have a discussion related to their observations, and potentially prioritize whether a physical (in-person) visit is necessary at their home. Budgeted funds may need to be reallocated if donation sources cannot be obtained to cover the cost of smoke detector (or combination smoke/carbon monoxide detector) purchases. On-duty resources can be utilized instead of overtime resources for each encounter/visit.

AFD's $500,000 respective community risk reduction budget covers the programs entailed within it, along with its five FTE staff members (two uniformed and three civilian members). Comparatively, Dallas (TX) Fire Department's budget is approximately $11.5 million and includes a staff of ten FTE (10 uniformed members). The population of Dallas is 1.3 million compared to Austin's population of just under one million. As such, this raises concern related to the overall level of commitment that AFD has toward its CRR programs, including its Red Angel Program. Considering that the RAP targets over 28,000 residences (see ***Table 45***), it does not seem feasible to become or remain effective with a minimal staff, budget, and timeframe commitment toward its efforts. AFD's 2019 Annual Report indicates that only 100 residences were visited through the RAP's efforts. This equates to less than 0.04% of its targeted residences being visited, and an even smaller percentage when you consider the entire population of the City, which could also benefit from the program's potential. As it currently sits, the RAP is a great program in theory, but has poor support and execution and needs a major shift in its focus away from its duplicated, yet still inadequate, medical component. Efforts should be made to incorporate all AFD's outreach and CRR programs/ initiatives into the RAP brand, with an over-arching focus on community safety. AFD should also closely collaborate with APH and ATCEMS to minimize duplication of services and enhance the community outreach throughout the service area.

Table 45: Red Angel Program Target Neighborhoods

Neighborhood	Zip Code	Homes/Mix-Use Occupancies
Colony Park	78724	5,419
Del Valle	78617	5,310
Dove Springs	78744	10,083
Windsor Hills	78753	7,715

Health Prevention Program Effectiveness

Based on the FTE staffing that both AFD and ATCEMS allocate toward public outreach initiatives, the department could better target resources to improve health outcomes. At first glance, many of the current programs seem misguided or misfocused in their oversight and follow through. AFD's Red Angel Program (RAP) is a prime example of a program that has great initial intentions but seems to have branched into multiple directions that are neither sustainable for long-term continuation, nor supported enough to maintain enough of a positive public impact. ATCEMS's Community Health Paramedic (CHP) program does not seem to be garnering the total population outreach it should, with only approximately 300 contacts/interactions annually per FTE, compared to another community paramedicine program's respective 850 contacts/interactions per FTE as outlined previously in the report.

Additionally, there seems to be a mis-aligned focus on some of the outreach effort utilization of both external resources and internal staff with both AFD and ATCEMS. AFD, for example, has a working relationship with nursing students to interact with patients within their homes, while ATCEMS's CHP program, on the contrary, would be ideal for this type of relationship (outlined further in the section addressing the Red Angel Program). ATCEMS, in comparison, focuses outreach efforts on car seat inspections when they clearly are not primed for such staffing and/or facility demands in comparison to their AFD counterparts. Further comparison, collaboration, and cessation of different community outreach programs/initiatives offered by both AFD and ATCEMS should take place between the two entities to prevent unnecessary duplication of efforts, and to align each program's/initiative's demands more appropriately with each agency's abilities and specialties.

In comparing the outreach programs and initiatives offered by APH, there seems to be further duplication of efforts such as car seat safety, fall prevention, and other topics that are already offered by another entity. Collectively and collaboratively, it is recommended that all three entities meet to assign "ownership" of different topics and discuss respective stakeholders, community resources, funding sources, logistics and program operations, marketing, and a tri-agency (collaborative) approach toward outreach and holistic community risk reduction, rather than taking an individual agency approach and program replication. This should also be done with respective representation from the OCMO as, perhaps, a facilitator in such collaborative efforts.

Recommendation 34:
Form a collaborative work group between OCMO, AFD, ATCEMS, and APH that can evaluate program data, responsibilities, and effectiveness, as well as collaborate on future community risk reduction initiatives.

SECTION X: INTERNATIONAL RESEARCH AND BEST PRACTICES FOR ACHIEVING EQUITABLE OUTCOMES

At the request of the OCMO, we evaluated two international EMS systems, service offerings, and strategic initiatives to determine if any could be applied to a re-imagination of ATCEMS.

In each of the two international systems, Québec, Canada, and the South Australian Ambulance Service (SAAS), which provided inspiration for ATCEMS, the focus is on fulfilling their primary mission. Neither of these two organizations provide duplicate services and both tout the collaborative nature of their relationships with partner organizations. Each of these organizations collect, analyze, and act on the data gathered while delivering their service. The data is then used to inform their strategic plans and their tactical deployments.

We first looked to Québec (Canada) where pre-hospital health service standards of care, levels of service delivery, training programs, and quality assurance are controlled by a provincial medical director[18]. Each individual region has its own medical director who is responsible for the services providing emergency response, community care, and inter-hospital transfers operating in those jurisdictions.

Fire-based first responders are part of the pre-hospital health system[19]. The system allows for interlocking service offerings which form a collaborative continuum across the province. Funding for fire-based first response is allotted to regional health districts to be administered to the services in their respective territories. The agreement between the province of Quebec and the Montreal Fire Department[20] hinges on the fire service being able to attain certain key performance indicators based on response time. The number of times the target time is achieved (the time from when the call is received to the arrival of the first vehicle) is the basis of the performance-based contract.

The Montreal Fire Department provides medical response service from 67 stations and serves 2 million people. Since implementation of the service, the survival rate for out-of-hospital cardiac arrest (OHCA) increased from 12.2% in 2007 to 49.2% in 2017. Montreal Fire first responders are credentialed at a PR3 level, which means they complete a 60-hour training program followed by additional training modules (e.g., naloxone administration). Each vehicle is equipped with an AED, oxygen, and basic trauma/medical equipment. 1,725 firefighters are trained for emergency medical response, which is roughly 73% of the total number of firefighters. In 2018, the Montreal Fire Department responded to 78,508 medical emergency calls, including more than 3,000 OHCAs.

The emphasis of the Montreal Fire Department is on a collaborative and seamless approach to providing pre-hospital care. Service offerings are optimized for efficiency in terms of leveraging available human capital, technology, and emergency services infrastructure. This collaborative approach would serve AFD and ATCEMS well.

We also looked to the South Australian Ambulance Service (SAAS)[21] who provides emergency medical assistance, treatment and transport, non-urgent patient transport, and high-quality patient care to 1.7 million residents in a total land area of 379,725 square miles.

SAAS responded to 99,775 cases during the 2018-2019 fiscal year. These cases were comprised of 42% life threatening cases (priority 1 and 2), 41% urgent cases (priority 3, 4 and 5) and 17% transfers (priority 6, 7 and 8). In 2012-2013, the number of cases was 76,486, representing a growth of 23.3% over six years.

[18] Ministère de la Santé et des Services Sociaux. (2014, November 21). *Services préhospitaliers: Urgence d'agir Rapport du Comité national sur les services préhospitaliers d'urgence*. https://publications.msss.gouv.qc.ca/msss/fichiers/2014/14-929-01W.pdf

[19] Ministère de la Santé et des Services Sociaux. (2021, April 21). *Cadre de développement des pratiques préhospitalières*. https://publications.msss.gouv.qc.ca/msss/fichiers/2020/20-929-03W.pdf

[20] Liebmann, R. (2021, January 13). Published interview [Published interview].

[21] SA Ambulance Service. (2020, September 30). *Annual Report 2019-2020.* http://www.saambulance.com.au/LinkClick.aspx?fileticket=mEm_faA_byM%3d&tabid=193

Of particular interest is the SAAS Reconciliation Action Plan (SAAS-RAP)[22]. This is their commitment to work in partnerships with aboriginal and Torres Strait Islander communities to provide care that meets their needs. The SAAS-RAP could serve as a blueprint for a similar Equitable Delivery of Services Plan for ATCEMS: "It is vital that we can support every single one of our patients physically, culturally, and clinically, no matter how diverse they may be. To do that, we need people who can understand and enhance the changing needs of those communities..."[21]

Also, of interest is the SAAS Disability Access and Inclusion Plan (DAIP) 2020-2024.[23]

> "SA Ambulance Service is committed to ensuring South Australians living with disabilities have full and equitable access to health services, resources, information, and facilities in the public health system. Through systematic engagement with people with disabilities, SA Ambulance Service recognizes leadership and collaboration will foster a sustainable and socially inclusive health system, and an environment that promotes equity and empowerment for all our consumers."
>
> "Social inclusion is a priority for people living with a disability as it affects all aspects of their lives. It is our aim that the contributions and rights of people living with disability are valued and understood by all South Australians and that their rights are promoted, upheld, and protected. We also want to ensure that people living with disability are supported to advocate for their own rights." This strategic approach to equitable service delivery could be emulated by ATCEMS.

Among the primary service offerings of the SAAS, these were the items which seemed to be a good fit for ATCEMS, either as an inspiration or as a template to build upon:

- Extended Care Paramedics and SPRINT (Single Paramedic Response Intervention Team)
    - Extended Care Paramedics provide the highest paramedic level clinical treatment, advice, and support to assist people with remaining in the community instead of being transported to a hospital ED. ECPs focus in areas such as residential care, palliative care, community referral, and support of out of hospital care programs. Within SAAS, they also provide clinical advice to ensure safe and effective ambulance care and referral across the state.
- SAAS has undertaken a Scheduled Transport Development Program to improve the efficiency of the Patient Transport Service. By collaborating with the metropolitan local health networks, SAAS supports patient flow by assisting with timely discharges and creates capacity within their hospitals.
- The SAAS Emergency Operations Centre has Health Network Coordinators (HNCs) who assist in the coordination of ambulance distribution among their hospitals. They actively manage any delays and support the sharing of capacity across the state's health system.

SAAS has implemented alternative pathway programs to reduce dependence on hospital emergency departments (ED) as destinations for all patients:

- Clinical Telephone Assessment (CTA), which is a system to improve service to low-acuity callers with the aim of reducing unnecessary transports to the ED and increased capacity for crews to respond to urgent calls.
    - A telephone assessment is completed by Paramedics for low priority and low acuity 911 calls. The detailed clinical assessment provides an optimum clinical response for the patient (e.g., primary health service referral).
    - Response time is not considered an appropriate measure for low acuity cases; clinical indicators are the preferred method of measuring performance for these types of cases.

[22] SA Ambulance Service. (2020, June). *SAAS Reconciliation Action Plan*. http://www.saambulance.com.au/LinkClick.aspx?fileticket=t7yrQCmrJ0k%3d&tabid=176

[23] SA Ambulance Service. (2021). *SAAS Disability Access and Inclusion Plan*. http://www.saambulance.com.au/LinkClick.aspx?fileticket=mEm_faA_byM%3d&tabid=193

ATCEMS's C4 program is providing this service currently in a limited capacity but budget enhancement in FY22 have added staff to enhance the C4 program.

- Mental Health Co-Response (MH-CORE) which is a co-response model teaming a Central Adelaide Local Health Network mental health worker with a SAAS paramedic to strengthen and prioritize community-based assessment and referral.
    - Low-acuity mental health consumers who sought ambulance assistance to be treated at a hospital ED were provided Mental Health Co-response services which employed a paramedic and a mental health clinician. Over 60% of consumers were able to safely avoid transport to an ED and remain in the community for their ongoing care.
    - The development of SAAS's clinical response model to increase the use of single responders to treat complex patients (SPRINT).

ATCEMS is in the process of implementing a similar crisis response program based on a study conducted by the Meadows Mental Health Policy Institute (MMHPI).

- Directory of Service - The directory provides SAAS clinicians with a ready source of information about available referral pathways based on their location, the time of day, and their patient's specific needs. SAAS continues to work with Local Health Networks and Non-Governmental Organizations to populate the directory.

ATCEMS has established a relationship with the University of Texas School of Social Work to allow social work interns to work with ATCEMS. One of the projects for the interns would include assisting with the development of a directory similar to the one as described above.

To summarize, each of these services have placed an enormous amount of emphasis on fulfilling their primary missions while providing a collaborative and seamless approach to providing pre-hospital and out-of-hospital care. The Montreal Fire Department has retained a specific focus on its primary mission while also providing modified basic level care as first responders for the regional third-service ambulance system. The South Australia Ambulance Service has assessed their workforce sustainability, client outcomes, and made good on equity and reconciliation efforts in the communities they serve. There are lessons and inspiration available for both the ATCEMS and AFD if their leaders are willing to look beyond their immediate horizon for innovative ways to deliver their services.

SECTION XI: ACHIEVING EQUITABLE HEALTH OUTCOMES

Overview

The City of Austin, through the Office of the Chief Medical Officer (OCMO), requested recommendations optimizing EMS services designed to improve the quality and equity of emergency medical and community health care services throughout the coverage area. Currently, the Medical Director (OCMO) provides clinical oversight to EMS, telehealth, mobile crisis intervention (MCOT) units, the community health paramedic (CHP) program, the street medicine (Street Med) program, the re-admission prevention program, and the opioid response program. This oversight is reflective of the vast and various needs identified within the community through community partners like Central Health and documents like the Community Health Improvement Plan. Focus within each of these programs and initiatives is placed on engaging and informing the community to ensure that both public safety and public health services are being delivered throughout the diverse community and to its vulnerable populations.

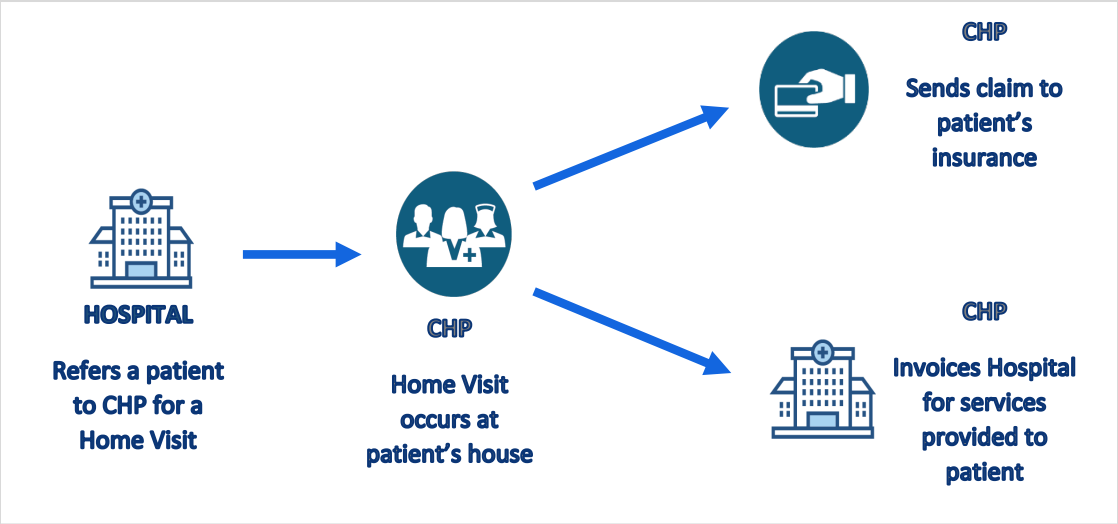
Health equity gaps are present in areas of the City, particularly on the "eastern crescent," often referred to as the "healthcare desert." PCG's analysis of response times and coverage zones, as well as our review of various population growth projections beyond this region, have validated a lack of healthcare resources in this diverse region. As such, the consultants feel it is important for all three entities (APH, AFD, and ATCEMS) to focus the synergy of healthcare providers and the improvement of healthcare outcomes by incorporating both an analysis and projection of current resources, healthcare equity, current program sustainability, program collaboration efforts, and feasibility related to meeting established (and future) system goals.

Proactively, the Community Health Paramedic (CHP) program can feasibly be put to work by shifting their organization and deployment patterns. To ensure financial sustainability, OCMO has obtained a Billing National Provider Identification (BNPI) number to bill and receive reimbursement for healthcare services provided by qualified licensed healthcare providers separate from ATCEMS billing. This BNPI should give OCMO the ability to bill for services that not only qualify for EMS reimbursement but also primary care type visits that occur at patient home visits. In collaboration with local healthcare facilities, CHP program referrals can be increased with the support of local case managers via oversight support from executive staff within local hospital systems and other referring healthcare facilities. Following with OCMO's current path toward obtaining this status, PCG recommends seeking appropriate authorizations for expanded Medicaid and Medicare billing opportunities. The OCMO has developed a menu of services it expects to provide including the estimated frequency of those services as well as the fee for each type of service provided.

Recommendation 35:
OCMO should follow through with its application process(es) to obtain approval for Medicaid and Medicare billing for supplemental, on-scene services.

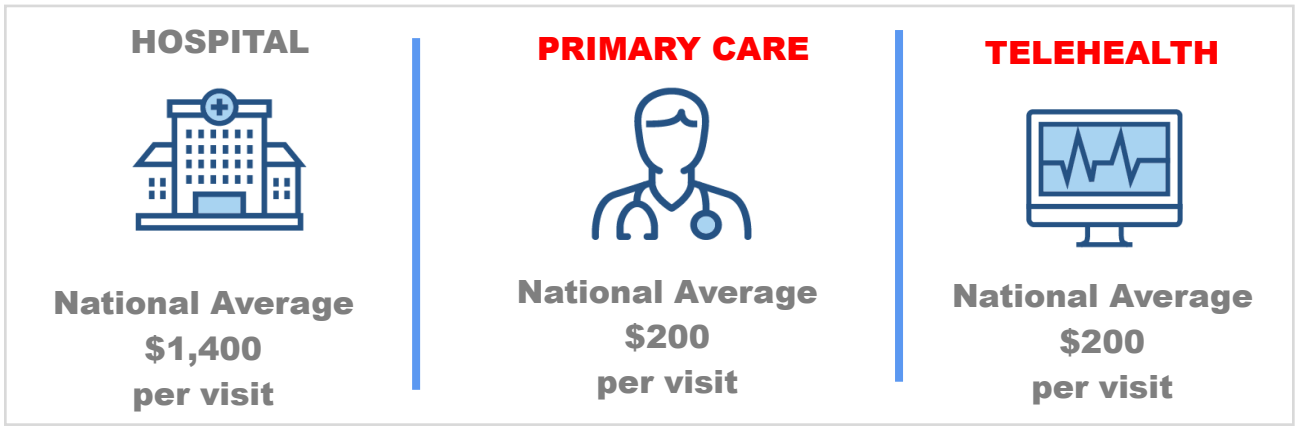
With appropriate staffing, home visits can be reimbursed as primary care visits, producing revenue to support the CHP program. OCMO should work directly with hospital case management programs to identify the high-utilizers appropriate for home visits by CHP providers. OCMO can work with hospital and clinic case management to bill home visits to a specific BNPI per each hospital or clinic. This protects OCMO for home visits occurring post discharge from a hospital that could be related to a global payment (bundled payments or capitated procedures) that the hospital may not receive reimbursement for. Each hospital or clinic willing to participate in this coordination of services must agree to allowing OCMO to bill these providers to the hospital or clinic's NPI for these types of services and reimburse the OCMO for services provided. ***Figure 43*** portrays this process. ATCEMS leadership related that they have not had success in engaging the two major hospital networks and Central Health to have CHPs work towards preventing readmissions and being reimbursed for their services.

Figure 43: CHP Program Process



The cost of this model favors hospitals, as Medstar in Fort Worth (TX) has found readmission to hospitals costs the hospital more as they lose revenue under capitated payments during the 90-day continuum of care. Any readmission to a hospital during the 90-day post discharge period costs the hospital in loss of reimbursement due to bundled payments capitating revenues. In comparison, a home visit at the primary care level averages $200 (see ***Figure 44***) and can help divert the patient to options outside of the hospital. For outpatient clinics, this model allows providers to spend more time with patients giving the right level of care in the right setting.[24] [25]

Figure 44: Cost Per Type of Visit



A Phased Approach to Implementation of a New Model

It should be noted that hospitals and clinics may feel threatened by this type of program as it can represent a loss of patient revenues. A phased approach may be best to alleviate any hospital/clinical concerns on a loss of revenue. For example, the CHP program can target home visits for Medicare and Medicaid beneficiaries who are frequent utilizers of EDs. These patient populations typically represent a loss for

[24] National Highway Traffic Safety Administration (DOT), Office of the Assistant Secretary for Preparedness and Response (HHS), & Health Resources and Services Administration. (2013, July 15). *Innovation Opportunities for Emergency Medical Services: A Draft White Paper.* Ems.gov. https://www.ems.gov/pdf/2013/EMS_Innovation_White_Paper-draft.pdf

[25] Pfuntner, A., Wier, L. M., & Steiner, C. (2013, January). *Costs for Hospital Stays in the United States, 2010.* NCBI. https://www.ncbi.nlm.nih.gov/books/NBK121966/

hospitals as the reimbursement averages 30% less than a commercial patient. National studies show that Medicare and Medicaid populations are the highest user groups of EMS services.[26] Starting a program with Dell/Seton hospitals to coordinate these types of services makes sense, as they carry the majority of the Medicaid/Medicare populations. Expansion into other populations will be dependent upon the size of the CHP program and its available staff/resources.

Necessary Collaboration

Of note, when APH published their Community Health Plan in 2018, they thanked their partners. While Austin Transportation Department, Central Health, Integral Health, Travis County Health and Human Services were on that list, AFD and ATCEMS were conspicuously absent.

Due to the incredible quality, breadth, and depth of the data collected by various local resources, there exists a unique opportunity to create a model system of out-of-hospital care while addressing social determinants of health (SDOH) and outcome indicators designed to clearly communicate the successes/failures of the meaningful upstreaming of health care. This system, with guidance from the OCMO and in close collaboration with Central Health and CommUnityCare (and with publishing a series of pilot programs and studies in mind), could address equitable prevention of burden of disease by managing that burden proactively.

Regional Data

In Travis County's FY 2020 Community Impact Report, it was stated that 136,100 (11%) of Travis County residents live below the "official poverty threshold."[27] The report estimates that more than 25% of Travis County (313,295 individuals) residents may struggle to meet basic needs due to their income. Central Health's 2020 Demographic Report for Austin-Travis County estimated that there are 23,181 families (a family counts as two or more related people living together) in poverty (8% of the total number of families.[28] According to the same report, there are 69,959 households (a household is considered as one or more people who reside within a single housing unit and can include people who are not related to one another) living at or below 200% of the federal poverty level (FPL). FPL guidelines are used to determine eligibility for Central Health, state-funded health care programs, and Affordable Care Act Marketplace subsidies.

Central Health collects and analyzes data on the prevalence of eight chronic diseases and conditions among their patient population. The eight conditions are asthma, behavioral health, COPD, diabetes, heart failure, hypertension, malignant neoplasm, and renal failure. These conditions account for some of the leading causes of death in the county. Central Health reports hypertension, behavioral health, and diabetes have the greatest number of diagnosed patients among their enrollees.

It is important to note that Central Health is not a direct provider of health care services. They are a network hub for primary care, specialty care, hospital, and other providers to deliver health care to Travis County's low-income and uninsured populations.

According to Central Health's Demographic Report, nearly two out of three of their enrolled patients resided east of I-35. Areas west of I-35 with high concentrations of patients included Leander/Lago Vista, Oak Hill, Rundberg, South Congress, and Wells Point. The highest concentrations of poverty in Austin are along the I-35 corridor. Increased poverty can be seen in east and west Travis County. Central Health projects that in 2025 there will be 25,287 families living at or below the poverty level in Travis County. Oak Hill, Mueller, and Webberville are areas expected to see an increase in the count of families in poverty.

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[26] Ambulatory and Hospital Care Statistics Branch. (2016). *National Hospital Ambulatory Medical Care Survey: 2016 Emergency Department Summary Tables.* Centers for Disease Control and Prevention. https://www.cdc.gov/nchs/data/nhamcs/web_tables/2016_ed_web_tables.pdf

[27] Travis County Health and Human Services. (n.d.). *2020 Community Impact Report.* traviscountytx.gov. https://www.traviscountytx.gov/health-human-services/research-planning/cir-2020

[28] Central Health. (2020, September 4). *2020 Demographic Report.* https://www.centralhealth.net/our-work/2020-demographic-report/

As stated in the Demographic Report, northeast Austin averaged the highest number of households without vehicles per census tract. Central Health reports more than one out of 10 households do not have access to a car for their transportation needs in east central Austin, north central Austin, and southeast Austin. Access or lack thereof to alternative transportation can make a significant difference when seeking ongoing health care. Central Health reports that the highest number of unserved residents are in the Rundberg, St John's, and Montopolis areas.

If ATCEMS were to increase their collaboration with Central Health and APH, the placement of pop-up resource clinics (PURC) and the deployment of CHP could target census tracts with the highest levels of poverty, the highest burden of chronic disease, and the lowest access to transportation. Specific census tracts could be targeted with pilot programs designed to address one or more of chronic conditions which result in repeated calls to 911 for emergency assistance, (e.g., asthma, COPD, diabetes, heart failure, hypertension, behavioral health). Education and prevention should focus on the eight conditions identified by Central Health.

Cardiac Arrest Survival Equity and Enhancement Recommendations

As stated by a recent study which examined community disparities in out-of-hospital cardiac arrest (OHCA) outcomes in Texas, minority and poor neighborhoods experienced large and unacceptable disparities in OHCA bystander response and outcomes. The study conclusions are listed below.

- Relative to White neighborhoods, Black neighborhoods had lower rates of AED use, and Hispanic/Latino neighborhoods had lower rates of bystander CPR, AED use, and survival.
- Lower income was associated with lower rates of bystander CPR, AED use, and survival.
- Lower high school graduation was associated with a lower rate of bystander CPR and AED use.
- Higher unemployment was associated with lower rates of bystander CPR.

The data gathered and analyzed for the study was drawn from the Cardiac Arrest Registry to Enhance Survival (CARES). The data specific to Austin-Travis County needs to be analyzed on an ongoing basis to inform community outreach and education efforts based on neighborhood specific disparities in terms of incidence, process of care, and outcome of OHCAs. The study authors found that socioeconomically disadvantaged neighborhoods suffered from worse cardiac arrest care and outcomes in Texas.

A general overview of ATCEMS's CARES data shows that the discharge survivability of cardiac arrest patients transported to the hospital is quite successful, at 44% in 2020. It was noted that on the ATCEMS online dashboard for Q1 of 2019 the percentage was below 30% and for Q2 of 2019 it was just above 30% for survivability. This general data does not elaborate on 30 or 90-day post-discharge survivability results. This success does compare to CARES average data reflecting only 10% survivability rates (hospital-to-discharge).[29] ***Table 46*** demonstrates a three-year (2018-2020) overview of ATCEMS's cardiac arrest CARES data, with greater emphasis placed on its transported patients.

Table 46: 2018-2020 Cardiac Arrest Data (Transported Patients, Only)

YEAR	TOTAL CARDIAC ARRESTS	CARDIAC ARREST TRANSPORT VOLUME	CARDIAC ARREST TRANSPORT %	DISCHARGED ALIVE VOLUME	DISCHARGED ALIVE %	DECEASED/DNR AT HOSPITAL VOLUME	DISCHARGED/DNR AT HOSPITAL %
2018	767	183	24%	89	49%	94	51%
2019	752	223	30%	97	43%	126	57%
2020	910	196	22%	87	44%	109	56%
Average	810	201	25.%	91	45.%	110	55.%

[29] Cardiac Arrest Registry to Enhance Survival. (n.d.). *About CARES*. https://mycares.net/sitepages/aboutcares.jsp

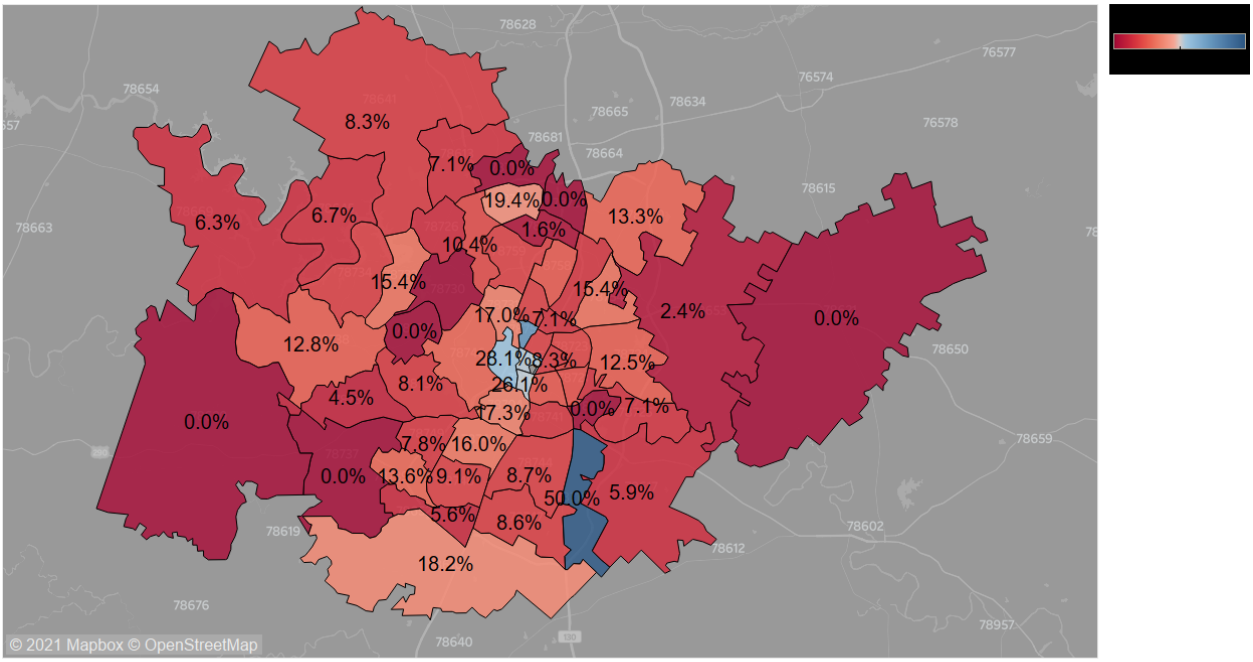
The 2020 data indicating higher cardiac arrest rates is likely due to both population increases and the impact of the pandemic. Further internal breakdown of data management and clinical focus should be emphasized on differences respective to medical cardiac arrests versus traumatic cardiac arrests, post-resuscitation to 12-lead ECG acquisition timeframes, and the evaluation of lights and siren transport times of active cardiac arrest patients in comparison to comparable location times without the use of lights and siren.

Factors contributing to OHCA survival are often the promotion of bystander CPR (cardiopulmonary resuscitation), early access to defibrillation with an automated external defibrillator (AED), a systematic response approach incorporating law enforcement and fire department resources as first responders, and medical protocols (clinical operating guidelines) promoting active on-scene resuscitation with ensuing transports only occurring after clinical indicators are met.

A study published in 2020 determined that in Memphis, Tennessee, White patients were much more likely to receive bystander CPR compared to Black patients (44.0% vs. 29.8%), while a 2009 study identified a similar disparity in Los Angeles, California (24% vs. 13%).[30] Representatives from OCMO mentioned that their analysis by zip code also demonstrated lower cardiac arrest survival in minority neighborhoods.

Figures 45-48 represent total cardiac arrest survival rates (accounting for all cardiac arrests, including those without transport) based upon various considerations such as bystander CPR initiated, AED use, and overall survival percentages broken down by zip code.

Figure 45: Overall Cardiac Arrest Survival Percentage by Zip Code (2018-2020 Average)



Map based on Longitude (generated) and Latitude (generated). Color shows Zip Code, % Discharged Alive as an attribute. The marks are labeled by Zip Code, % Discharged Alive as an attribute. Details are shown for Incident Zip Code.

[30] Clawson, J. & Miko, M. (2021, February 1). *Black Lives Not Only Matter, They Should Reinforce Our Emergency Dispatch Values.* ICMA. https://icma.org/articles/pm-magazine/black-lives-not-only-matter-they-should-reinforce-our-emergency-dispatch

Figure 46: Overall Cardiac Arrest Survival Percentage with AED Use by Zip Code (2018-2020 Average)

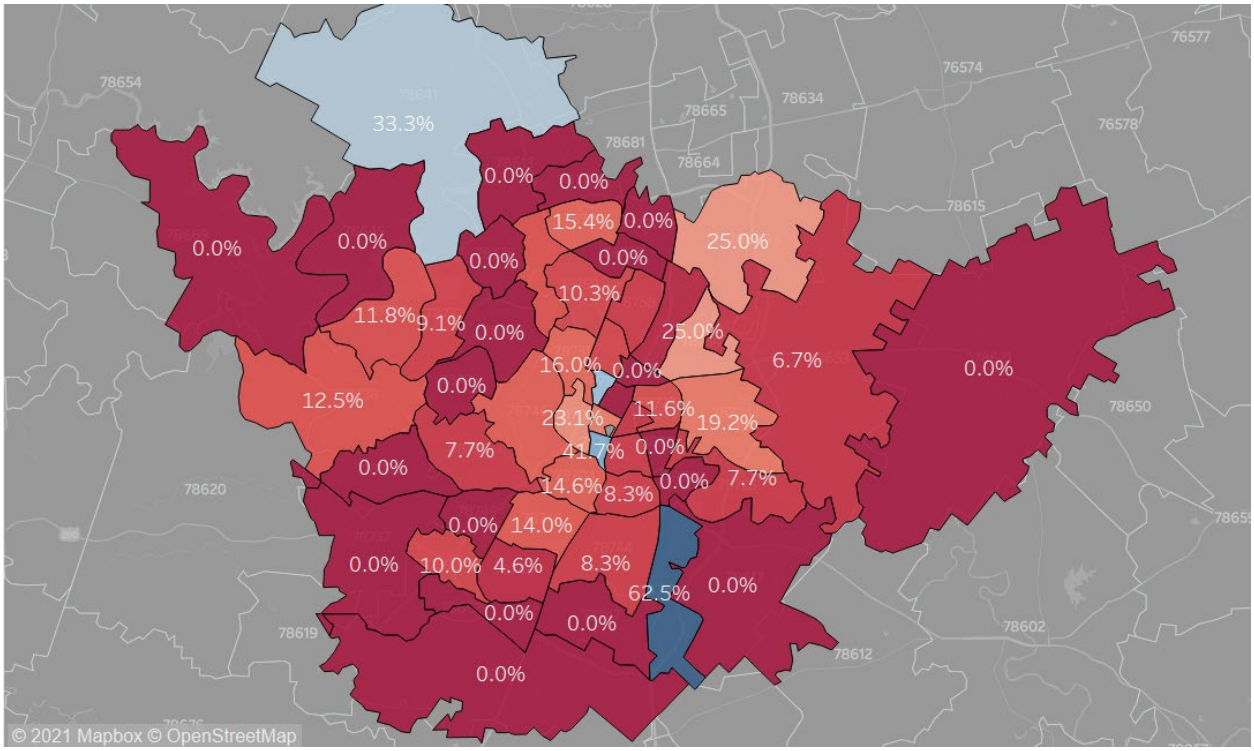


Figure 47: Percentage of CPR Initiated by Bystanders (First) per Zip Code (2018-2020 Average)

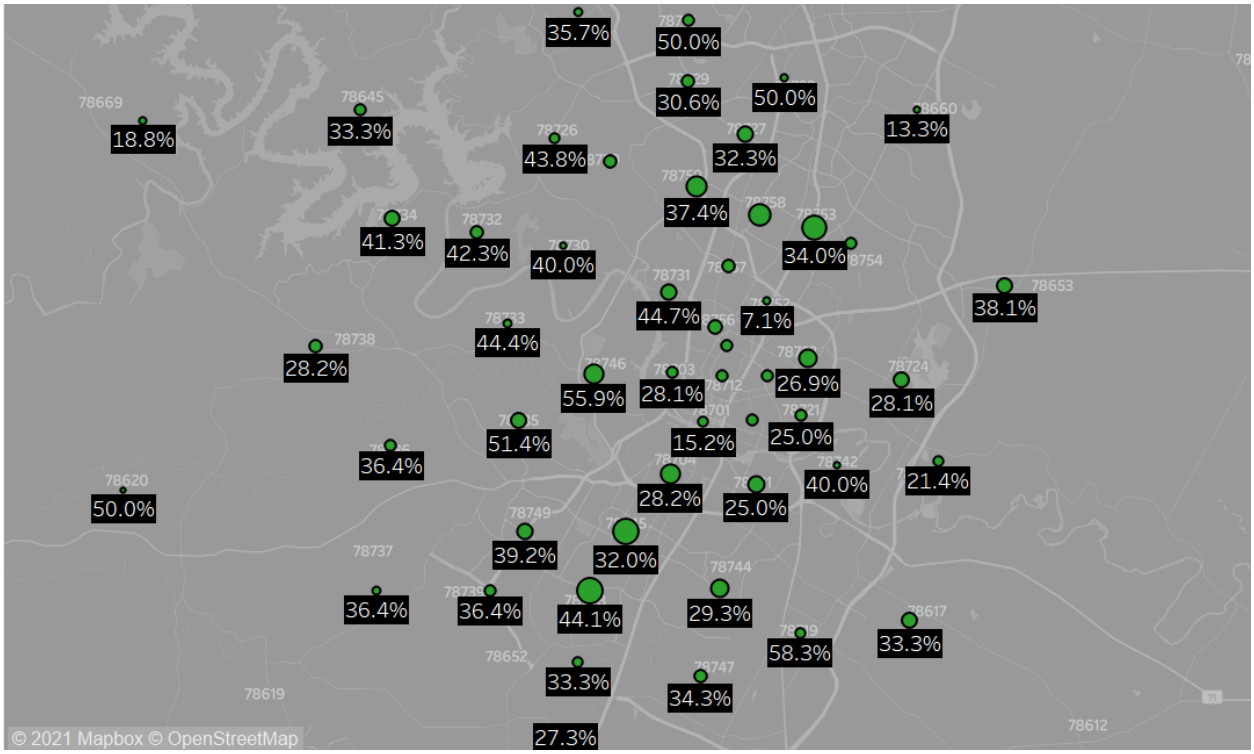
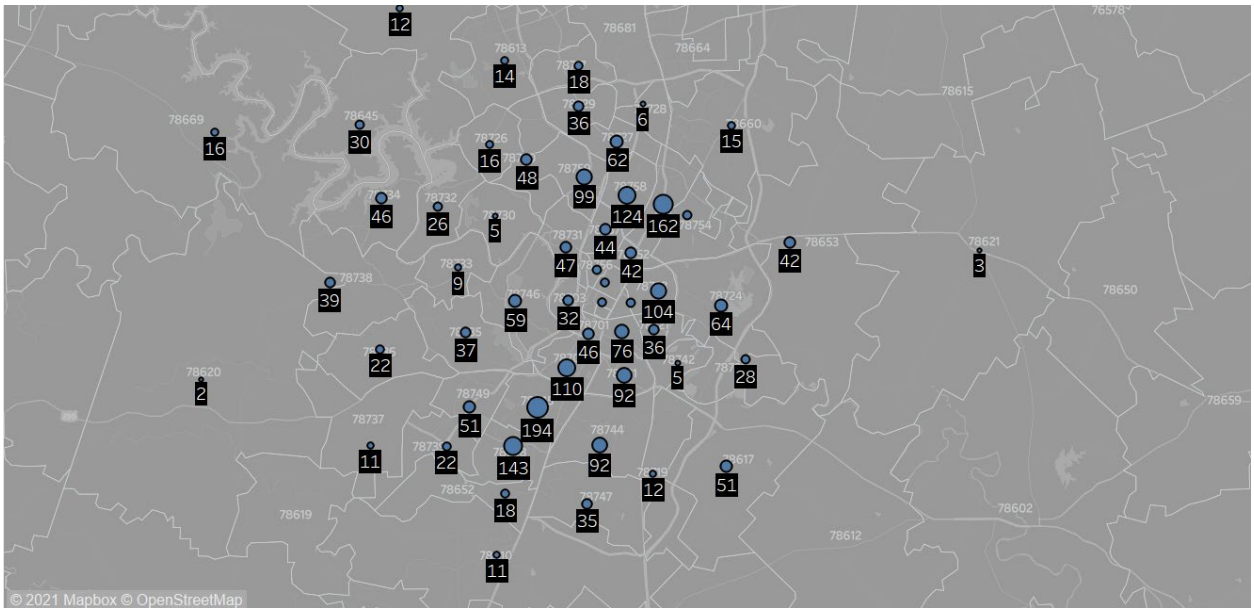


Figure 48: Total Cardiac Arrest Call Volume by Zip Code (2018-2020)



This study data and other related studies could be used to inform community outreach and education initiatives across minority and poor neighborhoods in Austin and Travis County. PCG recommends focusing on those minority areas of Austin with low OHCA survival rates by offering CPR classes at the fire stations in those neighborhoods, providing CPR and AED training to the Austin Police Department, adding AEDs to APD patrol units, and implementing a community notification tool/app (e.g., PulsePoint) that would allow for a greater local response by residents trained in CPR to such events. Further education related to bleeding control could also be incorporated into any such community outreach education.

Recommendation 36:
Consider the implementation of fire station neighborhood/bystander CPR & bleeding control training programs, APD CPR & AED training, and the integration of a public notification tool/app platform in an effort to increase local community training and cardiac arrest response readiness.

As previously mentioned, the CHP program could be used to address social determinants of health (SDOH) in the districts identified by Central Health as being the most vulnerable to poverty and chronic disease. By adding a social needs screening tool, such as the recently-released *Accountable Health Communities Health-Related Social Needs Screening Tool* developed by the Centers for Medicare and Medicaid Services (CMS) to the basket of data-gathering instruments, the CHP program could help identify unmet basic resource needs.[31] This data could be evaluated to help ensure the equitable delivery of emergency health services both upstream in terms of prevention and management/mitigation of chronic illnesses, and downstream in terms of re-establishing activities of daily living (ADLs) after a hospitalization.

Recommendation 37:
Consider addressing the social determinants of health (SDOH) using Central Health data to guide the development of the CHP

The data gathered, in the form of a survey, would be associated to various key social need indicators: food insecurity, housing instability, utility needs, financial resource strain, transportation, exposure to violence, socio-demographic information, childcare, education, employment, health behaviors, social isolation and supports, and behavioral/mental health.

[31] Center for Medicare and Medicaid Services. (n.d.). *The Accountable Health Communities Health-Related Social Needs Screening Tool.* https://innovation.cms.gov/files/worksheets/ahcm-screeningtool.pdf

There are several clinically validated screening tools available. The data generated using these survey tools would deepen the meaningful impact of the CHP program while providing important benchmarking data. Pilot projects could be created to address specific social needs, and, if proven to be successful, could be replicated and implemented in other districts. Combined with the integration of social worker staff within the CHP program, great strides could be taken to not only identify SDOH, but to proactively address them as well.

ET3 Initiative: Alternative Transport Destinations and Telehealth Opportunities

The ET3 initiative (Emergency Triage, Treatment, and Transport) is a voluntary, five-year payment model that will provide greater flexibility to ambulance services to address emergency health care needs of Medicare Fee-for-Service (FFS) beneficiaries following a 911 call. CMS (Centers for Medicare and Medicaid Services) will continue to pay to transport a Medicare FFS beneficiary to a hospital emergency department or other covered destination. In addition, under the model, CMS will pay participants to transport to an alternative destination partner, such as a primary care office, urgent care clinic, or a community mental health center (CMHC), or initiate and facilitate treatment in place with a qualified healthcare practitioner either at the scene of the 911 emergency response or via telehealth.

The model will allow beneficiaries to access the most appropriate emergency services at the right time and place. The model will also encourage local governments, their designees, or other entities that operate or have authority over one or more 911 dispatches to promote successful model implementation by establishing a medical triage line for low-acuity 911 calls. As a result, the ET3 Model aims to improve quality and lower costs by reducing avoidable transports to the ED and unnecessary hospitalizations following those transports.[32]

Alternate Destination Transports

ATCEMS was accepted into the CMS ET3 Program, and their first partner in this initiative will be WellMed. The WellMed business model is physician-owned and patient-centric like an Accountable Care Organization (ACO). As an early adopter of the ACO philosophy, WellMed has continuously demonstrated how the health care delivery system can work by reducing costs and improving care while also enhancing and saving lives. This model is designed to provide the most efficient, comprehensive, and proven care techniques to treat the whole patient – physically, mentally, and socially – at each visit. WellMed works with physicians, specialists, nurse practitioners, physician assistants, and staff who all share one important characteristic: they genuinely care about patients and their health. WellMed accepts original Medicare and certain Medicare Advantage health plans and currently has 11 clinic locations in the Austin/Travis County Region. Although ATCEMS is currently not transporting to any of these locations as of January 2021, ATCEMS continues to work through a technological proof-of-concept with one WellMed clinic in Central east Austin.

Telehealth Opportunities

An emerging opportunity within the dispatch, medical consult, and mobile integrated healthcare/community paramedicine (MIH/CP) space is telehealth. One of the nation's most prominent telehealth programs is operated by a fellow Texas EMS agency, the Houston Fire Department. Its ETHAN (Emergency Telehealth and Navigation) program began in 2014 and combines telehealth, social services, and alternative transportation to direct primary care-related patients away from emergency departments (ED).[33] Applicable to ATCEMS, potential exists for the integration and expansion of telehealth opportunities specifically in the dispatch and MIH/CP areas, much like the same opportunities exemplified in the ETHAN program.

[32] Center for Medicare and Medicaid Services. (n.d.). *Emergency Triage, Treat, and Transport (ET3) Model.* https://innovation.cms.gov/innovation-models/et3

[33] Langabeer, J. R., Gonzalez, M., Alqusairi, D., Champagne-Langabeer, T., Jackson, A., Mikhail, J., & Persse, D. (2016, September 6). *Telehealth-Enabled Emergency Medical Services Program Reduces Ambulance Transport to Urban Emergency Departments.* Pubmed.gov. https://doi.org/10.5811/westjem.2016.8.30660

Respective to the implementation of telehealth opportunities in the dispatch arena, directly connecting 911 callers with online resources such as nurse consultants, midlevel providers, or staffed community health paramedic (CHP) personnel can provide ATCEMS an advantage toward navigating appropriate resources to patients through direct, video-based conversations in the early stages of a 911 call's processing. Combined with integrated dispatch code parameters, a variety of low-acuity calls may be directed to telehealth staff to navigate a virtual consultation environment with potential patients that may appropriately benefit from alternative resources, as opposed to a traditional fire/EMS 911 response. This medical triage opportunity, combined with additional transport destination alternatives, is a driving premise behind CMS's ET3 initiative.

Within the context of ATCEMS's CHP program, the utilization of telehealth technologies while leveraging stakeholder relationships may open a potential funding source for the agency. Through the focus of the ET3 initiative, the pathway for EMS reimbursement for telehealth services is being paved, and the care continuum that extends beyond the EMS provider-patient relationship is being expanded to resources outside of the traditional hospital setting. Direct, on-scene communications between ambulance and CHP providers with partnering healthcare stakeholders, such as CommUnityCare and other Federally Qualified Health Centers (FQHC), may prove to be a worthy investment. In instances where a patient meets criteria for telehealth consults, patient disposition may be directed toward transport to an alternative care destination, or even recommended for a treatment-in-place plan of action while a future appointment with a healthcare clinic or provider is established. Collaboration with its dispatch-center-located Collaborative Care Communication Center (C4) may prove to be the most appropriate navigation point to accomplish all of this, especially with the eight additional personnel identified in the FY 2021 budget. The department's ET3 application shows that approximately 4,600 Medicare patients may be indicated in such an alternative transport destination effort, in addition to another 4,500 patients that may benefit from a more comprehensive treatment-in-place plan.

Although telehealth services increased over the past year because of COVID-19, the use of telehealth is only used routinely in a few EMS systems in the U.S. ATCEMS has two telehealth platforms they intend to use for their telehealth program, and a third platform was also mentioned to PCG. These platforms should be further evaluated for their intended use, compatibility, infrastructure requirements, and costs.

Recommendation 38:
Consider using one standardized telehealth platform to integrate and expand telehealth services in the ATCEMS dispatch center and with MIH/CP programs.

The San Antonio Fire Department has been using a platform that allows them to triage low-acuity calls to a telehealth provider while the call taker is still online with the 911 caller. The City and the OCMO should consider implementing a similar program with telehealth services provided by the OCMO and ATCEMS advanced practitioners and CHPs or other advanced practitioners. Meanwhile, AFD and ATCEMS emergency medical resources would not respond to these incidents.

Telehealth opportunities continue to evolve within the EMS industry and ATCEMS's operating model may prove itself as a potential leader within this respect. Because of its direct connection to 911/dispatching services, in addition to its already operating CHP program, ATCEMS is already poised to handle the communications infrastructure necessary to establish stakeholder engagement. Now, all it needs to do is begin its next steps toward further collaboration with its public healthcare partners and open its line of communications with potential receiving facilities who are willing to participate in this innovative opportunity. ATCEMS is expanding its C4 program for low acuity, non-emergent conditions and should consider integrating a telehealth component to C4 activities.

Recommendation 39:
Consider initiating 911 telehealth services for low acuity 911 calls utilizing the dispatch center-located Collaborative Care Communications Center (C4) as the navigation point. 911 telehealth services could be provided by the City's advanced practitioners and billed to insurance payors.

Integrating Advanced Practitioners

The delivery of EMS has transformed dramatically over the past few years, especially with the advent of the COVID-19 pandemic. Even prior to the pandemic, payors and providers began to view EMS as more than a method of conveyance from the scene of a 911 request for medical assistance, but rather an integral part of the healthcare continuum.

Many EMS agencies, including ATCEMS, initiated partnerships with healthcare providers and payors to provide mobile integrated healthcare/community paramedicine (MIH/CP) models. These programs have demonstrated value to patients, providers, and payors through an improvement in patient outcomes, reduction in high-acuity healthcare utilization, and enhancement in the patient's experience of care.[34]

However, like ATCEMS, many EMS agencies struggle to find economically sustainable models of MIH/CP. The enhancement in care delivery models like MIH/CP are truly ahead of their time, and the payor stakeholders have been slow to adopt payment strategies that compensate EMS for these enhanced services.[35]

The fact that the Medical Director for ATCEMS also served as the Interim Medical Director for the local Public Health District provides an advantage that most EMS agencies do not have. This crucial link between EMS and Public Health can be leveraged to create unique synergies for healthcare delivery, equity, and reimbursement. This synergistic alignment could be the use of the ATCEMS personnel to identify persons who call 911 for ambulatory care sensitive conditions (ACSC) due to a perceived lack of primary care resources to address ACSC before these conditions escalate, leading to a 911 activation. While this was a temporary (interim, ending after May 2021) working assignment for ATCEMS's Medical Director, it shows the potential collaboration and positive relationship building that may exist between both ATCEMS, APH, and the OCMO when working on future projects and initiatives.

For example, a diabetic patient on Medicare with food insecurities has difficulty managing their diet and medical regimen due to a lack of primary care resources. The patient becomes hypoglycemic (low blood sugar level), leading to a 911 call. ATCEMS personnel respond and can successfully treat the patient's acute hypoglycemia, but they feel the patient needs referral to a primary care and community resources to assist with medication management and food insecurity. Using a telemedicine application on their on-board smart device, the ATCEMS crew contacts an on-duty Physician Assistant (PA) employed by the Office of the Chief Medical Officer (OCMO). The PA and ATCEMS crew jointly determine it is clinically safe for the patient to not be transported to the emergency department, and the PA is able to make a referral for the patient to a CommUnityCare Health Center for follow-up care. The ATCEMS crew is also able to refer the patient to a community health paramedic (CHP), who in turn navigates the patient toward resources with the Keep Austin Fed program to establish food deliveries for the patient. The CHP providers also schedule follow-up (in-home) appointments with the patient related to their blood sugar monitoring.

This holistic approach is a simple and logical synergy. The patient benefits from these linkages, while the healthcare system also benefits through reduced acute care utilization and the expenses associated with it. It also addresses the typical inequity that exists in many communities by tailoring the overall response to the patient's clinical and social needs.

Financially, many of the services described in this scenario are reimbursable by Medicaid and other payors. The EMS response and no transport, along with the telehealth intervention, are reimbursable through the Emergency Triage, Treat and Transport (ET3) mode, of which ATCEMS has been approved to participate in. The clinic visits to CommUnityCare are also traditionally reimbursed by Medicare.

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[34] Xie, F., Yan, J., Agarwal, G., & Ferron, R. (2021, February 1). *Economic Analysis of Mobile Integrated Health Care Delivered by Emergency Medical Services Paramedic Teams.* Pubmed.gov. https://doi.org/10.1001/jamanetworkopen.2021.0055

[35] Roman, J. (2020, January 1). *Lessons Learned From MIH Experts.* NFPA Journal. https://www.nfpa.org/News-and-Research/Publications-and-media/NFPA-Journal/2020/January-February-2020/Features/NFPA-451/SIDEBAR-incidents

Many EMS systems have been successful in negotiating payments for MIH/CP services for Managed Medicare, Managed Medicaid, and other health insurers.[36] With a focused effort, ATCEMS could arrange payment models by those payors in Austin as well.

Leveraging these resources will require the various departments, ATCEMS, OCMO, APH, and CommUnityCare to work together, prioritizing the delivery of health and wellness services to Austin's at-risk residents as the primary focus to enhance healthcare equity through the service delivery model.

Deployment of Medical Assets to Improve Equitable Health Outcomes

AFD and ATCEMS medical assets can be deployed into the community based on needs demonstrated through data analytics. Data such as emergency medical response volume and patterns, types of responses, and response outcomes (i.e., transport, refusal, deceased on scene) can be used to "hot spot" areas of unique response patterns. Additionally, socio-demographic data can be incorporated into the analysis to identify additional underserved communities which would benefit from a targeted deployment of medical and social service assets. Using the results from this analysis, ATCEMS, OCMO, Public Health, and AFD could tailor the deployment of assets to address the unique needs of that community. Of note, AFD has already identified priority zip code areas to focus on as part of the Red Angels Program.

> **Recommendation 40:**
> Using data analysis, identify "hot spot" areas by zip code that would see the greatest enhancements in healthcare and social services.

For example, a specific zip code area demonstrates a high volume of low-acuity responses. Many of these responses result in an ambulance transport to an emergency department. Further analysis reveals a relatively low residential income level and high prevalence of Medicaid residents. ATCEMS, OCMO, Public Health, and AFD partner to target this area for a comprehensive community health intervention.

AFD Red Angels visit an address that is identified as a high-frequency EMS location and complete an initial in-home safety assessment. Safety issues such as smoke and carbon monoxide detectors are evaluated and addressed, and fall hazards are identified and corrected. An inspection of kitchen cupboards and the refrigerator identify a potential food insecurity issue. AFD also refers the patient to the ATCEMS CHP program for medical follow-up and communicates the need for further resource offerings from Keep Austin Fed.

During a community health paramedic visit, the CHP completes a comprehensive medical assessment and medication reconciliation. This reveals that the resident has an epilepsy diagnosis but does not have an adequate supply of anti-seizure medication due to the lack of a transportation resource to fill prescriptions. The resident also appears to possibly be suffering from alcohol dependency. The patient and family are educated on medication compliance and referred to a local pharmacy that can fill Medicaid prescriptions from the patient's primary care physician and deliver them to the residence as needed. A copy of the assessments and clinical findings from the CHP visit is provided to both the patient's primary care physician and APH for further resource follow-up. The CHP also discusses the potential alcohol dependency with the resident, who, with family support, agrees to seek counseling for the dependency. The CHP contacts a local substance abuse resource and arranges for the patient to attend an upcoming meeting, including arranging transportation. The CHP and the resident agree to schedule follow-up CHP visits for ongoing assessment and progress.

As another example, the data analysis also reveals a high incidence of EMS responses to this zip code for influenza-like illness complaints. As a result, APH arranges for a series of vaccine clinics at the local community center and through a PURC located near a local fire station. As residents come for vaccines, a

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brief medical history questionnaire and assessment are provided to identify any medical needs. The patients receive their vaccines and are counseled on ways to prevent contracting an influenza virus. ATCEMS and AFD support these clinics with personnel for the medical assessments, vaccine administration, and additional community risk reduction education efforts.

Vaccine administrations, and even medical assessments are reimbursable through most insurers, including Medicare and Medicaid.[37] ATCEMS and AFD are generally unable to be reimbursed by third-party payors for those services due to their provider type. However, reimbursement *is* available to physicians, even when the actual administration of these assessments and treatments are provided by physician assistants, nurse practitioners, and other care providers, when they are under the direct supervision of the physician. Using this process, APH or OCMO may bill third-party insurers and reimburse ATCEMS and AFD for a portion of their expenses.

Employing this type of a data-driven, proactive, community-based approach to hot spot utilization area could dramatically improve the health status of residents who are at-risk for acute care utilization. It will also serve to balance health inequities in Austin by deploying resources into communities in need of these services.

All Advanced Life Support Deployment

Currently, all ATCEMS ambulances are staffed with Advanced Life Support (ALS) personnel. However, recent evidence suggests that many EMS responses do not require ALS interventions.[38] Therefore, effective deployment of basic life support (BLS) staffed ambulances could yield enhanced response capabilities, enhanced patient outcomes, as well as a reduced unit hour cost for the system.

Several studies have demonstrated that paramedic skill proficiency and patient outcomes are enhanced when specific processes are put into place, including:

- When there are fewer total paramedics per ambulance, which allows the paramedics to use their ALS skills more frequently,
- When paramedics are supplemented with EMT partners (e.g., staffing ambulances with one EMT and one paramedic rather than two paramedics), and
- When paramedic-staffed (ALS) ambulances are only sent to higher-acuity calls while BLS ambulances are sent to lower-acuity calls.[39] [40] [41]

For these reasons, the MedStar system in Fort Worth recently initiated a tiered ambulance deployment model after 35 years of an all-ALS deployment system. Many other well-respected EMS systems, such as Seattle's Medic One system, Regional Emergency Medical Services Authority (Reno, NV), and Little Rock Ambulance Authority (AR) also use this "tiered deployment" model.

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Recommendation 41:
Consider implementing a tiered deployment model that includes a BLS response component based on the EMD determinant.

Comprehensive data analytics of EMS response outcomes will likely reveal that certain EMS response determinants do not need an ALS level of care and which response determinants rarely result in an ambulance transport to an emergency department. Using this data effectively, ATCEMS and AFD can redesign response configurations to deploy resources more equitably to EMS responses.

An example of this effective data utilization was recently used in the MedStar system to redesign the all-ALS model to a tiered deployment model. The emergency medical dispatch (EMD) determinant of "24-B-01" (pregnancy/labor with delivery not imminent, ≥5 months/20 weeks gestation) revealed that 0.7% of the responses resulting in any ALS care being provided, and 0.0% of the patients had any critical medical needs. This response is eligible for a BLS response, based on local evidence-based patient outcomes.

Ambulance Response

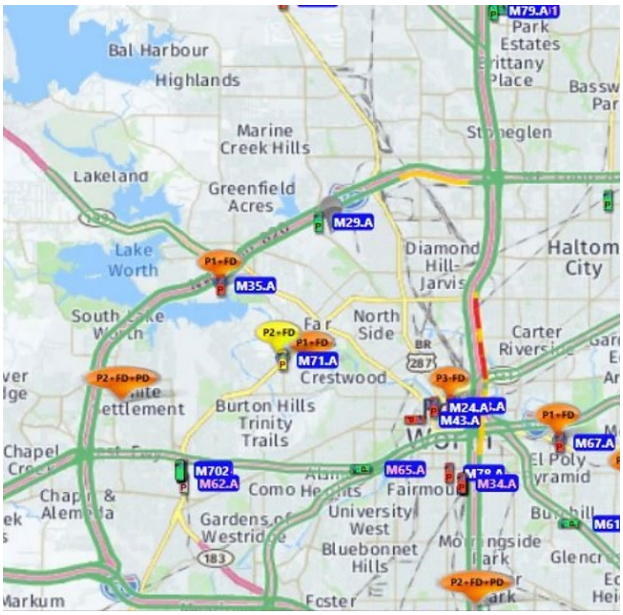
Additional data analytics may reveal that there are certain medical calls in Austin that typically do not result in an ambulance transport to an emergency department. Since ambulance resources are generally more limited than fire-based first response resources, EMD determinants that do not usually result in an ambulance transport could receive an initial first response only without a simultaneous response of an ambulance resource. In the MedStar system, the response determinant 32-B-03 (unknown Problem, person down, unknown status) only resulted in an ambulance transport on 24.1% of the responses. This response determinant could be responded to with a fire-based first response only, and if ambulance transport is required, the ambulance could be requested by the first response resource. Using this model would result in a more equitable use of ambulance resources and reduce overall system costs, with little to no change in patient outcomes.

Dynamic Resource Management

In addition to the overall response volume predictability, geographic response patterns generally emerge with effective data analytics. Locations of EMS response generally follow the movement of people throughout a service area. For example, service areas with defined urban commerce areas and residential areas will generally experience higher EMS response volume in the urban core during business hours, when more people are in those areas. During non-business hours, there may be a higher response volume in the suburban, residential areas as people relocate from the urban core back to the residential areas. Most high-performance, high-value EMS systems will make effective use of a dynamic response model, moving available resources around their response areas based on relatively predictable geographic patterns of EMS response volume.

Often, systems use "post" (or "posting") locations to pre-position ambulance units in areas with predicted high demand. This demand deployment helps assure resources are available in geographic locations with a high probability of an EMS response. This "demand" deployment could change multiple times throughout a staffing period, so for this reason, the use of fixed stations is inefficient. Instead, street-level deployment is used with ambulances pre-positioned at strategic locations such as convenience stores, fuel stations, or other commercial hubs of activity. A visual depiction of this model is shown on the map in ***Figure 49***.

Figure 49: Dynamic Resource Model



Note the grey bubble showing just east of ambulance number M29.A (an available ambulance). That "bubble" represents the geographic location of an incoming 911 EMS request. The call is still undergoing the EMD protocol to determine the type and mode of response; in essence, it is a "pending" response at that location. M29 was pre-positioned at a convenience store by the computer-aided dispatch (CAD) system, due to the likelihood of an EMS response at that time of day and day of the week. You will see that the pre-positioning of ambulance M29 was precisely placed to immediately respond to the actual incoming call, resulting in a three-minute ambulance response to that request.

ATCEMS and the Communications Center should consider extensively using practices such as Flexible Deployment and Dynamic Resource Management to match the supply of ambulance resources to the anticipated demand and geography of EMS responses. This would likely result in better equity of response capabilities for the community, and the equity of workload on the EMS staff.

Flexible Staffing Strategy

Unlike fire incidents, EMS response volumes are relatively predictable. Generally, there will be more EMS responses at 5pm than there will be at 5am. For this reason, most high-performance, high-value EMS systems will flexibly staff ambulances based on these predictable response patterns. ATCEMS employs a limited use of a flexible staffing strategy to meet anticipated EMS response volume. "Demand" ambulances are staffed during times of predicted high response volume as additional resources in the system. However, ATCEMS still uses numerous 24-hour units (units with personnel on-duty for 24 consecutive hours) as a core deployment model. Several studies have indicated that the 24 consecutive hour staffing model is a dangerous practice in general, especially for busy, urban response systems.[42] [43] We would recommend that ATCEMS review their current deployment model and reexamine the 24-shift configuration as they did in 2006 and 2016.

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Conclusion

Public Consulting Group LLC would like to thank the City of Austin for selecting our firm to gain an in-depth insight into its fire, EMS, dispatch, medical officer, and public health departments and practices. It is moments of transparency and vulnerability like this where all entities have an opportunity to analyze their current practices and data to begin discussions toward strengthening their relationships and organizational best practices moving forward.

Our firm's comprehensive evaluation of the City's dispatch equity and optimization efficiency opportunities yielded 41 recommendations spanning over categories related to system equity, efficiency, revenue generation, policies/operations, and labor. Within the context of our recommendations, we note that additional opportunities exist for the City's departments to continue to cooperate, further coordinate, efficiently collaborate, and even consolidate some of their efforts. Supported by objective data and stakeholder commentary, we hope that readers of this report find each of our recommendations to be well-founded, purposeful in nature, and achievable in practice.

We acknowledge and applaud the AFD, ATCEMS, APH, and OCMO for providing the citizens of Austin with a high-quality, reputable, and national standard-meeting level of service that they should be proud of.

APPENDIX A: RECOMMENDATIONS MATRIX

#	Recommendation	Priority Level	Priority Rating	Implementation Timeline	Equity	Efficiency	Revenue Generation	Policy-Ops	Labor
1	The City should consider establishing the position of Public Safety Director to oversee AFD and ATCEMS.	Medium-High	1b	6 - 12 months				X	
2	The City should consider having the Chief Medical Officer (CMO) report directly to the City Manager.	Medium-High	1b	6 - 12 months				X	
3	OCMO and ATCEMS should consider revising the Performance Improvement (PI) program to address clinical care concerns.	Medium-High	1b	6 - 12 months		X			
4	Consider adding an EMS research function to the OCMO to analyze EMS system data to form evidence-based decisions.	Medium	2a	1 - 3 years		X			
5	Consider adding healthcare finance system expertise to the OCMO to develop revenue strategies related to the provision of expanded physician care and services and ATCEMS advanced care providers.	Low	3	1 - 3 years			X		
6	Consider assigning a Health Equity staff member to OCMO to ensure that health equity is achieved in the most vulnerable neighborhoods.	Medium	2a	6 - 12 months	X				
7	AFD should reassess its role and support of EMS delivery from an administrative and operational perspective based on the historical staffing and administrative support of EMS.	Medium-High	1b	6 - 12 months				X	
8	ATCEMS and OCMO should consider further collaboration to develop a list of routine and ad hoc reports to be provided to OCMO on a regular and at on-request basis.	Medium-Low	2b	0 - 6 months		X			

#	Recommendation	Priority Level	Priority Rating	Implementation Timeline	Equity	Efficiency	Revenue Generation	Policy-Ops	Labor
9	Consider conducting facilitated workshops with APH, AFD, ATCEMS and the OCMO to identify areas for cooperation, coordination, and collaboration, and in some instances, consolidation, that would increase efficiency, effectiveness, and enhance health equity community wide.	High	1a	0 - 6 months	X	X			
10	ATCEMS should obtain the reports and documents produced by APH, Central Health, CommUnityCare, and others to review and analyze for opportunities for CHP focus and deployment.	Medium	2a	0 - 6 months	X				
11	Consider adding healthcare system finance expertise to the ATCEMS Administration and Finance Department to generate additional revenues through partnerships and other relationships with the Austin-Travis County healthcare community.	Medium	2a	1 - 3 years			X		
12	Coordinate data collection and data analysis across APH, AFD, ATCEMS and the OCMO to develop outcome data to be used in EMS delivery decision making.	Medium	2a	6 - 12 months		X			
13	Review billing practices to identify opportunities to capture revenue for both "treatment, no transport" and allowable ALS-level services.	Medium	2a	0 - 6 months			X		
14	Revise ATCEMS's Charity Care policy and eligibility determination process to maximize ambulance supplemental payment program (ASPP) revenues.	High	1a	By 9/30/2021			X		
15	Consider reviewing commercial payment data regarding charges and payments by procedure code for commercial payors to ensure accurate reporting and to identify opportunities to maximize revenues.	Medium-High	1b	6 - 12 months			X		

#	Recommendation	Priority Level	Priority Rating	Implementation Timeline	Equity	Efficiency	Revenue Generation	Policy-Ops	Labor
16	Consider implementing significant fee schedule increases for ambulance transport services.	Medium-High	1b	0 - 6 months			X		
17	AFD should consider the implementation of a cost-recovery program to offset operational costs.	Medium-Low	2b	6 - 12 months			X		
18	AFD and ATCEMS should consider implementing a first-responder fee (FRF) for services provided to non-City of Austin and non-Travis County residents.	Medium-Low	2b	6 - 12 months			X		
19	ATCEMS should consider implementing an ambulance membership program to generate additional revenues and reduce the out-of-pocket expense to Austin-Travis County residents.	Low	3	1 - 3 years			X		
20	In collaboration with the labor organizations, consider exploring an alternate staffing model for AFD dispatch that incorporates civilian call takers supervised by sworn, uniformed fire officers.	Medium-High	1b	6 - 12 months		X			X
21	Consider cross-training AFD Dispatch personnel in the medical priority dispatch system (MPDS) to provide back-up capacity to the ATCEMS dispatch center.	Medium-High	1b	1 - 3 years		X			X
22	ATCEMS should consider exploring an alternate staffing model that incorporates civilian call takers supervised by sworn uniformed EMS officers.	Medium-High	1b	6 - 12 months		X			X
23	Consider consolidating fire and EMS dispatch operations as part of the creation of a new Emergency Communications Department employing civilian telecommunicators integrated with sworn AFD and ATCEMS personnel.	High	1a	6 - 12 months		X			X
24	Develop outcome metrics related to response time performance and patient outcomes.	Medium-Low	2b	6 - 12 months		X			

#	Recommendation	Priority Level	Priority Rating	Implementation Timeline	Equity	Efficiency	Revenue Generation	Policy-Ops	Labor
25	Consider renumbering ATCEMS stations and units in the City of Austin to match the co-located AFD Station.	Low	3	1 - 3 years				X	
26	ATCEMS should reevaluate support for special operations teams such as technical rescue, urban search and rescue, and swift/flood water rescue as these functions fall under the operational purview of AFD and other local fire departments; instead, dedicate trained personnel in a supplemental role to the other established programs.	Medium	2a	6 - 12 months				X	
27	ATCEMS should consider reevaluating its current processes for determining optimal deployment of demand units to areas of the City and throughout Travis County that maximize UHUs and relieve demand stress on busier units.	High	1a	0 - 6 months		X			X
28	Consider implementing strategies to convert some of the high-UHU Medic units into split 12-hour Demand Medic units.	High	1a	6 - 12 months		X			X
29	Evaluate daily productivity and workflow of ATCEMS's Community Health Paramedicine Program to determine if improvements can be made related to effectiveness and efficiency.	Medium	2a	0 - 6 months		X			
30	Consider a partnership or staff additions of social workers, pharmacist consultants, dieticians, and/or case managers for ATCEMS's CHP program in an effort to broaden the program's capabilities, as well as potentially open future revenue streams through additional billing opportunities.	Low	3	1 - 3 years	X	X	X		

#	Recommendation	Priority Level	Priority Rating	Implementation Timeline	Equity	Efficiency	Revenue Generation	Policy-Ops	Labor
31	Become full partners in the Community Health Improvement Plan. The placement of Pop-Up Resource Clinics (PURC) should be coordinated with other community partners, particularly with APH and OCMO, and should consider the demographic findings of Central Health. Create a list of criteria for the placement and scheduling of PURCs, collect and share the data among partners, and leverage the PURCs to launch new collaborative pilot programs.	High	1a	0 - 6 months	X	X			
32	Commit to the Red Angels Program in a community safety-focused capacity, leaving the medical focus for ATCEMS and its CHP program. Establish key performance indicators (KPI) for the program and adopt a community-focused approach toward developing new initiatives, ensuring all are interlinked and supported by data.	Medium-High	1b	0 - 6 months	X	X			
33	Consider incorporating an electronic/survey-based assessment into pre-appointment options for each encounter and potentially expand visits to virtually via tele-visit platform (which may increase the number of encounters/visits that can be performed, while reducing the travel and operational demands of each encounter).	Medium-Low	2b	1 - 3 years		X			
34	Form a collaborative work group between OCMO, AFD, ATCEMS, and APH that can evaluate program data, responsibilities, and effectiveness, as well as collaborate on future community risk reduction initiatives.	Medium-High	1b	0 - 6 months	X	X			
35	OCMO should follow through with its application process(es) to obtain approval for Medicaid and Medicare billing for supplemental, on-scene services.	Medium	2a	1 - 3 years			X		

#	Recommendation	Priority Level	Priority Rating	Implementation Timeline	Equity	Efficiency	Revenue Generation	Policy-Ops	Labor
36	Consider the implementation of fire station neighborhood/bystander CPR and bleeding control training programs, APD CPR and AED training, and the integration of a public notification tool/app platform in an effort to increase local community training and cardiac arrest response readiness.	Medium	2a	6 - 12 months	X	X			
37	Consider addressing the social determinants of health (SDOH) using Central Health data to guide the development of the CHP program.	Medium	2a	0 - 6 months	X				
38	Consider using one standardized telehealth platform to integrate and expand telehealth services in the ATCEMS dispatch center and with MIH/CP programs.	Medium	2a	1 - 3 years		X			
39	Consider initiating 911 telehealth services for low acuity 911 calls utilizing the dispatch center-located Collaborative Care Communications Center (C4) as the navigation point. 911 telehealth services could be provided by the City's advanced practitioners and billed to insurance payors.	Medium	2a	1 - 3 years	X	X			
40	Using data analysis, identify "hot spot" areas by zip code that would see the greatest enhancements in healthcare and social services.	Medium-High	1b	0 - 6 months	X				
41	Consider implementing a tiered deployment model that includes a BLS response component based on the EMD determinant.	High	1a	1 - 3 years		X			

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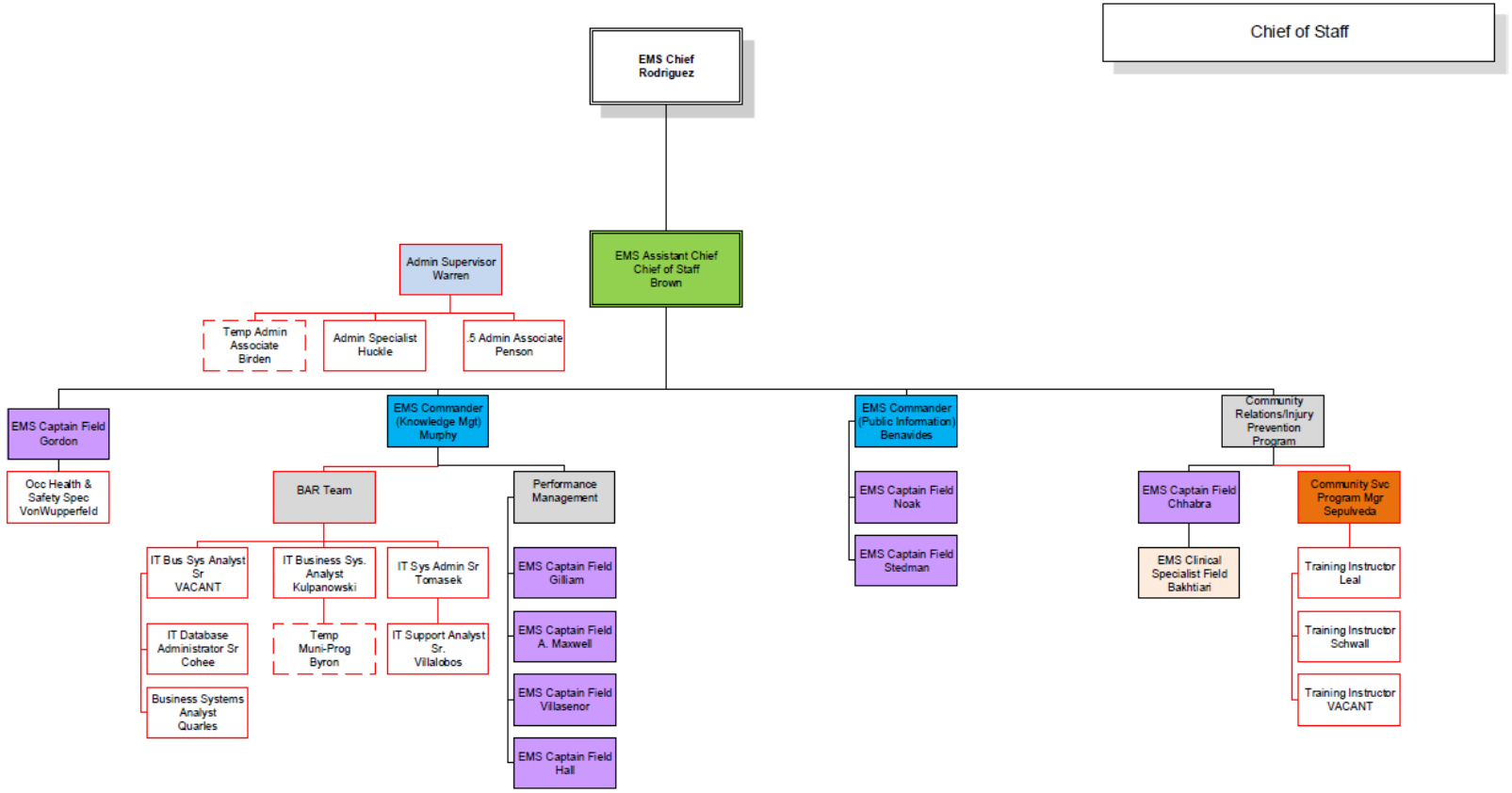
APPENDIX C: ATCEMS ORGANIZATION CHART BREAKDOWN

Chief of Staff



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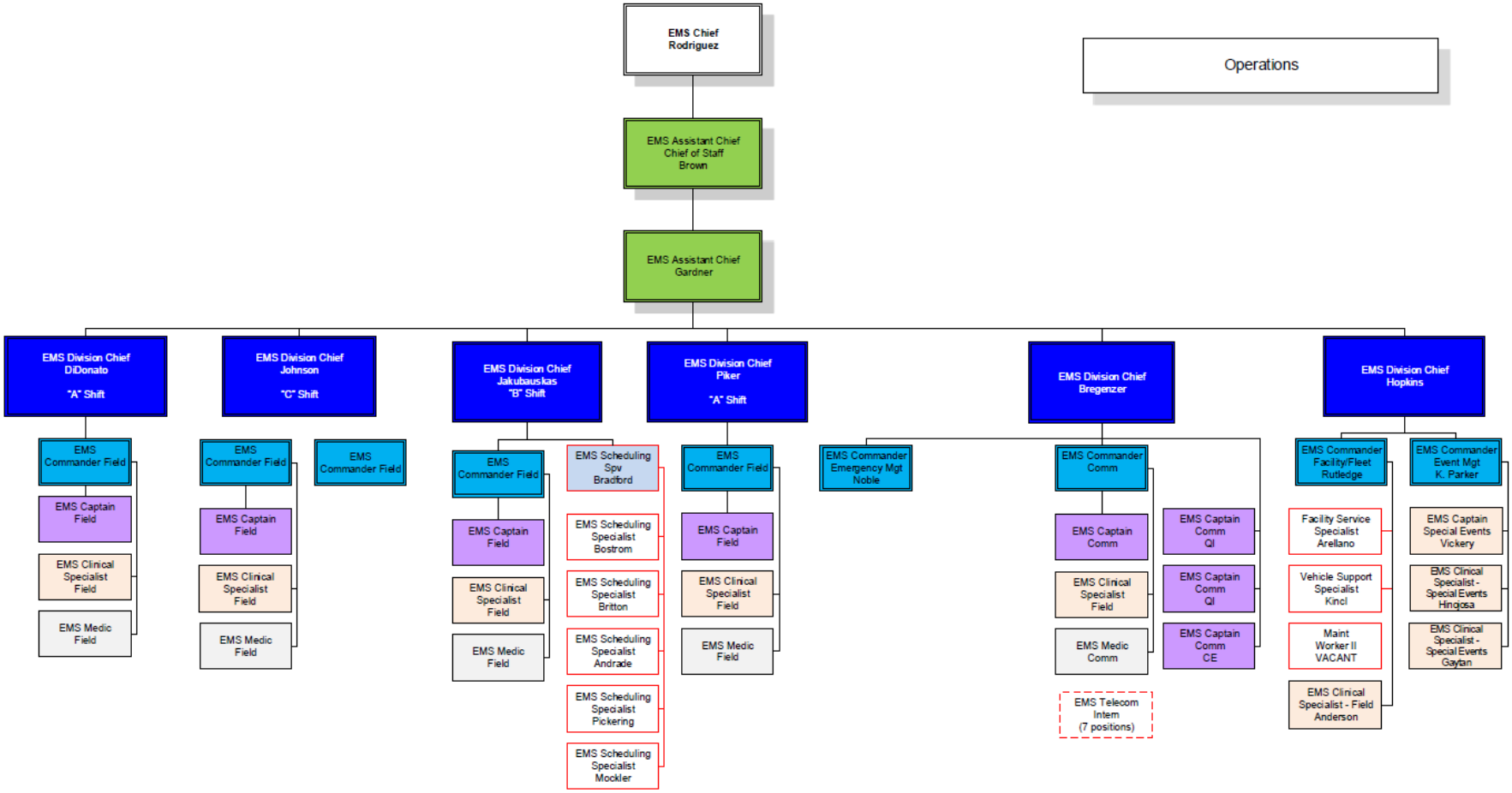
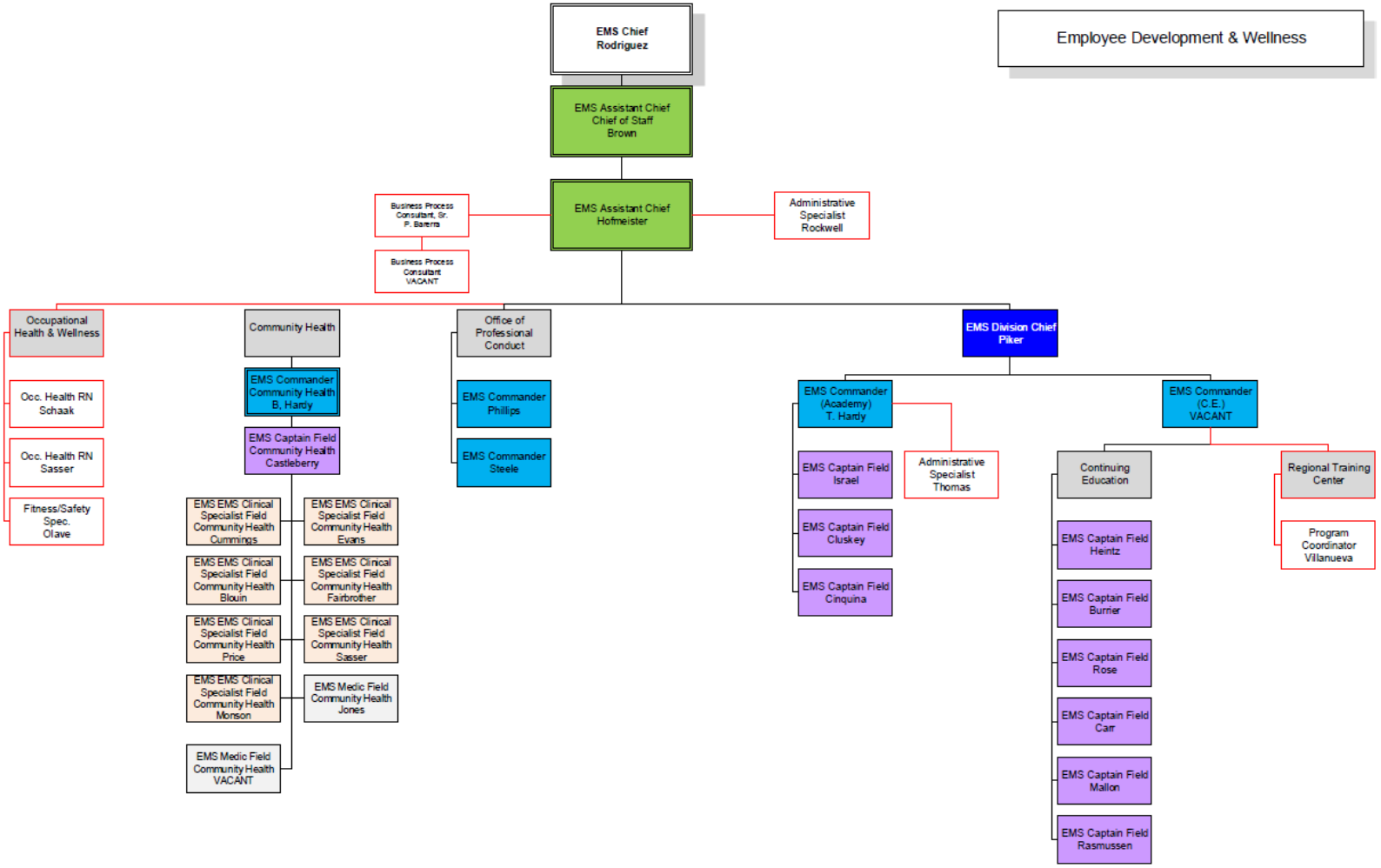
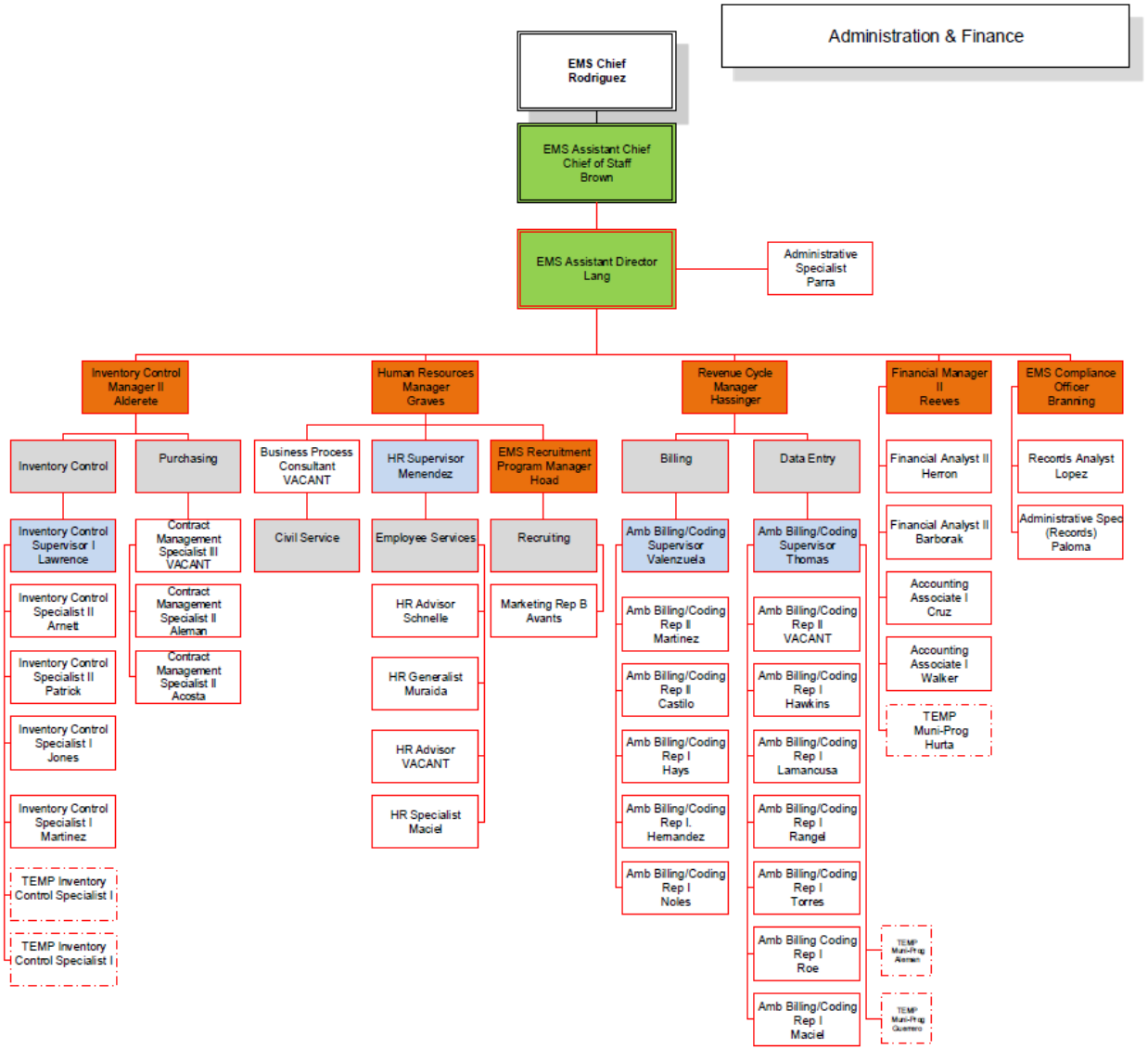

EMS Chief Rodriguez
Operations
EMS Assistant Chief Chief of Staff Brown
EMS Assistant Chief Gardner
EMS Division Chief DiDonato "A" Shift
EMS Division Chief Johnson "C" Shift
EMS Division Chief Jakubauskas "B" Shift
EMS Division Chief Piker "A" Shift
EMS Division Chief Bregenzer
EMS Division Chief Hopkins
EMS Commander Field
EMS Captain Field
EMS Clinical Specialist Field
EMS Medic Field
EMS Commander Field
EMS Captain Field
EMS Clinical Specialist Field
EMS Medic Field
EMS Commander Field
EMS Commander Field
EMS Captain Field
EMS Clinical Specialist Field
EMS Medic Field
EMS Scheduling Spv Bradford
EMS Scheduling Specialist Bostrom
EMS Scheduling Specialist Britton
EMS Scheduling Specialist Andrade
EMS Scheduling Specialist Pickering
EMS Scheduling Specialist Mockler
EMS Commander Field
EMS Captain Field
EMS Clinical Specialist Field
EMS Medic Field
EMS Commander Emergency Mgt Noble
EMS Commander Comm
EMS Captain Comm
EMS Clinical Specialist Field
EMS Medic Comm
EMS Telecom Intern (7 positions)
EMS Captain Comm QI
EMS Captain Comm QI
EMS Captain Comm CE
EMS Commander Facility/Fleet Rutledge
Facility Service Specialist Arellano
Vehicle Support Specialist Kincl
Maint Worker II VACANT
EMS Clinical Specialist - Field Anderson
EMS Commander Event Mgt K. Parker
EMS Captain Special Events Vickery
EMS Clinical Specialist - Special Events Hinojosa
EMS Clinical Specialist - Special Events Gaytan

Employee Development and Wellness



Administrative and Finance



APPENDIX D: COMMUNICATIONS CENTER STAFF INPUT SURVEY

Survey Content

The City of Austin and the Office of the Chief Medical Officer has contracted with Public Consulting Group, LLC (PCG) to conduct an analysis of Fire and EMS delivery for the City of Austin and Travis County. The primary focus of this study is to assess emergency service delivery from the perspective of "Equity and Dispatch Optimization".

PCG recognizes that the first and most critical step in the delivery of emergency services is the ability of citizens and visitors to access the 911 system to report an emergency. Answering and processing these calls in a rapid and efficient manner is critical to successful outcomes for all emergencies no matter the nature of the emergency (Law, Fire, EMS, or Mental Health).

PCG is requesting your voluntary participation in completing the survey as it relates to dispatching emergency medical service resources provided by both departments. The survey is not scientific in nature but rather and opinion survey so there is no right or incorrect response. What is important to PCG is the opinions of those who work in the dispatch environment and possess in-depth knowledge about systems and processes employed by both departments (AFD and ATC-EMS) specific to call answering, call processing and dispatching of emergency response resources.

Survey questions have been reviewed, vetted, and approved by department and labor leadership teams from both AFD and ATC-EMS. The survey is anonymous, and responses will be included in our final report to the City Council and leadership teams for AFD and ATC-EMS, both labor and management.

PCG would like to thank you in advance for your time and participation.

1. Which department do you currently work for?

- ◯ Austin Fire
- ◯ Austin/Travis County EMS

2. What position do you currently hold?

- ◯ Captain - Dispatch
- ◯ Captain - Communications
- ◯ Fire Lieutenant – Dispatch Shift Supervisor
- ◯ Fire Lieutenant - Dispatch
- ◯ Fire Lieutenant – Communications
- ◯ Fire Specialist – Dispatch
- ◯ Fire Specialist - Communications
- ◯ Fire Specialist – Dispatch Secondary Supervisor
- ◯ Firefighter – Call Taker/Dispatcher

◯ Firefighter – Communications

3. What position do you currently hold?

◯ EMS Commander

◯ EMS Captain – Dispatch

◯ EMS Captain - Administration

◯ EMS Clinical Specialist

◯ EMS Medic

4. How long have you worked in the Communications Center?

◯ <1 Year

◯ 1-5 Years

◯ 6-10 Years

◯ 10-15 Years

◯ 20+ Years

5. Do you believe your dispatch operation is adequately staffed?

◯ Yes
◯ No

6. Please provide details on why you believe the dispatch operation is not adequately staffed.

7. Are you provided the training and resources necessary to perform your duties?

◯ Yes
◯ No

8. Please provide details on why you believe you are not provided the training and resources necessary to perform your duties.

9. From a systematic perspective, if you were provided the opportunity to make the decision, what enhancements or improvements would you make to the current dispatch operation? Select your top three.

- [ ] Upgraded/New CAD
- [ ] Additional/Improved Software
- [ ] Call Transferring Processes
- [ ] Reconfigured Workstations
- [ ] More Comfortable Chairs
- [ ] Changes/Modifications to Work Schedule
- [ ] Back-Up Center of Same Capacity/Quality as CTECC
- [ ] Reconfiguration of AFD/ATC-EMS Dispatch Space (The Wall)
- [ ] Environmental Conditions (please explain under "other" below)
- [ ] Other

10. What suggestions would you make, (if any) to improve/enhance the working processes between Fire and EMS Dispatch Operations?

11. Is there any additional information you feel is important to this study you would like to share?

Open Response Item Comments

Question #6: Please provide details on why you believe the dispatch operation is not adequately staffed:
Retaining employees due to lack of career advancement. Secondary to current city retirement.
there are one ocp days per month for the field operations and in comm there is on average of four days per month you are on call. we do have significantly less full time positions in comm but 4 a month is a lot of ocp.
Minimum staffing should be raised by 1. Call volume has increased. So as with the field adding ambulances, staffing taking those calls also have increased.
Up the minimum staffing by at least 1, and actually hold the same people who routinely call out sick accountable.
We have a hard time retaining personnel due to the nature of our job and due to the way the public treats us
We have the same minimum staffing levels we have had for 20 years. We do not have enough staff to allow more than 1 person on vacation at a time. This often results in staff calling in sick in order to get a day off. Additionally, staff are overworked with increasing call volume and they are assigned overtime shifts (OCP) 4 times a month.
We have consistently been given more and more tasks we have to accomplish with the same number of staffing we currently have in addition to call volume rapidly increasing due to Austin rapidly growing
It is not uncommon for us to use On Call Personnel on off days, we also have approximately three or more on-call days per month. I believe this is partially due to staff retention because we have available positions to hire into.
There are two dispatchers for the entire city of Austin and Travis County - almost 2.5 million? people. It is unrealistic, the dispatchers are beyond overwhelmed. ATCEMS processes 500-700 calls per DAY, in perspective this is what AFD processes per MONTH. EMS Dispatchers have multiple radios and channels in their ear. It's incredibly easy to either miss information or sacrifice personal mental health and be incredibly exhausted every shift. I love my department**,** but we are barely compensating. Unless Austin-Travis County, and surrounding areas are comfortable with staying shorthanded during a pandemic and natural disasters, we need more call-takers, units/EMTs/Paramedics.
Need more dispatchers for increasing call volumes and radio traffic
We need 3 dispatchers all the time, 2 is not enough. We need 5 call takers all the time, 4 is not enough. Staffing levels have not increased, and they should.
Always asking for AT for the next day
After hours, my immediate supervisor becomes the shift commander. I believe our shifts should be staffed with a Captain, a Lieutenant, a Fire Specialist and 6 firefighters.
Each shift is almost always at minimum staffing causing work life balance to be pretty much nonexistent. Even if you take on call days out of the equation, using PTO time is also near impossible. The schedule is not sustainable for someone to do anything outside of work. I have so many on call days, that I am almost guaranteed to get called in for, I maybe end up with full day off a week. I would much prefer to come in, work a 24 hour shift and have more freedom with my off days.
When a citizen of Austin or surrounding communities calls 911**,** they are having a emergency, should not have to hold for a call taker.
Turnover. We are understaffed and overworked which causes turnover. Coupled with the semi-permanent night shift assignment for most new hires, this causes high turnover. I feel people would stay longer if we got rid of dayshift and night shift. More qualified employees would promote as well.
Minimum staffing levels have not changed to reflect sustained increased call volume, current staffing levels are routinely unable to meet even the outdated minimum levels. Additionally, there are administrative needs that are unmet due to lack of personnel.
When we work "minimum staffing" It still feels like a hard shift and taxing on the body. Our on call list gets called in more frequently that should be.
Since the OSM, I can say that my prior shift assignment, it felt, that every day we were running at minimum staff and/or calling in OCP. Now that I have moved I see my current shift more staffed than day shift. However, currently on my new shift there are only 4 cleared CS's after one moves in July. With the staffing how it is on my OCP dates it almost feels like a 95% chance of getting tagged. Also, on my prior shift there are the "usual" call-in staff that make things harder on everyone else because they don't come to work.
There are not enough call taker**s** for the volume of calls we receive daily, not only do we do the ems portion we also do APD call taking for unknowns that should be check welfare for and also all accidents are supposed t**o** go to AFD (which by the way the added staff for) yet ems STILL continues to get 75 % of these calls... we have the same minimum staffing from when I started 13 years ago but at least double or triple the call volume... This is NOT sustainable for the mental wellbeing of an employee of EMS.

Question #6: Please provide details on why you believe the dispatch operation is not adequately staffed:
We have two dispatchers covering the entire city and county, plus Starflight, special events, and deal with AFD crews, especially when they can't get what they want from their own dispatchers
We are frequently at minimum staffing, which has not been increased in several years. On call personnel are used frequently, as is the accumulative list. While on shift we consistently have calls in queue because we do not have enough call takers to handle the number of calls that come in. When on the radio there is a high amount of call volume, which presents a high likelihood of missing radio traffic, this is a potential safety hazard for the field medics and firefighters.
this is a follow -up to original reply - afd uses auto dispatch - if an ems call... they come to mcom channels and we have to take care of them on the call
It has varied between incentives to go to night shift (stipends), too much work load, and the general atmosphere of EMS comm floor. People often complain about the inconsistency between command staff on the floor.
I believe the duties and call volume of Dispatch have both increased, keeping pace with the growth the City of Austin has experienced. Along with the additional responsibilities of being the primary dispatching agents for the surrounding ESDs, our workload has increased! AFD is largely staffed as it has been for the last decade. We did increase our minimum staffing from 6 people to 7 people; our shifts now each have 9 assigned (to account for people using accrued time).
I do not believe we have enough staff to handle the call volume we have in Austin on a day to day basis. There is a higher chance of burn out with the staffing levels usually being near or at minimum for most shifts, then adding in the on-call schedule to that.
I believe we give the very best service with the people we have, but we need two more personnel in order to ensure all calls are answered and not put on hold, and that all fire units get the best and quickest service even during any busy times that regularly occur (thunderstorms moving through, brush alarms, rtf incidents)

Question #10: What suggestions would you make, (If any) to improve/enhance the working processes between Fire and EMS Dispatch Operations?
EMS does all radio traffic related to any incident with patients to include traffic accidents. Austin Fire Dispatch is dangerous to our providers and patients. Ignoring our medic unit and lack of competency in the job.
I feel we do have a good relationship with fire. maybe more joint events.
Tear down the wall.
To have AFD be more reliable when our units are on there channels. We have too many times when EMS crews are assigned to a firecom channel and their requests go unanswered by fire dispatch so they are having to come back to a Medcom channel to request additional resources
If EMS could get the proportionate staffing that AFD has, EMS could take over the fire dispatch duties. This would improve/enhance the work processes of all dispatch operations, as well as the service to the public. If given the proportionate staff, EMS is more than capable of doing the activities of both agencies. EMS has a communications specific training section, AFD does not. EMS has a quality improvement unit, AFD does not. EMS is an accredited center, AFD is not. EMS is willing to do what is best for patients, AFD is not. It seems AFD often fights against process improvement initiatives because those initiative often causes them more work.
When fire dispatch fails to perform in their duties they should be held accountable instead of EMS dispatch picking up their slack. We have many units advising they are unable to reach Fire dispatch on Traffic accident calls and regularly have to move to EMS dispatch to get needed resources.
If we could use FD as secondary medical call takers with MPD to catch e-ruling calls or even other medical calls that way rescue conditions, traffic accidents, falls, etc could all be solely handled through them, versus FD having to transfer to EMS and the caller having to answer questions all over again; this would lessen our workload, utilize proper resources and overall improve the secondary PSAP call taking experience on an employee side but also on a caller/patient side of things. FD call takers are all tenured fire fighters with AFD who are all system credentialed by the same medical directors who oversee field medical operations as well as Communications Division operations, there is no reason why FD cannot train to an MPD standard and help out with some of the work load.
Fire and EMS dispatch have a good working process. I have seen many improvements over the years with each agency working toward the common goal of providing outstanding service to the internal and external customer.

Question #10: What suggestions would you make, (If any) to improve/enhance the working processes between Fire and EMS Dispatch Operations?
I wish AFD's information was more accurate. I cannot trust or rely on them, ever. Their addresses are almost always incorrect and delays pt care. Their rescue calls and procedures are also conflictive, which there was more unity in our information, medicine, and science. I don't mean to be rude but sometimes siblings need to be stern with one another. We need to be proactive and reliable for one another, which includes AFD practicing and putting more effort into calls. Yesterday I had a lift assist call at a Roadway Inn (there's ONLY TWO in Austin). AFD would not call the TWO Roadway Inns to figure out pt's room number. It's just TWO locations. EMS was incredibly busy w/911 calls. AFD was not busy. AFD kept messaging EMS dispatch, pushing the problem onto the EMS dispatcher. Since AFD would not call, in-between 911 calls, I called the Roadway Inn, opened AFD's call and typed the room number for them. This as not required of me but I did it to help EMS Dispatch and the patient. I felt if I did not find the patient's room number, the patient would probably still be on the floor right now.
Either combine them, or Seperate us further apart. They try to tell us how to do our jobs constantly. The less we are able to communicate with them the better.
Training and understanding the others job
We should not be combined with AFD. That is what this survey sounds like its looking for. I don't think that is going to solve anything. It will create more problems.
There is an obvious disconnect. The first understanding needs to be we are two different departments with different rules. My decisions at the Dispatch LT are made based on my rules and the way I see the situation. I have an ability to "watch" the units and make decisions based on what I see. The same is true for the supervisor of EMS. The supervisors/staff work together, but one is not "in charge" of the other. It takes too much time to make changes to protocols that are flawed and need changing for the better of the public (traffic accidents, lift assits).
After COVID protocols have relaxed, we could try to organize a Sunday lunch we could all share, that would lead to at least some more communication between departments.
make all communication go through cad
If they had assigned dispatch positions, we would know where to go to for questions about calls
Use, and expected credential/accreditation of, same/similar dispatch and call taking protocols. Differences in expectations and process are the root of most issues.
Have EMS communicate with SUPV via phone or msg instead of yelling HEY FIRE over the wall (often when radio traffic in ear or on call).
only that the fire dispatchers need to sit across ems dispatchers so that we don't have to yell over the wall
I would have Fire be more active in dispatch. We have to send numerous notifications for things to be done which makes an audible alarm and they just. DON'T. PAY. ATTENTION.
Working processes between the two agencies have improved during my tenure with the department. I believe continuing to improve relations, and having a consistent place that the fire dispatchers sit while on the radio would be helpful. EMS dispatchers always sit at 12 and 13 when on the radio, it would help if we knew where the fire personnel on the radio are.
I believe that EMS and Fire dispatch work together fairly well. My only complaint is when we are to patch channels for vehicle rescues. For some reason recently, Fire likes to wait until a fire unit specifically arrives on scene to confirm the rescue. This ALWAYS results in a delayed response WHEN it is truly a vehicle rescue scenario. I understand that often times it appears unlikely that it is a true rescue given the limited call text, lack of repeat calls for the supposed high acuity call, etc. I think the best remedy for this is to either modify questions for protocol 29, or give an updated and better training for when a call should be upgraded to a rescue for both fire and dispatch. If this truly means that we do wait for a unit to arrive on scene to upgrade, that's fine. But for now the protocol is that when we upgrade the call, we send as a rescue and patch the channels. Until that changes, we need to follow procedure.
My top suggestion is always "USE THE CAD"!! We have a very sophisticated CAD system that allows inter-agency communication; standing up and yelling "across the wall" is the least efficient way to accomplish our objectives (generally speaking, most individuals are already performing at least 1 other task, so person to person communication can easily be missed). In addition, I believe that "in a perfect world" EMS would defer to Fire Dispatch on call types that involve multi-unit responses (for example: wilderness rescues, water rescues, vehicle rescues). Fire Dept call takers should have the opportunity to triage calls that involve that kind of escalated response (5+ vehicles driving code 3 through the City). Often EMS believes they know how Fire would "type" the call, and don't conference Fire call takers into the call.
Better the system in having only Fire set Fire Call types.

Question #11: Is there any additional information you feel is important to this study you would like to share?
More joint training between the agencies.
When you look at the call volume and what we actually do we do a much larger amount of call processing and obtain a lot more information. There are times we have crews on scene of a “fire” incident and fire dispatch has quit monitoring the channel. The whole reason ems goes to a firecom on collisions is because of our work load on EMS channels. Does it really hurt them to listen to the channels? That’s their job.
EMS is very process driven and are very attentive to radio traffic from EMS and Fire crews; AFD is not. It seems that if AFD does not have to do something, they won't even if it is related to the safety of citizens or responders. Often, EMS crews who are on the AFD radio channels cannot get a fire dispatcher to talk to them if EMS does not use specific terminology or if the fire crew has requested the channel no longer be monitored. EMS has to then switch over to the EMS channel to get the information and resources they need. Examples are requesting police for active or potential violence against medics AFD is unwilling to break tradition for the sake of improvement. AFD leadership is a revolving door based solely on promotional opportunities. EMS Communications is staffed with people who want to work in EMS Communications. AFD dispatch is staffed with people who want a 24/72 schedule, have other interests, or who have promoted into the only available spot in order to not be passed over and who will transfer out when the next available fire combat position becomes available. EMS Communications has a staff dedicated to the mission of assisting the public through telephone triage and treatment. AFD dispatch has a staff dedicated to convenience.
The increasing cost of living in the greater Austin area including but not limited to all of travis county, hays county and surrounding counties is making it impossible for the folks who serve and have a passion to help Travis County residents, buy a house and live here. Commutes are becoming longer not due to traffic but because medics are having to drive 45-90 minutes, if not more, just to get to work. After shift, we are tired and stressed driving one or two counties over. Our pay does not make it practical to live anywhere near the area that we serve and will eventually force us to seek employment elsewhere. Increased pay would increase staff retention and attract more staffing which has a multitude of other benefits associated with it Austin EMS does not train for catastrophic failure in the comm center by utilizing the backup center regularly. We also do not practice using the SAEMS switch, and call taking for them, vise versa.
Only one improvement off the list above. AFD has done a great job with enhancements listed above. New chairs ordered, Transfers work with all agencies, Workstations have already been reconfigured, Work schedule is perfect-This is a driving factor in why so many on the fire side have stayed at dispatch for so long. Back Up center matches our CTECC configuration. (We train at the BUC regularity).
Please upgrade our chairs. I still love my job but these chairs are unbearably uncomfortable. They're worse than the ones at Goodwill. I was told there isn't enough funding for new chairs. Some chairs are 10 years old. If it were appropriate to start a GoFundMe for CTECC or the City of Austin for better chairs, I would.
The academy is to long, the clearing process is to long.
While I understand we work in a busy system, I think it is equally as important that the department take home life and mental health into consideration. If not taken into consideration, the quick turn over in staffing is going to continue and short staffing on every shift is going to continue.
A more relaxed uniform for comm could help with moral. It’s simple, cheap and we relish in few opportunities we get to wear tshirts.
Our new phone system is horrible without the legs you could see before .. you never know if anyone is on the line if apd has the call ….etc ...please do not hesitate to contact me if you need more of my sagely advice.. Dena
EMS needs more calltakers and dispatchers during the day, especially as we still handle collisions and falls/lift assists
It feels like we are drowning in call volume with no relief or life preserver in sight.
Fire Dispatch is an extremely cohesive group of individuals willing to go above and beyond to offer exceptional service to our internal and external customers. After all these years, I am still impressed by the professionalism and commitment our members show to this often tiresome and thankless job. We appreciate all the support we have for the highly technical systems we rely on daily, as well as for the facility team that is responsive and provides a clean, well maintained facility for our use.
More people are absolutely necessary. Two more dispatchers, and 4 shift captains over each shift. The amount of dispatchers a Lieutenant must monitor, along with answering the dispatch phone and managing that aspect, does not allow proper management. The Lieutenant is already doing a Captain level job and is also monitoring way too many people (span of control unmanageable).

APPENDIX E: PUBLIC INPUT SURVEY - IMPROVING EMERGENCY MEDICAL SERVICES RESPONSE IN THE CITY OF AUSTIN/TRAVIS COUNTY

Survey Contents

Surveys were developed in English, Spanish, Vietnamese, Traditional Chinese, and Simple Chinese.

English Survey

1. How long have you been a resident of the City of Austin/Travis County? *

- ◯ 1-5 years
- ◯ 6-10 years
- ◯ 11-20 years
- ◯ 20+ years
- ◯ I am not a City of Austin/Travis County Resident

2. Enter your zip code: *

3. Have you ever called 9-1-1 for a medical emergency? *

- ◯ Yes
- ◯ No

4. Provide your opinion on how long it took medical assistance to arrive: *

- ◯ Arrived sooner than expected
- ◯ Arrived at the time I expected
- ◯ Arrived later than expected

5. How would you rate the overall QUALITY of emergency medical services provided in the City of Austin/Travis County? *

	Excellent	Average	Fair	Poor	N/A
Fire Department	◯	◯	◯	◯	◯

Ambulance/Emergency Medical Services	○	○	○	○	○

6. What are your expectations for how long it takes for medical assistance to arrive after calling 9-1-1? *

- ○ 4-6 minutes
- ○ 7-10 minutes
- ○ 11-20 minutes
- ○ 20-30 minutes
- ○ 30 minutes or more

7. We want to understand how you access health care. When you need medical care for an unexpected condition, where do you seek care? (select all that apply) *

- ☐ My primary doctor
- ☐ Urgent Care Clinic
- ☐ Hospital Emergency Department
- ☐ Community Clinic
- ☐ None
- ☐ Other

8. If you need medical care, how do you get there? (select all that apply) *

- ☐ My own car
- ☐ Public Transportation (Capital Metro Bus)
- ☐ Friend/Family
- ☐ MetroAccess/Paratransit
- ☐ I don't have access to transportation
- ☐ Call 9-1-1
- ☐ Other

9. Select the type(s) of care that would be acceptable if after calling 9-1-1, emergency medical services personnel determined that your situation is not life threatening (select all that apply): *

- [ ] Assessment of my medical situation and advice or referral for further care
- [ ] Treatment on-site (no transport to the hospital)
- [ ] Treatment at a hospital emergency room
- [ ] Alternative treatment center (urgent care, clinic)

10. Select the age groups that best describe the people living in your home (check all that apply): *

- [ ] 0-5 years old
- [ ] 6-18 years old
- [ ] 19-49 years old
- [ ] 50-64 years old
- [ ] 65 or over

11. Is there anyone in your household that has disabilities? *

- ○ Yes
- ○ No

12. What race/ethnicity best describes you? *

- ○ White - Anglo (non-Hispanic)
- ○ African American (non-Hispanic)
- ○ Hispanic - Latino
- ○ Asian (non-Hispanic)
- ○ American Indian (non-Hispanic)
- ○ Other (non-Hispanic)
- ○ Multi-Racial (non-Hispanic)
- ○ Prefer not to answer

13. How would you describe your gender? *

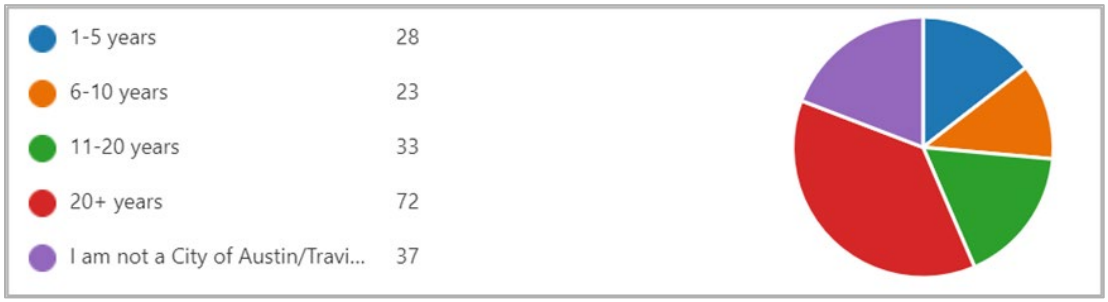
- ○ Female
- ○ Male
- ○ Non-binary
- ○ Other/Prefer to Self-Identify
- ○ Prefer not to answer

14. Please enter any feedback or concerns you'd like to share about the emergency medical services provided in the City of Austin/Travis County.

Survey Results and Feedback

A total of 193 individuals responded to the public input survey. 37 respondents were not residents of the City of Austin nor Travis County and were, therefore, unable to complete the rest of the survey. A total of 156 responses were collected and most respondents have been residents for more than ten years.

Length of time that respondents have lived in Austin/Travis County

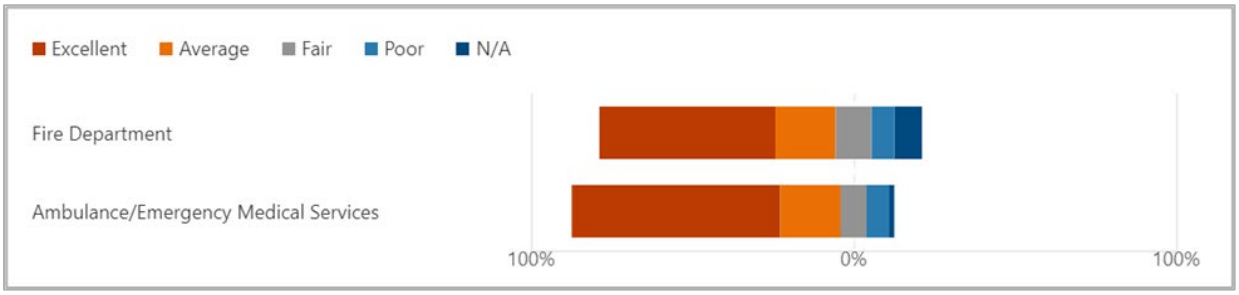


Of the 156 respondents, 46**%** have called 911 in the past for a medical emergency. Those who have called 911 were asked questions about timeliness and quality of care, while those who have never called 911 were asked about their expectations of timeliness. The graphic below shows respondent's perceptions of how long it took medical assistance to arrive after calling 911. More than half of respondents who had called 911 stated that medical assistance arrived on time and 32% responded that assistance arrived sooner than expected.

How long did it take medical assistance to arrive?

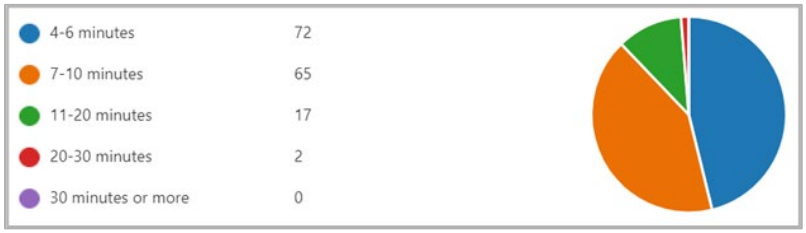
The survey also asked respondents to rate the quality of services received. Results indicate that 54.9% of respondents gave the fire department "excellent" quality ratings, while 64.8% of respondents gave the EMS department "excellent" quality ratings. 7% of respondents gave the fire and EMS respondents "poor" quality ratings.

Rate the QUALITY of EMS services provided



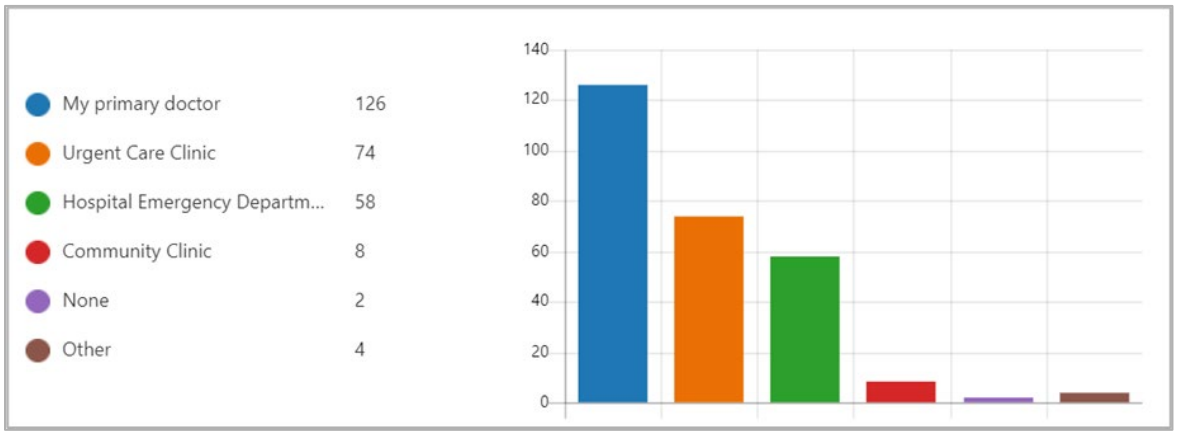
Respondents who have received emergency medical services provided by the City were asked to share their expectations of how long it takes medical assistance to arrive after calling 911. The graphic below shows a breakdown of the public's expectation for response times.

Public expectations for emergency medical response times



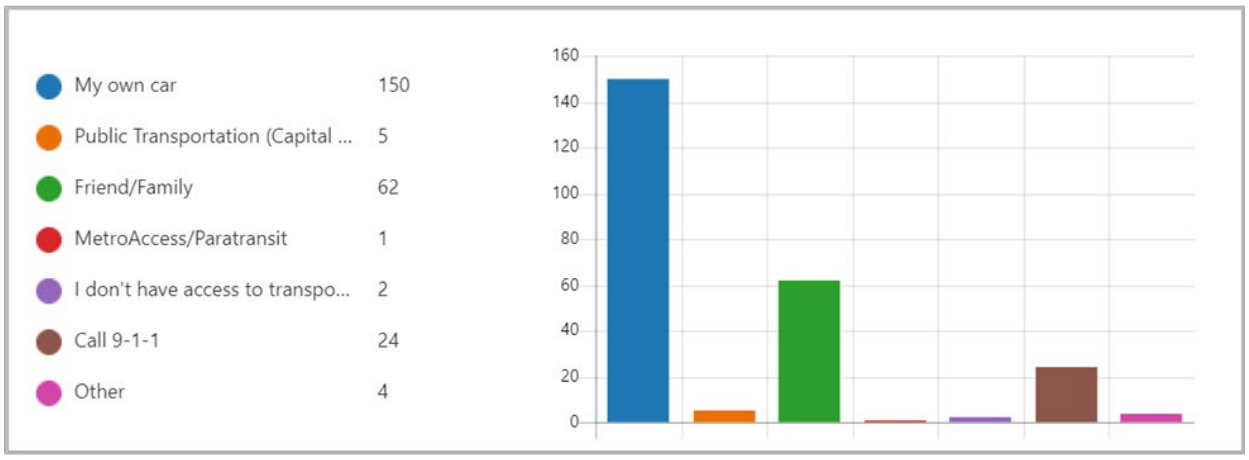
PCG also wanted to understand how and where residents in the City of Austin and Travis County seek care when they have a medical need or unexpected condition. When given a list of choices to select from, 126 respondents indicated going to their primary doctor for an unexpected medical condition. Notably, 74 respondents indicated going to an urgent care clinic, and 58 respondents indicated going to the hospital emergency department. Respondents were urged to select all options that applied to them.

Where respondents Seek Care for an Unexpected Medical Condition



The survey also asked about the transportation method(s) respondents use when seeking medical care.

Transportation Method(s) when Seeking Medical Care



Respondents were also asked what types of care were acceptable if their situation was deemed non-life-threatening to better understand the public's perception and comfort level with alternative treatment options and destinations. Respondents were encouraged to select all applicable choices:

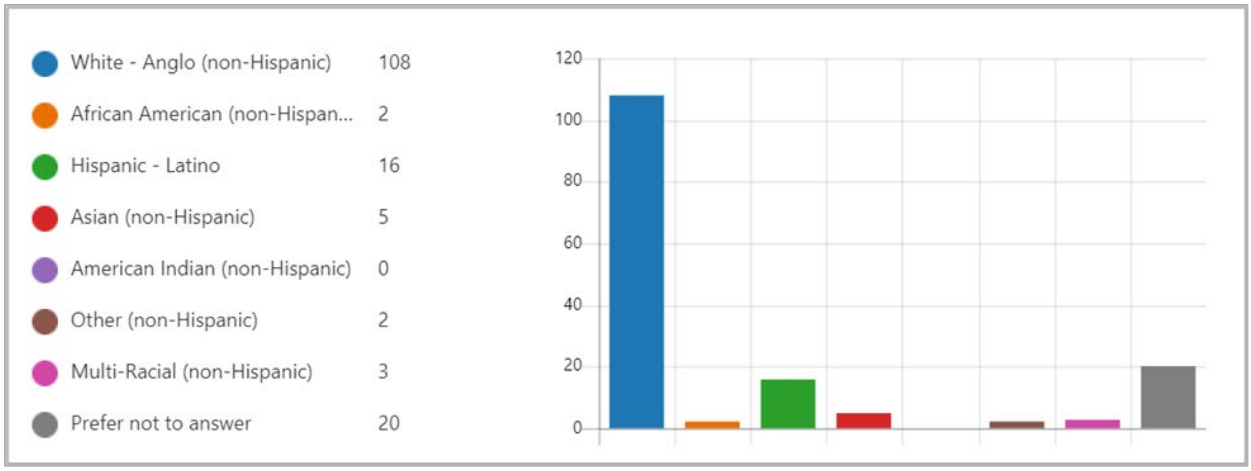
- Assessment of my medical situation and advice or referral for further care.

- Treatment on-site with no transport to the hospital.
- Treatment at an alternative treatment center such as an urgent care or clinic.
- Treatment at a hospital emergency room.

Acceptable Types of Care for Non-Life-Threatening conditions

The survey also collected demographic and zip code information in hopes of evaluating equity in emergency response by taking into consideration race/ethnicity and other demographic factors. Another important component was gaining insight into health care access and challenges for disadvantaged communities. Due to the low response rate, the PCG team was unable to draw meaningful conclusions regarding emergency medical response and racial disparities. Demographic data is provided below to give an overview of respondent characteristics. Of all respondents, 21% had individuals with disabilities living in their households. The graphic below shows the racial/ethnic background of respondents. A large majority of respondents (108) respondents were White-Anglo, non-Hispanic. Additionally, 83 respondents identified as female, 59 respondents identified as male, 1 respondent identified as non-binary, and 13 respondents preferred not to answer the question about their gender identification.

Racial/Ethnic Background of Respondents



The last question of the survey provided respondents with an opportunity to share their feedback about the emergency medical services provided in the City of Austin/Travis County. A list of comments received is documented on the pages that follow.

Question 14: Please enter any feedback or concerns you'd like to share about the emergency medical services provided in the City of Austin/Travis County:
Better Triage
Stop rushing through the questions for people that are calling because they don't know what kind of help they need. If someone is unconscious you can figure it out pretty quick but if someone is awake, breathing, and scared/doesn't know what to do, find out enough info to help them figure out if they even need an ambulance at

Question 14: Please enter any feedback or concerns you'd like to share about the emergency medical services provided in the City of Austin/Travis County:
all. We don't need ambulances screaming down the road to give someone advice when another resource or even a slower response would be just as safe, but this obsession with getting an ambulance started in seconds for EVERY call wastes resources and wastes the time that could be used to find out what's wrong and who actually can help. Maybe a crisis counselor could help more than paramedics who aren't trained in crisis deescalation. Maybe an urgent care nearby they didn't think about going to is a better visit for their small cut that has bleeding controlled. Maybe, we should wait until the calltaking software says to dispatch a resource instead of sending it within seconds on EVERYTHING. Having resources like a crisis counselor on the phone means nothing if it takes 7 minutes to finish all the questions and by then an ambulance or police are there and transferring the caller to that counselor only for the firefighters or paramedics or police to tell them to hang up on the one person that could actually assess and help treat their non-life threatening mental health crisis. You'll never see changes in outcomes for these newfangled programs if you refuse to change the response times that calltakers are held to as part of their performance. NOT EVERY CALL NEEDS AN AMBULANCE LIGHTS AND SIRENS, but it takes more than 45 seconds to figure out what non-critical calls might need. You can keep ambulance response times low by tacking on more seconds to the calltaking time, holding non-critical calls until triage is complete to assign the most appropriate resource. Stop asking calltakers to say "an ambulance has been on the way since you gave us the address" because not every call needs an ambulance that fast. Instead educate the public on the different resources that might be useful and let them know that critical calls will still go out immediately and non-critical calls will take a few more seconds or a minute or so to figure out which resource is needed. The change has to start with the calltaking too, not just with the field response.
ATCEMS is the best! High quality providers. If I ever have to call 9-1-1 I know it starts with amazing medics in the communication center!
ATCEMS rocks!!!!! They need a substantial pay raise and 12 hour shifts, not 24s!
You are trusted the same as police...not much. We love firemen, not cold 911/311 operators or insane transport costs to use emergency services.
I do not have a car and over 65 living alone. So if I have a health emergency I am dependent on calling 911 sometimes. It is expensive but there is no other options sometimes - especially in the middle of the night.
I think Austin would benefit greatly from having more non-transport first responder units for non-life threatening calls and calls such as homeless people sleeping in the open where the caller was "just driving by" or doesn't want to approach to see if they're in distress or not.
I've never needed them but friends have. It seems there's areas that are better covered than others, and the City/County should make it more equitable for Paramedic responses times.
Continue improving response time
Fd is good but I want a Paramedic
ATCEMS needs more trucks!
ATCEMS responds to entirely too many non-emergencies placing both the paramedics and public at risk by driving lights and sirens to ailments that do not require a 911 paramedic ambulance. The dispatch matrix and protocols for which an ambulance is sent on needs to be seriously reviewed and modified. In many cases, the closest ambulance is unavailable for a real emergency because they are tied up on the homeless drunk at the bus stop.
Ambulances should be utilized for emergencies only. A paramedic and an Emt should not be responding to basic calls, keep them available for real emergencies and please don't burn them out on basic calls that can be handled by a separate bls unit.
Very good folks. Only used once but they were quick and thorough
Your poor employees clearly are overworked compared to other areas. They must be protected.
Having never had to use EMS for an emergency, I am not sure what is reasonable in terms of how long it should take for them to get here. I was torn between 7-10 min. and 11-20. I checked 7-10 based on if, for instance, someone was having a heart attack.
EMS providers require the training, equipment, compensation, safety, and leadership to effectively and efficiently execute the expectations of their employers and the public.
I would be strongly in favor of separating 9-1-1 from APD, letting a trained dispatcher decide which agencies should respond. Many 9-1-1 calls do not warrant a police response, yet the police always show up because APD runs 9-1-1. A well-trained dispatcher should be able to determine what resources each call requires--be it fire, medical, mental health, or police. We should spend more money training dispatchers to ensure that they know how best to respond quickly to deploy appropriate resources to every call. If I call 9-1-1 because someone in my home is having a mental health crisis, I DO NOT WANT APD to respond at all. I want a medical person well trained in dealing with mental health crises to respond, and all I want that person to be armed with is knowledge and medical equipment.
I would appreciate an initial assessment that didn't automatically take me to an emergency room! Thinking that that's the default is a barrier to calling for help.

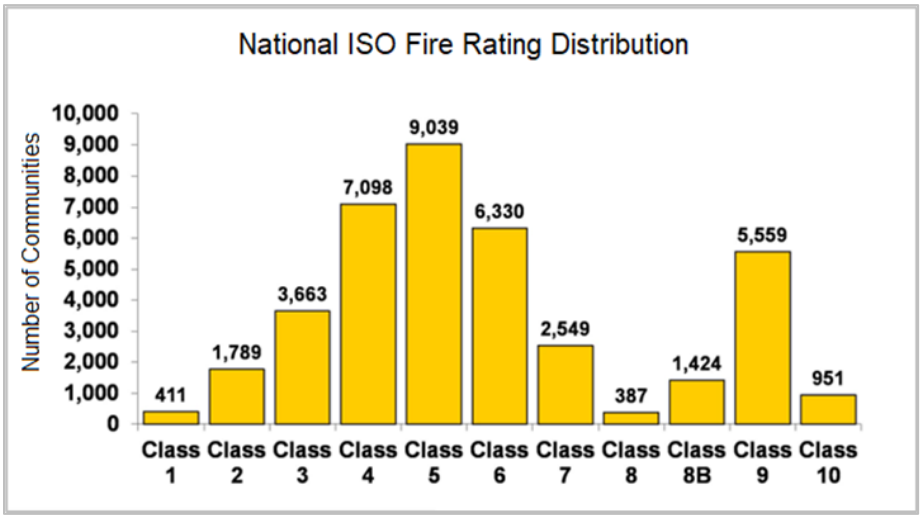
Question 14: Please enter any feedback or concerns you'd like to share about the emergency medical services provided in the City of Austin/Travis County:
How are ambulance charges developed. By distance or time? Austin is now a metro city, and the closet hospital may not be the quickest hospital to get to. For example, at 5pm, it is quicker to get to Kyle than it is to get to South Austin hospital. But Austin/Travis EMS says a person with a possible heart issue must go to South Austin even though it will take 30 minutes where Kyle Seton only takes 8 to 10 minutes. Golden Hour is taken away by rules?
Until we have universal healthcare, always keep cost in mind. These emergencies can devastate individuals and families financial position for life (in addition to long-term medical repercussions). Unfortunately we may need to see you as our first resource in addition to first responder. Maybe if the city could help families preplan for emergencies, this would take a burden off of responders. Obv not EMS' problem or duty but it's a scary part of the equation for the patients.
EMS should consider medical squads like the Commanders trucks as first response then request full service ambulances as needed while treatment is being provided. I see the full service units responding constantly and can understand burnout with minor calls. Using AFD is an option for first response works but is a 2.5 million dollar Fire Department apparatus the best choice for sick calls considering tight neighborhoods. Maybe AFD squads or brush trucks as first responders that can also respond to collisions on IH35 easier with heavy traffic. Your people are great but there needs to be more of them.
Love ATCEMS, y'all need more funding
My experience with Austin-Travis County EMS has always been excellent. They've always been professional, caring, compassionate and considerate of my families needs. As for the other responding Public Safety agencies that have also responded for our calls for assistance, they are far less than desired.
HOPEFULLY ANY CARDIAC OR BREATHING EMERGENCY IS WITHIN THREE MINUTES OF A FIRE DEPT RESPONSE
Very professional.
With the growth of the city, I don’t think the emergency services can keep up. There aren’t enough fire and police.
ATCEMS has been fantastic to my family. Over the past few years, they have been to my parents’ home to treat my Dad on at least a couple of occasions. They arrived in a timely manner, were professional, and compassionate. I am a native Austinite and feel very fortunate to have this agency with these top notch paramedics in this city/county.
2007 was when I called them and they were very quick. I would guess they wouldn’t be as quick today.
The emergency medical services are helpful in a community and their services are appreciated.
I live very close to the fire station/EMS on Braker next to McBee Elementary. I have been very pleased with care when I recently fell and needed to be assisted to get up and taken to NAMC.
Good service from caring people - we appreciate it!
Takes very long. Charge highway robbery fees, too expensive
EMS needs more ambulances
Since we live in the farthest east area of Travis County, we do have concerns on how long the response time would be for an ambulance to reach us in the Elm Creek subdivision (Elgin) for a life threatening condition. Luckily, we have not needed any emergency services, but at 75 years of age, it well may be in our future!
Way too expensive. An EMS charge is the only debt I have, thousands in the whole for a life threatening emergency while i was a college student.
Every emergency medical service provider is important and valuable to our community. Thank you for being there for us.
The County was great. Less than 3 minutes for a disturbance call. The City is TERRIBLE. Westlake Fire was and is GREAT. AFD, not so much.
Lights are not fitted with strobe sensors to allow emergency vehicles to trigger lights but the busses have them?
We need to be able to receive referrals to emergency mental health services when calling 9-1-1 for a mental health emergency instead of being referred to an emergency room or for police assistance.
Overworked and underpaid. They are the best and we are so fortunate to have them.
They’ve always been very responsive when I’ve called and needed them which has only been three times in 20 years. Great job!
Too many patients come to the ER for non-emergency problems
i support efforts to deter and redirect non urgent calls on these services. they should be reserved for more serious medical and other life threatening conditions, for assessment, and transport to appropriate level services.
I filled this out for my Human service agency. We represent on any given day about 20 young adults. When EMS is good they’re quite good. But when they’re bad they’re extremely bad. Direct quote one day they were very bad: “what shit show are we here for” in response to a suicidal mental health call. They were at least 10 emergency personnel on site and not a single one of them called out the person in uniform who stated this. Much more training is necessary to serve the public that was exhibited that day. For the longest time it was city policy

Question 14: Please enter any feedback or concerns you'd like to share about the emergency medical services provided in the City of Austin/Travis County:
to send to EMS, fire, and police to every single emergency. I would like to not see a return to that policy. I applied and want to keep the triage 911 regarding mental health. Once upon a time in Austin you could request mental health deputies. Now it is claimed that every officer is trained for this but I can tell you for certain that is not true and the quality of mental health calls was severely be graded.
I do not have clear understanding of expected out of pocket billing/costs for accessing emergency medical services, which makes me reluctant to use EMS.
Ems has enough ambulances
With growth in the suburban areas more ambulance stations are needed on the outskirts and in the county. With vertical growth downtown, more staffing is needed but not necessarily ambulances due to the non emergent nature of many 911 calls.
EMS needs better funding and to stop transporting bums
I am deeply concerned about the fatigue, stress, mandatory overtime, imbalance of home vs work time faced by the EMS employees. I see it as a driver of a high turnover rate, causing the treatment I may need to be delivered by a less experienced, fatigued, stressed out medic.
Merge EMS with AFD. The admin and support services are complete duplications of each other.
For ever yrs EMS has concentrated on “cool” stuff and not comprehensive clinical care. Over priced ambulances, drone air craft, too many managers and chiefs, staff who looses driver lic or paramedic lic are not terminated but moved to desk jobs. FD wants EMS but they are not interested in high quality medical care.
If you want to provide exceptional service you need to start treating your staff exceptionally well

APPENDIX F: ISO AND NFPA STANDARDS

Insurance Services Office (ISO) and National Fire Protection Association (NFPA) Standards – Austin Fire Department

The Austin Fire Department has a Public Protection Classification (PPC) rating of 1 from the Insurance Services Office (ISO), which is the highest rating a fire department can receive. There are 14 fire departments in Texas and only 411 fire departments in the U.S. that have achieved this rating.



National ISO Fire Rating Distribution. Source: ISO Website

What does an ISO Class-1 rating mean? It means that property owners of residential occupancies and businesses of all types pay the most favorable premium rates for annual property or "fire" insurance.

How does ISO make this determination? ISO uses an assessment tool called the Fire Suppression Rating Schedule (FSRS) to determine a fire departments PPC rating. FSRS ratings range on a scale of 1 through 10, with PPC-1 being the superior or best rating a community can receive and a PPC-10 being the lowest. ISO calculates the FSRS on a point system scale of 0 to 105.5. This point scale examines four primary areas to reach its final rate classification, which are:

- **Emergency Communications** *(Standard for processing 911 calls and notification of fire personnel)*
- **Fire Department** *(Staffing, Resource Deployment, Apparatus/Equipment and Training)*
- **Water Supply** *(Does the water purveyor have and maintain a system that can provide sufficient water for the most extreme fire potential in a community and the presence of and spacing of fire hydrants within the community?)*
- **Community Risk Reduction** *(The department's ability to recognize, categorize, and initiate program(s) to minimize the most common types of emergencies in a community such as kitchen fires, elderly fall injuries, child drownings, etc.)*

NFPA 1221: Emergency Communications

A maximum of 10 points of a community's overall rating is based on how well the 911 communications center receives, processes, and dispatches emergency incidents. The rating criteria used by the ISO field representative that grades fire departments strictly follow the *National Fire Protection Association (NFPA) 1221: Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems* and assess the following criteria derived from the standard:

- The emergency reporting system (Phone lines, type, and capacity)
- The Communications Center, including the number of Call Takers and Dispatchers
- Computer Aided Dispatch (CAD) facilities and backup capabilities.
- Dispatch circuits and alerting systems that notifies firefighters as to the location of the emergency.

NFPA 1221 establishes standards for how quickly 911 calls must be answered, how quickly 911 calls are processed by call takers, and how quickly response fire companies must be dispatched. *NFPA 1221* also sets standards for how quickly firefighters must react and begin their response to emergencies, known as "Turnout Time." There are set turnout times for day-time hours and set times for night-time hours as well as variances for fire versus EMS calls.

PCG consultants thoroughly reviewed the City of Austin's City Auditor report on the 911 communications center (CTECC) which played a contributing role with issuing the RFP to study *Dispatch Equity and Optimization*. The City Auditor report made no reference to AFD as an ISO Class-1 department, nor did they reference the fact that CTECC and the AFD component received a score of **9.99** out of a total possible score of 10 as a key performance measure for the ISO PPC rating. Previous scoring for the Emergency Communications component were an **8.21** score in 1985 resulting in an ISO Class 3 rating and a **9.16** score in 1997 for an ISO Class 2 rating. This scoring by ISO reflects a continual improvement in the processing and dispatching of 911 emergency calls by AFD over the preceding 33 years. PCG considers the omission of this information a deficiency in the City Auditor report that bears mentioning.

Fire Department

A maximum of 50 points of a community's overall rating is based on the fire department itself. ISO field representatives review the following criteria:

- The distribution of fire companies (fire engines, ladder trucks, and specialty apparatus) throughout the community. Response areas for fire engines are 1.5 linear highway miles travel distance and 3.0 linear highways miles travel distance for ladder trucks.
- All fire apparatus equipped with a fire pump must be tested annually and pass in accordance with *NFPA 1901: Standard for Automotive Fire Apparatus* and *NFPA 1911: Standard for the Inspections, Maintenance, Testing and Retirement of In-Service Automotive Fire Apparatus.*
- The number of firefighters staffing each type of fire apparatus in compliance with *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*
- Standard of equipment carried on each type of fire apparatus (Standardized Equipment List) which includes the testing and maintenance of all equipment in accordance with *NFPA 1911: Standard for the Inspections, Maintenance, Testing and Retirement of In-Service Automotive Fire Apparatus* and *NFPA 1915: Standard for Fire Apparatus Preventative Maintenance Program.*
- The extent of training each firefighter receives annually according to the NFPA standard for their respective position. (240-hours of training annually for all line/uniformed personnel with fire officers receiving an additional 24-hours of training annually).

NFPA 1710: Minimum Staffing and Response Times

One of the key benchmarks of any fire department is the *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*. The *NFPA 1710* standard is based upon a combination of accepted practices and more than 30 years of study, research, testing, and validation. *NFPA 1710* defines minimum staffing levels and response times for fire companies, initial full alarm response levels, and extra alarm response levels for municipal fire and emergency medical services apparatus.

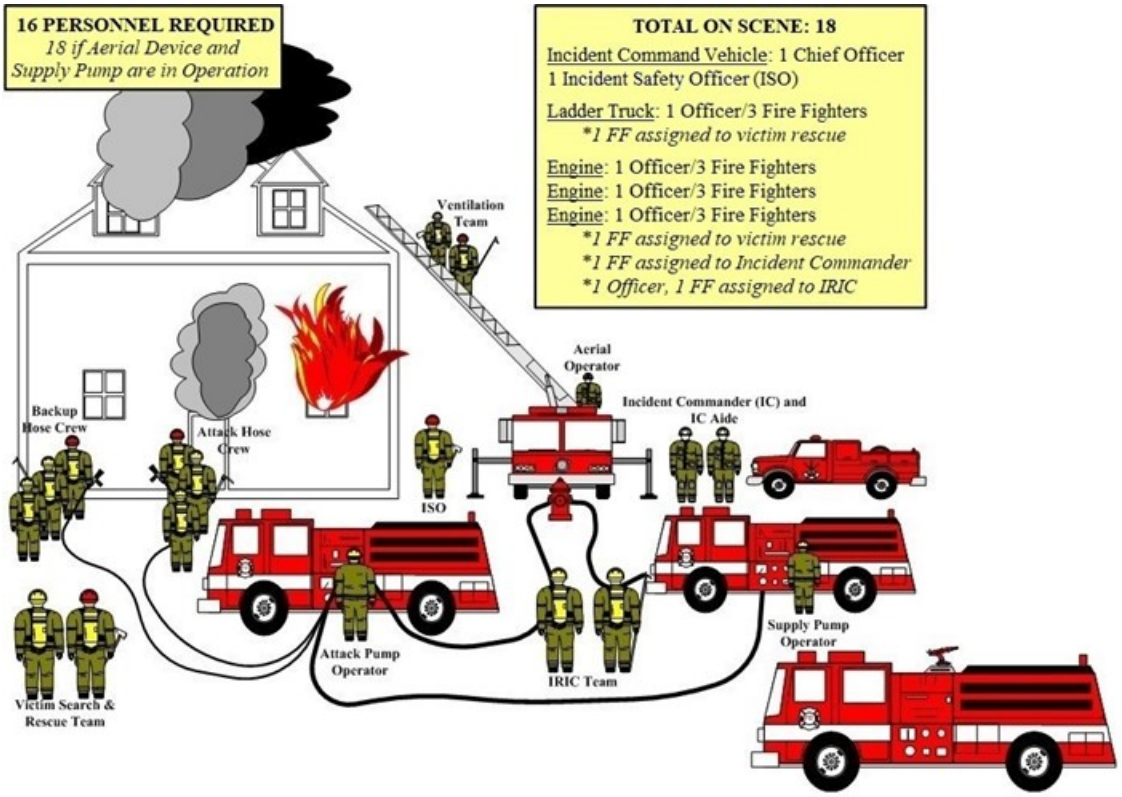
The standard also defines minimum response times to an emergency and minimum fire company and EMS staffing levels. For municipal fire departments, *NFPA 1710* calls for fire companies to be staffed with a minimum of four on-duty personnel. "Companies" are defined as groups of members (engine companies, ladder companies, squads, etc.) "operating with one piece of fire apparatus except where multiple

apparatus are assigned that are dispatched and arrive together, are continuously operated together, and are managed by a single company officer." In addition, *NFPA 1710* requires five to six personnel to staff fire apparatus in a "hazardous" or "high-risk" area such as high-rise office buildings or chemical processing/manufacturing plants. The response time objectives for fire suppression, EMS response, and other operations are:

- Turnout time (the period between the time firefighters are notified of an emergency and the time they begin response): **1 minute for day-time and 1.5 minutes for night-time**
- Arrival of first engine company at a fire: **4 minutes (travel time)**
- Deployment of a full first alarm assignment at a fire scene: **8 minutes**
- Arrival of EMS first responder: **4 minutes**
- Arrival of advanced life support unit at an EMS incident: **8 minutes**

In addition to these time intervals, call processing time is added to the overall response time. Call processing should be accomplished in **one minute or less 90% of the time**.

The graphic below depicts what a *NFPA 1710* deployment model is for a typical residential structure fire:



NFPA 1710 Staffing Configuration

The Austin Fire department exceeds the response requirements in *NFPA 1710* to each of the alarm response classifications. By example, the figure above shows the recommended number of personnel and apparatus to a typical residential structure fire as being:

- Three engine companies each staffed with four personnel
- One aerial/ladder company staffed with four personnel
- One Chief Officer with one staff aid to serve as Incident Commander*

*****_There are two positions on the Fire Ground, Hazardous Materials, and Confined Space Rescue Incidents that are required by law under the guidelines set by the Occupational Health and Safety Administration (OSHA) under Title 29 CFR-1910. These positions are_ ***Incident Commander*** _and_ ***Incident Safety Officer.***

AFD responds to these types of incidents and complies with the OSHA requirement with the following resources:

- Four engine companies each staffed with four personnel
- Two aerial/ladder companies staffed with four personnel
- One heavy rescue company staffed with four personnel
- Two Battalion Chief Officers Incident Command positions
- One Incident Safety Officer
- Total responders to a structure fire consist of 31 total personnel on scene

Whereas *NFPA 1710* calls for **18** personnel to a residential structure fire, AFD responds with **31** personnel to the same classification of incident. This level of response commitment directly relates to greater firefighter safety at an incident, improved results with regards to confinement and containment of the fire to room of origin, extinguishment of the fire prior to the most hazardous condition on the fire ground, and also greatly reduces the potential for civilian loss of life. This assessment can be validated by the fact that there were only three civilian fire fatalities in Austin for the 2020 reporting period. This is an unusually low number for a city of size of Austin.

ISO awarded AFD with a score of **43.88** out of a maximum score of **50** points. Previous scoring for the Fire Department components were a 1985 score of **33.30** resulting in an ISO Class 3 rating and a 1997 score of **38.28** for an ISO Class 2 rating. This scoring by ISO reflects a continual improvement in the operations, resource deployment, staffing, and training provided by AFD over the preceding 33 years.

Water Supply

A maximum of 40 points of the overall score is based on the community's water supply system. Many citizens simply do not realize that the water supply to their home comes from the same systems firefighters use for fighting fires in the community. This impacts the system in two equal cause and effect ways. If there is a large fire requiring multiple fire hydrants to be used and flowing, then residents in the area of the fire are going to experience decreases in both volume and pressure of water coming from their taps. Conversely, if there are considerable residents using water in their homes simultaneously and a fire breaks out, then this could impact the fire department's ability to have sufficient water supply to combat the fire, resulting in greater damage to the structure and its contents by the fire. ISO field representatives look at the following:

- Number of fire hydrants and the spacing distance between hydrants (Hydrants which are 300' apart receive the highest score. Hydrants that are 1,000' apart or greater receive the lowest score.)
- Inspection and testing of fire hydrants (This should be performed once annually, and records must be kept for each and every hydrant. Hydrants should be color-coded based on Gallon Per Minute GPM flow capacity in accordance with *NFPA 291: Standard Recommended Practice for Fire Flow Testing and Marking of Fire Hydrants*.)

ISO awarded the City of Austin with a score of **36.28** out of a maximum score of **40** points. Previous scoring for the Water Supply component were a 1985 score of **34.47** resulting in an ISO Class 3 rating and a 1997 score of **34.65** for an ISO Class 2 rating. This scoring by ISO reflects a continual improvement in the ability of the City of Austin to provide sufficient domestic water supply over the preceding 33 years.

Community Risk Reduction

The Community Risk Reduction component of the FSRS offers a maximum of **5.5** points to the community PPC rating in all states with the exception of Texas, which has a maximum point rating of **6.5**. This component of the ISO rating is a relatively new addition to the rating process. Previous ISO PPC ratings could receive a maximum score of 100. However, ISO realized that it should provide some benefit to communities who were taking proactive measures to address specific life safety hazards in their communities. Texas is somewhat unique in that the State Fire Marshal falls under the Texas Department of Insurance rather than a state fire agency such as California, (California Department of Forestry and Fire Protection or CalFire) or as is the case in most states, the State Fire Marshal (a division within the State

Police). Accordingly, ISO uses the "Texas Addendum" to rate the following Community Risk Reduction Programs:

- Code Enforcement (This is typically known in most communities by business and owners of multi-family dwellings as a "fire inspection." In most states, occupancies that fall under the provisions of the Fire and Life Safety Code, *NFPA 101*, must be inspected at least once annually.)
- Public Fire Safety Education (These programs are designed to target specific audiences such as children and the elderly but can also focus on special needs populations and impoverished areas of the community.)
- Fire Investigations (Also known by their commonly used name "Arson Investigators." These highly specialized, highly trained firefighters are tasked with employing scientific methods and processes to determine both the cause and origin of a fire. They determine if the fire was accidental or if an individual deliberately set the fire. Because they perform this function, most are sworn peace officers, carry side arms, and have the power to arrest persons just as police officers do.)

ISO awarded AFD with a score of **5.10** out of a maximum score of **6.5** points. Previous scoring for the Community Risk Reduction Program component were a 1985 score of **3.5** resulting in an ISO Class 3 rating and a 1997 score of **4.0** for an ISO Class 2 rating. This scoring by ISO reflects a continual improvement in the ability of the City of Austin to provide sufficient risk reduction over the preceding 33 years.

Progression of the ISO classification for the Austin Fire Department over the past 33 years are shown in the chart below:

Year	Score	ISO Class
1985	75.48	3
1997	84.07	2
2016	94.66	1

Training of Personnel:

Training for all AFD personnel begins with the entry-level fire academy when they are hired. Like many departments, this is an arduous process for newly hired firefighters that lasts 6.5 months. During the academy, recruits learn all the apprentice-level skills of firefighting as spelled out in *NFPA 1001: Standard for Firefighter Professional Qualifications.* According to the AFD Chief of Training, recruits must pass all the required skills examinations. If they are unable to successfully pass the skills test after remediation and retesting, then the recruit is dropped from the academy. Once a recruit passes and graduates from the academy, they have 5.5 months remaining of their civil service probationary period. Probationary firefighters are assigned to a training company officer who is responsible for refining skills learned in the academy. The probationary firefighter must again pass all of the mandatory skills tests to successfully complete probation. By the end of this first year the new firefighter can be certified by the Texas Commission on Fire Protection as a Firefighter-I and II.

As an ISO Class-I fire department, AFD personnel must complete no less than **240 hours** of training annually per member, with company and chief level officers requiring an additional **24 hours** of training as spelled out in *NFPA 1021: Standard for Fire Officer Professional Qualifications*. This equates to 20 hours of training per month and typically, two hours of training each 24-hour shift a firefighter works. The number set by ISO is derived from NFPA standards as well as OSHA standards that include Hazardous Materials (24 hours annually), Confined Space (16 hours), Respiratory Protection (16 hours), and Bloodborne Pathogens (4 hours). The ISO training also excludes training required for Emergency Medical Technician (EMT). Hours of continuing education for EMS training averages 24 hours annually or 48 hours for a two-year certification period. In Texas however, the recertification period is every five years.

AFD has established a continuing education process that uses "Training Modules" with differing topics each month. This program includes a combination of skills-based task testing and didactic sessions each month.

AFD has a fully dedicated training staff but the department opts to capitalize on subject matter expertise from the rank-and-file line personnel. This means that personnel assigned to the training division are used more for the logistics of setting up and coordinating training sessions than providing or instructing the training sessions. In an interview with the IAFF Local Union President, he stated that there is a clause in the Memorandum of Understanding (MOU) that members must successfully pass all skills testing to continue employment.

In various interviews with officers from AFD at all levels they stressed the importance AFD places on firefighter safety. In April of 2010, the National Institute for Standards and Testing (NIST) worked in partnership with the International Association of Firefighter's (IAFF), the International Association of Fire Chief's (IAFC), and the National Institute for Occupational Health and Safety (NIOSH) to conduct a series of tests based on standard firefighting operations at various occupancy types such as residential and commercial.

The overall operation was broken down into fireground evolutions and each evolution was broken down into a set of tasks. The study evaluated these tasks performed by two-, three-, four-, and five-member companies separately to assess effectiveness, efficiency, and safety as well as time-on-task to perform and complete the evolution.

The study concluded that four-member companies were the most efficient and effective at performing skills and tasks. AFD personnel participated in this study and AFD has integrated elements of the study into how it performs fireground operations. The following section will discuss how AFD puts the results from the NIST study into action based on response types/classifications.

Response Policies:

All major apparatus types operated by AFD are staffed with a total of four personnel: one Company Officer (Lieutenant or Captain), one Fire Specialist, and two Firefighters. This staffing profile provides for an aggressive response to all fire and rescue emergencies, as the total number of personnel assigned to emergencies exceeds the numbers called for in *NFPA 1710*. For example, AFD assigns a total of 31 personnel to a "Box Alarm Assignment" consisting of four Engine Companies, two Ladder Companies, one Heavy Rescue, two Chief Officers and an Incident Safety Officer. This is just under twice the number called for in *NFPA 1710*. This response profile equates to greatly enhanced firefighter safety, a more aggressive attack on the fire (Extinguishment, Ventilation, Salvage and Overhaul) which greatly reduces fire loss and damage, and a greatly reduced potential for loss of life.

Box Alarm: 4-Engines, 2-Ladders, 1-Rescue, 2-Chief Officers, and an Incident Safety Officer = 31

Commercial: 4-Engines, 2-Ladders, 1-Rescue, 2-Chief Officers, and an Incident Safety Officer = 31

Apartment: Mid-rise apartments (three to five stories) receive the same assignment as a commercial fire

High-Rise: The Building Code and the Fire and Life Safety Code both define a high-rise as any structure 70' in height from the ground floor to rooftop or, any structure seven stories tall from the lowest level of fire department access. Buildings in Austin that meet this classification are assigned the following resources on the initial alarm: 4-Engines, 3-Ladders, 2-Rescues, 2-Chief Officers, and an Incident Safety Officer = 39.

The average citizen will turn on the news and hear reporters refer to a *"3-Alarm Fire"* without knowing what this really means. Each of the alarm assignments listed above reflects the resources and personnel AFD provides on an "Initial Alarm" or "First Alarm" Assignment. Upon arrival at a reported fire the first arriving fire officer, typically a company officer on either an engine, ladder or rescue, performs what is called a "Size-Up" of the incident. This means that they are assessing if the resources dispatched to the incident are sufficient to handle the fire conditions presented on arrival. If, on arrival, the officer makes the determination that additional resources are needed they have procedures they can follow to request additional assistance.

Beyond the initial alarm assignment, the next level is a "Second Alarm" within AFD this means that the following additional resources will be dispatched by CTECC:

4-Engines, 2-Ladder, 1-Rescue, and 1-Chief Officer = 26

AFD provides response resources to the full spectrum of emergencies typically found under fire departments such as response to:

- Traffic/Motor Vehicle Accidents
- Hazardous Materials at the Technician/Specialist Level
- Confined Space Rescue
- Swift/Flood Water Rescue to include Dive-Team
- Airfield Rescue Firefighting ARFF
- High-Angle/Technical Rope Rescue
- Explosive/Bomb Squad
- Cause and Origin Investigation to include Accelerant Detection K-9
- Wildland Urban Interface Firefighting

Each of these disciplines requires extensive training and certifications to perform as well as continuing education to maintain certifications. Each represent a major commitment by the department and are done so based on needs within the community due to the number of each emergency type listed annually.

Standards of Coverage:

"Standards of Coverage" or SoC maps developed by the Data Analysis team at AFD detail the response time standards used by AFD. Each of the maps that encompass the entire City of Austin and surrounding response areas for the 11 Emergency Services Districts (ESDs) that AFD dispatches for. These maps break down the AFD response and dispatch areas into multiple and layered *"Response Area Polygons"* (RAPs). Each RAP reflects an area an emergency response unit can reach in four minutes or less based on established performance measures set by AFD. These RAPs are also directly correlated with *NFPA 1710* and, in turn, ISO response guidelines for Engine (1.5 Linear Miles) and Ladder Companies (3.0 Linear Miles). These RAPs are then evaluated against responses by line fire companies located within each of the RAP's designated areas (*each RAP reflects a four-minute response time per Polygon)*. See ***Figure 30*** in Section 8 to view the current AFD RAP map.

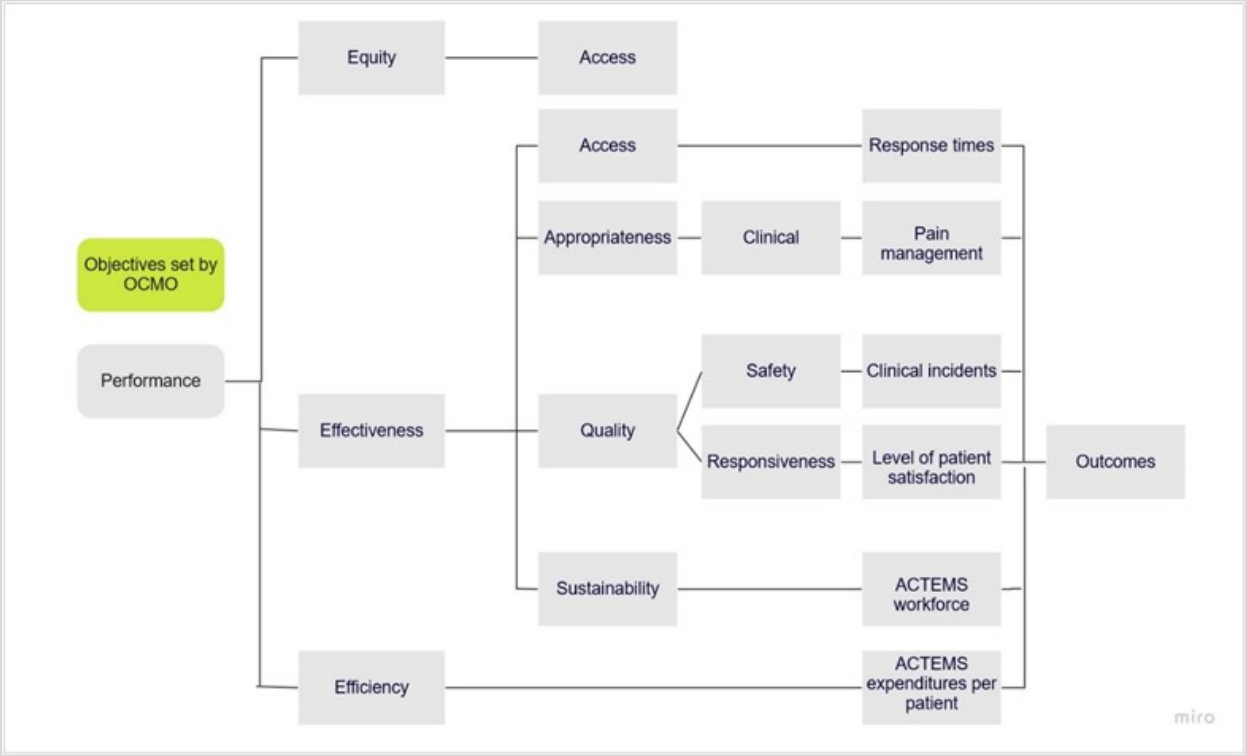
Analysis of the SoC maps show that AFD is providing response coverage that meets or exceeds *NFPA 1710* response guidelines to most of their response jurisdiction (the areas shown in varying shades of green or yellow). Areas reflected in orange or purple reflect areas where response times do not meet targets set by the department or within the NFPA standards. However, closer analysis of these areas reveals several important facts regarding emergency response.

1. Areas on the extreme edge of City of Austin City Limits (areas to the extreme east, southeast, south, southwest, and west) do not have infrastructure to support rapid response times.
2. These areas are currently under-developed with respect to housing and community infrastructure such as fully paved streets, sidewalks, sewer, and water mains. Infrastructure can also include homes, apartments, schools, businesses, medical care facilities, shopping centers, and parks. Because of this very low response activity it does not warrant or justify the expense of placing a fire station in these areas currently. This does not mean that the city planners and leadership of AFD have not forecasted certain locations in these areas for future fire stations once growth and build-out occurs.
3. There are several locations on the west side of Austin that pose topographical/geographical response challenges that simply cannot be overcome by fire station placement. This is primarily due to the rivers, lakes, and bluffs in this area that restrict or limit construction of roads, bridges, and highways for response crews to arrive within established time standards.

PCG fire and EMS subject matter expert consultants have considerable experience developing standards of coverage platforms and believe that the *Response Area Polygons* are one of the most effective and

efficient processes employed in the fire service. PCG believes this platform provides the strongest example of how AFD ensures dispatch and response equity throughout the City of Austin but also to the 11 ESDs throughout Travis County. The fact that the use of the RAP as it relates to dispatching and response of emergency companies was not mentioned by the City Auditor in the February 2020 report is a significant oversight as it bears greatly in the efficiency of the overall dispatching process and services provided by AFD.

APPPENDIX G: ATCEMS EXAMPLE PERFORMANCE INDICATOR FRAMEWORK ADDRESSING EQUITY



Equity: The establishment of indicators for equity of access of services to all communities served by ATCEMS. This should include measuring how well ATCEMS is meeting the needs of groups/communities who have special needs or challenges in accessing emergency and public health services.

Response times: Response times should reflect the time taken between the initial receipt of the call for an emergency at the 911 Center and the Initiating Patient Contact (IPC) time of the first AFD, ATCEMS, or law enforcement resource at the scene of an emergency medical incident.

Pain management: This should be defined as the percentage of patients who report a clinically meaningful reduction in pain severity. Clinically meaningful pain reduction is defined as a minimum two-point reduction in pain score from first to final recorded measurement (based on a one to ten numeric rating scale of pain intensity). This would include patients who are aged 16 years or over and received care from ATCEMS which included the administration of pain medication, recorded at least two pain scores (pre- and post-treatment), and recorded an initial pain score of seven or above (referred to as severe pain). Patients who refuse pain medication for whatever reason are excluded. A higher or increasing percentage of patients who report a clinically meaningful reduction in pain severity at the end of ATCEMS treatment suggests appropriate care meeting patient needs.

Clinical events: This should be defined as the number of adverse events which occur because of ATCEMS system and process deficiencies and which result in the death of, or serious harm to, a patient. Clinical events should occur infrequently. They are independent of a patient's condition. A low or decreasing number of clinical events is desirable.

Patient satisfaction: This should be defined as the quality of ATCEMS services as perceived by the patient. It is measured as patient experience of aspects of response and treatment which are key factors in patient outcomes. Patients are defined as people who were treated by ATCEMS whether the patient was transported to an ER or an alternative destination. The following measures of patient satisfaction should be reported:

- Proportion of patients who felt that the length of time they waited to be connected to an ATCEMS call taker was much faster or a little faster than they thought it would be,
- Proportion of patients who felt that the length of time they waited for an ATCEMS or ATCEMS partner resource was much faster or a little faster than they thought it would be,
- Proportion of patients who felt that the level of care provided to them by ATCEMS paramedics was good or very good,
- Proportion of patients whose level of trust and confidence in ATCEMS paramedics and their ability to provide quality care and treatment was very high or high, and
- Proportion of patients who were very satisfied or satisfied with the ATCEMS services they received in the previous 12 months.

High or increasing proportions can indicate improved responsiveness to patient needs.

ATCEMS workforce: Sustainability is the capacity to provide infrastructure to respond to the emerging needs of the community in an equitable manner. ATCEMS workforce should be defined by two measures:

- Workforce by age group – the age profile of the workforce, measured by the proportion of the operational ATCEMS workforce in 10-year age groups (under 30, 30-39, 40-49, 50-59, and 60 and over);
- **Workforce attrition**: defined as the number of FTEs who exit ATCEMS as a proportion of the number of FTEs. This includes staff in operational positions where paramedic qualifications are essential. A low or decreasing proportion of the ATCEMS workforce who are in the younger age groups and/or a high or increasing proportion who are closer to retirement suggests sustainability problems may arise in the coming decade as the older age group starts to retire. Low or decreasing levels of staff attrition are desirable.

ATCEMS expenditures per person: These are defined as total ambulance service expenditures per patient. High or increasing expenditure per person may reflect deteriorating efficiency. Alternatively, it may reflect changes in aspects of ATCEMS (such as more equitable response).

Outcomes are defined by the OCMO as the impact of ATCEMS on individual patients or groups of patients (e.g., CARES).