



**Rebuttal Analysis and Report of Travis County
ESD No. 2, Concerning AP Triton Fire & EMS
Assessment Service Options for the City of
Pflugerville**

September 1st, 2021

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Section 1: Acknowledgements

Travis County Emergency Service District No. 2 (the District) Board of Commissioners directed District staff to review and analyze the *Fire & EMS Assessment Service Options for the City of Pflugerville* report completed by AP Triton in June of 2021. Initial review by District leadership identified several errors, omissions, and inaccuracies in the report.

The Board of Commissioners requested the report be thoroughly reviewed and for staff to use subject matter experts to assist with the review. Specifically, the financial, population, service demand forecasts, and the assertion made concerning the number of paramedics the District employs were examined. The following subject matter experts were asked to assist the District in evaluating the opinions and assertions about the District made by AP Triton consultants.

Edward L. King, Vice President with Government Capital Securities Corporation

Ed King is a registered Municipal Advisor who works for Government Capital Securities Corporation, which is a government financial firm based in Southlake, Texas. With over twenty-five years of experience in banking and public finance, Ed has been involved in hundreds of municipal financing transactions including being integral to the creation of the federal tax-credit program at Government Capital, which benefits rural and economically disadvantaged school districts across the state of Texas. These tax-credit structures reduced borrowing costs for disadvantaged schools and cities in Texas by over \$75 million.

Ed also has extensive experience in financing for emergency services districts in Texas and is a registered Municipal Advisor who is licensed to advise municipal entities such as ESDs on debt issuance, including the issuance of loans, leases, and municipal securities that are regulated by the MSRB, SEC, and Attorney General's office. Ed holds a BBA in Economics from the University of Texas, Arlington.

Michael Rainey, Data Scientist

Michael Rainey is a former active-duty service officer in the United States Army and currently serves as a strategic level scientific, technical, and decision science consultant working with high stakes decision makers, including many high-level governmental policy makers listed below.

Michael previously served as an Assistant Professor in the Department of Systems Engineering at the United States Military Academy in West Point, NY. While on staff, his faculty research initiatives extended into systems engineering design and project management, decision science, and the design and development of analytics to support leaders in making the highest quality decision possible when faced with uncertain and challenging environments.

He is honored to have served the following clients: North Atlantic Treaty Organization (NATO) Consultation Command and Control Agency (C3A), the US Army Command and General Staff College (CGSC) Intermediate Level Education (ILE) and School of Advanced Military Studies (SAMS), US Cyber Command (CYBERCOM), US Army Corps of Engineers (USACE) Engineer Research and Development Center (ERDC), Williamson County (TX) Emergency Services District No. 3, and Travis County Emergency Services District No. 2 (TX).

Michael Zimmermann, M.D. Emergency Medicine Physician

Dr. Mike Zimmerman is an emergency physician in Round Rock. He moved to Texas in 2013 and joined the Emergency Department (ED) staff at Seton Medical Center Williamson, a nearby Level II trauma center.

Previously, Dr. Zimmerman served as associate medical director/EMS director at Riverview Emergency Department in Wisconsin Rapids, Wisconsin. His career includes service as a member of the board of directors for Infinity HealthCare Inc., a clinical instructor of emergency medicine, a hospital education director, and a flight physician.

After being a flight physician for the University of Chicago Aeromedical Network and while working with MedFlight at the University of Wisconsin-Madison, he helped start and was the medical director of a helicopter EMS program in the Chicago area for more than seven years. Dr. Zimmerman is currently the medical director for Travis County Emergency Services District No. 2/Pflugerville Fire Department. He is also an American Heart Association instructor for ACLS and PALS.

Board-certified in emergency medicine, Dr. Zimmerman grew up in central Illinois and earned his medical degree from the Loyola University Stritch School of Medicine. He completed his emergency medicine training at University of Chicago Hospitals, where he served as chief resident for EMS and international transport and was the recipient of the first Illinois College of Emergency Physicians Resident Leadership Fellowship.

Section 2: Executive Summary

Travis County Emergency Service District No. 2/Pflugerville Fire Department (the District) provides fire suppression, rescue, hazmat, community risk reduction, and EMS first response services to approximately 77 square miles, which include the City of Pflugerville.

In 2017 the District began providing ambulance transport services at the Advanced Life Support (ALS) level with dual-role firefighter/paramedics. In 2019 District leadership identified a future financial shortfall while conducting its regular forecasting and strategic planning process. The fiscal challenges were a result of a combination of several factors including:

1. The District beginning EMS transport services in 2017 from its limited fire suppression/rescue budget (originally meant to supplement the existing service),
2. Receiving no funding from other local government agencies, and
3. The addition of a new budget growth cap limit put in place by the state legislature's Texas Property Tax Reform and Transparency Act of 2019.

District leadership identified four options to handle the upcoming financial problem. These options were:

1. Do nothing,
2. Reduce or eliminate services,
3. Receive funding from other government agencies, and
4. Voter creation of an EMS overlay District for dedicated EMS funding.

NOTE: For profit ambulances were considered, but ultimately determined to be unviable for the community due to lower quality and services.

In September of 2020 this information was communicated to the City of Pflugerville Council and City Manager which included a report packet, a presentation to Council, and then several ad-hoc meetings between the District, County Commissioners, and City officials.

In December of 2020 a petition with approximately 4,700 signatures was filed with the Travis County Commissioners Court calling for an election for the creation of an EMS overlay District (known as ESD17). In an effort to explore all options the District also requested funding from both Travis County and the City of Pflugerville for EMS transport services in January of 2021.

Travis County responded by unanimously approving the petition and then calling the election for the creation of ESD17 in May of 2021. County officials also met with District leadership to further discuss cooperative funding sources as another option to adequately fund EMS transport services provided by the District.

The City of Pflugerville responded at a special meeting on February 3, 2021 by denying a resolution consenting for voters to determine the creation, or rejection, of the proposed ESD17 overlay, for both the City limits and the Extra-Territorial Jurisdiction (ETJ). The City of Pflugerville does not operate its own fire or EMS department and has no legal authority to provide EMS to its ETJ. City officials then initiated a \$34,000 taxpayer funded assessment of the District with a directed focus of the City providing EMS and fire services.

AP Triton, a California based consulting firm, was selected by the City to conduct the assessment between February and June 2021. The approved study was a detailed analysis of Travis County Emergency Service District No. 2's operations and options for emergency medical services.

District officials fully cooperated with this unusual request, i.e., one governmental entity using taxpayer funds to assess an autonomous governmental entity. During the process it was discovered that, of the different service options potentially available to the City, only the District was being studied in detail. It was communicated to the consultants that District officials had concerns regarding a consultant providing recommendations without analyzing other service options to the extent the District was being analyzed.

The consultant acknowledged these concerns and responded that they were commissioned to perform an assessment on the District only. District leadership views this as a fundamental and critical shortcoming for the scope of the project.

It was also noted that not all of AP Triton's staff had previously served as fire chiefs, nor had any staff served as head of department for an emergency services district in Texas. Although the District acknowledges that a company officer level consultant is capable of conducting research and analysis, our experience and research into consulting firms show that many of the principal consultants have extensive experience as fire chief and/or senior chief fire officers. These shortcomings should have been appropriately vetted by the City of Pflugerville procurement contract administrators. District leadership views this as a serious oversight by the City of Pflugerville as there are many reputable firms that meet these simple, yet critical, requirements.

AP Triton had promised that a draft of their report would be given to the District to review, which is customary and usual in the consultant work processes. This process allows for checks and balances to be applied in order to produce a report that is accurate and free of potential bias or political agenda. This did not occur. The District did provide feedback to the consultant after the consultant's one-day site visit, but it appears that the feedback was not considered.

AP Triton presented their report to the Pflugerville City Council at a work session on Monday, June 21, 2021. AP Triton identified four options for the City of Pflugerville:

1. The District continue EMS transport service at no additional cost,
2. The City engage with for-profit EMS,
3. The City start its own third service EMS, or
4. The City start its own Fire and EMS department.

Each of these options has fundamental flaws in that the assumptions used to reach these conclusions are missing critical information for both context and accuracy.

Numerous errors were immediately identified within the report by District officials. The two most significant and fundamental flaws in the AP Triton report are:

1. AP Triton used outdated financial forecasts in reaching their financial conclusions and recommendations for the District. Additionally, capital outlay plans were not included in their report, despite being publicly available in the District's financial records posted on the District's website. There are also several accounting errors in the financial section of the report (see Section 4.1: Errors Identified with AP Triton's Financial Forecast).
2. The methodology used for population and incident volume forecasts are unclear and are not explained in a transparent manner. The report states the District will not need additional stations or resources until 2030. The District's contracted data scientist, Michael Rainey, has provided clear methodology and projections in this report that challenge AP Triton projections (see Section 4.2: Errors Identified with AP Triton's Population and Incident Volume Forecasts). Rainey's projections are both well accepted in this field, are transparent, and are very conservative in nature. With that being said, District officials can confidently say that there is indeed growth occurring in the District, and that without additional resources, response time and service delivery performance will suffer in the near future.

These two critical flaws were used to make the most significant assertions and drew incomplete conclusions and recommendations in the report relating to the District's finances as well as its preparations to handle future growth within the District. The recommendations, based on several other additional factors, are not in the best interest of the community in terms of service delivery as well as working conditions for District firefighters and paramedics. The recommendations also do not contribute to a sustainable high level of service for the taxpayers.

It should be noted that during the June 21st presentation to Council, Councilperson David Rogers made a statement about his understanding from the report that the District doesn't need any additional tax dollars through 2030, to which AP Triton president Kurt Henche stated, yes but "with a qualifier"... "you could have an Amazon come in" (City of Pflugerville, 2021, 2:08:28) to the community and create a population increase. The statement went unchallenged by the City Council and City staff. This is troubling in light of recent efforts by District staff who had been working with City staff providing developmental services for a newly constructed Amazon facility in the community. The facility is less than two miles away from the Council chambers. When completed, the Amazon facility will be approximately 3.8 million square feet, employ at least 1,000 employees, and up to 5,000 employees. It is scheduled to open in September of 2021. Research conducted by the District shows that Amazon facilities are well known and documented for their dependence and reliance on utilization of fire and EMS resources for frequent, if not daily, occasions (BBC News, 2020 and Oklahoma City). This is just one example of the obvious growth occurring in the community.

The recommendations are also not consistent with District policies and philosophy related to service delivery to the citizens of the District, which includes the City of Pflugerville. In the view of District leadership, our assessment is that the recommendations potentially jeopardize the safety of citizens and District personnel, and our ability to provide efficient and effective response resources throughout the District and City of Pflugerville.

The analysis used by the District to identify and determine the report deficiencies fall into four general categories:

1. Adequacy of data - Was the original source information collected in an accurate and timely fashion, did it account for the entire range of options, and to what extent were those options studied?
2. Analysis of data - Was the data analyzed competently and with regard to relevant and current issues, including local, state, and federal considerations, using current standards and best practices, modern perspectives, techniques, and methodologies?
3. Validity - Is the information in the report presented in an objective manner or is it presented in such a way that it supports inaccurate statements made on the record prior to the commissioning of the report?
4. Credibility - Will decisions be made on information that has been proven to be inaccurate or biased? Are there competing agendas not discussed in the report?

The District analysis of the AP Triton report will provide counter assessments to those presented in the report and will do so based on current facts and information which appear to be either incorrect or missing from the AP Triton report. The District will provide step-by-step analysis of data and information in order to refute assertions and conclusions drawn by AP Triton Consultants.

The District, to ensure an objective analysis of the AP Triton report, has enlisted the services of outside consultants who possess highly qualified credentials and experience as Chief Fire Officers, physicians, municipal advisors, and data analysts. These subject matter experts were tasked by District leaders to be objective and transparent in their analysis of the AP Triton report. All information will be shared between the District and City leaders.

District leadership wishes to acknowledge and thank AP Triton consultants for validating several well-established factors about the District:

1. That the District is an organization with a first-class reputation,
2. That the District is providing high levels of service and,
3. That the District has an excellent response time within the community.

Section 3: Report Accuracies

There are a number of items in the AP Triton report that are accurate and that the District agrees with. District officials consider these “strengths” of the report and have outlined these observations and conclusions in this section. Some added information is also included in order to clarify information for additional context.

The report correctly identified that the District “provides service that meets or exceeds all fire service and EMS response standards” (AP Triton, 2021, p. V). The report also correctly identified that the District is “a Class 1 Public Protection Classification (PPC®) rating by the Insurance Services Office (ISO). This is the best rating possible in a range of 1–10. The PPC rating is one of the factors utilized by insurance companies to determine the costs of fire insurance premiums for businesses and residences” (AP Triton, 2021, p. 5).

The report correctly states “the District has an excellent operations plan designed to deliver critical services to emergency events” (AP Triton, 2021, p. 97), and that this was obviously demonstrated during the winter storm in February of 2021 as well as the COVID-19 pandemic.

The report correctly identified that the District has “excelled in its efforts to develop a cancer prevention program which includes: Issuing each line personnel two sets of bunker gear, Gross decontamination in all stations, Extractors for cleaning bunker gear” (AP Triton, 2021, p. 19).

The report accurately states that the District had very conservative revenue forecasts from early 2020, just as many governments did, including the City of Pflugerville. However, over time and after additional economic performance information was gained, District leadership adjusted forecasts to reflect the current economic performance more accurately, as did many governments including the City. Despite these updates, the District must make essential funding adjustments to account for increased operating costs for advanced life support and ambulance transport services.

The report also correctly identified that “EMS revenues have grown” (AP Triton, 2021, p. 24) which can be explained due to the increase in call volume and the addition of a fifth full time ambulance at station five beginning in April of 2020. Since the inception of the ALS transport program, the District has made continual improvements in our billing and collection processes. There is, however, an omission on this topic: the District incurs exponential costs in order to add the resources that will provide additional services to meet the increasing service demands. These expenses are exponential when compared to limited incremental increases in revenue that occur.

In terms of evaluating EMS billing revenue as a solution, the District agrees that there are some limited opportunities to increase revenue in this area. However, District leadership have chosen a cautious approach to EMS billing, which is based on the public utility model developed by economist Jack Stout. This system provides high levels of service and ensures the individual patient is not hit with an overly high medical bill. This is achieved through a blended subsidy and user fee model with a focus on providing higher than average levels of service. The District made the conscious decision to focus on providing higher than average levels of service.

Overestimating EMS billing revenue, using unreasonably high EMS rates, and then aggressive collection practices come at an unreasonable cost for the individual patient. These actions do not sit well with taxpayers and can lead to poor public sentiment for the provider. It is also very important to note that these practices can adversely affect residents of the community that face economic challenges and barriers to accessing healthcare services.

Overreliance on EMS billing revenue can also place the system at risk for long-term sustainability issues. The State of Texas, Centers for Medicare & Medicaid, and Congress continue to look at and scrutinize the practice of EMS billing, particularly balance billing (having already enacted laws to prevent this practice for fixed facilities and air ambulances) and are working towards EMS billing standardization nationally (New Medicare Ground Ambulance Data Collection System, 2020). There are currently no

standards on this topic, so recommendations and analysis from consultants need to be identified as subjective opinions that concern a topic with an uncertain future.

The topic of EMS billing is a challenging and complicated subject. This can best be summarized from a 2019 report by the RAND corporation which found that:

Assessing how Medicare payment rates are related to costs is complicated by the significant variation in ambulance organizations and by differences in how ambulance services are delivered and financed across communities. Ambulance organizations vary in the mix of services they provide, including the share of responses resulting in transport, the blend of emergency and non-emergency transports, and, even within emergency and non-emergency transport categories, the level of transport....Different types of services require different capabilities and inputs and therefore contribute differentially to organizations' costs. Furthermore, many ambulance organizations share personnel, facilities, and vehicles with other services such as fire departments or hospitals. Determining the specific share of costs that should be allocated to their ambulance services for the purposes of comparing payments to costs is challenging.

Furthermore, many ambulance organizations receive significant revenue from communities to support emergency medical services (EMS) systems with varying capabilities. It is not clear how Medicare and other healthcare payers' rates should align with costs in this case. Neither is it clear whether payments should cover the total costs involved in furnishing ambulance services, including the costs of responses that do not result in billable transports, or only the costs associated with patient transports. (p. 6)

Regardless, District officials continue to work on this very complicated topic to ensure maximum reimbursement within the realistic constraints at the local, state, and federal levels to ensure high levels of service while remaining fiscally responsible to the taxpayers, including those who face financial hardship.

AP Triton president Kurt Henche can be indirectly quoted as stating "probably the optimum system we see out there is a medic on the engine, and then a medic on the ambulance" (City of Pflugerville, 2021, 1:03:40). The District absolutely agrees with this statement, and this is the basis for the staffing program the District is trying to build – firefighter/paramedics on first-response engines and firefighter/paramedics on ambulances. The idea that the District has excess paramedics who are not being utilized is completely inaccurate and is not based on realistic findings. Utilizing dual-role firefighter/paramedics allows the District flexibility in its day-to-day staffing of personnel between engines and ambulances.

AP Triton recommends implementing a partially automated inventory control system due to the size of the District operations and organization. Various systems have proven to be cost-effective in the long run; these systems are particularly effective in reducing expiration date waste and resulting loss of seldom used supplies (p. 86). The District absolutely agrees with this recommendation and as also noted in the report, has recently purchased software and initiated processes for implementing this type of a program.

Section 4: Report Inaccuracies

District analysis of the report found some information to be inaccurate, incomplete, or omits information that is current, accurate, and relevant. This section reviews 34 significant findings that the District identified as inaccurate, incomplete, omitted, and then provides updated information. This section is comprised of these areas:

- Errors Identified with AP Triton's Financial Analysis
- Errors Identified with AP Triton's Population Growth and Incident Volume Analysis and Forecasts
- Errors Identified Concerning Operational and Administrative Conclusions and Recommendations

Section 4.1: Errors Identified with AP Triton's Financial Forecast

Finding No. 1: *"Limited information was provided regarding non-recurring expenditures for equipment, apparatus, land, buildings, lease payments, and debt service. Triton requested a copy of the capital improvement plan, but it was not provided. As a result, we were unable to project future expenditures and related timing. Accordingly, no provision is made in the projections for capital improvements or additional related debt and debt service. Some information regarding debt service and capital lease payments was obtained from the September 30, 2019 audit report. Triton is unaware of any new debt instruments occurring in FY20." (AP Triton, 2021, p. 30)*

1. The five-year forecast provided to AP Triton, replicated in Figure 22 on page 28 of the AP Triton report, illustrates five years of capital outlay and debt service payments.
2. A line-by-line detail for FY20 and FY21 capital projects can be found within the TCESD2 FY21 Approved Budget. The District strongly believes in transparency and posts budget documents on the District's publicly accessible website.
3. District records indicated that AP Triton's financial staff were directed to the District's financial page on March 9, 2021 to begin their review of TCESD2's financial related information.
4. The District Finance Director met directly with the AP Triton financial representative to answer any outstanding questions. The only follow-up request received and not fulfilled was to obtain a copy of the District's FY20 draft audit report, which had just been received and not yet reviewed by District staff.

AP Triton has repeatedly referenced utilizing historical percentage increases for sales and property tax revenue projects and insisted that forecasting should reflect reality. They have utilized this approach in their five-year revenue forecast but have not employed the same methodology on the expenditure side.

The AP Triton forecast fails to identify capital projects and it documents only a three percent increase on salaries/benefits and four percent on all other operating expenditures. TCESD2's average expenditure increase for the past five years has been 16%. From FY19 to FY20, the year-to-year increase was at its lowest at five percent, but that was due to temporary cutbacks as a result of COVID-19. The result is that the expenditure forecast created by AP Triton is underestimated based on the reality of the department with programs already in progress. Even if the department instituted new cost-saving measures, it is unlikely that a decrease down to three or four percent would be realized in such a short period.

From the capital expenditure perspective, even if the District decided to lower its service levels and not to build any more stations, AP Triton has a complete inventory of the District's facilities, apparatus, and medic units along with their current condition. Given the experience they are purported to have in the fire/EMS field, they should have, at a minimum, been able to estimate a proposed replacement plan for the apparatus and medic units and included that as a capital expense and debt payment for the forecast years. Instead, they chose to completely remove all capital expenditures and debt payments, even for purchases that are in progress for FY21, which are detailed in the District's FY21 Approved Budget published on the District website. This extremely low forecast of increasing District expenditures is neither accurate nor realistic.

If AP Triton wasn't able to create a proposed capital plan for the District, they could have utilized the budget figures in the fire-year forecast provided by TCESD2. The total debt service cost in the TCESD2 five-year forecast provided to AP Triton (AP Triton, 2021, Figure 22) would increase expenses by \$8.3 million over the five-year period above what is reflected in the AP Triton forecast (AP Triton, 2021, Figure 24).

Methodologies and philosophies toward financial forecasting vary widely and it is understandable that an outsider to TCESD2 would have an alternative approach, but for AP Triton to completely leave out current and future capital expenditures and future debt service in their five-year forecast because "*Limited information was provided*" is not just a difference in methodology, it is misleading and illustrates an inaccurate portrayal of TCESD2's future financial status.

Furthermore, utilizing increased forecast percentages to be more in line with historical data on the revenue side, but not using the same methodology on the expenditure side, paints an unachievable financial picture absent a realistic and itemized plan of how the District could achieve such significant cost reductions.

In reality, the District has built and maintained an impressive track record with regard to financial management. This can be affirmed by the District's financial advisor Ed King, who describes the ESD's financial situation below:

- "Travis County ESD No. 2 is in sound financial condition and represents an attractive credit risk to the capital markets. The 2020 Audit Report was issued with an unqualified opinion. This means the accounting, budgeting, management practices and controls that are in place at the ESD meet the highest standards for transparency and accuracy. This matches up with our experience in working with the ESD over the last several years."
- "The success the ESD has realized in maintaining its fiscal health has resulted in the ESD being well positioned to adequately fund the substantial capital improvement projects and operational needs that are on the horizon while maintaining its level of service to the community. This is due in large part to the board and administration's careful financial practices that include striking a balance between utilizing cash reserves and debt in order to complete capital projects."
- "It would represent an unnecessary risk if the board were to abandon its conservative bias on cash and debt management. Deciding to issue maximum amounts of debt and drawing down its reserves to address a short-term need might be politically expedient today but could hinder the ESD's ability to access the capital markets over the long term, and this would not serve the interests of the ESD or its constituents'."

Finding No. 2: "Property tax revenues have increased at an average annual rate of 10.6% over the past five years. The District collects sales tax through two separate taxing districts as it has property in two counties. Combined sales tax collections have increased an average of 12.3% annually" (AP Triton, 2021, p. 24).

The two sales tax boundaries do not correlate with the location of District property. Using the data in Figure 17 from the AP Triton Report, the average increase is 13.6% for property taxes (see **Table 1**).

Table 1: Property Tax FY16-FY20

	FY16 Actual	FY17 Actual	% Chg	FY18 Actual	% Chg	FY19 Actual	% Chg	FY20 Projected	% Chg	Average % Chg
Property Tax	\$ 7,891,764	\$ 9,406,986	19%	\$ 10,499,398	12%	\$ 11,972,234	14%	\$ 13,105,961	9%	13.6%
	FY16 Actual	FY17 Actual	% Chg	FY18 Actual	% Chg	FY19 Actual	% Chg	FY20 Projected	% Chg	Average % Chg
Property Tax	\$ 7,861,029	\$ 9,373,082	19%	\$ 10,466,371	12%	\$ 11,906,193	14%	\$ 13,017,799	9%	13.5%
P&I on Property tax	\$ 32,455	\$ 34,006	5%	\$ 33,027	-3%	\$ 66,041	100%	\$ 88,162	33%	33.8%
	\$ 7,893,484	\$ 9,407,088	19%	\$ 10,499,398	12%	\$ 11,972,234	14%	\$ 13,105,961	9%	13.6%
Difference	\$ 1,720	\$ 102		\$ -		\$ -		\$ -		

Using the data presented in Figure 17, the average increase is 11.5% for sales taxes. This can be seen in **Table 2** below.

Table 2: Average Increase of Sales Taxes FY16-FY20

	FY16 Actual	FY17 Actual	% Chg	FY18 Actual	% Chg	FY19 Actual	% Chg	FY20 Projected	% Chg	Average % Chg
2	\$ 7,144,035	\$ 7,191,943	1%	\$ 5,556,422	-23%	\$ 6,776,580	22%	\$ 7,667,640	13%	3.3%
2A	\$ 1,757,216	\$ 2,400,557	37%	\$ 5,061,321	111%	\$ 5,512,681	9%	\$ 6,065,260	10%	41.6%
	\$ 8,901,251	\$ 9,592,500	8%	\$ 10,617,743	11%	\$ 12,289,261	16%	\$ 13,732,900	12%	11.5%

Finding No. 3

The page 28 header contains an error in the title. It is listed as “Approved Budget FY21-FY25” (AP Triton, 2021, p. 28). The first column is the FY21 approved budget. What remains is a forecast and the Board has not approved the forecast. Commensurate with the law, only the next budget year is approved.

Finding No. 4: “AP Triton recommends a cost/benefit analysis and potential reduction of capital medical equipment based on limited utilization.” (AP Triton Report, 2021, p. 45)

A cost/benefit analysis was used to develop the District’s capital plan. The AP Triton report does not include any capital expenditures in its financial analysis yet recommends a potential reduction to the District’s capital plan. This is evidence of the author’s awareness of the District’s capital plans, though they excluded those plans and related expenditures in their financial analysis and projections.

Like many new businesses coming to Pflugerville, the District is experiencing significant and costly delays with construction of new stations due to the City of Pflugerville’s permitting process and these plans include staffing and equipment. Additionally, as the District moves closer to full time ALS first response service from all apparatus, it should be noted that much of the planned medical equipment capital costs are related to these efforts. AP Triton staff has described the District’s goal of ALS first response availability as the “optimal system” in other parts of their report. Permitting, construction and staffing delays aside, purchasing equipment early is actually a cost saving tool since the price of this equipment goes up annually, at least three to four percent in most cases. Another benefit is the ability to utilize and staff this additional equipment during local disasters, such as the multi-year ongoing pandemic and winter storm Uri. As noted by the local public health authority and AP Triton, Pflugerville has been a COVID-19 hotspot throughout the pandemic. Having the appropriate medical equipment, such as cardiac monitors and ventilators, has enabled the District to treat COVID-19 patients with a high level of care.

District firefighters and paramedics have been on the frontlines of the pandemic since day one. Many agencies and health organizations have faced medical equipment shortages. The District was able to meet the unique challenge with appropriate planning alongside these equipment purchases. Suggesting

otherwise is both irresponsible and not in the benefit of serving the community. The District remains engaged in the fight against COVID-19 and access to appropriate medical equipment continues to be a resource for the District.

Section 4.2: Errors Identified with AP Triton's Population and Incident Volume Forecasts

District staff, working with an outside consultant, identified fundamental flaws in AP Triton's methodology for determining population and incident forecasts. A detailed analysis is included in Appendix A of this document. Additionally, the methodology used for District planning purposes is also contained in that document. Conclusions and critical issues with AP Triton's forecasts are summarized in the following pages.

Finding No. 5

Static 2020 Calls/1,000 Population Factor used for 2030 Call Volume Projections is an invalid simplified assumption based on analysis of historical District call volume and population data.

Finding No. 6

There is a lack of clarity on the data and methodology to determine District population estimates in 2030 that is used to calculate call volume projections, and this eliminates the ability to effectively analyze the suitability of the projections for decision making.

Finding No. 7

Replicating the AP Triton projection methodology outlined in the assessment with a better suited estimate for the 2030 Calls/1,000 Population factor, given the AP Triton 2030 District population estimate of 161,875, results in a 2030 EMS Call Volume Projection of 11,201 (reflecting an increase in 2,518 EMS calls in comparison to the original 2030 projection of 8,683).

Finding No. 8

The updated 2030 Calls/1,000 Population factor, when used in conjunction with the US Census methodology 2030 population estimate of 141,925, produces a 2030 EMS Call Volume Projection of 9,819 which is in alignment with the report provided by Michael Rainey and Associates (MRA) determined 2030 projection of 9,879 EMS Calls in 2030.

Analysis of AP Triton Population and Incident Volume Forecasts

In order to calculate 2030 call projections, AP Triton identified the use of population estimates as a means to project service demands. The methodology used to project call volume in future years is outlined in the below paragraph.

To forecast the future service demand, AP Triton used the population projections within the fire district. Population tends to be a relatively good indicator of service demand, and the current service demand per 1,000 persons can provide a standard for service demand at future dates. The assumption is made that the demographics of the future will be similar to today's demographics. The current service demand per 1,000 population is determined by taking the annual number of responses and dividing by the population number in thousands. (AP Triton Report, 2021, pp. 46-47).

The methodology outlined in the paragraph above implies the use of the following equations to determine service demand projections:

$$\text{2030 Call Volume Projection} = \text{2030 Population} \div 1,000 \times \text{2020 Calls/1,000 Population Factor}$$

$$\text{Where: 2020 Calls/1,000 Population Factor} = \text{2020 Call Volume} \div \text{2020 Population} \times 1,000$$

The Projected EMS Call Volume in Figure 39: Projected Service Demand (2030) in the AP Triton Report identifies an EMS Projected Call Volume in 2030 of 8,683. Given the equations detailed above, this projection implies a projected District population count in 2030 of 161,875 ($8,683 \times 1,000 \div 53.64$).

Although not specified in the report, it is reasonably concluded that the 53.64 EMS calls per 1,000 population is calculated based on the reported 7,510 EMS calls for 2020 divided by the AP Triton assumed population of 140,000 (detailed on Page 47 of the report as an estimate provided by the District to AP Triton) multiplied by 1,000. ($7,510 \div 140,000 \times 1,000 = 53.64$).

However, the use of the 2020 Calls/1,000 Population Factor to determine 2030 Projected Call Volume implies a static factor for the next ten years and does not follow historical analysis. Therefore, using a static 2020 factor for 2030 projections is more likely a simplified assumption that results in invalid estimates for policy level decision making.

Table 3 replicates the calculation of the EMS Calls/1,000 Population factor for 2017, 2018, and 2019 for the District given the US Census provided population counts and the District EMS Call Volume data for 2017-2019.

Table 3: EMS Calls per 1000 Population Factor for 2017-2019

	2017	2018	2019
Population	118,843	123,355	125,317
Calls	5,643	6,773	7,012
Calls/1000 Population	47.5	54.9	56.0

As shown in **Table 3**, the volume of calls experienced over this three-year period is increasing at a greater rate proportionally than the population. Therefore, the Calls/1,000 Population factor is not static and instead is increasing in each year.

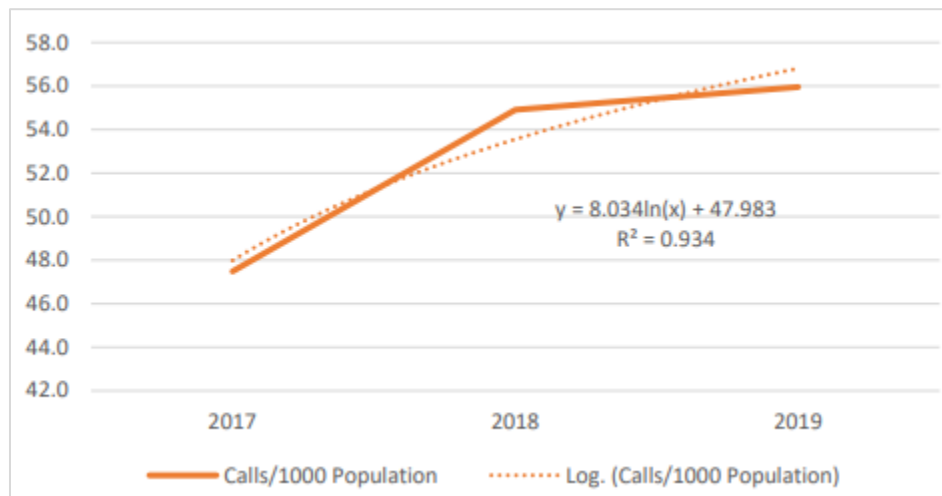
Given the AP Triton methodology, if the 2019 Calls/1,000 factor of 56.0 is used in conjunction with the AP Triton estimated 2030 District population of 161,875 population, then the estimated EMS 2030 Call Volume Projection would be at 9,065 ($161,875 \div 1,000 \times 56.0$). This is an increase in approximately 382 EMS calls in comparison to the original 2030 projection of 8,683.

However, given the historical increase in the Call/1000 Population factor over the last three years of data, it is more likely that the factor will be higher in 2030 than in 2019. Using regression analysis, it is possible to project the Calls/1,000 population factor for 2030 in a similar fashion as projecting population.

Although a linear regression ($y = 4.2357x + 44.31$) of the historical Calls/1000 population in the table above produces a $R^2 = 0.8412$, a 2030 factor projection of 103.6 does not account for the factor increasing each year at a decreasing rate. The factor increased from 2017 to 2018 by 7.4 Calls/1000 Population and from 2018 to 2019 by 1.1 Calls/1000 Population. This implies that even though the factor will increase in the future, there will also be a 'leveling' of that increase.

As an alternative, a logarithmic trendline to project the factor using the equation $8.034\ln(x) + 47.983$ produces not only a greater ($R^2 = 0.934$) but also accounts for the decreasing returns to scale impact described above. As a result of using this method, the projected factor in Calls/1000 Population factor in 2030 is 69.2 which can be seen in **Figure 1**.

Figure 1: Calls/1000 Population in 2030



Given the AP Triton methodology, using the 2030 logarithmic projected Calls/1,000 factor of 69.2 in conjunction with the AP Triton estimated 2030 District population of 161,875 population results in an estimated EMS 2030 Call Volume Projection of 11,201 ($161,875 \div 1,000 \times 69.2$). This is an increase in approximately EMS 2,518 calls in comparison to the original 2030 projection of 8,683.

Of note, using the projected 2030 Calls/1,000 factor of 69.2 in conjunction with the US Census methodology projected population of 141,925 results in an estimated 9,819 EMS Calls in 2030. This estimate is in alignment with the MRA 2030 projection of 9,879 EMS Calls in 2030.

Recommendations to Correct and Improve AP Triton’s Forecasts

- Identify and evaluate methodology on determining population projection for the District in 2030 (161,875 as determined by AP Triton) used as the basis for 2030 projected call volume to determine relevance, applicability, and suitability.
- Update the Calls/1,000 Population factor (53.64 as reported by AP Triton) with US Census provided population estimates for 2020 via District provided estimates.
- Evaluate reliability and suitability of applying a static Calls/1,000 Population calculated in 2020 as the basis for 2030 projected call volume.

District Population and Incident Volume Forecasts

What is actually occurring in the District using accurate and acceptable methodology for analysis and forecasting:

- District call response times are increasing, on average, in a similar pattern to the increased straight-line distance from call locations to the nearest existing station. (MRA Report p. 24; p. 8)
- District EMS Call volume are becoming geospatially dispersed at a greater distance on average from the nearest existing station. (MRA Report p. 25)
- Population counts at the block group level within the District are increasing at a higher rate in those areas that are at a greater distance from existing stations. (MRA Report p. 31)
- Population counts within the District, in general, effectively explain expected EMS Call volume counts from year to year. (MRA Report p. 44)

In conclusion, growth is indeed occurring in the District, and it is reasonable to conclude that growth will continue into the future. Resources will need to be added in order to at least **maintain** the current standard of cover (response time performance), and additional resources will need to be considered for the deployment standard in order to **improve** the growing response times.

Section 4.3: Errors Identified Concerning Operational and Administrative Conclusions and Recommendations

Finding No. 9: *“NFPA 1720 gives recommended response times from when dispatch notifies the fire department until the first unit arrives. This differs both in time of response and allows measurement at the 80th percentile rather than the 90th.” (AP Triton, p. 77).*

In this case, AP Triton used NFPA 1720, a standard meant for volunteer fire departments rather than the current standards for career fire departments identified in *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 District is a career department and the consultants presumably understand this since they studied the District. Based on this fact, using 1720 is not an accurate representation of industry standards, best practices, or what is consistent with how the District should configure its deployment.

Finding No. 10: *“TCESD2 should consider staffing cost reductions through cooperative agreements with neighboring agencies or the City of Pflugerville. Examples include information technology (IT), vehicle/apparatus maintenance, and human resources” (AP Triton, p. 97).*

The District agrees there are ways to reduce some costs with cooperative agreements like vehicle/apparatus maintenance. The District has been pursuing additional cooperative agreements with the Pflugerville Independent School District, as TCESD2 already has agreements for land sharing, facility sharing, and educational/resources sharing in place. This also includes opportunities for agreements for facility maintenance (not listed by AP Triton) and for white fleet services. Since maintenance work on fire apparatus requires specialized certifications, additional work will be needed to address that aspect of the District’s maintenance needs. However, we remain excited and appreciative about our long-standing cooperation and partnership with our community focused partners at the school district.

There are challenges and limitations with each of the cooperative agreements listed by AP Triton. Significant cost savings would not be achieved by contracting human resources with an outside entity such as the City of Pflugerville. The District is approximately a 200-member organization and Status HR recommends between 1.7 and 3.4 HR professionals per 100 employees for proper human resource management (Farnsworth, 2018). The Society for HR Management published a study in 2015 recommending 3.4 HR professionals for organizations up to 250 employees. Bloomberg BNA’s HR Department Benchmarks and Analysis report dated 2021 sets HR staffing ratio at 2.8 for 200 employees. The capacity for the human resources department in the City of Pflugerville (currently four full time employees) to take on additional resource management would denote that there are underutilized resources currently in the City.

The District’s three positions (two full-time/one part-time) assigned to the HR Section currently perform all standard HR functions, payroll processing (performed by the City Accounting Department), administrative support to the Board of Commissioners (performed by the City Secretary), and administration of the District’s official records to include all public information requests. Two full-time employees (FTEs) are dedicated to very complex HR management, which means the HR staffing ratio is less than any study recommends and is consistent with the District’s lean operating philosophy.

The District also maintains and manages a complex labor relations agreement known as “collective bargaining agreement” with the uniformed firefighters. The agreement allows firefighter input in the development of salaries, benefits, and working conditions for the firefighters. This legal agreement was granted to the firefighters by voters overwhelmingly, including those in the City of Pflugerville, in 2008. The City of Pflugerville has no experience in managing a labor agreement of this complexity. The closest example would be with their police officers, but police officers in Pflugerville have no labor agreement of any kind. Not managing these agreements appropriately and skillfully can lead to costly lawsuits for the organization and District residents, including the City of Pflugerville. The District maintains an excellent track record in this area, as there have been no employment lawsuits for over 15 years, and the District

enjoys a low attrition rate. Additionally, the complexities of the federal Fair Labor Standards Act and its specific application to firefighters further calls for a specialized HR capability that other agencies in the area are not prepared to provide without increased cost through outsourcing as well as additional legal expenses.

The District would only consider an agreement to consolidate human resources if cost efficiencies could be achieved while maintaining service levels. A full review would need to be conducted by the District for labor relations and risk management performance of the City of Pflugerville staff over the last 15 years. This would include reviewing current and previous employment lawsuits, settlements, including those with issued non-disclosures, terminations/separations (including police chiefs), attrition rates, and documentation to review and assess how City staff handles labor relations and employment law issues. This is another example of the flawed methodology used by AP Triton in only studying one agency yet making recommendations to work with other agencies that have not been studied from a comparative standpoint.

To control costs, the District carefully monitors and weighs its investment in two full-time human resources staff members against the cost of contracting these services with a private entity or outsourcing to another agency. This practice has served the District and its workforce well to date.

Finding No. 11: “Most departments, including full career departments that serve rural areas, find it unreasonable to adopt the 1710 Standard travel time throughout their jurisdiction. Instead, many will adopt the 4-minute travel time in response zones with urban and suburban population densities and the 1720 Standard response time for rural areas.” (AP Triton, 2021, p. 63)

While this statement is partially accurate, in that achieving 1710 response time standards are difficult, it is not appropriate to completely eliminate the standard for comparison. The District is a fully career fire department that strives to meet these standards within its financial constraints. Having to use dedicated fire budget revenues to support the community’s overwhelming need for ALS and ambulance transport has been a barrier to achieving advancement towards this standard. AP Triton cites a seven-year-old version of the 1720 standard, again meant for rural volunteers, rather than the current 2020 edition available for both standards (AP Triton, 2021, p. 125).

Throughout the report, additional references to NFPA 1710 are not from the most current 2020 standard. The 2020 version of NFPA 1710 has several key differences, including additional firefighters compared to the 2016 standard referenced in the AP Triton report.

Finding No. 12

Figure 59 shows a minimum staffing requirement as 15 for a structure fire in an urban area (AP Triton, 2021). This is an inaccurate and outdated figure that is not within any recent standard. Current NFPA recommendations state a minimum of 16 firefighters, or 17 firefighters if an aerial device is used, which is the case in the District and throughout the region.

Finding No. 13: “Based on the analysis in the Staffing Section, TCESD2 has an operational overage of up to 17 firefighters. TCESD2 should consider limiting future hiring and assignment to positions through attrition” (AP Triton, 2021, p. 97).

It appears AP Triton did not include the District’s minimum staffing requirements for two squads, which are located at station two and station five. While the report mentions the squads, it does not include them in the staffing. No context or explanation is provided for this error. Additionally, the report uses 281 hours for its leave calculation, despite District firefighters earning 312 hours annually. These are critical flaws in their methodology.

AP Triton did not provide an appropriate source for their staffing model using a 1.2 relief factor. Currently, neither the National Fire Protection Association, the International Association of Firefighters, or Chiefs, or Texas Commission on Fire Protection have a consensus standard for a staffing factor calculation. The

District is aware of some fire departments, many in California, that rely on an antiquated staffing model that it appears AP Triton's recommendation is built upon. This involves a fire department operating at a negative balance in terms of staffing and relying almost entirely on overtime to fill vacancies.

Using a system that relies on firefighters working excessive overtime, instead of hiring adequate staff to cover vacancies and leave, comes at a cost. While overtime can be a cost saving tool when compared to hiring, it does have a limit and reaches a diminishing marginal return. This is both costly to the taxpayer, and unhealthy for the workforce. For example, individual overtime earnings for some entry level California firefighters range from an additional \$200K to \$360K annually (Lopez, 2020). It can be argued that due to the high cost of living in California, overtime can be a benefit for firefighters, but simple accounting and appropriate management can show cost savings using more modern and sophisticated staffing models. The staffing factor recommended by AP Triton is outdated and does not reflect the current operating environment in the area. It is also not sustainable for the future, and is detrimental for firefighters and paramedics safety.

A 1.2 staff factor gives little consideration for firefighter health and safety and can cause negative consequences to the taxpayer in terms of increased healthcare cost for firefighters and degradation in service levels due to an over-stressed workforce. It should be noted that AP Triton describes their analysis as "theoretical" (AP Triton, 2021, p. 13). This statement recognizes the potential differences and shortcomings between what is an educated guess when compared to reality. For example, one significant variable is the District's significant effort in recruiting military veterans, many of which still serve in the National Guard and as reservists. This has resulted in over 10% of staff being active or past military veterans. The District has enjoyed the benefits of employing trained military veterans who are well suited for emergency work and has been recognized by the Texas Workforce Commission and the United States Department of Labor for these accomplishments. In doing so, the District incurs impacts to staffing to accommodate active duty, state and national training requirements, and deployments. This has considerable impact to the District's staffing needs but is well worth the quality and diversity of the employees that have been hired due to this program.

Significant research and evidence has shown repeatedly that firefighting and EMS are some of the most stressful jobs in the world (Min, 2019). As mentioned in AP Triton's report, significant increased risk for cardiovascular disease, cancer, and behavioral health problems is becoming more fully understood in the modern fire service (CDC, National Institute for Occupational Safety and Health and Firefighters Support Alliance, 2021). Some of the recommendations from recognized and respected sources such as the NFPA, the National Fallen Firefighters Foundation, the Center for First Responder Excellence, and other fire service experts include careful monitoring and utilization of excessive work schedules and overtime as they likely increase sleep deprivation and job stress exposure, which contribute to increased health risks for firefighters and paramedics (Provident Insurance Solutions, 2021). Overworked responders are more likely to have errors in judgment, which is particularly important when providing complicated advanced medical procedures and medication administration (Federico, 2020).

A 1.2 staff factor also gives little consideration for the evolving modern workforce. Millennials became the largest workforce in the U.S. labor market in 2016 (Fry, 2018). Millennials place work life balance and schedule flexibility as the most important driver of employer choice (Forbes, 2020). Current and competent fire service leaders understand this unique challenge, and many are adapting to this issue in order to remain competitive in the job market. While freedom in scheduling is hard to offer with a 24/7 essential service, ensuring work life balance is a very real benefit that must be addressed. Taking this into account and the growing body of evidence of the associated negative health effects of working long and extra hours, this is not simply a nice benefit to have, but will be required for the emergency services to remain competitive in the job market in the future.

Finding No. 14: "The analysis supports that TCESD2 has an operational overage of up to 11 paramedics. TCESD2 should consider limiting the hiring of additional paramedics and re-evaluating the advanced life support staffing plan" (AP Triton, 2021, p. 97).

The District categorically disagrees with this recommendation. Similar to the staffing model, AP Triton is using antiquated methodology that relies on firefighter paramedics only working as paramedics. This methodology is not only incredibly stressful for the paramedic for reasons described above, but it also creates legal risks with Section K of the federal labor standards act which specifically delineates classifications between dual-role and single function paramedics employed by fire departments. Section K of the FLSA is known as “The Firefighter Rule” and is one of the more challenging salary computations as it is based on work schedules, duties and capabilities assigned, and any time taken off by employees during “Premium-Pay Periods” (U.S. Department of Labor).

This recommendation also disallows the added community and system benefit of having paramedics available to deliver advanced life support skills from an engine on first response. This provides a higher level of service with ALS being delivered even faster to patients by arriving on engines and trucks that typically arrive quicker than ambulances. This allows for minimal time on scene as well as a faster patient transfer to the ambulance and ultimately to definitive care in an emergency room.

An interesting point of AP Triton consultants challenging the use of firefighter/paramedics on both engine companies and ALS ambulances is that both principal officers of AP Triton served as fire chief and assistant chief of EMS for one of the largest fire districts in California (Sacramento Metropolitan Fire District, Sac Metro), which is a department that deploys ALS engines and ALS transport ambulances. Our research has identified that Sac Metro fields as many as four firefighter/paramedics on many priority medical incidents.

Having more than the bare minimum number of paramedics also provides the District more capacity and the ability to adjust staffing patterns during no-notice or short-notice disasters. During winter storm Uri for example, the District was able to place three additional ALS ambulances in service in order to meet the 300% increase in service demand. Had the District not had this capability, the City of Pflugerville and surrounding residents would have experienced significant delays as was the case in neighboring cities, which included no ambulances being available. The shortage of response resources in the City of Austin during the winter storm disaster made national news headlines. While the City of Pflugerville has significant emergency management needs in nearly all categories, FEMA Emergency Support Functions (ESF) fire (ESF-4) and EMS (ESF-8) are addressed appropriately by TCESD2. Over the past 16 months, the District has had multiple documented examples of success in meeting service demands during locally declared disasters. The same cannot be said for the City of Pflugerville.

The District’s staffing and deployment plan was developed according to a number of reliable data sources and outside consultants. Some of these sources include executive fire officer thesis papers from the National Fire Academy, the Center for Public Safety Excellence, and medical doctors, including the District’s Medical Director Michael Zimmerman.

Finding No. 15: “The majority of Travis County agencies function under the protocols established by ATCEMS” (AP Triton, 2021, p. 84).

This is inaccurate. There are multiple other EMS systems within Travis County who have different protocols and medical directors. In addition to TCESD 1, 2, 5 and 7 has different protocols, as does the Travis County Division of Clinical Performance and Education which is separate from ATCEMS and includes TCESD: 3,6,8,9,10,11,14, as well as the Travis County Parks. This is not addressed by AP Triton and is misleading in providing a view of the Travis County EMS system(s), seemingly singling TCESD2 out as an outlier, which is categorically not the case.

Finding No. 16: “there are not many differences between the 2 protocol documents [ATCEMS vs. TCESD2]”...and recommends the District use ATCEMS protocols” (AP Triton, 2021, p. 90).

Even a cursory glance at the District’s protocols versus ATCEMS show that TCESD2 protocols are 106 pages in total whereas ATCEMS is 370 pages. There are many reasons why the District produced its own protocols, which include eliminating redundancy, updating them (which are done regularly), and ultimately

ensuring the protocols are the most appropriate, evidence based, easily accessible, usable and readable for the provider in order to best treat the patient.

Finding No. 17: "Intubations performed in a hospital setting are beneficial, but paramedic skills in the field setting are essential" (AP Triton, 2021, p. 90).

AP Triton asserts that intubation is the ultimate measure of a paramedic; this is an antiquated and inaccurate belief. The authors of this section are not physicians, nor are they actively practicing paramedics (currently working regularly on ambulances). They conflate all advanced airway management with tracheal intubation. Airway management is complex, multimodal, and encompasses much more than placing a tube constructed of polyvinyl chloride into the trachea. This can be supported by a recent randomized study that included 1,523 paramedics and 9,296 patients with out-of-hospital cardiac arrest, favorable functional outcome (modified Rankin Scale score in 0-3 range) at hospital discharge or after 30 days (if still hospitalized) occurred in 6.4% of patients in the supraglottic airway group vs 6.8% of patients in the tracheal intubation group, a difference that was not statistically significant. This is strong evidence that ET intubation is not the single determinate in paramedic performance and that other airway adjuncts, including those that are less complicated and are able to be administered by lower trained EMTs have to be evaluated for the benefit of the patient (Benger, 2018).

As non-practitioners of advanced airway skills, it is clear that the authors at AP Triton are not up to date on recent trends and research in this area of medicine. The District's medical director, a current practicing emergency physician, has a vested interest in ensuring that District practitioners are up to date on the latest airway management practices and skills. As a board-certified emergency physician who has been practicing full time for over 20 years (mostly at trauma centers) and having been involved in EMS for the same amount of time, Dr. Zimmerman is capable of managing the District's approach to airway management. Due to the lack of expertise in this area, AP Triton is not as qualified.

On this topic, ATCEMS has a small percentage of their paramedics credentialed to perform RSI, as do most modern systems. A thorough examination of ATCEMS and for-profit systems would have revealed this had the consultants studied other systems.

Finding No. 18: "Additionally, based on interviews with ATCEMS, the different protocols performed by TCESD2 and different EMS billing practices are excluding auto-aid into the City of Austin" (AP Triton, 2021, p. 9). "Both previous analyses consider only the resources of TCESD2 and do not include any automatic aid responses from other agencies. TCESD2 needs to consider setting up automatic aid responses from other agencies that could supply resources sooner than TCEDS2's resources" (AP Triton, 2021, p. 66). "TCESD2 is dispatched by Austin Travis County EMS (ATCEMS), so ATCEMS often provides service demand in the south/west district under auto-aid response but TCESD2 is not permitted to reciprocate" (AP Triton, 2021, p. 80).

In the interest of patient care, the District does receive automatic-aid from ATCEMS when their ambulances are closer than the District's ambulances. AP Triton uses this data in their report yet fails to acknowledge it (p. 111). ATCEMS does not allow automatic-aid in the City of Austin due to a City ordinance adopted in 1992. This ordinance prevents any other ambulance service from operating or responding as a 911 service. This action limits the resources that could assist Austin residents during a medical emergency. The District believes that anyone in need of an ambulance should receive care from the closest unit, this is a moral and ethical issue, and this is reflected in current District operations. The District is always open and available to assist any agency in the interest of improving service delivery and saving lives.

Finding No. 19: "Consider evaluation of current response plan. Response of an engine/truck, squad, safety, and ambulance to a single EMS event is not an efficient use of resources. Research supports that more than two paramedics does not translate to improved Care" (AP Triton, 2021, p. 97).

The District does not send an engine/truck, squad, safety, and an ambulance to a single EMS event as part of a standard response plan. This claim by AP Triton is not accurate. The District does send an engine/truck, safety, and ambulance to the highest acuity level the District responds to, such as a cardiac arrest. These calls require the highest number of skills and critical tasks to be performed on a singular medical incident. Some of these tasks include high performance CPR, advanced airways skills, establishment of intravenous or intraosseous access, medication selection, verification, and medication draw, administration, cardiac monitoring and interpretation, and related monitor actions such as defibrillation, ventilation monitoring including pulse oximeter, end tidal carbon dioxide monitoring, evaluating lung sounds, performing traditional vital signs including blood pressure, pulse, respirations, skin condition, medical documentation, family support, coordination, and communication. This requires a minimum of nine personnel to meet the bare minimum required for carrying out these critical tasks. If one witnesses these incidents, these are all-hands-on-deck type incidents. Everyone is working quickly and purposefully in an effort to save the patient's life. Comparatively with this type of incident, a similar number of hospital staff must respond to care for the patient correctly in a hospital setting. This is the methodology used to determine the appropriate number of resources to send to an emergency medical incident, not simply how many paramedics are required. The District aims to provide the highest level of service and quality to a patient when they need it the most, in order to produce the best chance for a successful outcome.

AP Triton cites limited research (a periodical opinion piece referencing limited research) that having multiple paramedics does not improve patient outcomes. AP Triton attempts to use this to make a recommendation concerning having a lower number of total emergency medical staff on an incident, such as EMT-Basics. This was not the intent or focus of the research cited by AP Triton. The purpose of that research is related to the total number of paramedics on a scene, which is generally accepted to be no greater than two (except in the Departments where AP Triton staff worked). The District minimum number of paramedics on these incidents is two. AP Triton fails to provide information on what this limited research points to as the potential reasons for this topic in pre-hospital care. As indicated in the research there are five key factors that should be addressed in an emergency medical system related to this topic:

1. Practitioner proficiency,
2. Treatment time,
3. Error rates,
4. Practitioner shortage,
5. Financial sustainability of the system.

The District's quality management staff are appropriately credentialed and include medical physicians. The staff reviews current research and have systems and programs in place to address these key factors.

Finding No. 20: "Consider focusing on future recruitment and hiring processes based on diversity. TCESD2 should strive to have diversity consistent with area demographics" (AP Triton, 2021, p. 97).

AP Triton did not request this information in the paperwork used for data collection given to the District. The district places diversity as a core value in its policy and procedures given to AP Triton. The District has successfully implemented several programs and supporting actions to build a more representative workforce compared to the community. These programs include:

- 2016 District Recruitment and Retention Strategy Program. This program outlined and introduced three programmatic areas, all of which were implemented, to increase diversity opportunities and efforts within the District which led to the creation of:
 - A High School Fire and EMT academy conducted in partnership with Pflugerville School District,
 - An Internship that allows community members to attend fire and/or EMT training and be given access to hiring opportunities if available, and
 - Non-traditional hiring practices, including recruiting military veterans, to increase diverse hiring.

The District does have internal metrics and goals for increasing diversity in the workforce. Although AP Triton does not list the most obvious and significant gap in diversity facing the fire service, the District places a high priority on improving gender disparity. Since implementing these programs, the District is proud that over the last six years it has met the national average for career female firefighters, according to the National Fire Protection Association, and has made significant positive improvement towards recruitment of African American, Hispanic, Latino, and other multicultural race and ethnic categories. The District recently completed a female firefighter listening session with its female employees and is committed to becoming an even more inclusive and sensitive organization. This work is ongoing and remains a top priority.

Finding No. 21: *“TCESD2 benefits from an internal initial paramedic certification program. Based on the limited number of patient contacts in the system, AP Triton recommends expanding the clinical training program to include a high-volume EMS transport system such as ATCEMS” (AP Triton, 2021, p. 99).*

AP Triton fails to provide a source, qualifier, or comparison to define what a limited number of patient contacts constitutes. No other paramedic education program is mentioned in the report. Had the consultants studied other programs they would have found that in reality the District enjoys one of the highest patient contact counts in the region for student opportunities. We agree there should be ample opportunity to practice skills, and the District's high call volume provides that opportunity. District paramedic students average 58 advanced patient contacts, which is 16% higher than the state/national minimum (Texas Department of State Health Services and Commission on Accreditation of Allied Health Education Programs).

The District paramedic course maintains a 100% pass rate and has quickly established itself as an effective and well-respected program in the area. Limited participation in the region is primarily due to the program not being open to the public. The program is small in nature and the small class size is by design and is optimized for student learning. Based on market research the District could easily fill the classroom with students, and potentially generate revenue. However, that is not the goal of the program. This would bring lower trained and inexperienced students into the classroom and would slow the overall pace and progress of the class. This would reduce the number of advanced patient contacts for students as well. The District does agree that expanding this program is something to explore to help the overburdened education system that exists in the region and fails to keep up with the demand. However, time is needed to build additional capacity for this to be realistic and beneficial. District staff continue to monitor this potential using data for any decision making.

Initial establishment of a paramedic training program requires approval, or accreditation, with the state and national accrediting bodies, which include the Texas Department of State Health Services and Commission on Accreditation of Allied Health Education Programs. These programs can take several years to complete that process. The District program currently has two broad goals:

1. The creation of quality paramedics who are competent and compassionate, and
2. To achieve accreditation. The District anticipates full accreditation of its program in 2022 and we are excited about this extraordinary accomplishment in the near future.

Many fire departments looking for paramedic education programs opt for online programs for the cost saving benefits. District training staff are familiar with these programs as the District works directly with a few of these programs and have hired students that have completed online programs. While a lot of positive things can be said for online paramedic learning, it is the District's assessment that critical items and proficiencies are not achieved with online paramedic training, and do not meet the District's high standards for patient care. This observation has resulted in the District having to retrain and delay these paramedics from practicing. This may be the reason why ATCEMS does not allow these online program students to ride or do clinicals on their ambulances. However, the District has stepped up and met this need for these programs, adding the educational opportunity and capacity in the region as a regional partner to support these programs and workforce needs.

There are additional educational capacity issues in the region where ATCEMS cannot be fully relied upon to meet the need. The Travis County Department of Clinical Performance and Education has also requested an opportunity for their personnel needing “credentialing” to ride out on District ambulances to gain sufficient experience due to not being able to get clinical time on ATCEMS ambulances. Again, the District has the utmost respect for the men and women of ATCEMS, but their system is costly and overburdened. It is understandable that they cannot be the sole provider of everything EMS education related. Again, the District has supplemented and met this need, adding to the educational opportunities and capacity in the region as a partner to support the current workforce needs.

Finding No. 22: “AP Triton recommends a cost/benefit analysis relating to the provision of an initial paramedic certification program. There appears to be limited participation by surrounding agencies, and the overall cost per student seems too high. Consideration of a regional program may prove to be more cost-effective” (AP Triton, 2021, p. 99).

A cost benefit analysis was conducted and is why the District’s paramedic program was created in the first place. In addition to the logistical and capacity challenges faced by existing programs, and the limited opportunities for clinicals, the cost of the District’s program is cost neutral. Tuition in the region averages between \$12K - \$15K per student. For a class of six students, the District would have to pay \$90K. This is one and a half salaries for the District to pay an instructor. Many of the programs in the region have moved to two-year programs. The District’s program is approximately 10-12 months depending on clinical schedules. The most expensive part of a paramedic education program is the labor associated with covering a firefighter paramedic student while they are in class, and for the actual paramedic student in class. This cost exists whether the District engages in an in-house class or not. The benefit of conducting in-house training which is overseen and taught by the District’s medical director is invaluable and has proven to be a successful endeavor. This environment leads to accurate and system-focused training that expedites credentialing and produces excellent paramedics for the community. High failure rates and attrition, common with paramedic programs, are not seen with the District’s program.

Finding No. 23: “There appears to be a need for a more collaborative/cooperative training program relating to multi-casualty incidents (MCIs)” (AP Triton, 2021, p. 99). “Minimal” is used on page 93 to describe the drills (AP Triton, 2021).

This statement is inaccurate. AP Triton fails to cite their comparison for this opinion. The District does conduct multiple drills of this nature at least annually and they are required for ISO Class 1 designation, which the District has. A multi casualty incident is defined by the Federal Emergency Management Agency’s (FEMA) operational templates and guidance for EMS mass casualty incident deployments as “any event; planned or unplanned that results in the need to provide medical care to patients outside of traditional hospital settings” in large numbers. The District has conducted an MCI drill annually since 2011 using active shooter scenarios as the drill’s focus. Evidence of these drills can be produced with District training records, which were never requested by AP Triton. These MCIs represent one of the most likely low frequency, high risk incidents encountered by District personnel. These drills emphasize the core principles in MCI management:

- Save the largest number of survivors from the incident, with a focus on responder safety
- Identify, triage, treat, and transport to definitive care

These drills typically occur in cooperation with the City of Pflugerville Police, Pflugerville Independent School District Police, faith-based organizations, and the Hutto Fire Rescue Department. These drills have occurred at different sites, including multiple school locations and churches in the area over the last ten years. All District firefighters are trained to the national standard by ALERT (Advanced Law Enforcement Rapid Response Training) certified instructors. Most fire officers in the District also possess ALERT level 1 training, which is the same training that law enforcement officers receive. The District is one of very few agencies in the area that can state this. For example, ATCEMS personnel lack this training (Thompson, 2021). The District has invited ATCEMS to these drills, and there has been limited participation. We understand ATCEMS limited funding and availability to conduct this training. The District

is unaware of any other agency in the area with this history and effort on this subject and MCI drills for the past ten years.

A video of a recent MCI drill can be found on the PFD Training Division Vimeo channel (2018). While these drills are costly and very difficult to plan and conduct because of the number of resources needed to simulate realistic situations with multiple patients, there has been significant effort dedicated to ensuring area first responders are prepared for these events. The District has been able to capitalize on its internship and high school programs to secure patient actors for these MCI drills. Several staff members have gained attention as experts in this subject as a result of these efforts and have spoken at conferences regarding MCI drills and training as a result of a decade conducting these drills.

Finding No. 24: *Figure 82 reports that the District does not have a driver training program. (AP Triton, 2021)*

This is inaccurate. The District utilizes the Coaching the Emergency Vehicle Operator program, and all personnel who operate apparatus must complete the course(s). This program is nationally recognized and has been used to train over 500,000 responders. The District maintains an excellent claims history which is evident by its low vehicle accident and error percentages. This information is available but was not requested or part of AP Triton's analysis.

Finding No. 25: *"the District lacks a balance between actual incident volume and training topic percentage" (AP Triton, 2021, p. 92).*

AP Triton fails to describe its methodology and comparison of the District training to their subjective standards in order to make this statement. Ironically the report goes on to describe ideal training evolutions and approaches which the District uses (planning and use of mannequins). The District has a reputation for excellent training programs, which is evident by its ISO Class 1 designation as ISO evaluates training. Additionally, the District's training programs are regularly audited by the Texas Commission on Fire Protection (TCFP) and the Texas Department of State Health Services. The most recent training audit by the TCFP states "excellent work" and "good job, no issues found".

The District utilizes a well-established training methodology for determining program focus and outcomes. This process utilizes the concept of focusing on high-risk, low-frequency events as responders rarely make mistakes on high frequency events. According to Gordon Graham, "mistakes in any occupation or profession are more likely to occur on low-frequency events." Graham goes on to explain that:

A basic rule in life is when the deviation becomes the norm, it creates a problem lying in wait. Dr. Tony Kern writes about this in his great work *Going Pro: The Deliberate Practice of Professionalism*. Kern posits that "excellence should be the norm, not the deviation." These are words to live by. We must strive for excellence (aka "getting things done right") on everything we do.

These concepts, along with state and national mandates, determine the District's training goals and objectives.

Finding No. 26: *Figure 87 states the District does not have an SCBA obstacle course (AP Triton, 2021, p. 94).*

This is inaccurate. The District does have an SCBA obstacle course, including props recognized and approved by the International Association of Firefighters and Canadian National Fire Forces.

Finding No. 27: *"Based on on-site interviews, it appears that coordination between the City of Pflugerville and TCESD2 during the recent winter storm was strained and limited. TCESD2 is currently evaluating options for a more independent role in emergency management. AP Triton recommends a coordinated effort following the direction of Travis County and the City of Pflugerville" (AP Triton, 2021, p. 95).*

The District's performance during winter storm Uri in February 2021 was nothing short of exceptional. The District, due to sound financial and operation planning and capability, was able to upstaff three additional ambulances (for a total of eight), three additional brush trucks, and two command units, in addition to a fully functioning District Operating Center handling a 300% increase in call volume, running 1000 calls in one week. This is the number of calls the District typically runs in a month.

All members of the fire department were recalled to handle the storm response. During this time District firefighters, including paramedics, worked nonstop, many working four and five days straight. While District facilities lost power and water (supplied by the City of Pflugerville); generators and disaster supplies, which included snow cables for every emergency vehicle, kept the department operating throughout the event. This cannot be said for the City of Pflugerville. In fact, District personnel had to divert resources to assist City staff with securing diesel and gasoline for their vehicles to supply the generators they had (including the 911 center), and to instruct how to use the state resource request system to provide basic city services. The District was proud to assist the City in their time of need, but the record is clear - they were not prepared for this storm in any capacity. Despite this, their fire and EMS department performed amazingly well.

To date the City does not have dedicated emergency management staff, or appropriate budget, planning, training, or exercising in place. There is no City emergency operations plan. This was apparent during the storm, and even more apparent in the actions that followed. After the storm, it was revealed there was little to no training for City staff and elected officials. The District is pleased to see efforts underway for City officials to receive basic disaster training, a proposal for a full-time emergency management position, and money included in the FY22 budget for emergency management. However, this is an example of having to have a disaster before change can occur. This represents poor planning and lack of strategic thinking on the part of City leadership. Contrary to AP Triton's assertion, the District is trying to do the just opposite of being independent, and has employed a consultant to ensure improvement and regional collaboration throughout the area, and to ensure improvements are made within the City of Pflugerville emergency management capability.

In terms of strained or limited coordination, District staff maintained communications with City staff every day, and were able to assist where they could. While not in the District's mission, this assistance included helping with fuel for City facilities and equipment and providing water to certain residents. The District would use the term "strained" to more accurately describe how it came to be that the Police Chief retired in the middle of the worst disaster in the history of the City. City management personality differences aside, it is completely unacceptable and derelict to remove the head of the Police Department during an active disaster. It should be noted that all but two Police units were incapacitated during the event. This resulted in limited Police response capability for traffic related issues including traffic accidents during the storm and a lack of traffic management. To be clear we value and appreciate our local Police partners, but they were not set up for success during the storm by City leadership. Police personnel are critical in disaster response. They should be properly funded, trained, equipped, supported and prepared for disaster events.

Many communities in the area had periods where no ambulances were available. These patients were transported in fire engines and police cars, properly equipped police cars, in many instances. This did not happen in ESD2 or the City of Pflugerville because of the District's planning and response capabilities. The District experienced no fleet accidents and is one of the only agencies that was able to meet storm response needs. This has been well established and is well known in the area. For more information, please read the District's after-action review in Appendix D.

Finding No. 28: "TCESD2 is currently evaluating the options for independent dispatch services. AP Triton recommends continued collaboration and regional dispatching" (AP Triton, 2021, p. 95).

The District is indeed trying to explore options to address the growing cost of using City of Austin services which are the highest in the region and nation in many respects. There are fundamental problems with the City of Austin dispatch services which include high cost, limited technology options, City of Austin

centric policies, limited end user input, and lack of oversight. This has been well established and documented by outside consultants for the past decade, and as recent as this year.

Ironically, one of the best win/win solutions to these dispatch problems is a cooperative approach between the City of Pflugerville and the District for regional dispatching services. District staff have requested multiple times to work with the City to take advantage of this opportunity. This would allow for enhancement to the existing 911 systems in the City and would help to meet the District's needs. This would save taxpayer dollars and increase performance at the local level. City officials have been unwilling to work on this area to date. District staff remains committed to pursuing this opportunity to better serve the residents, and has compelling data to support this as an option.

Finding No. 29: *AP Triton states the District has an average UHU of 13.8% (2020) and goes on to state that is "well below standard UHU recommended limits" (AP Triton, 2021, p. 16).*

There are currently no consensus standards for unit hour utilization (UHU) for emergency medical services. Comparisons to other agencies need to consider the full spectrum of services provided by that agency. AP Triton makes a comparison to ATCEMS, an agency they did not fully study, and notes the agency's high UHU of 55%. While AP Triton concludes that this is an unacceptably high UHU, they fail to qualify the comparison. ATCEMS is a third service EMS provider, the most expensive system available to deliver ambulance services. As such, they do not provide fire rescue services on top of EMS like fire departments do. This is one of the main reasons that fire-based EMS programs are much more economical than third service agencies.

AP Triton also did not explain that while fire-based EMS programs are more economical than third service agencies, it is because they provide two functions: EMS and fire services. A third service does not have additional duties other than ambulance transportation. Therefore, from a UHU perspective, additional duties need to be factored into the total workload analysis and comparison. Additional duties for fire-based EMS programs include fire and EMS training, fitness training requirements for firefighters, risk reduction activities such as smoke alarm installations, and additional maintenance requirements for fire and EMS equipment. Leaving out these differences presents an inaccurate comparison between fire-based EMS programs and third service agencies. Once these additional duties are factored in with an optimal workload utilization that is dedicated for incident volume only, a more accurate description is realized. This places the District's UHU in the optimal 15%-20% range. These UHU percentages represent the thresholds for the District's EMS system performance. Pushing responders beyond these numbers can have grave consequences.

A study by Washington University conducted in 2020 found that "27.2% of EMT and paramedic survey respondents reported suicidal ideation in the past year—a rate seven times higher than the general population" (Al Lula, 2020). The region has unfortunately experienced this very real threat for first responders (Davis, 2015). Failing to have appropriate UHU standards that maximize cost efficiency, clinical performance, and employee welfare can have detrimental effects to the community, employees, and the organization.

The report recommends an average UHU of 25% for the District, however, in the example provided by the dated source in Henrico County, a UHU of 25% indicates system stress and **reduction from 90% to 75% response time performance** (VA, 2016, p. 71). AP Triton is recommending a reduction in performance and fails to appropriately describe the methodology and best practice in making that determination for the community.

Finding No. 30: *Figures 93-95 are not presented in an accurate manner (AP Triton, 2021).*

It is presumed that the source of this data was from ATCEMS and it has been proven that they use a "clock stopper" for their response time performance. This involves counting the on-scene time of first response units, which are BLS in most cases, for their on-scene time. This creates the illusion that their ambulances have better response times than they actually do. While the incorporation of first response

can be a factor, the District believes that for this to be an accurate reflection of performance, it would need to be ALS first response. This is due to the fact that BLS practitioners cannot deliver the same skills and procedures that ALS practitioners can. Therefore, a clock stopper consideration would only apply to certain calls where ALS skills are not required. Using additional vehicles and factors is not a transparent or accurate representation of what is actually occurring with regard to ambulance response time performance by ATCEMS.

In all three figures, AP Triton shows ATCEMS meeting the Travis County response requirements. This is categorically not accurate. ATCEMS has not met these requirements for many years. Figure 95 is perhaps the most misleading as it compares ATCEMS response performance as being superior to the response performance of the District. There is no explanatory information or methodology to describe how AP Triton arrived at this "independent analysis." The District can produce concrete evidence that ATCEMS does not meet response time performance standards as set in the Travis County interlocal agreement and that this has been the case for many years. An analysis of ATCEMS actual response time performance for the period of February 2021-July 2021 found ATCEMS met the standard 84.06% of the time for ambulance response to all calls and then 65.94% for priority 1 incidents. The District maintains the response time standard at or greater than 90% in these categories.

Section 4.4: General Errors Identified in the AP Triton Report

This section identifies and explains general errors found in the AP Triton report.

Finding No. 31: *The organizational chart on page 6 provides an incorrect representation of the TCESD2 structure (AP Triton, 2021).*

The most up-to-date organization chart can be found on the District's publicly accessible website within the FY21 Approved Budget document.

Finding No. 32

AP Triton utilizes the City of Sugar Land, TX and the Sugar Land Fire Department to compare administrative support/staffing percentages (AP Triton, 2021, p. 11). The report states that the Sugar Land Fire Department is "slightly larger" than TCESD2. Sugar Land has a population of 118,755 as published in their FY21 Approved Budget document, TCESD2 has an approximate population of 133,000. Sugar Land's square miles total 43 compared to 77 square miles for TCESD2. Sugar Land also has a total of 124 certified firefighters whereas TCESD2 is authorized to 163. Requests for service in FY20 for Sugar Land totaled 8,823 and TCESD2 received 12,458 in the same time period. Based on these facts alone, the statement that the Sugar Land fire department is in any way larger than TCESD2 is completely false.

The comparison of Sugar Land was utilized in an attempt to illustrate that TCESD2 had an abundance of administrative/support positions in comparison to line staffing levels. One of the main reasons that comparisons between municipal (city) fire departments and emergency services districts (ESDs) like TCESD2 are flawed is because ESDs are stand-alone governmental entities responsible for the full administrative burden of finance, HR, payroll, IT, and other management responsibilities that are typically shared between departments and/or centralized in municipal governments.

If you compare a typical municipal fire department's administrative staff to that of an ESD, the ESD will appear to have a larger percentage in comparison to line staff than the municipal fire department if an allocation of the centralized functions are not included in the comparison. The City of Sugar land has over 40 employees in their Finance Department alone, 25 in IT, 11 in HR, and a combined 21 employees in the City Manager's and City Secretary offices. For a true comparison of administrative support between the Sugar Land Fire Department and TCESD2, an allocation should have been included for the centralized functions of the City of Sugar Land to the fire department for the same functions provided by TCESD2 staff and it was not.

Finding No. 33: *The totals on Figure 39 are incorrect for the “2018”, “2019” and “2020” columns (AP Triton, 2021, p. 47).*

The figures published in column “2018” total 9,434, not the 9,422 published. The “2019” column totals to 10,383 not the 10,377 published and “2020” column totals 10,705 not 10,703 published.

Finding No. 34: *The totals on Figure 52 are incorrect for the “2018” and “2019” columns (AP Triton, 2021, p. 56).*

The figures published in column “2018” total 6,528, not the 6,529 published and “2019” column totals 7,070 not the 7,142 published.

Section 4.5: Analysis of AP Triton Report - Future Options and Recommendations for Service

It appears AP Triton used significantly flawed financial, population, and incident forecasts to support many of the recommendations below. AP Triton has presented a total of four recommendations based on inaccurate and flawed conclusions for the City of Pflugerville (and then a completely unrealistic fifth option later in the report):

1. **Maintain Status Quo** - This option continues the status of service to the jurisdictions without change. TCESD2 and the City of Pflugerville continue to do business as usual, with no change to governance, staffing, or resource deployment. This option might preclude the increased efficiency, effectiveness, ability to add additional units and services, and possible cost-savings that may be realized in a long-term integrated environment.
2. **Private Ambulance Provider for the City** - The City can consider contracting with a private provider to provide advanced life support ambulance service/transport. The use of a private provider is a common method that cities and counties use to secure ambulance services. This option removes the City from becoming the provider of record and simply contracts for services from an outside ambulance company.
3. **City-Owned Third Service EMS** - The term “Third Service” refers to the City assuming the role of ambulance provider, meaning the City becomes the ambulance “provider of record.” This can be accomplished in three common ways:
 1. Using City employees, ambulances, and equipment to provide the services like any other city department or agency.
 2. Subcontract the services to an independent contractor (private ambulance company).
 3. A combination of the first two.
4. **Transport by Austin-Travis County EMS** - Prior to TCESD2 taking on EMS service in 2017, Austin-Travis County EMS provided EMS and ambulance transportation services to Pflugerville. Due to the short notice and limited capacity, ATCEMS would initially only be able to provide two ambulances. Based on this analysis, a minimum of three ambulances would be required within Pflugerville city limits, with one additional ambulance for the ETJ. The analysis showed that a four-ambulance system could meet or exceed the required performance objectives. However, with additional time, ATCEMS could acquire the additional staffing and units to provide adequate coverage.

Section 4.6: District Response and Analysis of AP Triton Recommendations

AP Triton Recommendation Option 1 - Maintain Status Quo

District response to this option:

With the overwhelmingly successful creation of ESD17 in May of 2021, an adequate and sustainable funding source has been secured for ALS and ambulance services for residents within ESD17. ESD17 Commissioners are pursuing a contract with ESD2 to provide these services and ESD2 intends to continue to provide these services for ESD17 jurisdictional area through an interlocal agreement. It is anticipated these arrangements will be finalized by the end of the calendar year (2021) and that ESD17 would begin collecting revenue as early as January 2022. When this occurs, this creates a tax inequity issue since the residents of ESD17 will be paying for ALS and ambulance services whereas the residents of Pflugerville and the ETJ will not. Residents of ESD17 would be left to subsidize areas not paying taxes for these essential high-quality services they voted to fund.

Critical issues with this option:

- Financial assumptions by AP Triton are incorrect. This includes anticipated revenue increases, salaries and benefits, recurring expenses, total revenues, and statements about the District's reserve balance.
- AP Triton failed to provide a source for their "best practice" staffing model factor using a 1.2 relief factor. Currently neither the National Fire Protection Association, the International Association of Firefighters, or International Association of Fire Chiefs, or Texas Commission on Fire Protection have a consensus standard for a staffing factor calculation. The District is aware of fire departments, many in California, that rely on an antiquated staffing model that is built upon:
 - Firefighters working excessive overtime, instead of hiring adequate staff to cover vacancies and leave. While overtime can be a cost saving tool, it does have a limit and will reach a diminishing marginal return as explained earlier in this document.
 - A 1.2 staff factor gives little consideration for firefighter health and safety and has negative consequences for the taxpayer in terms of increased healthcare cost for firefighters and degradation in service levels.
 - A 1.2 staff factor gives no consideration for the evolving modern workforce. Millennials became the largest workforce in the U.S. labor market in 2016.

AP Triton Recommendation Option 2 - City Contracts with a For-Profit EMS Ambulance Provider

District response to this option:

The District Board considered this as a potential option during its analysis but determined it would be the worst option for the community. For-profit ambulances have some of the highest EMS billing rates and have aggressive billing collection practices. They also operate at the lower end of quality service as they have lower wages for employees and struggle to meet basic response times standards. This option comes with significant changes in performance and the quality of service. For-profit EMS will identify the minimum level of service needed to be profitable and will accept significant lapses in response times. An example of these minimal levels of service resulting in a significant increase in response times can be seen in Bastrop, Texas and throughout Milam County. Some examples there include ambulance response times of 47 to 55 minutes in some cases (Wright, 2018).

Many for-profit EMS systems rely heavily on existing BLS services provided by the local fire department to subsidize their operating costs. They will typically staff their ambulance with only two personnel which is the bare minimum number of personnel required to respond to a basic emergency medical incident. This staffing is predicated on relying on the supplemental BLS staff provided by the fire department to assist on high acuity incidents. For-profit systems typically do not reimburse the fire department for this supplemental service but will aggressively bill the patient for their costs to ensure a profit.

In a critical care situation, such as a cardiac arrest (which occurs about every other day in the District), a minimum of six EMS personnel are required to deliver high performance cardio-pulmonary resuscitation (CPR) known as "pit crew" CPR. To increase CPR performance and survivability outcomes on these incidents, an additional crew of at least two personnel is needed to rotate out in order to maintain the required high number and fast pace of chest compressions. Several other emergency medical situations

require similar levels of staffing not provided by a for-profit EMS system. The District would be subsidizing the for-profit EMS/ambulance provider and would be saddled with this unreimbursed expense and would have to pursue reimbursement or a subsidy for those costs by billing the City since the for-profit corporation will not pay those bills.

In addition to the subsidy required by the fire department to support for-profit EMS on high acuity calls, the District would have to reduce responses to lower acuity calls in order to maintain its standard of coverage. To be clear, the District would not be able to respond to lower priority medical calls in the City of Pflugerville and this would be a reduction in the services that taxpayers currently receive.

In extended response time situations with for-profit EMS (as long as 47-55 minutes), fire department EMTs would be on the scene of these emergencies waiting alongside the patient. This puts the community squarely back to the same situation as 2016 with ATCEMS with regard to response times.

For-profit EMS would be required to reimburse the District for costs to house their ambulances in District facilities. For-profit EMS companies will typically not pay for this and will instead just post their staff and equipment in parking lots. AP Triton recommends that the City pay to house these units. This is an increased cost to the taxpayer and is a duplicative effort that does not maximize existing resources already paid for in the community.

Lastly, there are numerous operational issues with for-profit ambulances with regard to emergency communications that need to be fully understood by City officials as it appears they are not fully aware of the complexity of the 911 communications system in the region. This information is not addressed by AP Triton.

Critical issues with this option:

- For-profit companies are forbidden to be on the regional 911 system. The City of Pflugerville would have to provide 800MHz radios to the for-profit ambulance company in order to be able to communicate with other response agencies in the region other than City police. While radio patches can be created, these are not permanent communication solutions for emergency operations.
- Mobile data computers would not be linked with the first response agencies. Information sharing would not occur due to this reduction in technology. This jeopardizes responder safety on violent incidents.
- Currently the District is able to communicate and share information with other response agencies in the area, including Austin Travis County EMS. This is critical to handling day-to-day emergencies, and an absolute in a disaster or large-scale event like a school shooting. The issues created by bringing a for-profit service with its own separate dispatch center (even with the 911 calls being transferred by the City's Public Safety Answering Point (PSAP) would be stepping back in time nearly twenty years. This would also violate Homeland Security Presidential Directive 12 for radio interoperability.

AP Triton Recommendation Option 3 - City-Owned Third Service EMS

District response to this option:

This is a viable option but comes at a cost greater than working with ESD2. This would require initial capital investment for facilities, equipment, dispatch, and ambulances. This would fracture the current high-quality service being provided by ESD2 in cooperation with ATCEMS. As a larger entity ESD2 brings more robust resources to bear, which are particularly important during disasters. For example, during the winter storm ESD2 was able to staff three additional ambulances bringing a total of eight ambulances running nonstop in and around Pflugerville. In comparison, many Travis County communities had periods with no ambulances available during this time.

AP Triton Recommendation Option 4 - City Contracts with Austin Travis County EMS

District response to this option:

This was the previous arrangement and is part of the reason why ESD2 became involved in EMS and ambulance transportation in the first place. The men and women of ATCEMS are incredible paramedics. However, the ATCEMS is a third service option which is the most expensive system there is to deliver EMS. ATCEMS struggles to meet its current obligations with the City of Austin and Travis County. ESD2 entering EMS and ambulance transportation services actually alleviated some of the burden for ATCEMS as ESD2 was the busiest jurisdiction in the County. ATCEMS is currently at a historic high in terms of needing paramedics, reportedly having 115 medic vacancies. It was also reported that the ATCEMS budget was cut by \$1.3 million for FY22 (Thompson, 2021). They would also need significant lead time to build resources to be able to provide ambulance services in the City of Pflugerville. Again, we value and appreciate our partnership with ATCEMS and work with them daily. However, ESD2 is a more logical and cost-efficient option for EMS in the City of Pflugerville.

AP Triton Recommendation Option 5 - City Fire and EMS Department

District response to this option:

Both AP Triton and the City of Pflugerville have not adequately explained why they need to separate from ESD2, an ISO Class 1 rated fire department that is also the highest publicly rated service in the City of Pflugerville. This is the most expensive option the City could undertake. In order for it to be feasible, the City would have to partner with the ESD to make this realistically happen, or they would have to duplicate these services in a very short period of time at a significant cost. This is both illogical and costly for the taxpayer.

The District certainly agrees that 20-30 years in the future the borders of ESD2 and the City of Pflugerville will look similar, and it may be advantageous to merge. However, a lot of good faith work must be done to get to that point. The District also has a great responsibility to the surrounding community outside of the City of Pflugerville that must be cared for as well. Until then, ESD2 remains committed to working with all community stakeholders to continue to provide the highest levels of service at the most efficient cost for the benefit of the community. The District remains open to collaborative efforts, and cooperation with the best interest of the community as the focus.

Conclusion

The District's assessment of the AP Triton report is that it is critically flawed, has several significant errors, and cannot be relied upon as an accurate resource for the issue of how to provide adequate funding for ALS and ambulance transport services within the community. While the report does have accurate statements and recommendations, it has a large amount of subjective opinions, with little industry sources and accurate data to back the assertions made. The report appears to have been influenced by political bias, and supports prior statements made by City of Pflugerville officials without accurate supporting data.

District officials appreciate and understand governing bodies' responsibility and the challenges they face in decision making for a community. This is especially true in the growing Pflugerville area. The District respectfully requests that councilmembers sincerely consider consulting with local experts who represent an organization that has served the community for over sixty-five years, as a resource to assist in this critical and essential community need. District officials remain committed to being a supporting partner and resource to help local decision making with respect to public safety within the community *because we care*.

Appendix A: Michael Rainey and Associates

Background

The following document details the deliverables in support to the *Addendum to General Services Contract - Deployment Study* for the Travis County Emergency Services District No. 2 (the 'District').

The analysis represented in this document follows data science and analytics contained within the TCESD2 Emergency Medical Services (EMS) Standard of Cover (SOC) presentation given during the District Annual Planning conference dated July 9, 2021.

All mathematical analysis conducted in the EMS SOC presentation stem from EMS call data provided by the District (EMS 2017_2019 Data.csv; EMS 2020 Data.csv) and readily available, authoritative open-source population data (Center for Disease Control Health Statistics, US Census Bureau ACS 2018 5-Year Estimate, etc.).

Summary of Current Deployment Study Analysis

Conclusions

- District call response times are increasing, on average, in a similar pattern to the increased straight-line distance from call locations to the nearest existing station. (Page 8; Page 24)
- District EMS Call volume is becoming geospatially dispersed at, on average, a greater distance from the nearest existing station. (Page 25)
- Population counts at the block group level within the District are increasing at a higher rate in those areas that are at a greater distance from existing stations. (Page 31)
- Population counts within the District, in general, effectively explain expected EMS Call volume counts from year to year. (Page 44)

Analysis

The following EMS call data was provided by the District (EMS 2017_2019 Data.csv; EMS 2020 Data.csv), Michael Rainey and Associates (MRA) observed that response times for all calls (as defined by Ph PU to Unit Arrive) were proportionally getting longer across all time categories from year 2017-2020 available data (Page 8).

Time Category	2017	2018	2019	2020	% Change
11:59	89.3%	85.6%	85.1%	82.3%	-7.0%
13:59	94.0%	92.1%	91.4%	89.4%	-4.5%
15:59	96.1%	95.3%	94.7%	93.0%	-3.1%
17:59	97.5%	96.9%	96.4%	95.4%	-2.1%
19:59	98.2%	97.8%	97.5%	97.0%	-1.2%

As a contributing factor to the increase in response times, the geospatial locations of the calls (on average) were increasing in straight line distance from the call to the nearest station (18.4% increase on average from 2017 to 2020, Page 26).

Nearest Station:	2017	2018	2019	2020
Average Distance (m)	1,706.3	1,899.2	1,888.1	2,021.3

To estimate the impact on future call projections on response times, MRA analyzed projected population counts, projected EMS call volume, and estimated locations of the projected calls.

To calculate population projections through 2030, MRA employed the US Census Bureau derived cohort-component method starting with 2018 ACS 5-Year Estimates. The method takes into account age group specific projected fertility rates, survival rates and the net migration for each year by US Census Bureau defined block group within the district boundary (Page 45). Of note, year 2020 population projections are included due to available US Census Population Data limited through 2019. Based on historical timelines, it is anticipated that 2020 authoritative data will be available on or about September 2021.

Projections:	2020	2023	2025	2030
District Population	126,720	131,366	134,476	141,925

Following the analysis of the historical population data for the District in comparison to EMS call data, general linear regression at the block group level proved effective as a means to use population to estimate call volume (Page 44, 58).

Projections:	2020	2023	2025	2030
District Population	126,720	131,366	134,476	141,925
EMS Call Volume	7,774	8,105	8,626	9,879

The locations of the call projections were estimated using geospatial exploratory regression to approximate not only locations (Page 36, 59) but also estimated time distance analysis from the nearest station to the projected call (Page 62).

As a result, the following tables outlines the projected proportion of calls within each time category for the labeled calendar year given the current and projected station configurations. In comparison to the anticipated travel time analysis anticipated for year 2020, areas that are anticipated to experience greater than a 1% decrease and subsequent reduction in performance with respect to response times are identified in red (categories with >1% increase in performance are identified in green).

Current 5 Station Configuration: Page 67

Time Category	2020	2023	2025	2030
11:59	82.3%	81.6%	80.0%	77.4%
13:59	89.4%	89.9%	89.2%	88.1%
15:59	93.0%	92.8%	92.6%	91.8%
17:59	95.4%	94.1%	93.9%	93.3%

Current 6 Station Configuration: Page 68

Time Category	2020	2023	2025	2030
11:59	82.3%	82.4%	81.1%	78.6%
13:59	89.4%	90.1%	89.4%	87.6%
15:59	93.0%	93.7%	93.5%	92.8%
17:59	95.4%	95.2%	95.1%	94.7%

Proposed 7 Station Configuration (Hodde): Page 69

Time Category	2020	2023	2025	2030
11:59	82.3%	84.0%	82.8%	80.4%
13:59	89.4%	90.6%	90.0%	88.4%
15:59	93.0%	94.2%	94.1%	93.6%
17:59	95.4%	95.6%	95.5%	95.1%

Proposed 7 Station Configuration (Training): Page 70

Time Category	2020	2023	2025	2030
11:59	82.3%	83.9%	82.7%	80.4%
13:59	89.4%	92.1%	91.5%	89.9%
15:59	93.0%	95.9%	95.8%	95.3%
17:59	95.4%	97.0%	96.8%	96.3%

Proposed 8 Station Configuration (Hodde + Training): Page 71

Time Category	2020	2023	2025	2030
11:59	82.3%	85.2%	84.1%	81.8%
13:59	89.4%	92.2%	91.6%	90.0%
15:59	93.0%	96.0%	95.8%	95.3%
17:59	95.4%	97.1%	96.9%	96.3%

Proposed 9 Station Configuration (Hodde + Training + Brita): Page 72

Time Category	2020	2023	2025	2030
11:59	82.3%	85.5%	84.4%	82.1%
13:59	89.4%	92.6%	92.0%	90.3%
15:59	93.0%	96.2%	96.1%	95.4%
17:59	95.4%	97.3%	97.1%	96.5%

Recommendations

- In order to maintain current levels of performance with respect to anticipated response times, it is recommended that a 7-Station configuration be implemented no later than 2025 to support projected EMS call volume and location.
- For the 7-Station configuration, it is anticipated that the proposed Training area location will provide the District with the ability to maintain lower overall response times due to its central east location.
- In order to improve response time performance across all time categories, it is recommended that the 7-Station configuration (Training) be implemented no later than (NLT) 2023 and the 8-station configuration (Training + Hodde) be implemented NLT 2025.
- Given the anticipated populations growth in density and velocity to the east of the District, it is recommended that the proposed 9-Station configuration (Training + Hodde + Brita) be implemented NLT 2030 to **maintain** current response time performance within the 11:59 and 13:59 time categories.
- In order to **improve** response time performance across all time categories, it is recommended that the 9-Station configuration (Training) be implemented NLT 2025.

Summary of AP Triton EMS Assessment Analysis

Conclusions

- Static 2020 Calls/1,000 Population Factor used for 2030 Call Volume Projections is an invalid simplified assumption based on analysis of historical District call volume and population data.
- Lack of clarity on the data and methodology to determine District population estimates in 2030 that is used to calculate call volume projections eliminates the ability to analyze the suitability of the projections for decision making.
- Replicating the AP Triton projection methodology outlined in the assessment with a better suited estimate for the 2030 Calls/1,000 Population factor, given the AP Triton 2030 District population estimate of **161,875**, results in a 2030 EMS Call Volume Projection of **11,201** (increase in 2,518 EMS calls in comparison to the original 2030 projection of **8,683**).
- The updated 2030 Calls/1,000 Population factor, when used in conjunction with the US Census methodology 2030 population estimate of **141,925**, produces a 2030 EMS Call Volume Projection of **9,819** which is in alignment with the MRA determined 2030 projection of **9,879** EMS Calls in 2030.

Analysis

In order to calculate 2030 call projections, AP Triton identified the use of population estimates as a means to project service demands. The methodology used to project call volume in future years is outlined in the below paragraph.

Service Demand Projections (AP Triton page 46 and 47)

To forecast the future service demand, AP Triton used the population projections within the fire district. Population tends to be a relatively good indicator of service demand, and the current service demand per 1,000 persons can provide a standard for service demand at future dates. The assumption is made that the demographics of the future will be similar to today's demographics. The current service demand per 1,000 population is determined by taking the annual number of responses and dividing by the population number in thousands. The methodology outlined in the paragraph above implies the use of the following equations to determine service demand projections:

$$2030 \text{ Call Volume Projection} = 2030 \text{ Population} \div 1,000 \times 2020 \text{ Calls/1,000 Population Factor}$$

Where: $2020 \text{ Calls}/1,000 \text{ Population Factor} = 2020 \text{ Call Volume} \div 2020 \text{ Population} \times 1,000$

The Projected EMS Call Volume in Figure 39: Projected Service Demand (2030) identifies an EMS Projected Call Volume in 2030 of **8,683**. Given the equations detailed above, this projection implies a projected District population count in 2030 of **161,875** ($8,683 \times 1,000 \div 53.64$).

Although not specified in the report, it is reasonably concluded that the **53.64** EMS calls per 1,000 population is calculated based on the reported **7,510** EMS calls for 2020 divided by the AP Triton assumed population of **140,000** (detailed on Page 47 of the report as an estimate provided by the district to AP Triton) multiplied by 1,000. ($7,510 \div 140,000 \times 1,000 = 53.64$).

However, the use of the 2020 Calls/1,000 Population Factor to determine 2030 Projected Call Volume implies a **static factor** for the next ten (10) years and does not follow historical analysis. Therefore, using a static 2020 factor for 2030 projections is more likely to be a simplified assumption that results in invalid estimates for decision making.

The table below replicates the calculation of the EMS Calls/1,000 Population factor for 2017, 2018, and 2019 for the District given the US Census provided population counts and the District EMS Call Volume data for 2017-2019.

	2017	2018	2019
Population	118,843	123,355	125,317
Calls	5,643	6,773	7,012
Calls/1000 Population	47.5	54.9	56.0

As shown in the table above, the volume of calls experienced over this three year period is increasing at a greater rate proportionally than the population. Therefore, the Calls/1,000 Population factor is not static and instead is increasing in each year.

Given the AP Triton methodology, if the 2019 Calls/1,000 factor of **56.0** is used in conjunction with the AP Triton estimated 2030 District population of **161,875** population, then the estimated EMS 2030 Call Volume Projection would be estimated at **9,065** ($161,875 \div 1,000 \times 56.0$). This is an increase in approximately EMS **382** calls in comparison to the original 2030 projection of 8,683.

However, given the historical increase in the Call/1000 Population factor over the last three (3) years of data, it is more likely that the factor will be higher in 2030 than in 2019. Using regression analysis, it is possible to project the Calls/1,000 population factor for 2030 in a similar fashion as projecting population.

Although a linear regression ($y = 4.2357x + 44.31$) of the historical Calls/1000 population in the table above produces a $R^2 = 0.8412$, a 2030 factor projection of **103.6** does not account for the factor increasing each year at a decreasing rate. The factor increased from 2017 to 2018 by **7.4** Calls/1000 Population and from 2018 to 2019 by **1.1** Calls/1000 Population. This implies that even though the factor will increase in the future, there will also be a 'leveling' of that increase.

As an alternative, a logarithmic trendline to project the factor using the equation $8.034\ln(x) + 47.983$ produces not only a greater ($R^2 = 0.934$) but also accounts for the decreasing returns to scale impact described above. As a result of using this method, the projected factor in Calls/1000 Population factor in 2030 is **69.2**.

Given the AP Triton methodology, using the 2030 logarithmic projected Calls/1,000 factor of **69.2** in conjunction with the AP Triton estimated 2030 District population of **161,875** population results in an estimated EMS 2030 Call Volume Projection of **11,201** ($161,875 \div 1,000 \times 69.2$). This is an increase in approximately EMS **2,518** calls in comparison to the original 2030 projection of 8,683.

Of note, using the projected 2030 Calls/1,000 factor of **69.2** in conjunction with the US Census methodology projected population of **141,925** results in an estimated **9,819** EMS Calls in 2030. This estimate is in alignment with the MRA 2030 projection of **9,879** EMS Calls in 2030.

Recommendations

- Identify and evaluate methodology on determining population projection for the District in 2030 (**161,875** as determined by AP Triton) used as basis for 2030 projected call volume to determine relevance, applicability, and suitability.
- Update the Calls/1,000 Population factor (**53.64** as reported by AP Triton) with US Census provided population estimates for 2020 vice District provided estimates.
- Evaluate reliability and suitability of applying a static Calls/1,000 Population calculated in 2020 as the basis for 2030 projected call volume.

TCESD2 Emergency Medical Services

Standard of Cover Presentation
9 Jul 21

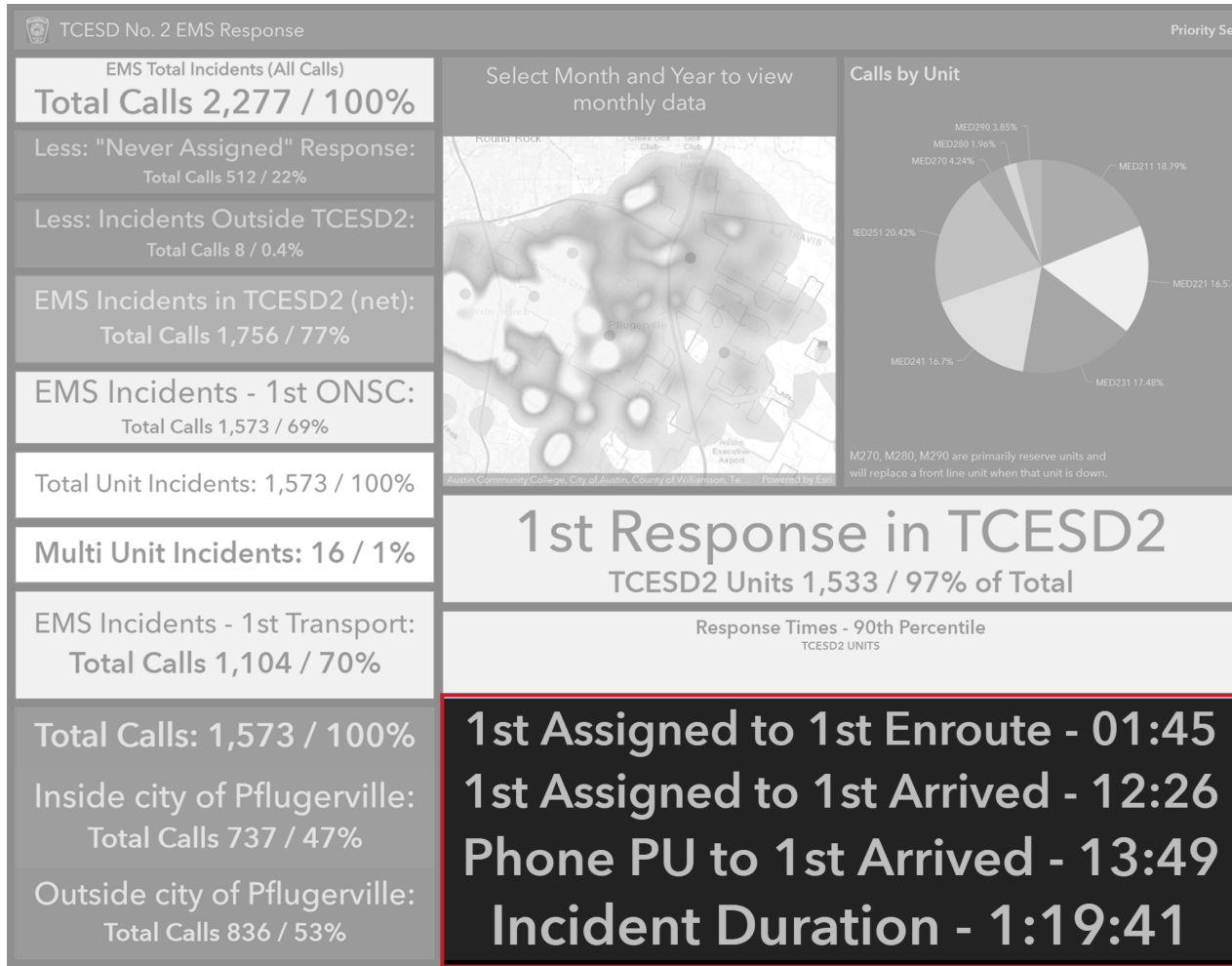
Decision Point(s)

- ▶ Deployment Study:
 - Evaluate current and future needs as it pertains to fire/**EMS** stations and personnel/apparatus deployment required to meet standards of cover

- ▶ Actionable Intelligence:
 - Utilization / deployment
 - Location intelligence
 - Current v. proposed stations

- ▶ Data:
 - EMS 2017_2019 Data.csv; EMS 2020 Data.csv

Assumption Measure of Effectiveness (EMS)



Response Time Compliance Summary

February 2020

Priorities: Priority 1, Priority 11, Priority 12, Priority 13, Priority 14, Priority 15, Priority 2, P
 Zones: Travis County,
 Include:
 Exclude: Duplicate Incidents, Test Incidents, STAR Flight Call Types, Tactical Call Types

	Any Unit		
Travis County			
Priority 1 (11:59 / 90%)	77	59	76.62%
Priority 2 (13:59 / 90%)	282	234	82.98%
Priority 3 (15:59 / 90%)	226	200	88.50%
Priority 4 (17:59 / 90%)	367	353	96.19%
Priority 5 (19:59 / 90%)	118	110	93.22%
	1,070	956	89.35%
ESD 01			
Priority 1 (11:59 / 90%)	4	3	75.00%
Priority 2 (13:59 / 90%)	20	19	95.00%
Priority 3 (15:59 / 90%)	14	14	100.00%
Priority 4 (17:59 / 90%)	19	19	100.00%
Priority 5 (19:59 / 90%)	3	3	100.00%
	60	58	96.67%
ESD 02			
Priority 1 (11:59 / 90%)	33	25	75.76%
Priority 2 (13:59 / 90%)	150	145	96.67%
Priority 3 (15:59 / 90%)	133	127	95.49%
Priority 4 (17:59 / 90%)	166	161	96.99%
Priority 5 (19:59 / 90%)	80	76	95.00%
	562	534	95.02%

Source: 15. County (ESD02 added) Response Time Compliance by ESD and Call Type 2020-02

Current Status **Response Time:** All EMS Calls

All Calls	Time	2017	2018	2019	2020	% Change (2017-2020)
	11:59	89.3%				
	13:59	94.0%				
	15:59	96.1%				
	17:59	97.5%				
	19:59	98.2%				

Analysis: EMS 2017_2020 data.csv *Ph PU to Unit Arrive*

Current Status **Response Time:** All EMS Calls

All Calls	Time	2017	2018	2019	2020	% Change (2017-2020)
	11:59	89.3%	85.6%			
	13:59	94.0%	92.1%			
	15:59	96.1%	95.3%			
	17:59	97.5%	96.9%			
	19:59	98.2%	97.8%			

Analysis: EMS 2017_2020 data.csv *Ph PU to Unit Arrive*

Current Status **Response Time:** All EMS Calls

All Calls	Time	2017	2018	2019	2020	% Change (2017-2020)
	11:59	89.3%	85.6%	85.1%		
	13:59	94.0%	92.1%	91.4%		
	15:59	96.1%	95.3%	94.7%		
	17:59	97.5%	96.9%	96.4%		
	19:59	98.2%	97.8%	97.5%		

Analysis: EMS 2017_2020 data.csv *Ph PU to Unit Arrive*

Current Status Response Time: All EMS Calls

All Calls	Time	2017	2018	2019	2020	% Change (2017-2020)
	11:59	89.3%	85.6%	85.1%	82.3%	
	13:59	94.0%	92.1%	91.4%	89.4%	
	15:59	96.1%	95.3%	94.7%	93.0%	
	17:59	97.5%	96.9%	96.4%	95.4%	
	19:59	98.2%	97.8%	97.5%	97.0%	

Analysis: EMS 2017_2020 data.csv *Ph PU to Unit Arrive*

Current Status Response Time: All EMS Calls

All Calls	Time	2017	2018	2019	2020	% Change (2017-2020)
	11:59	89.3%	85.6%	85.1%	82.3%	-7.0%
	13:59	94.0%	92.1%	91.4%	89.4%	-4.5%
	15:59	96.1%	95.3%	94.7%	93.0%	-3.1%
	17:59	97.5%	96.9%	96.4%	95.4%	-2.1%
	19:59	98.2%	97.8%	97.5%	97.0%	-1.2%

Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive



Current Status Response Time Compliance Summary

Priority	Standard (90%)	2017	2018	2019	2020	% Change (2017-2020)
P1	11:59	94.9% (n=473)				
P2	13:59	95.6% (n=1559)				
P3	15:59	96.2% (n=1173)				
P4	17:59	97.0% (n=2046)				
P5	19:59	97.4% (n=689)				

Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive

Current Status Response Time Compliance Summary

Priority	Standard (90%)	2017	2018	2019	2020	% Change (2017-2020)
P1	11:59	94.9% (n=473)	94.1% (n=527)			
P2	13:59	95.6% (n=1559)	94.5% (n=1840)			
P3	15:59	96.2% (n=1173)	96.4% (n=1523)			
P4	17:59	97.0% (n=2046)	96.0% (n=2294)			
P5	19:59	97.4% (n=689)	96.1% (n=792)			

Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive

Current Status Response Time Compliance Summary

Priority	Standard (90%)	2017	2018	2019	2020	% Change (2017-2020)
P1	11:59	94.9% (n=473)	94.1% (n=527)	90.9% (n=461)		
P2	13:59	95.6% (n=1559)	94.5% (n=1840)	94.4% (n=1883)		
P3	15:59	96.2% (n=1173)	96.4% (n=1523)	94.6% (n=1525)		
P4	17:59	97.0% (n=2046)	96.0% (n=2294)	95.5% (n=2403)		
P5	19:59	97.4% (n=689)	96.1% (n=792)	96.2% (n=911)		

Analysis: EMS 2017_2020 data.csv *Ph PU to Unit Arrive*

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison

Current Status Response Time Compliance Summary

Priority	Standard (90%)	2017	2018	2019	2020*	% Change (2017-2020)
P1	11:59	94.9% (n=473)	94.1% (n=527)	90.9% (n=461)	87.9% (n=540)	
P2	13:59	95.6% (n=1559)	94.5% (n=1840)	94.4% (n=1883)	91.4% (n=1800)	
P3	15:59	96.2% (n=1173)	96.4% (n=1523)	94.6% (n=1525)	92.9% (n=1645)	
P4	17:59	97.0% (n=2046)	96.0% (n=2294)	95.5% (n=2403)	94.8% (n=2291)	
P5	19:59	97.4% (n=689)	96.1% (n=792)	96.2% (n=911)	96.6% (n=861)	

Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison

Current Status Response Time Compliance Summary

Priority	Standard (90%)	2017	2018	2019	2020*	% Change (2017-2020)
P1	11:59	94.9% (n=473)	94.1% (n=527)	90.9% (n=461)	87.9% (n=540)	-7.0%
P2	13:59	95.6% (n=1559)	94.5% (n=1840)	94.4% (n=1883)	91.4% (n=1800)	-4.2%
P3	15:59	96.2% (n=1173)	96.4% (n=1523)	94.6% (n=1525)	92.9% (n=1645)	-3.3%
P4	17:59	97.0% (n=2046)	96.0% (n=2294)	95.5% (n=2403)	94.8% (n=2291)	-2.2%
P5	19:59	97.4% (n=689)	96.1% (n=792)	96.2% (n=911)	96.6% (n=861)	-0.8%

Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison

Current Status Response Time Compliance Summary

Priority	Standard (90%)	2017	2018	2019	2020*	% Change (2017-2020) (All)
P1	11:59	94.9% (n=473)	94.1% (n=527)	90.9% (n=461)	87.9% (n=540)	-7.0% (-7.0%)
P2	13:59	95.6% (n=1559)	94.5% (n=1840)	94.4% (n=1883)	91.4% (n=1800)	-4.2% (-4.5%)
P3	15:59	96.2% (n=1173)	96.4% (n=1523)	94.6% (n=1525)	92.9% (n=1645)	-3.3% (-3.1%)
P4	17:59	97.0% (n=2046)	96.0% (n=2294)	95.5% (n=2403)	94.8% (n=2291)	-2.2% (-2.1%)
P5	19:59	97.4% (n=689)	96.1% (n=792)	96.2% (n=911)	96.6% (n=861)	-0.8% (-1.2%)

Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison



Current Status Response Time Compliance Summary

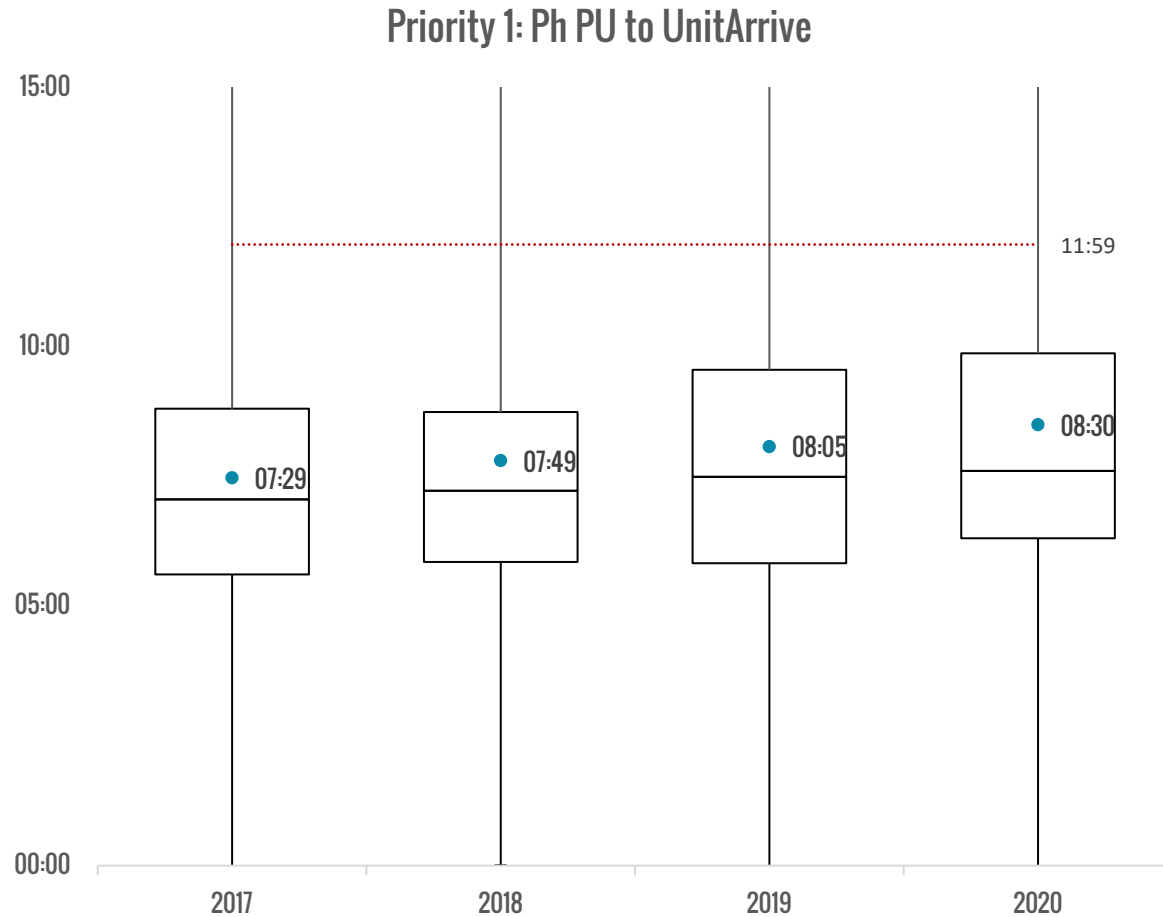
Similar change observed in All Calls as that observed within Priority breakdown. Useful for comparison of all v. priority performance for call projections.

Priority	Standard (90%)	2017	2018	2019	2020*	% Change (2017-2020) (All)
P1	11:59	94.9% (n=473)	94.1% (n=527)	90.9% (n=461)	87.9% (n=540)	-7.0% (-7.0%)
P2	13:59	95.6% (n=1559)	94.5% (n=1840)	94.4% (n=1883)	91.4% (n=1800)	-4.2% (-4.5%)
P3	15:59	96.2% (n=1173)	96.4% (n=1523)	94.6% (n=1525)	92.9% (n=1645)	-3.3% (-3.1%)
P4	17:59	97.0% (n=2046)	96.0% (n=2294)	95.5% (n=2403)	94.8% (n=2291)	-2.2% (-2.1%)
P5	19:59	97.4% (n=689)	96.1% (n=792)	96.2% (n=911)	96.6% (n=861)	-0.8% (-1.2%)

Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison

Current Status **Priority 1** (11:59 | (90%))

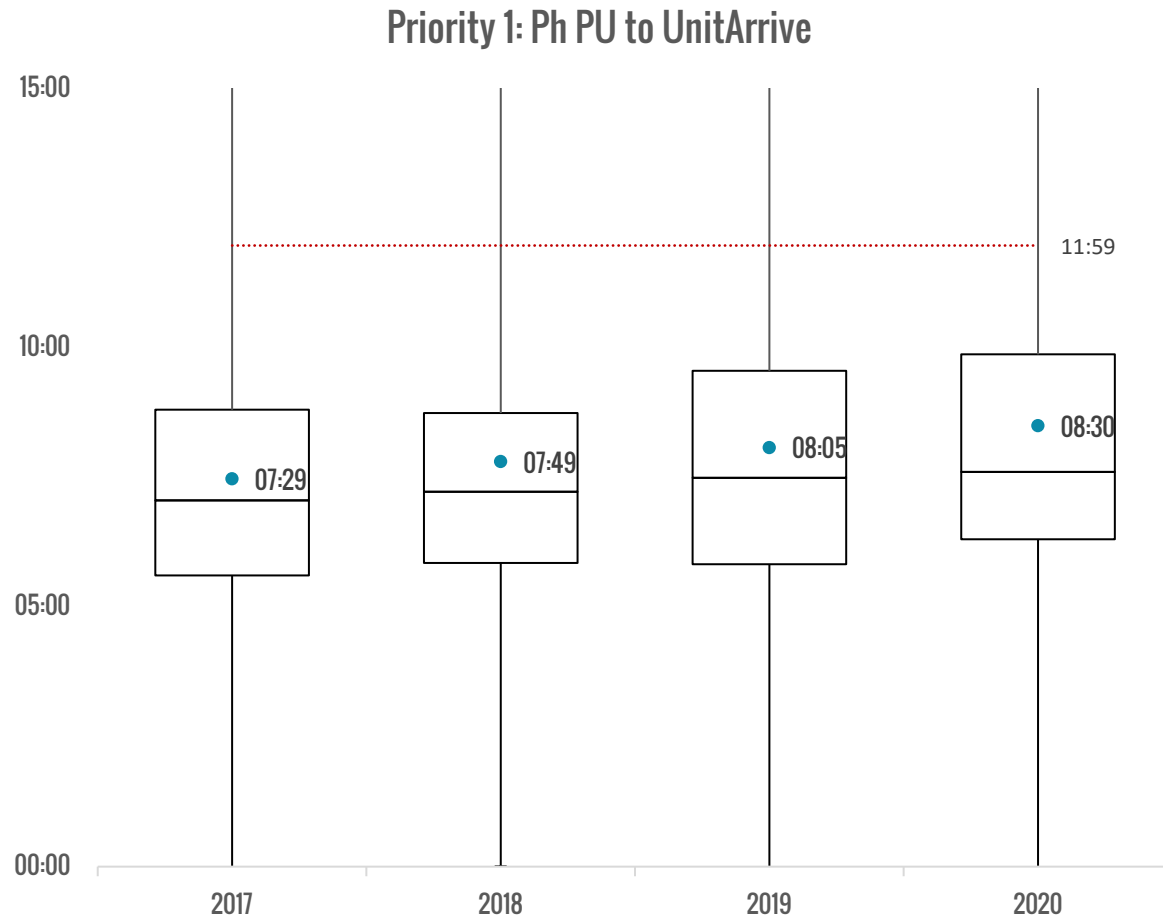


Analysis: EMS 2017_2020 data.csv **Ph PU to Unit Arrive**

P1 Count	2017	2018	2019	2020*
11:59	449	496	419	473
13:59	12	16	21	32
15:59	6	7	11	12
17:59	2	2	4	10
>17:59	4	6	6	13
Total:	473	527	461	540

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison

Current Status **Priority 1** (11:59 | (90%))



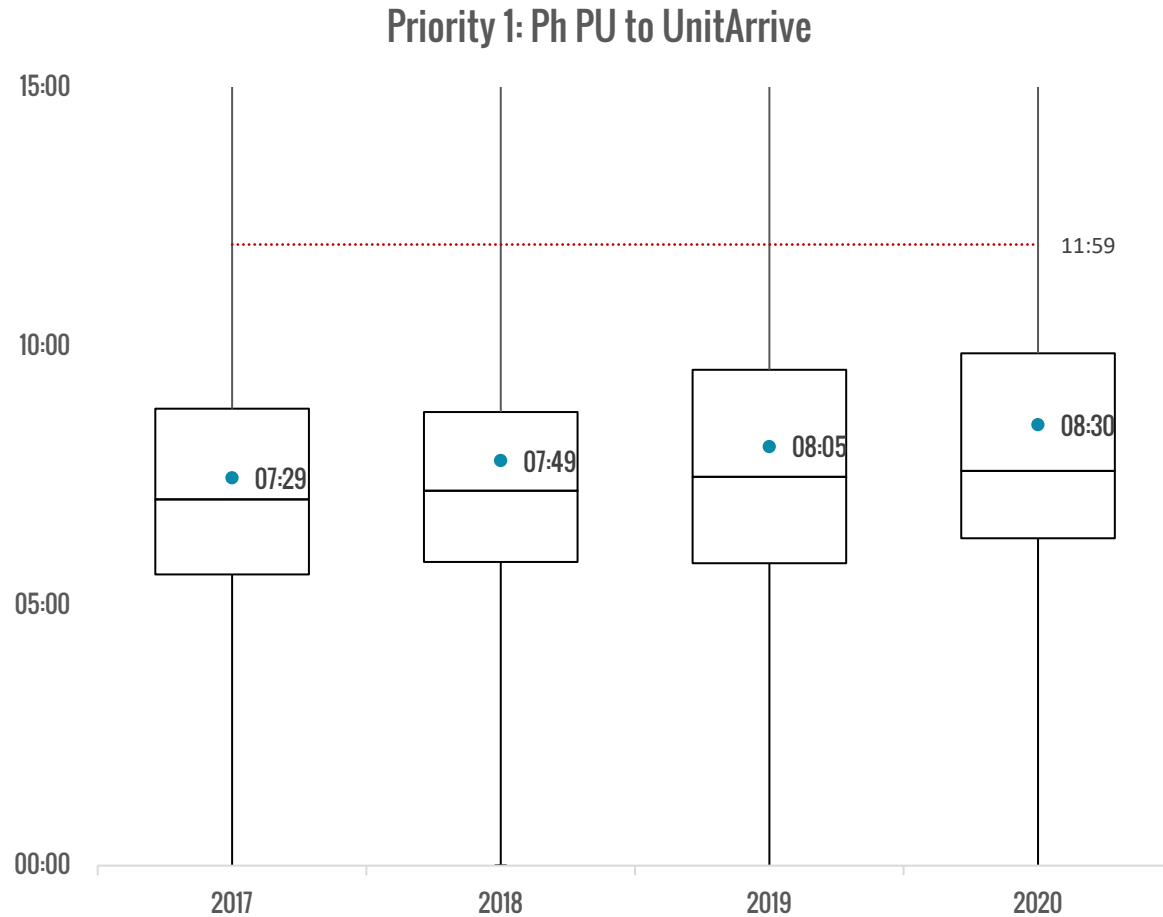
Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive

P1 Count	2017	2018	2019	2020*
11:59	449	496	419	473
13:59	12	16	21	32
15:59	6	7	11	12
17:59	2	2	4	10
>17:59	4	6	6	13
Total:	473	527	461	540

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison

P1 %	2017	2018	2019	2020
11:59	94.9%	94.1%	90.9%	87.9%

Current Status **Priority 1** (11:59 | (90%))



Analysis: EMS 2017_2020 data.csv Ph PU to Unit Arrive

P1 Count	2017	2018	2019	2020*
11:59	449	496	419	473
13:59	12	16	21	32
15:59	6	7	11	12
17:59	2	2	4	10
>17:59	4	6	6	13
Total:	473	527	461	540

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison

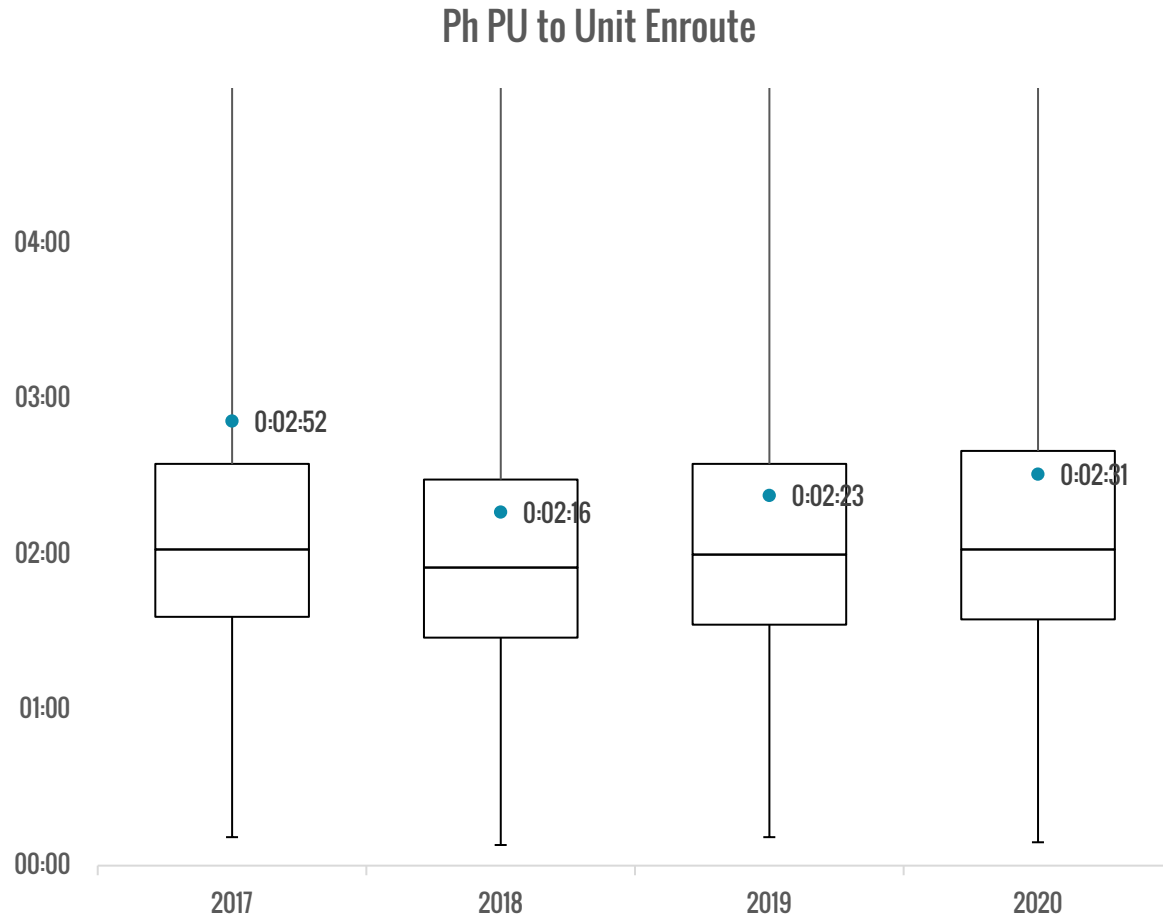
P1 %	2017	2018	2019	2020
11:59	94.9%	94.1%	90.9%	87.9%

**Identify contributing factors:
Internal performance, time
density, location, other?**



Pattern Analysis

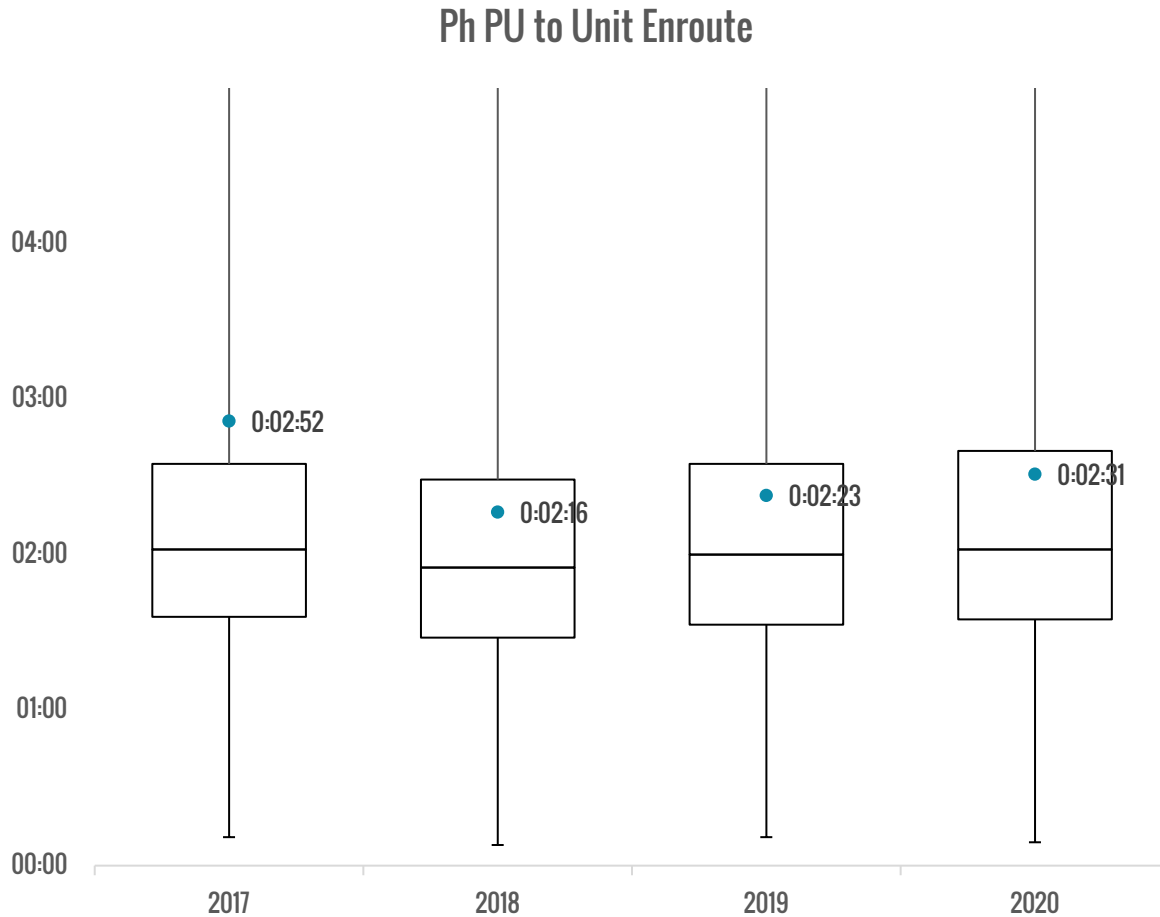
Internal Performance: **Ph PU to Unit Enroute**



	2017	2018	2019	2020
MEAN	0:02:52	0:02:16	0:02:23	0:02:31
Minimum	0:00:11	0:00:08	0:00:11	0:00:09
Q1	0:01:36	0:01:28	0:01:33	0:01:35
Median	0:02:02	0:01:55	0:02:00	0:02:02
Q3	0:02:35	0:02:29	0:02:35	0:02:40
Maximum	23:17:44	1:15:26	0:45:29	1:50:12

Pattern Analysis

Internal Performance: **Ph PU to Unit Enroute**



	2017	2018	2019	2020
MEAN	0:02:52	0:02:16	0:02:23	0:02:31
Minimum	0:00:11	0:00:08	0:00:11	0:00:09
Q1	0:01:36	0:01:28	0:01:33	0:01:35
Median	0:02:02	0:01:55	0:02:00	0:02:02
Q3	0:02:35	0:02:29	0:02:35	0:02:40
Maximum	23:17:44	1:15:26	0:45:29	1:50:12

► Findings:

- Average increased due to outliers (Max)
- Median remain constant (~2 minutes)
- Internal factors not changing at same rate as Ph PU to UnitArrive (external?)

Pattern Analysis Day of Week | Hour

All:

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
0:00	108	102	109	103	112	145	156
1:00	114	109	80	102	123	123	133
2:00	91	81	93	94	103	135	124
3:00	82	77	82	85	88	123	127
4:00	70	64	88	72	89	104	106
5:00	96	96	74	73	80	84	93
6:00	88	112	98	93	103	84	88
7:00	141	166	146	165	130	105	105
8:00	183	179	176	173	175	142	129
9:00	165	201	201	188	191	148	136
10:00	202	190	201	199	224	187	165
11:00	211	214	207	196	209	192	192
12:00	237	196	213	226	216	195	176
13:00	196	197	200	202	188	199	191
14:00	208	181	168	211	218	213	204
15:00	200	183	225	165	195	178	168
16:00	229	214	201	216	218	187	179
17:00	222	238	221	224	217	186	186
18:00	232	224	206	211	220	194	214
19:00	229	194	213	199	235	207	197
20:00	186	193	208	179	207	216	201
21:00	162	160	178	182	201	199	207
22:00	160	162	153	160	167	208	147
23:00	139	133	131	129	143	172	133

Priority:

P1	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
0:00	10	8	9	7	11	10	12
1:00	12	15	7	9	15	10	15
2:00	6	10	6	8	9	11	15
3:00	3	3	9	10	8	13	13
4:00	8	4	7	9	12	12	11
5:00	10	11	10	6	11	8	9
6:00	5	7	11	8	7	5	4
7:00	11	10	11	17	8	8	6
8:00	11	13	7	14	12	12	10
9:00	12	8	18	12	8	9	9
10:00	11	14	10	16	12	16	15
11:00	15	19	13	6	17	16	9
12:00	7	5	12	14	14	10	12
13:00	12	15	5	13	11	14	11
14:00	10	8	12	14	18	9	15
15:00	15	9	16	12	12	10	12
16:00	6	14	10	8	17	13	15
17:00	15	13	8	11	15	5	9
18:00	12	13	10	6	11	15	14
19:00	16	12	10	16	21	17	18
20:00	18	8	24	20	19	24	11
21:00	12	11	12	12	19	16	17
22:00	16	19	16	18	17	18	9
23:00	15	7	15	7	13	21	15



Pattern Analysis Day of Week | Hour

All:

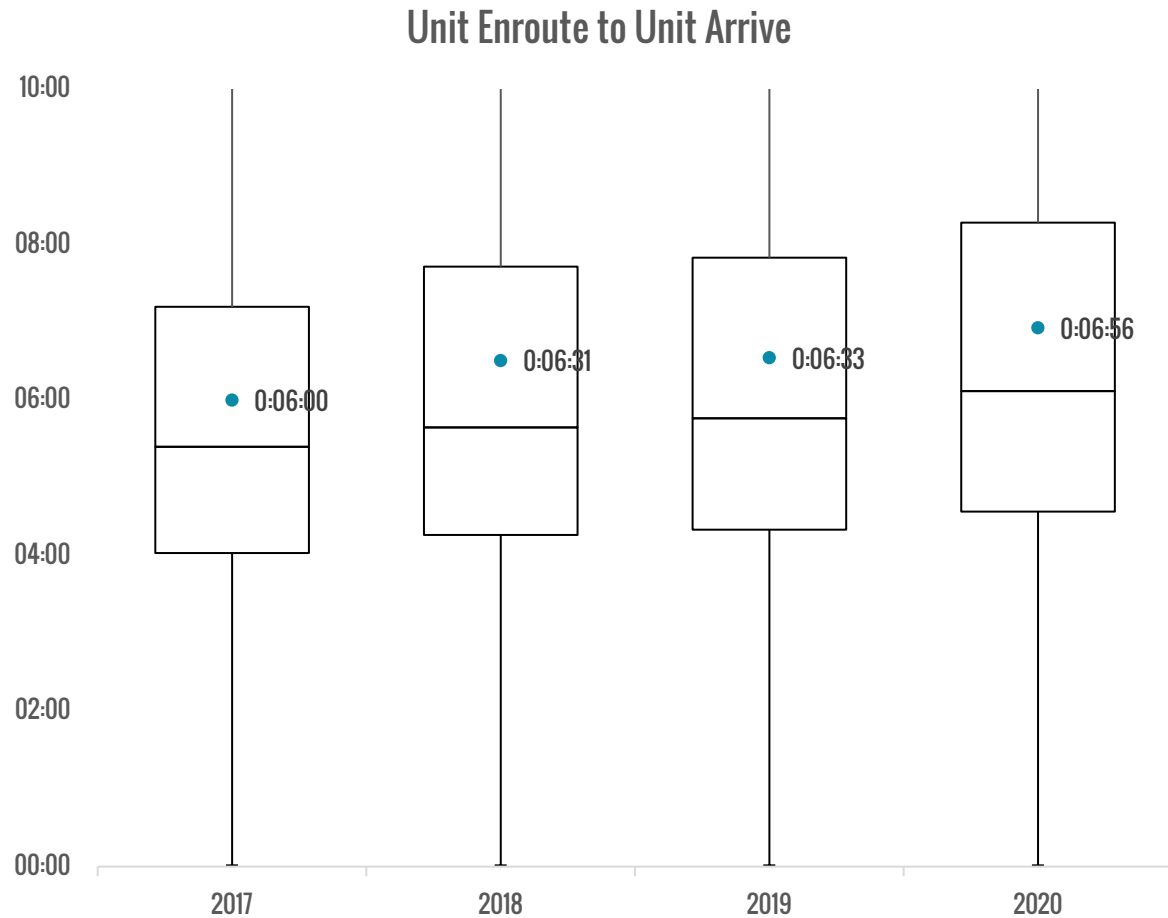
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
0:00	108	102	109	103	112	145	156
1:00	114	109	80	102	123	123	133
2:00	91	81	93	94	103	135	124
3:00	82	77	82	85	88	123	127
4:00	70	64	88	72	89	104	106
5:00	96	96	74	73	80	84	93
6:00	88	112	98	93	103	84	88
7:00	141	166	146	165	130	105	105
8:00	183	179	176	173	175	142	129
9:00	165	201	201	188	191	148	136
10:00	202	190	201	199	224	187	165
11:00	211	214	207	196	209	192	192
12:00	237	196	213	226	216	195	176
13:00	196	197	200	202	188	199	191
14:00	208	181	168	211	218	213	204
15:00	200	183	225	165	195	178	168
16:00	229	214	201	216	218	187	179
17:00	222	238	221	224	217	186	186
18:00	232	224	206	211	220	194	214
19:00	229	194	213	199	235	207	197
20:00	186	193	208	179	207	216	201
21:00	162	160	178	182	201	199	207
22:00	160	162	153	160	167	208	147
23:00	139	133	131	129	143	172	133

Priority:

P1	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
0:00	10	8	9	7	11	10	12
1:00	12	15	7	9	15	10	15
2:00	6	10	6	8	9	11	15
3:00	3	3	9	10	8	13	13
4:00	8	4	7	9	12	12	11
5:00	10	11	10	6	11	8	9
6:00	5	7	11	8	7	5	4
7:00	11	10	11	17	8	8	6
8:00	11	13	7	14	12	12	10
9:00	12	8	18	12	8	9	9
10:00	11	14	10	16	12	16	15
11:00	15	19	13	6	17	16	9
12:00	7	5	12	14	14	10	12
13:00	12	15	5	13	11	14	11
14:00	10	8	12	14	18	9	15
15:00	15	9	16	12	12	10	12
16:00	6	14	10	8	17	13	15
17:00	15	13	8	11	15	5	9
18:00	12	13	10	6	11	15	14
19:00	16	12	10	16	21	17	18
20:00	18	8	24	20	19	24	11
21:00	12	11	12	12	19	16	17
22:00	16	19	16	18	17	18	9
23:00	15	7	15	7	13	21	15

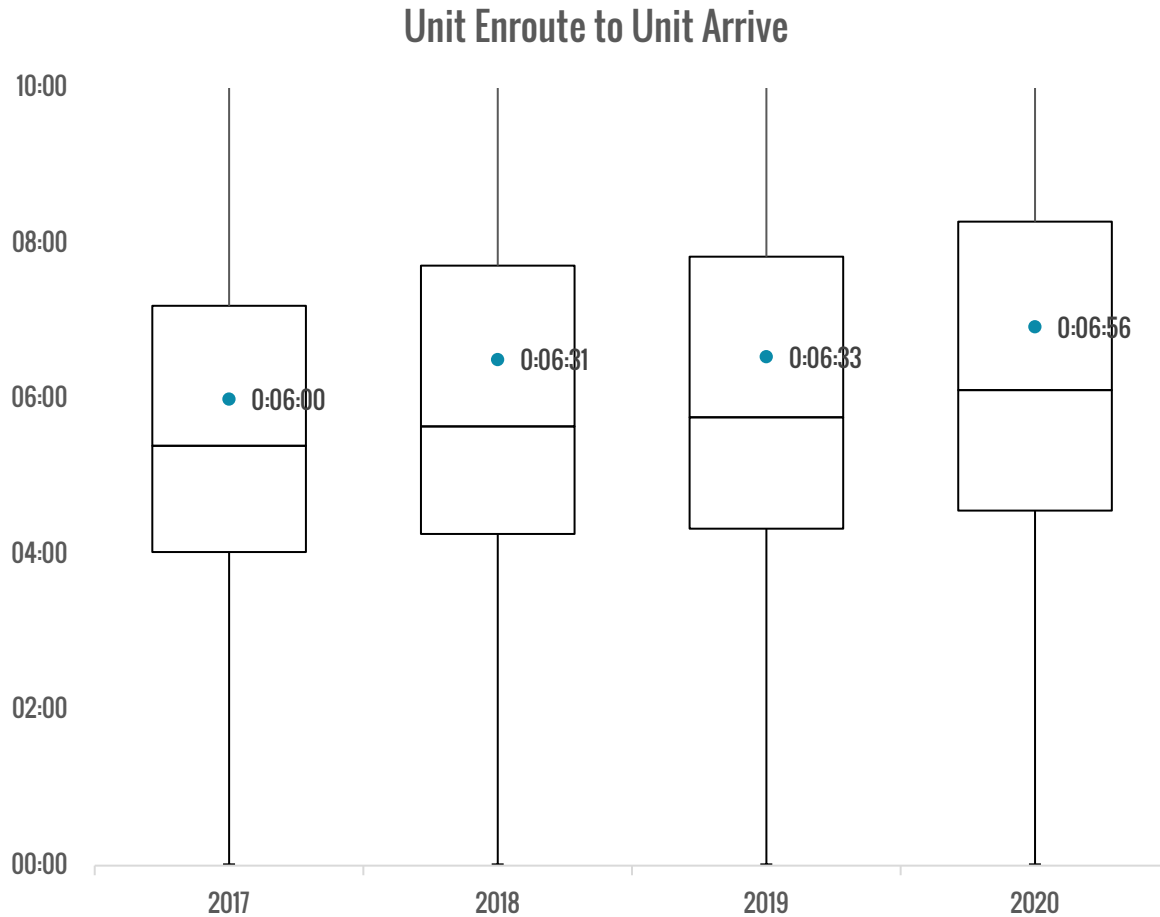
Not necessarily a discernible time pattern difference across priorities.

Pattern Analysis Travel Time: Unit Enroute to Unit Arrive



	2017	2018	2019	2020
MEAN	0:06:00	0:06:31	0:06:33	0:06:56
Minimum	0:00:01	0:00:01	0:00:01	0:00:01
Q1	0:04:02	0:04:16	0:04:20	0:04:34
Median	0:05:24	0:05:39	0:05:46	0:06:07
Q3	0:07:12	0:07:43	0:07:50	0:08:17
Maximum	0:40:44	4:05:16	1:03:06	0:55:20

Pattern Analysis Travel Time: Unit Enroute to Unit Arrive

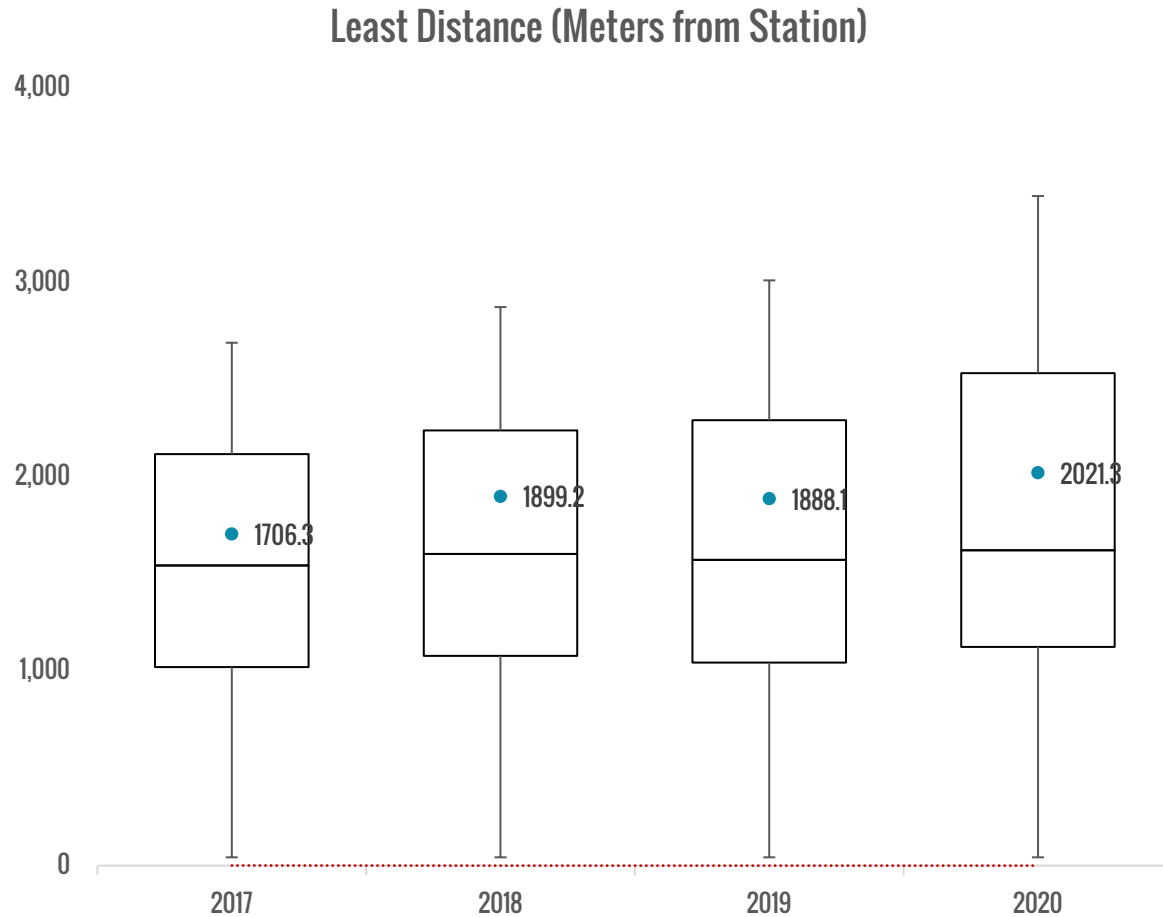


	2017	2018	2019	2020
MEAN	0:06:00	0:06:31	0:06:33	0:06:56
Minimum	0:00:01	0:00:01	0:00:01	0:00:01
Q1	0:04:02	0:04:16	0:04:20	0:04:34
Median	0:05:24	0:05:39	0:05:46	0:06:07
Q3	0:07:12	0:07:43	0:07:50	0:08:17
Maximum	0:40:44	4:05:16	1:03:06	0:55:20

► Findings:

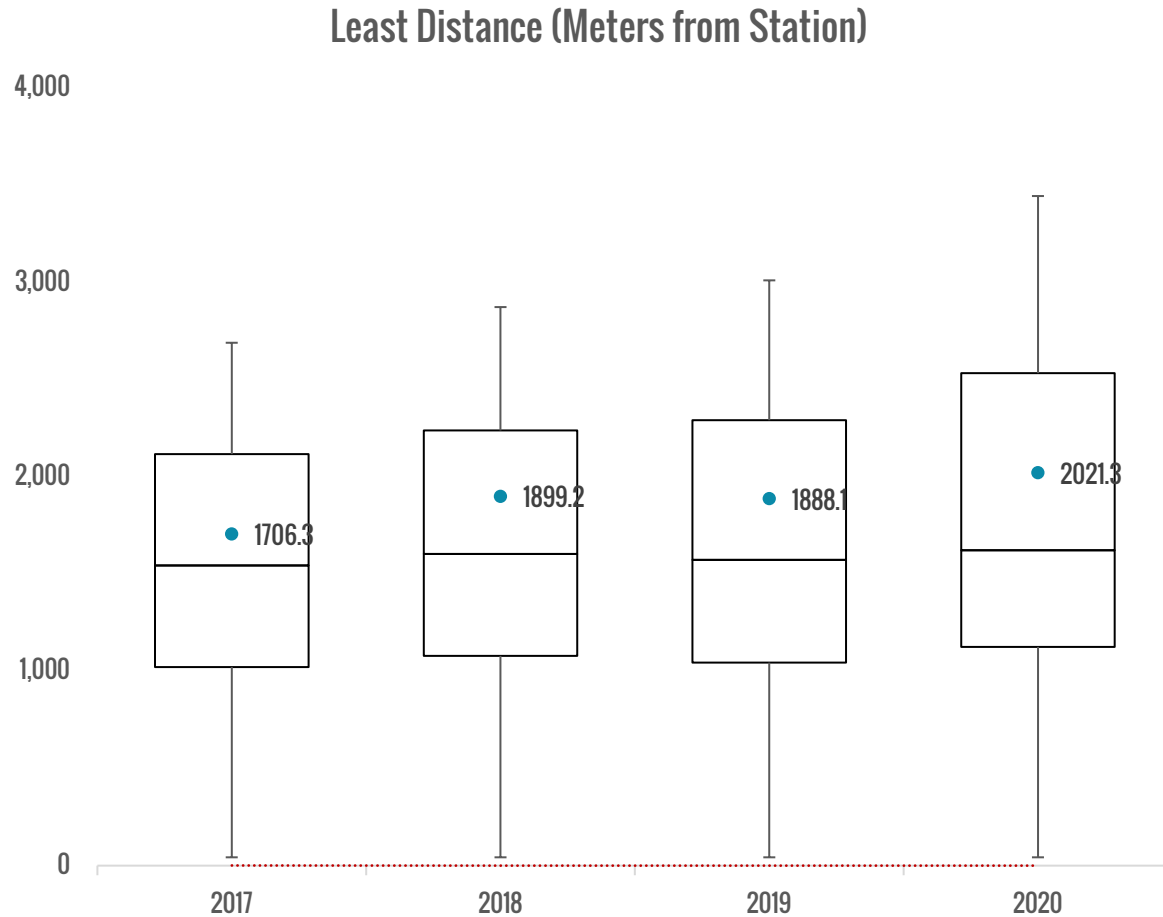
- Average increased **15%** (2017-2020)
- Median (**13%**) and Q3 (**15%**) increased at similar rate (not attributed solely to outliers)
- Consistent across all calls

Pattern Analysis Distance from Call to Nearest Station



	2017	2018	2019	2020
MEAN	1706.3	1899.2	1888.1	2021.3
Minimum	43.4	43.4	43.0	43.4
Q1	1022.0	1079.0	1045.1	1125.3
Median	1544.4	1603.8	1573.4	1622.7
Q3	2117.4	2238.9	2292.1	2533.6
Maximum	16925.8	13571.6	12275.6	18577.3

Pattern Analysis Distance from Call to Nearest Station

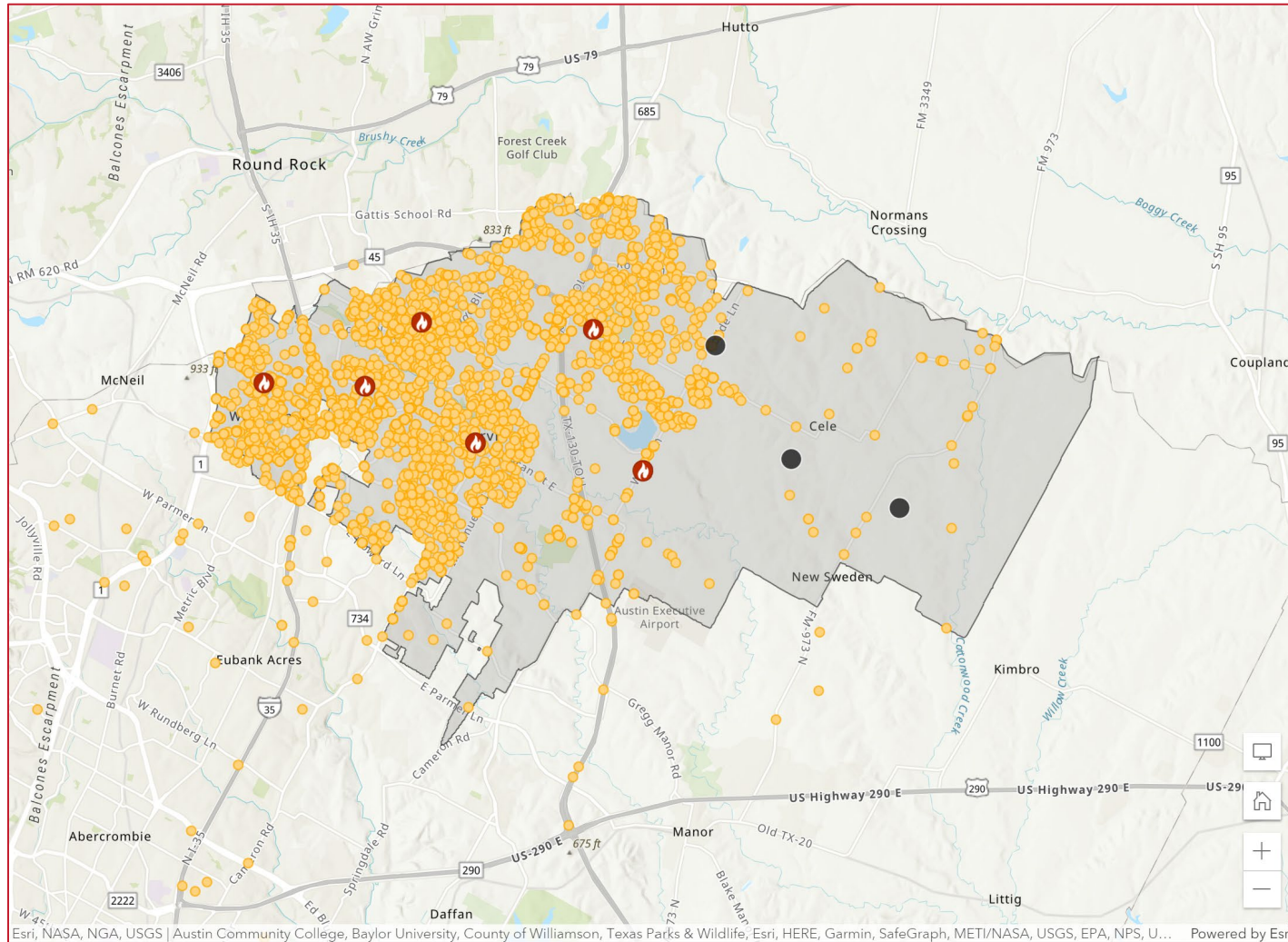


	2017	2018	2019	2020
MEAN	1706.3	1899.2	1888.1	2021.3
Minimum	43.4	43.4	43.0	43.4
Q1	1022.0	1079.0	1045.1	1125.3
Median	1544.4	1603.8	1573.4	1622.7
Q3	2117.4	2238.9	2292.1	2533.6
Maximum	16925.8	13571.6	12275.6	18577.3

► Findings:

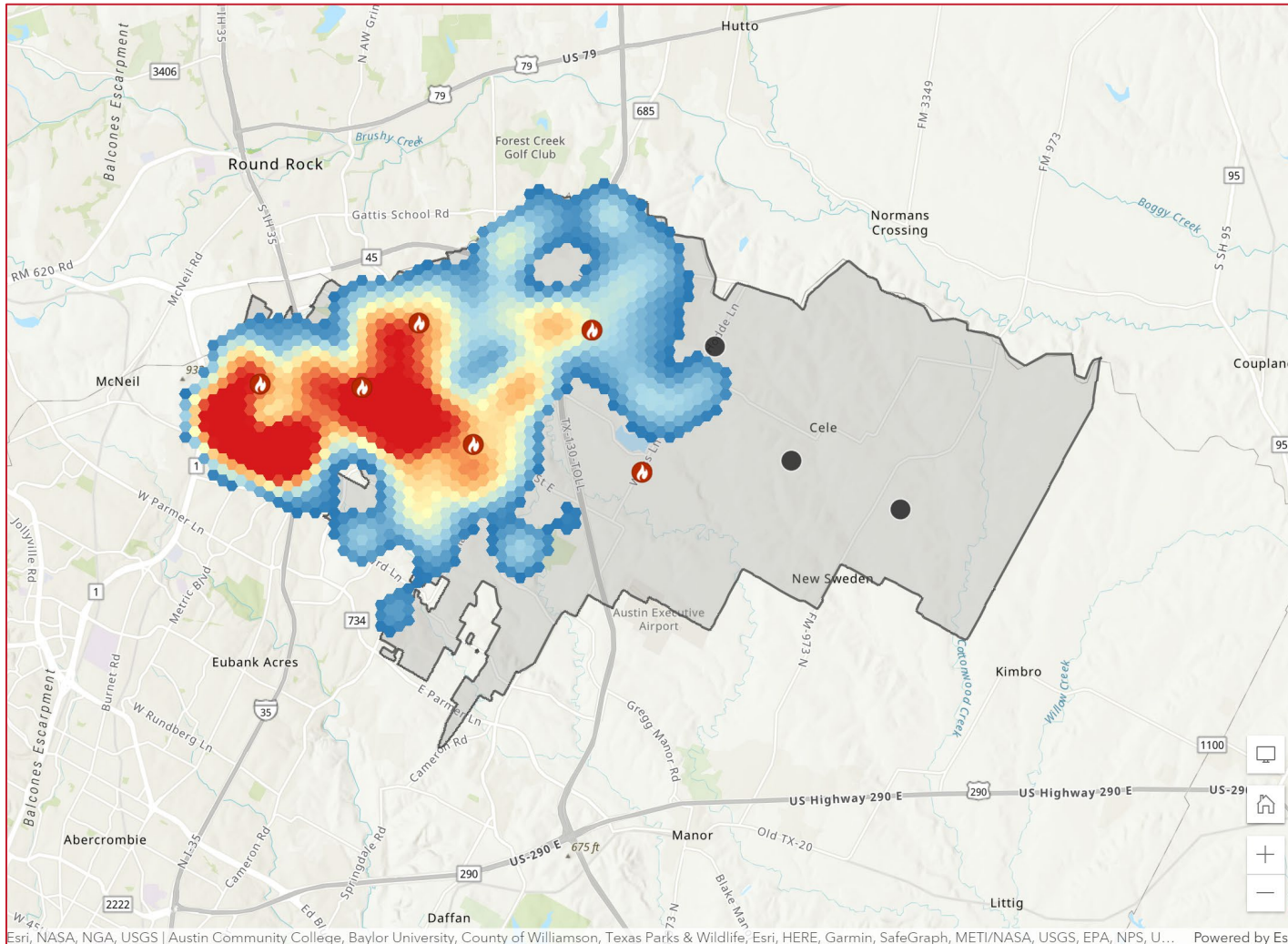
- Average increased **18%** (2017-2020)
- Q3 (**20%**) increased at greater rate than Median (**5%**) and less than Maximum
- Not affected greatly by outliers; Other(?)

Pattern Analysis **Call Location**



- ▶ EMS Call Locations
- ▶ Interactive Map (Internal Only)

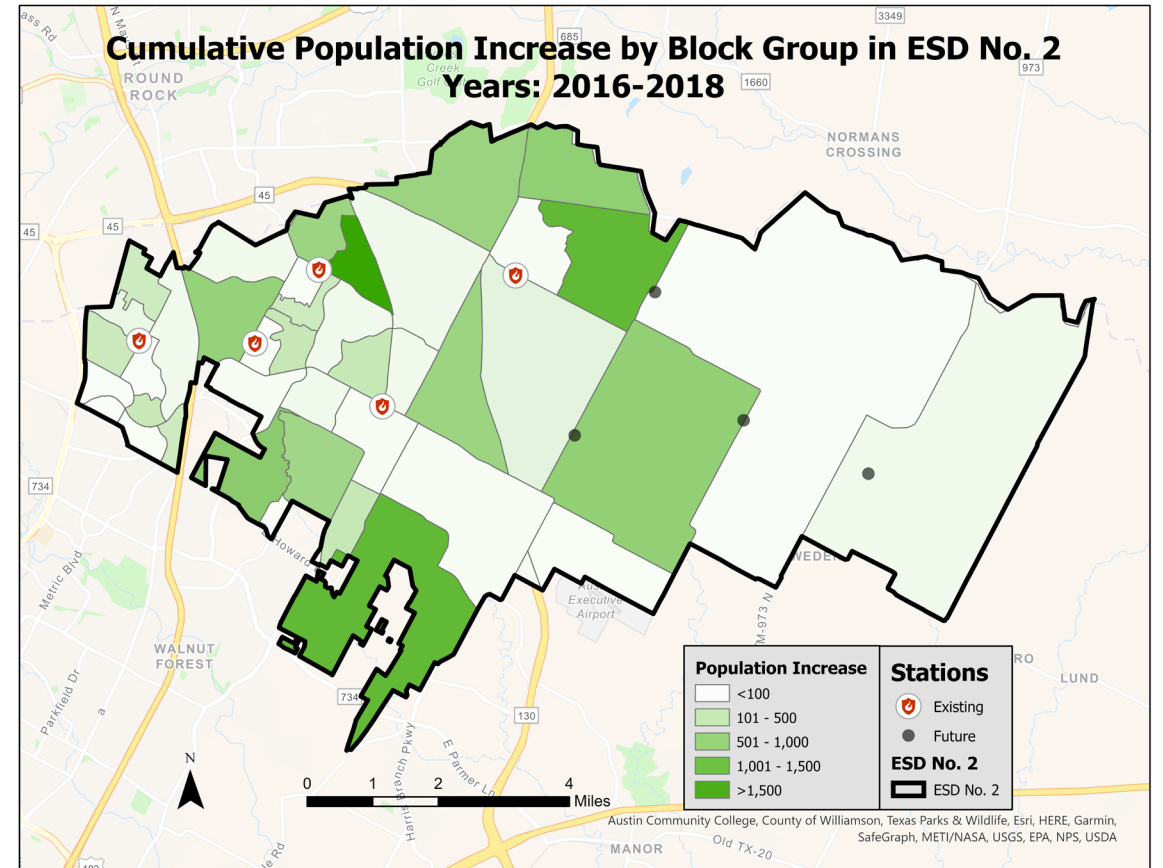
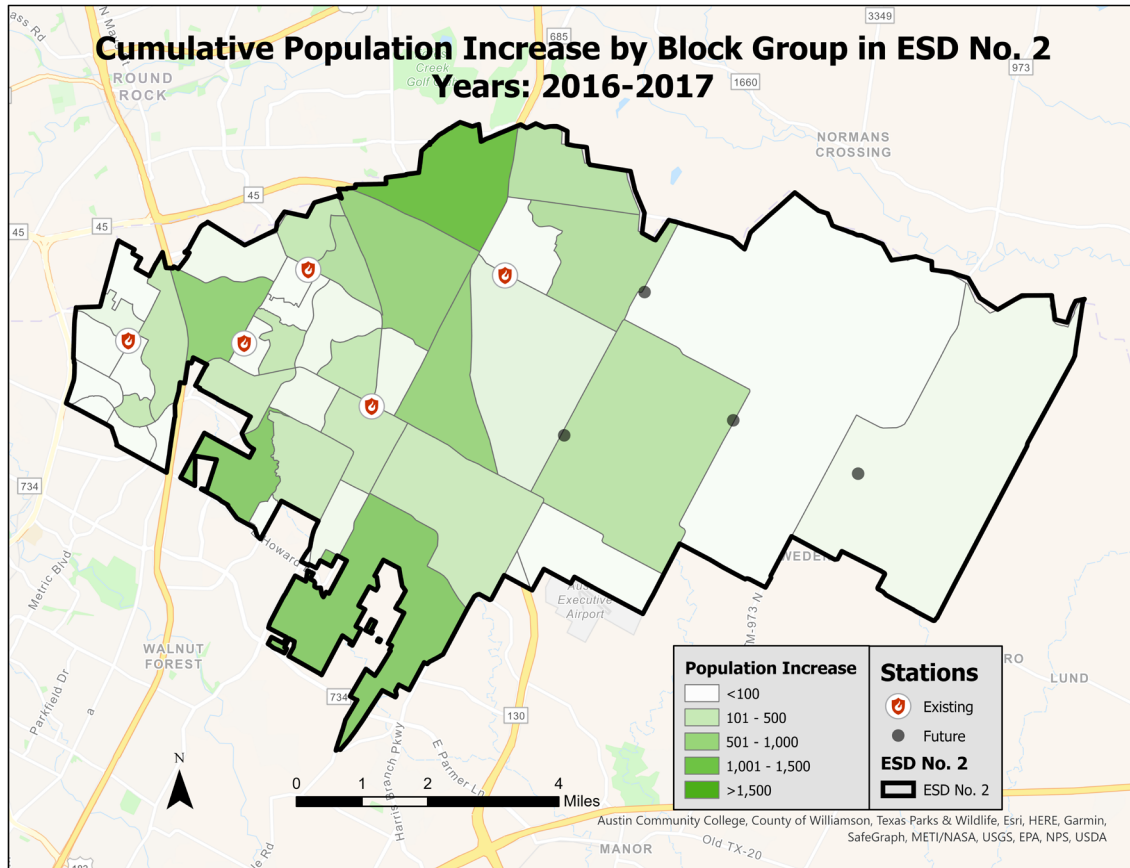
Pattern Analysis **Call Density**



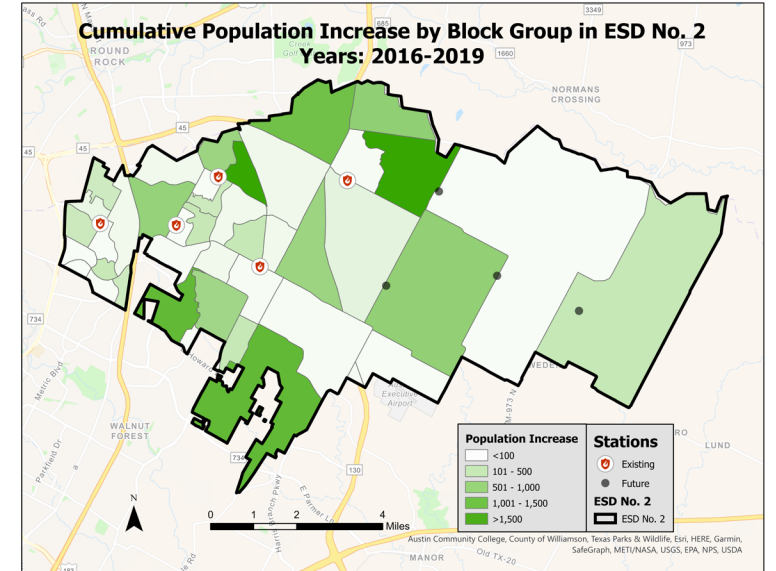
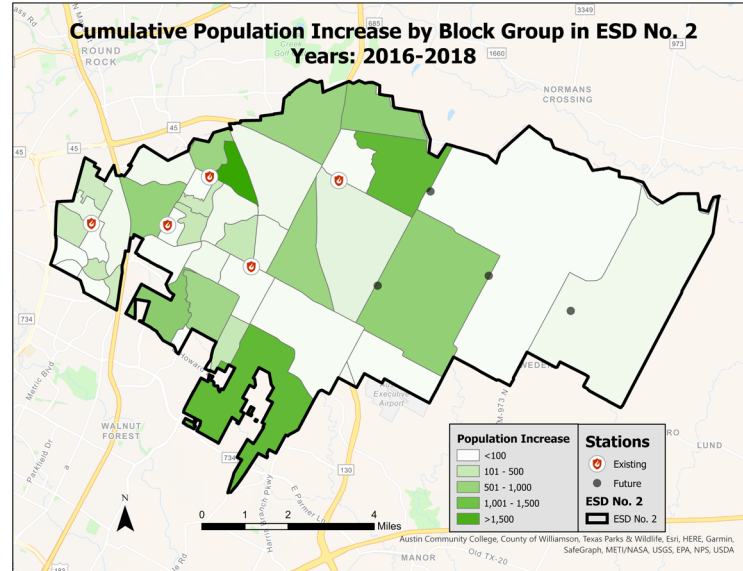
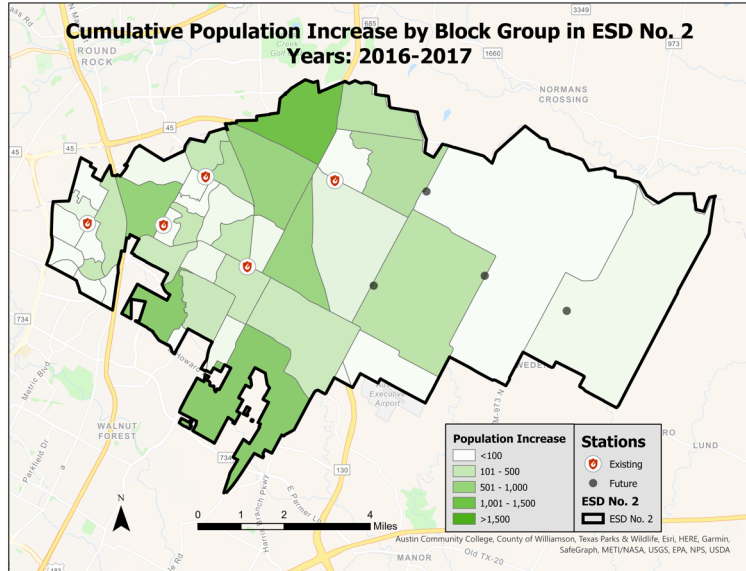
- ▶ EMS Call Density
- ▶ Interactive Map (Internal Only)
- ▶ Analysis:
 - ▶ Increased distance (on average)
 - ▶ ‘Movement’ in call locations
 - ▶ Contributing Factor(?)
- ▶ Testing:
 - ▶ Population

Pattern Analysis

Location Intelligence | **Population** (2016-2017; 2016-2018)



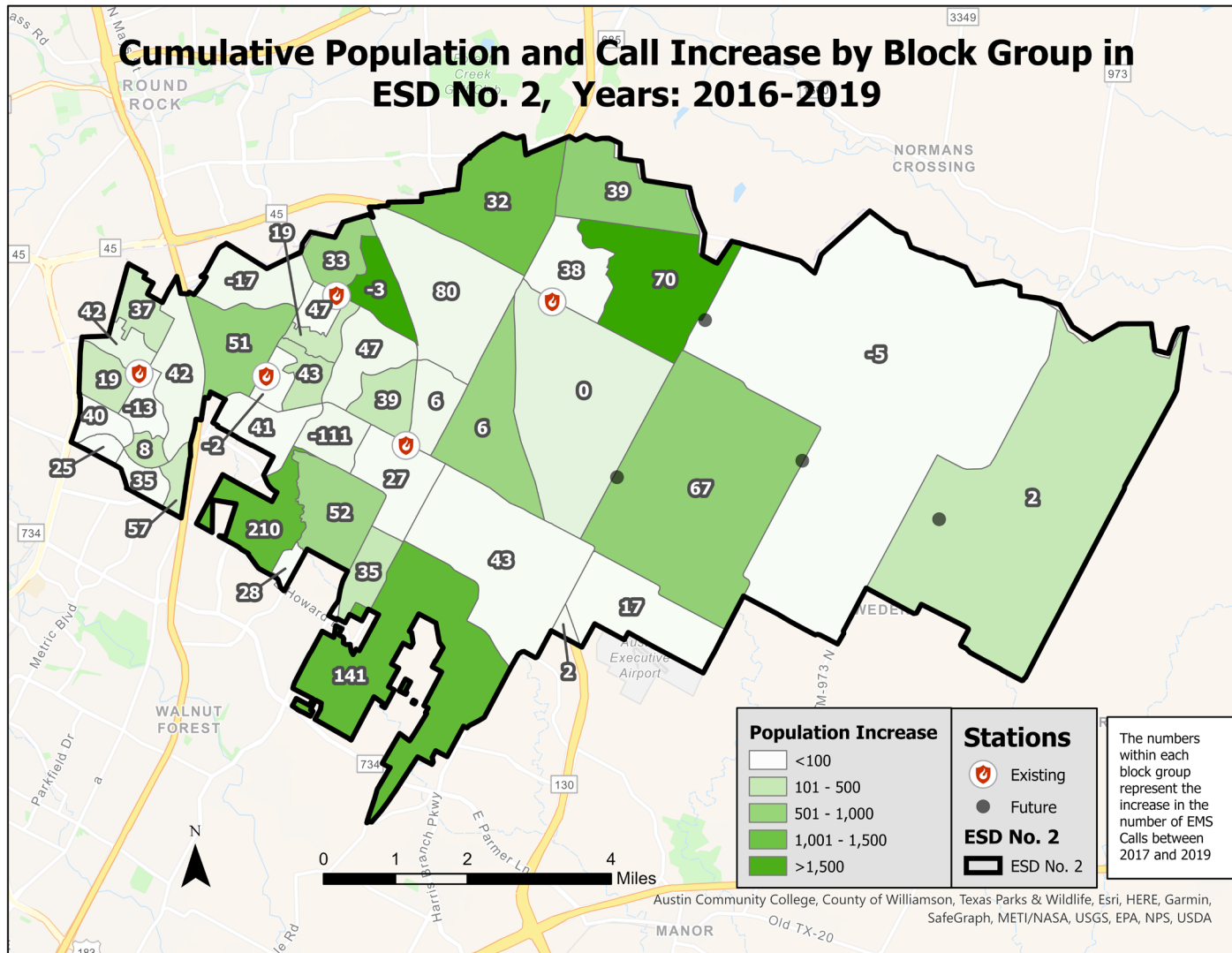
Pattern Analysis Location Intelligence | Population (2016-2019)



**Increasing at higher rate:
NE Station 4, North, South
& Central East.**

Pattern Analysis

Location Intelligence | **Population** (2016-2019)



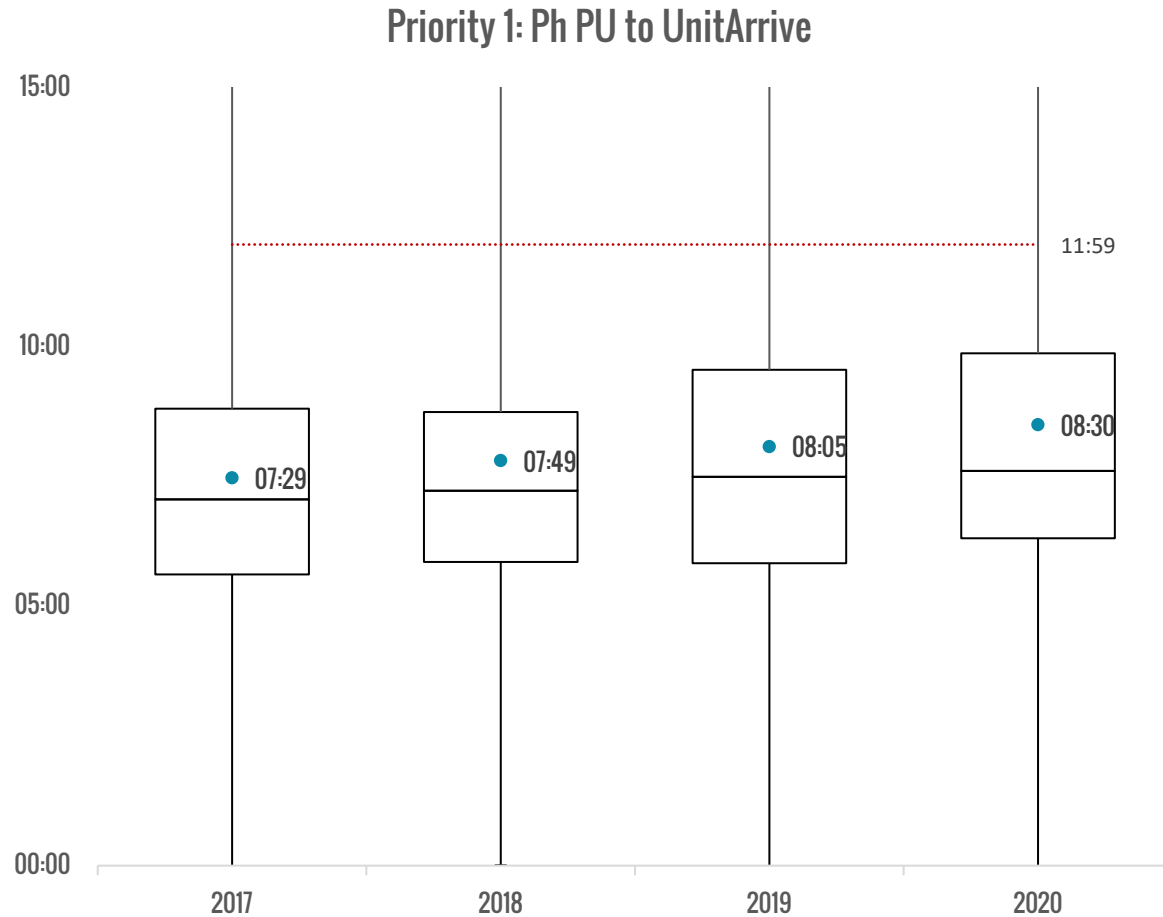
▶ Visual Representation:

- ▶ Population (Green Color Ramp)
- ▶ Call Volume (Label)

▶ Analysis:

- ▶ Increase | Movement in population
- ▶ **Population** impact on **call volume**
- ▶ **Location** impact on **time | distance**

Current Status **Priority 1** (11:59 | (90%))



P1 Count	2017	2018	2019	2020*
11:59	449	496	419	473
13:59	12	16	21	32
15:59	6	7	11	12
17:59	2	2	4	10
>17:59	4	6	6	13
Total:	473	527	461	540

*All 2020 Includes calls through FY 2020 adjusted for full calendar year comparison

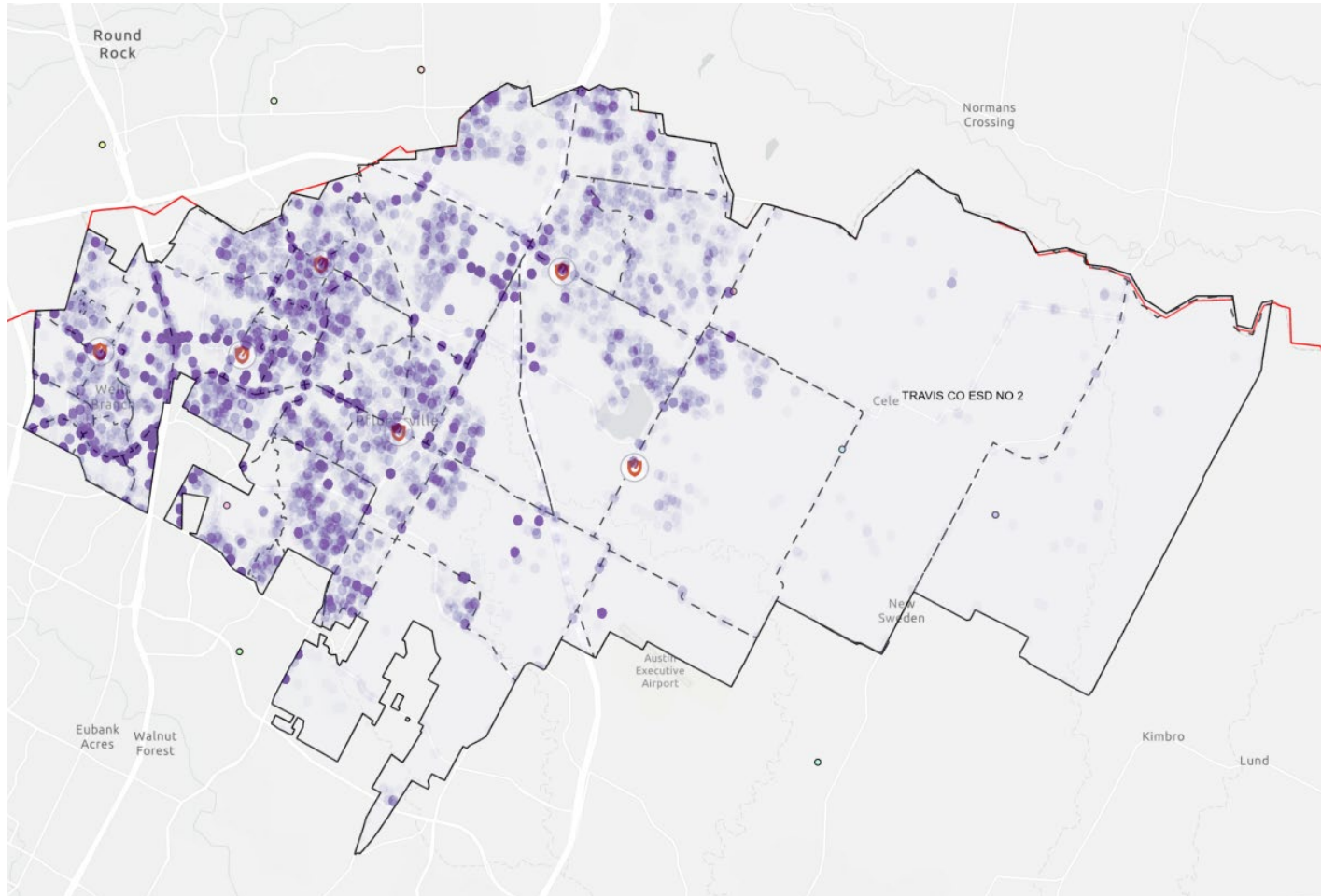
P1 %	2017	2018	2019	2020
11:59	94.9%	94.1%	90.9%	87.9%

**Identify contributing factors:
Higher volume of calls located
at greater distance(?)**



Findings

Location Intelligence | **Call Density**



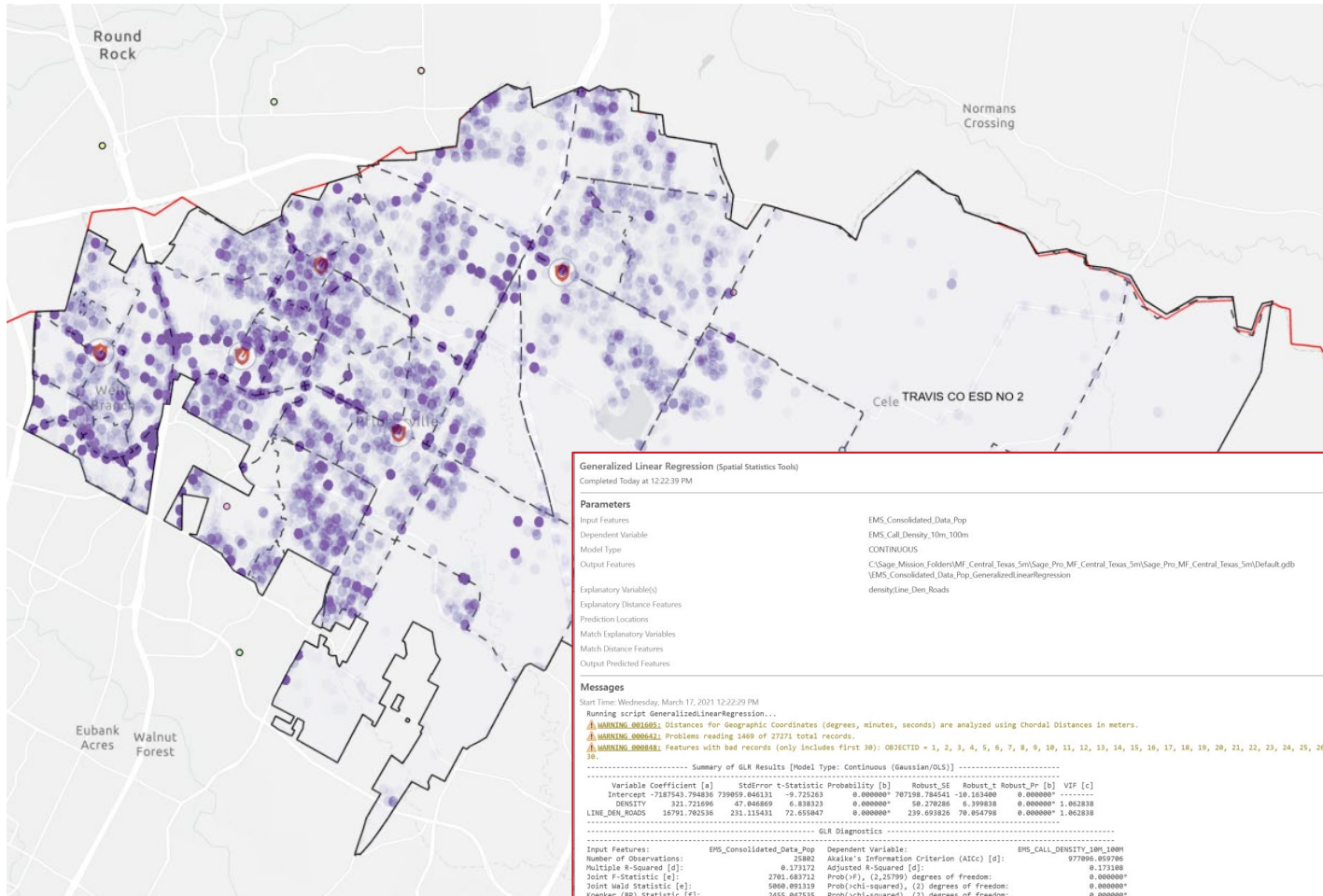
▶ Testing of Hypothesis:

- ▶ Location of calls
- ▶ Volume of calls

▶ Analysis: EMS Call Density (2017-2020)

- ▶ Factors contributing to call density
- ▶ Block Group Population
- ▶ Other(?)

Findings Regression Analysis: Call Density Explanatory Variables



▶ Exploratory Regression | Esri

- ▶ Road density
- ▶ Traffic Point Density
- ▶ Population Area

▶ Purpose

- ▶ Identify those contributing factors that explain the variation in call location

Generalized Linear Regression (Spatial Statistics Tools)
Completed Today at 12:22:39 PM

Parameters

Input Features: EMS_Consolidated_Data_Pop
 Dependent Variable: EMS_Call_Density_10m_100m
 Model Type: CONTINUOUS
 Output Features: C:\Sage_Mission_Folders\VF_Central_Texas_Sm\Sage_Pro_MF_Central_Texas_Sm\Sage_Pro_MF_Central_Texas_Sm\Default.gdb
 VMS_Consolidated_Data_Pop_GeneralizedLinearRegression
 Explanatory Variable(s): densityLine_Den_Roads
 Explanatory Distance Features:
 Prediction Locations:
 Match Explanatory Variables:
 Match Distance Features:
 Output Predicted Features:

Messages

Start Time: Wednesday, March 17, 2021 12:22:29 PM
 Running script GeneralizedLinearRegression...
WARNING 001605: Distances for Geographic Coordinates (degrees, minutes, seconds) are analyzed using Chordal Distances in meters.
WARNING 000621: Problems reading 1469 of 27271 total records.
WARNING 000621: Features with bad records (only includes first 30): OBJECTID = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.

----- Summary of GLR Results (Model Type: Continuous (Gaussian/OLS)) -----

Variable	Coefficient [a]	StdError	t-Statistic	Probability [b]	Robust_SE	Robust_t	Robust_Pr [b]	VIF [c]
Intercept	-7187543.794836	739059.846131	-9.725263	0.000000*	787198.745441	-10.163400	0.000000*	-----
DENSITY	321.721696	47.040869	6.838323	0.000000*	50.279286	6.399838	0.000000*	1.062838
LINE_DEN_ROADS	16791.782536	231.115431	72.655047	0.000000*	239.693826	70.054798	0.000000*	1.062838

----- GLR Diagnostics -----

Input Features: EMS_Consolidated_Data_Pop Dependent Variable: EMS_CALL_DENSITY_10M_100M
 Number of Observations: 25802 Akaike's Information Criterion (AICc) [d]: 977896.059786
 Multiple R-Squared [e]: 0.373732 Adjusted R-Squared [e]: 0.173288
 Joint F-Statistic [f]: 2701.683712 Prob(>F), (2,25799) degrees of freedom: 0.000000*
 Joint Wald Statistic [g]: 5860.093319 Prob(<chi-squared), (2) degrees of freedom: 0.000000*
 Koenerker (BP) Statistic [f]: 2455.847535 Prob(<chi-squared), (2) degrees of freedom: 0.000000*
 Jarque-Bera Statistic [g]: 7887.895445 Prob(<chi-squared), (2) degrees of freedom: 0.000000*

Notes on Interpretation
 * An asterisk next to a number indicates a statistically significant p-value (p < 0.01).
 [a] Coefficient: Represents the strength and type of relationship between each explanatory variable and the dependent variable.
 [b] Probability and Robust Probability (Robust_Pr): Asterisk (*) indicates a coefficient is statistically significant (p < 0.01); if the Koenerker (BP) statistic [f] is statistically significant, use the Robust Probability column (Robust_Pr) to determine coefficient significance.
 [c] Variance Inflation Factor (VIF): Large Variance Inflation Factor (VIF) values (> 7.5) indicate redundancy among explanatory variables.
 [d] R-Squared and Akaike's Information Criterion (AICc): Measures of model fit/performance.
 [e] Joint F and Wald Statistics: Asterisk (*) indicates overall model significance (p < 0.01); if the Koenerker (BP) statistic [f] is statistically significant, use the Wald Statistic to determine overall model significance.
 [f] Koenerker (BP) Statistic: When this test is statistically significant (p < 0.01), the relationships modeled are not consistent (either due to non-stationarity or heteroskedasticity). You should rely on the Robust Probabilities (Robust_Pr) to determine coefficient significance and on the Wald Statistic to determine overall model significance.
 [g] Jarque-Bera Statistic: When this test is statistically significant (p < 0.01) model predictions are biased (the residuals are not normally distributed).
 Completed script GeneralizedLinearRegression...
 Succeeded at Wednesday, March 17, 2021 12:22:38 PM (Elapsed Time: 9.35 seconds)

Findings

Regression Analysis: Call Density | Road Density



▶ Linear Regression | Esri

- ▶ Road density ($R^2 = 0.17$)
- ▶ Traffic Point Density
- ▶ Population Area

▶ Analysis

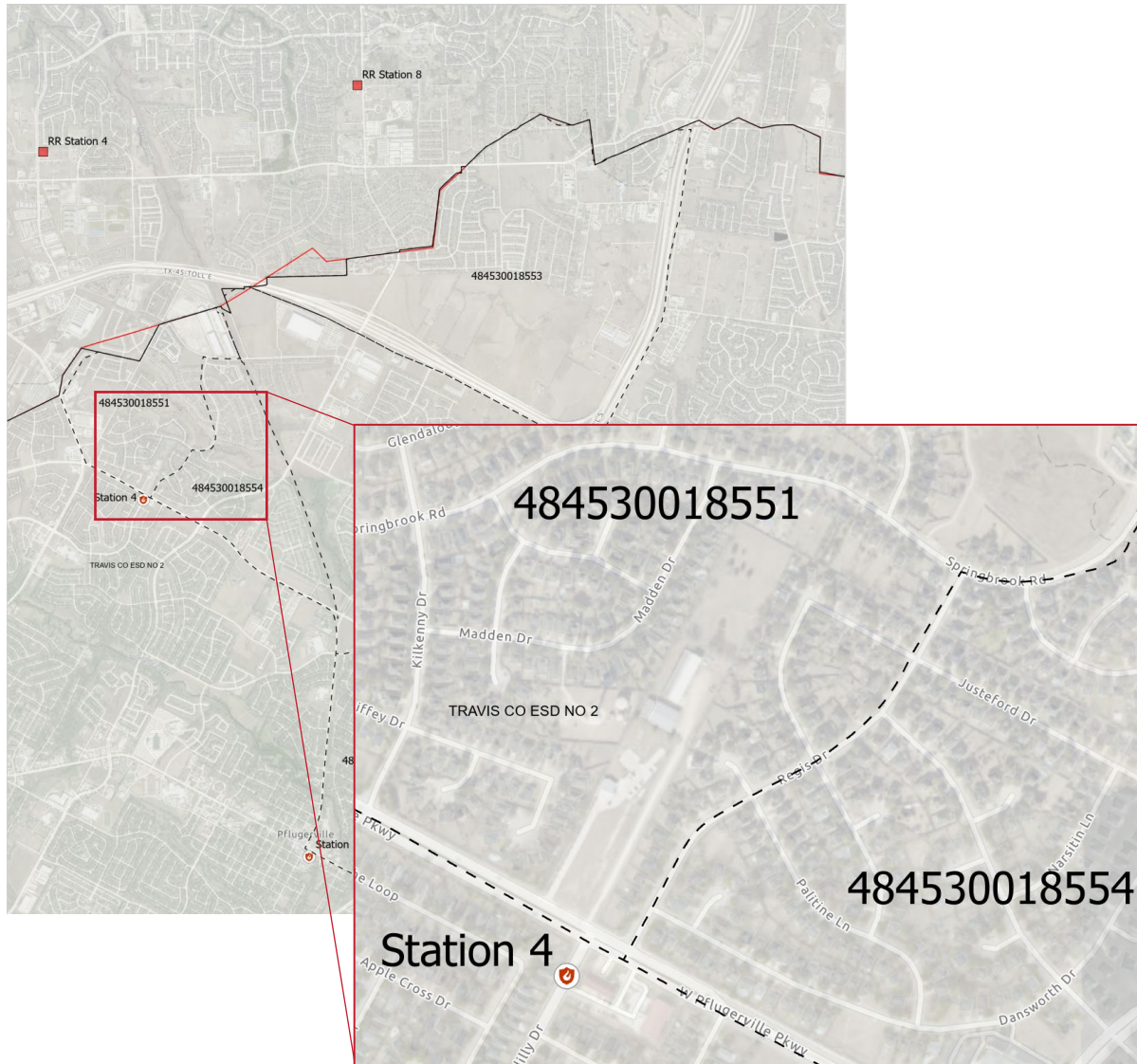
- ▶ R^2 : Percent of explained variability
- ▶ Social Science | Human Behavior
- ▶ Weak Signal | Strong Noise

▶ Insight into **where**...

- ▶ Not how many
- ▶ Impact on number of calls(?)

An R -squared of 10% or even less could have some information value when you are looking for a weak signal in the presence of a lot of noise in a setting where even a very weak one would be of general interest. Sometimes there is a lot of value in explaining only a very small fraction of the variance. (<https://people.duke.edu/~rnau/rsquared.htm>)

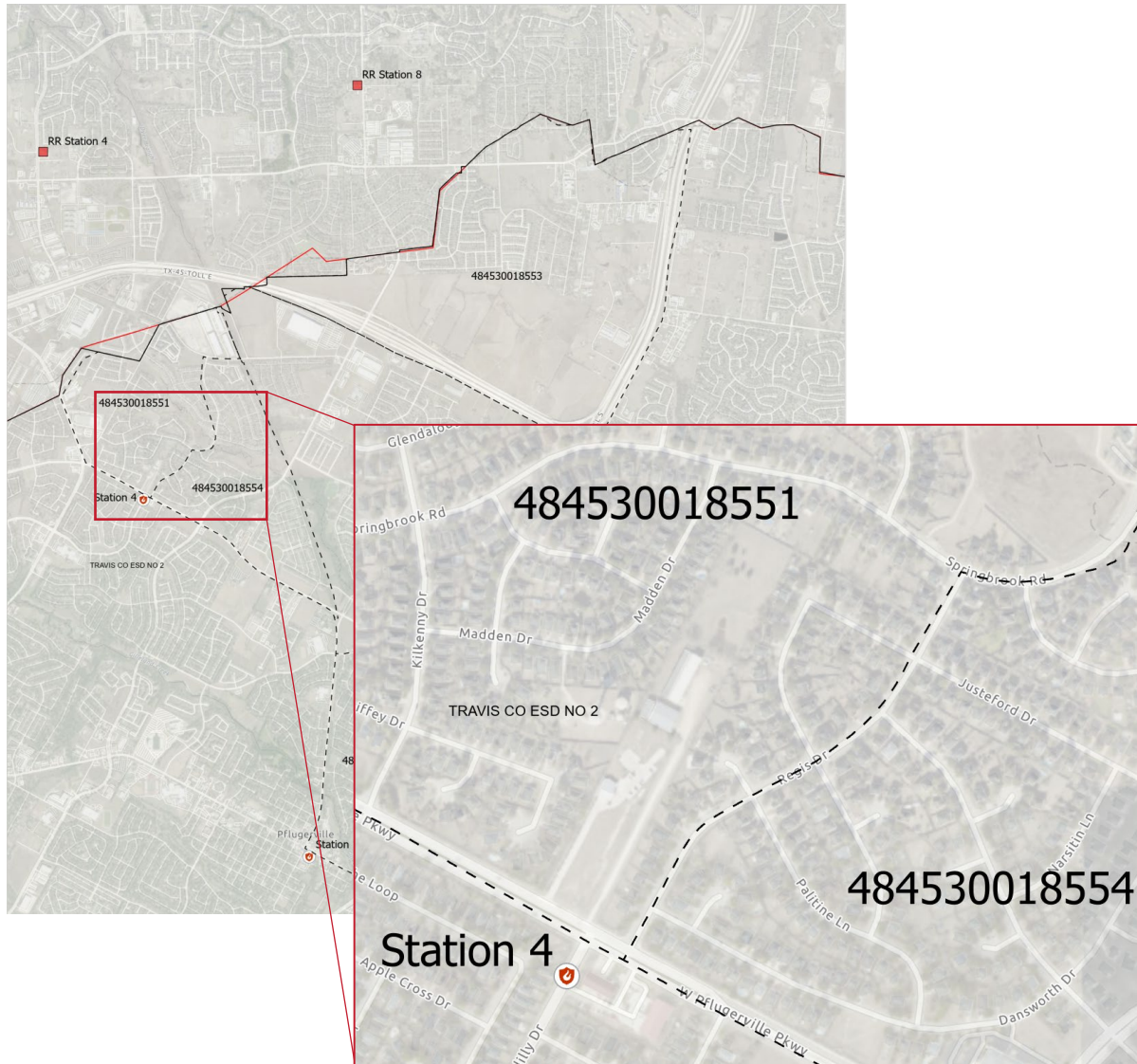
Findings Population Impact on Call Volume (2017-2019)



Group	Population	2017	2018	2019*
484530018551		2607	2864	2921
484530018552		5109	4515	4571
484530018553		5103	5090	5123
484530018554		2805	4506	4765
484530018555		2195	2358	2401

**US Census Population Data available through 2019; 2020 data anticipated in September 2021*

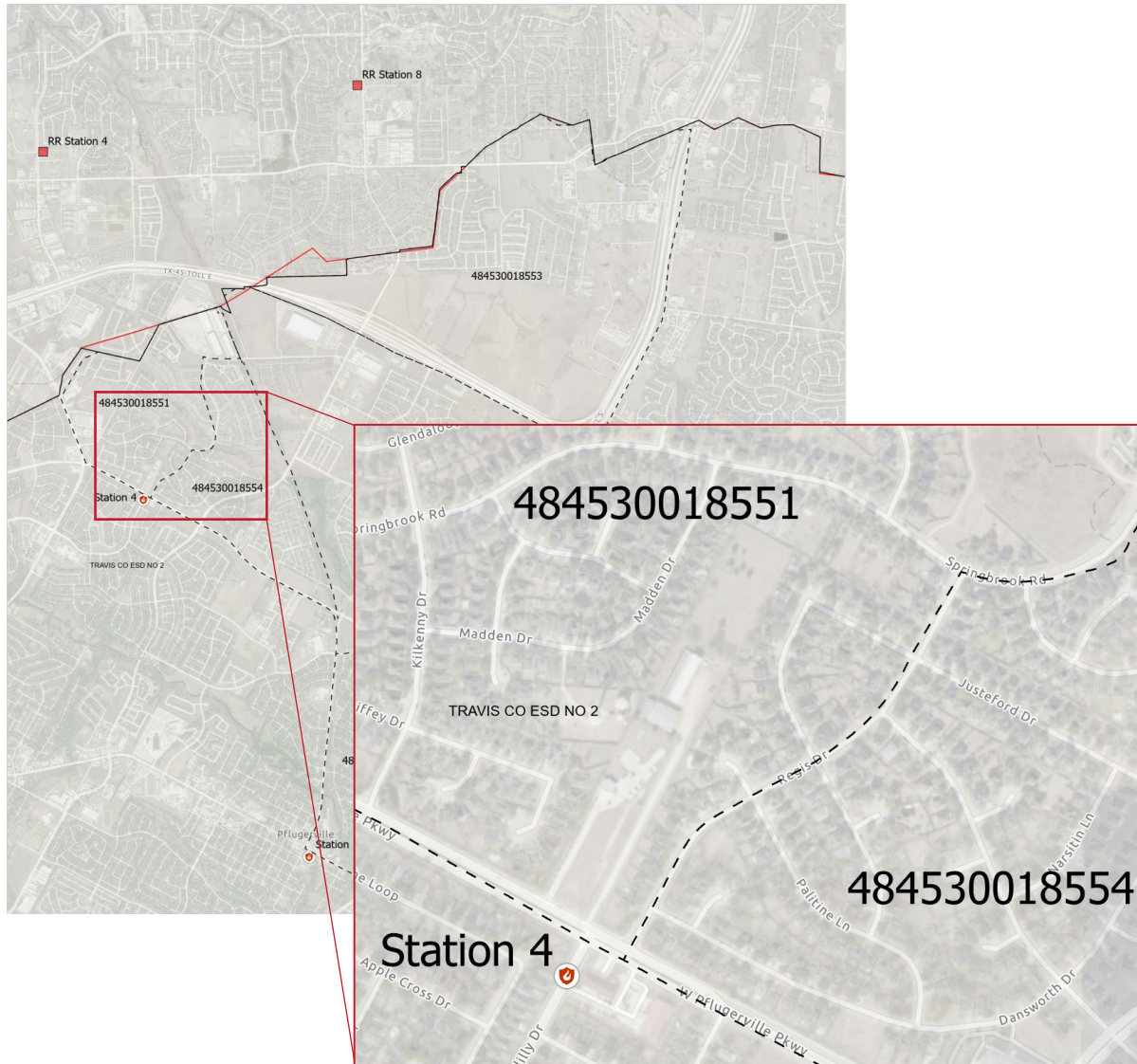
Findings Population Impact on Call Volume (2017-2019)



Group	Pop. No. Calls	2017	2018	2019*
484530018551		2607 56	2864	2921
484530018552		5109 323	4515	4571
484530018553		5103 205	5090	5123
484530018554		2805 119	4506	4765
484530018555		2195 125	2358	2401

**US Census Population Data available through 2019; 2020 data anticipated in September 2021*

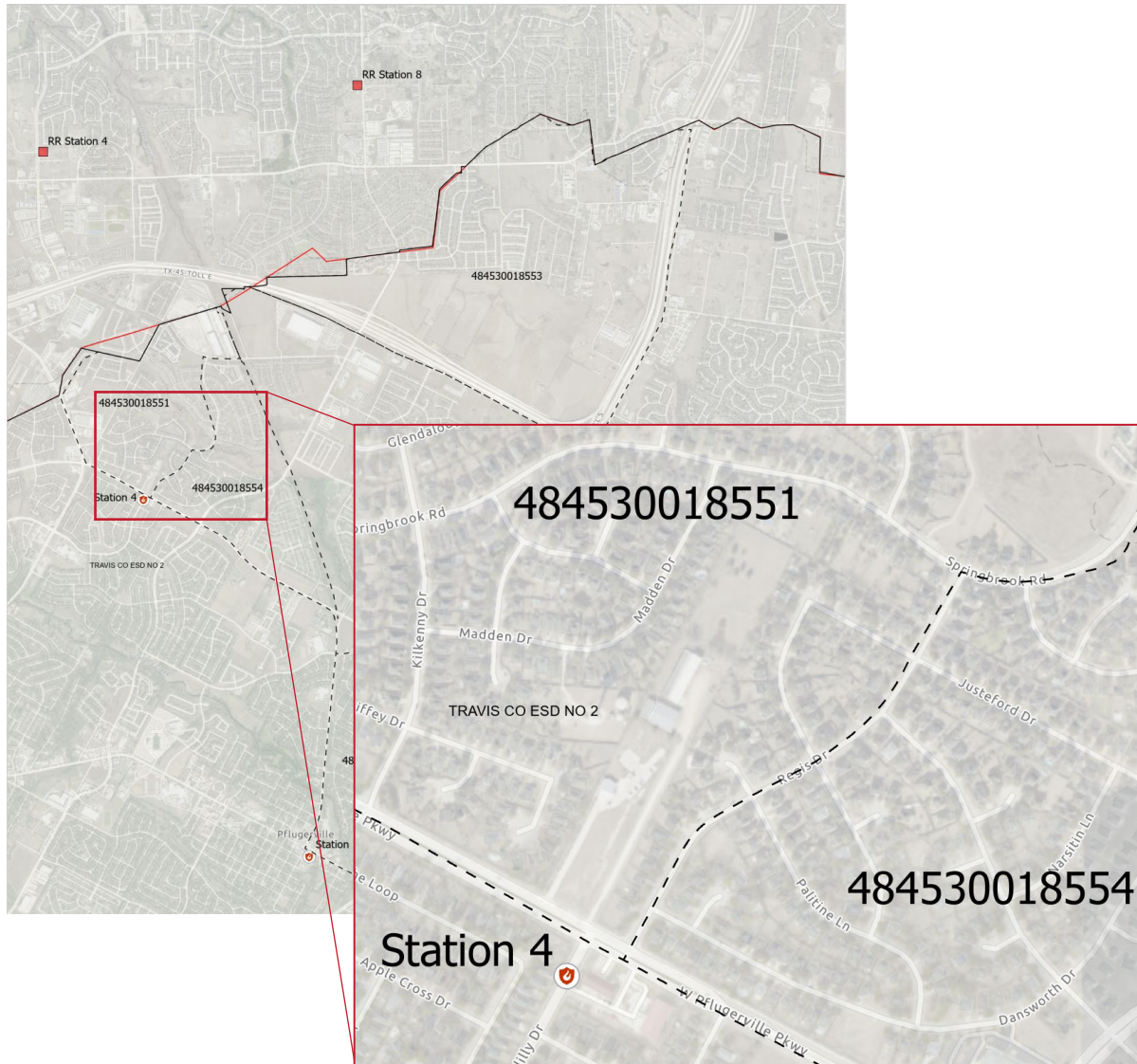
Findings Population Impact on Call Volume (2017-2019)



Group	Pop. No. Calls	2017	2018	2019*
484530018551		2607 56	2864 86	2921
484530018552		5109 323	4515 361	4571
484530018553		5103 205	5090 205	5123
484530018554		2805 119	4506 112	4765
484530018555		2195 125	2358 152	2401

*US Census Population Data available through 2019; 2020 data anticipated in September 2021

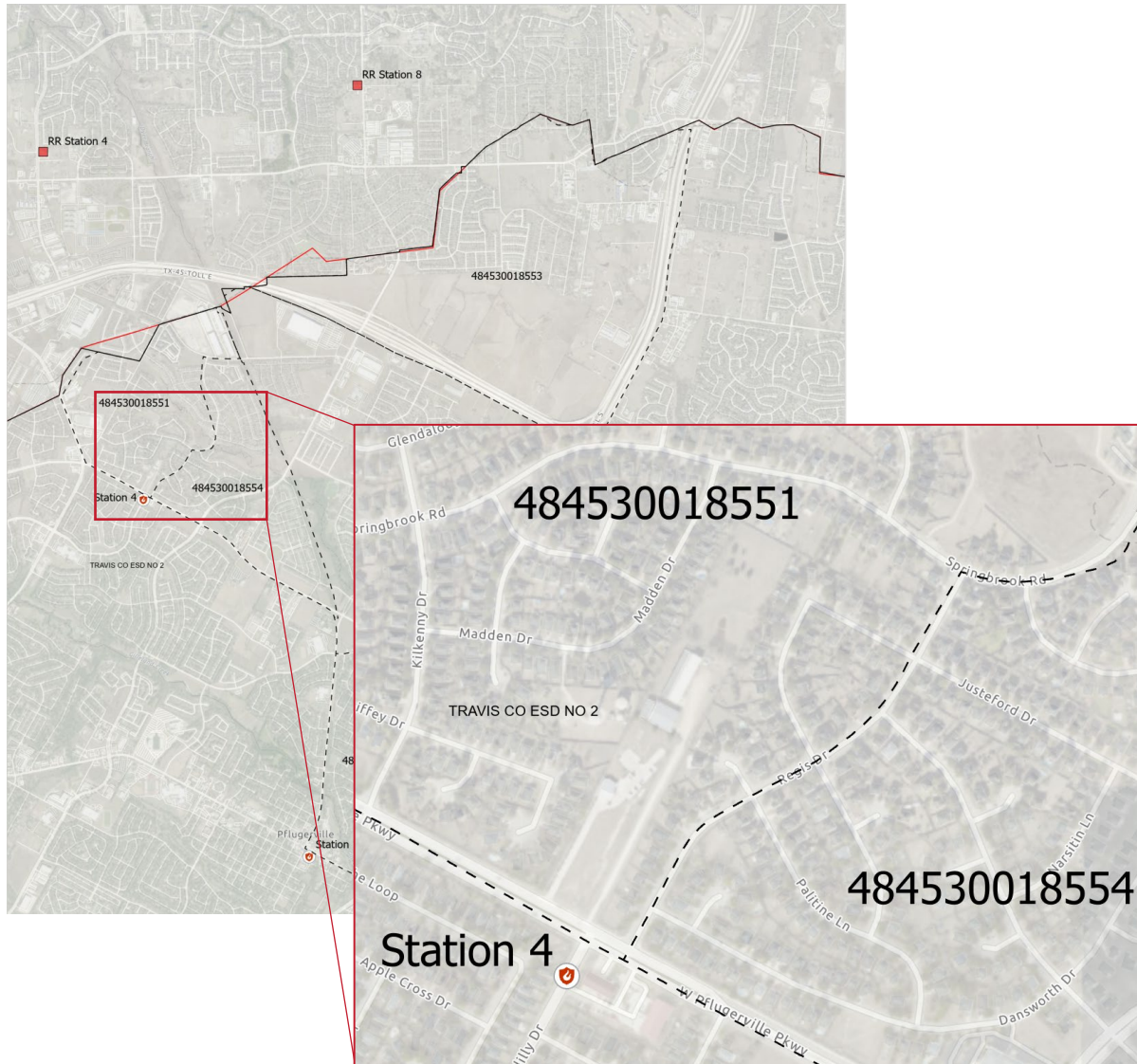
Findings Population Impact on Call Volume (2017-2019)



Group	Pop. No. Calls	2017	2018	2019*
484530018551		2607 56	2864 86	2921 89
484530018552		5109 323	4515 361	4571 403
484530018553		5103 205	5090 205	5123 237
484530018554		2805 119	4506 112	4765 116
484530018555		2195 125	2358 152	2401 131

*US Census Population Data available through 2019; 2020 data anticipated in September 2021

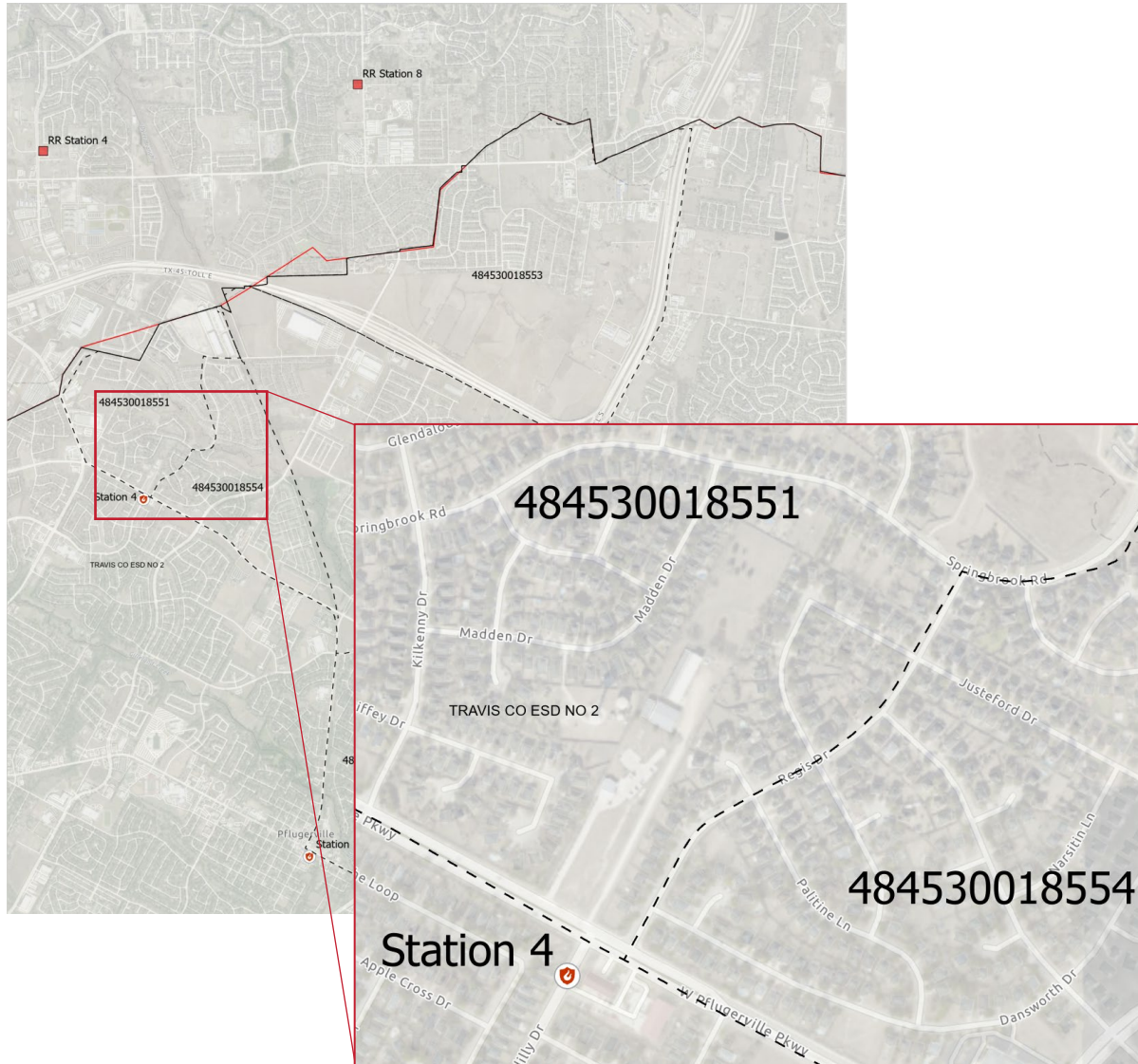
Findings Population Impact on Call Volume (2017-2019)



Group	Pop. No. Calls	2017	2018	2019*
484530018551		2607 56	2864 86	2921 89
484530018552		5109 323	4515 361	4571 403
484530018553		5103 205	5090 205	5123 237
484530018554		2805 119	4506 112	4765 116
484530018555		2195 125	2358 152	2401 131
Total		118,843 5643	123,355 6773	125,317 7012

*US Census Population Data available through 2019; 2020 data anticipated in September 2021

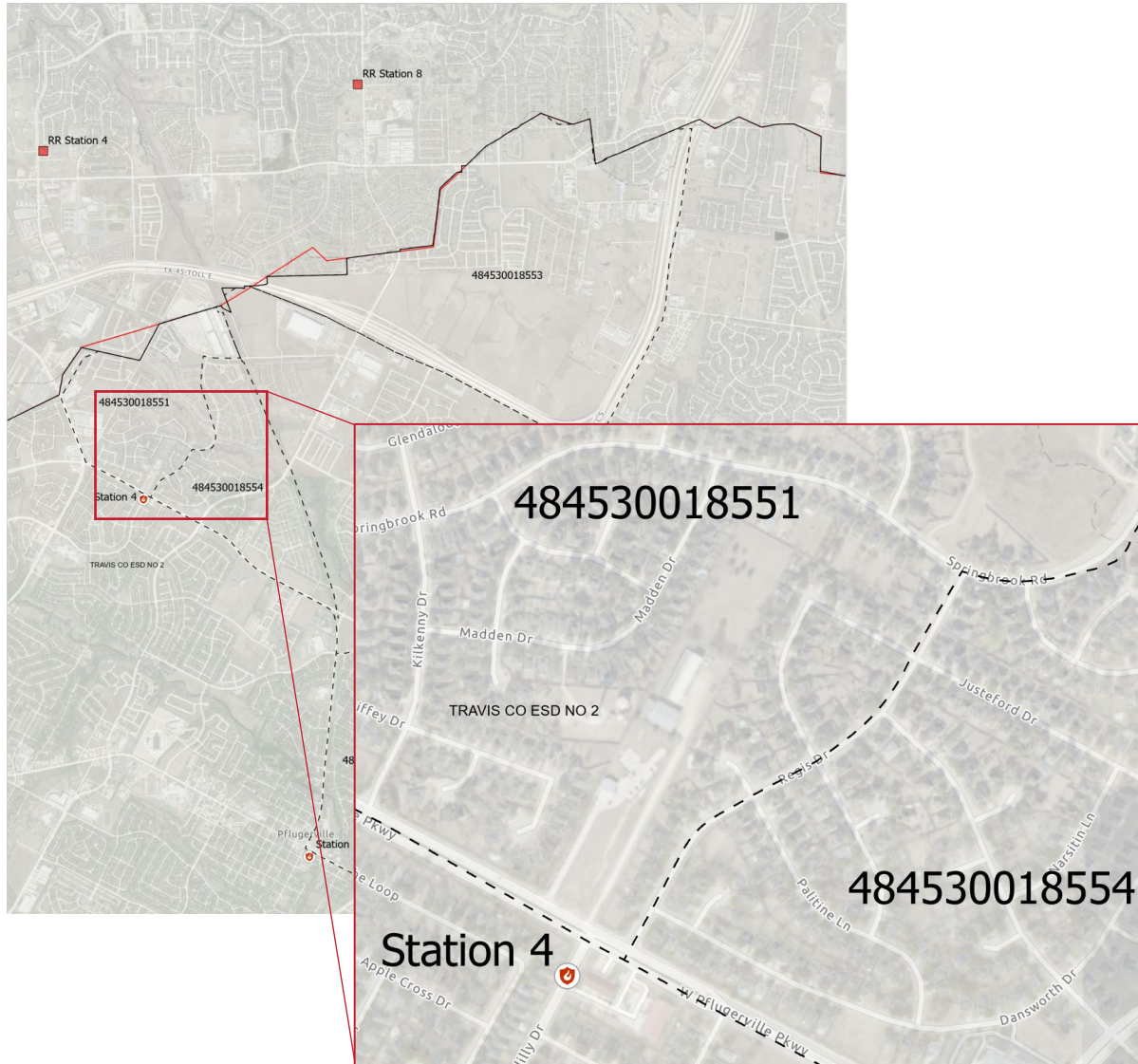
Findings Population Impact on Call Volume (2017-2019)



Group	Pop. No. Calls	2017	2018	2019*
484530018551		2607 56	2864 86	2921 89
484530018552		5109 323	4515 361	4571 403
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484530018554		2805 119	4506 112	4765 116
484530018555		2195 125	2358 152	2401 131
Total		118,843 5643	123,355 6773	125,317 7012
Calls/1000 Pop.		47.4	54.9	55.6

*US Census Population Data available through 2019; 2020 data anticipated in September 2021

Findings Population Impact on Call Volume (2017-2019)



Group	Pop. No. Calls	2017	2018	2019*
484530018551		2607 56	2864 86	2921 89
484530018552		5109 323	4515 361	4571 403
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*US Census Population Data available through 2019; 2020 data anticipated in September 2021

Total	118,843 5643	123,355 6773	125,317 7012
Calls/1000 Pop.	47.4	54.9	55.6

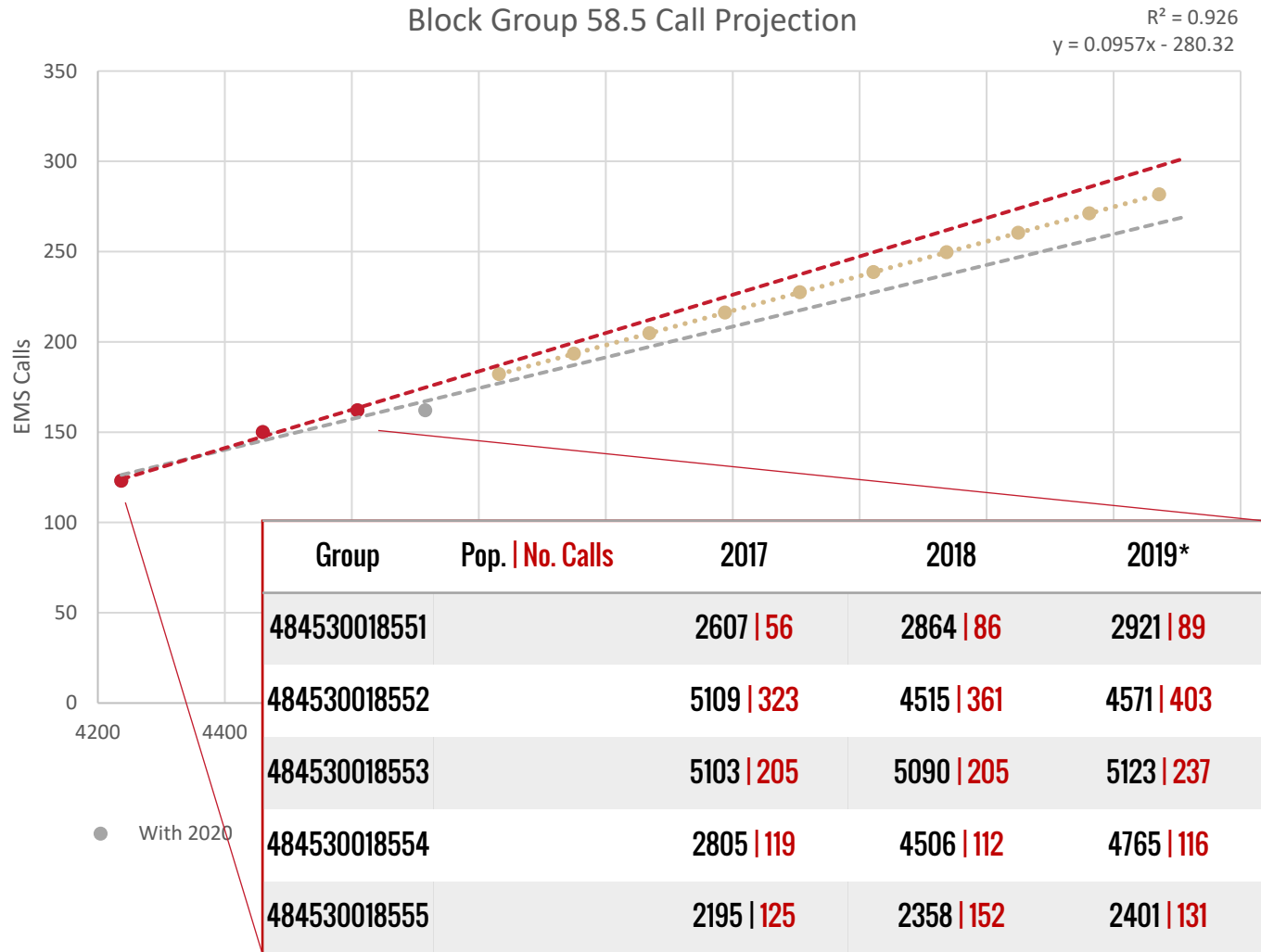
Findings:

- ▶ Increase in pop. | Increase in Calls (551)
- ▶ Decrease in pop. | Increase in Calls (552)
- ▶ Increase in pop. | Decrease in Calls (554)
- ▶ Analysis by block group **critical**
- ▶ Calls/1000 **increasing** each year



Findings

Regression Analysis: EMS Calls | Population (by Block Group)



▶ Linear Regression

- ▶ Estimates How **Many** Calls
- ▶ Population Increase ($R^2 = 0.92$)
- ▶ Population Decrease ($R^2 = 0.72$)

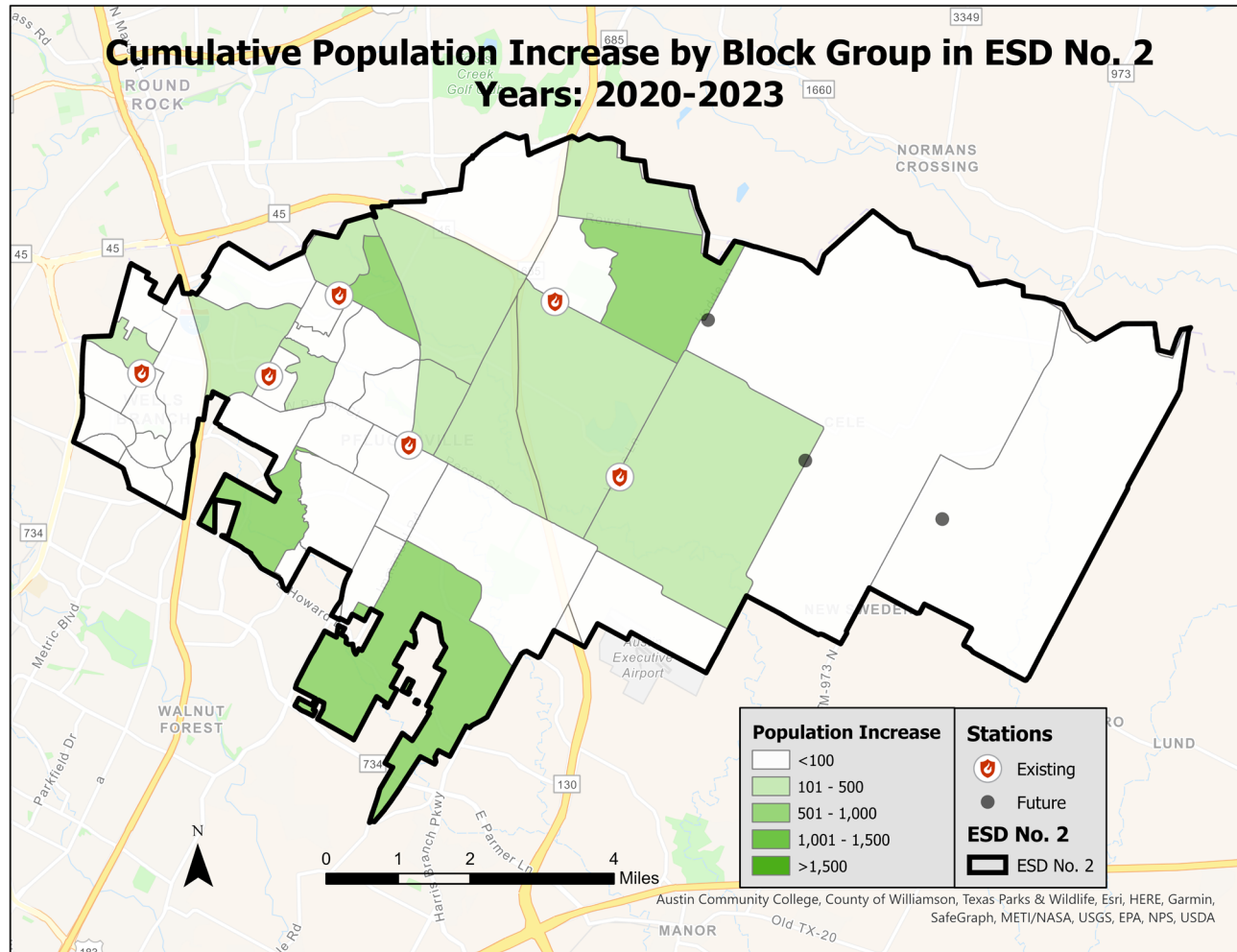
▶ Conclusion

- ▶ Population projections **can aid in estimating future** EMS Calls

▶ Next Steps: **Projected**

- ▶ Population
- ▶ EMS Calls

Analysis **Population Projection** by Block Group (2023)



▶ Methodology

- ▶ Projected using a **cohort-component method** (starting with 2018 ACS 5-Year Estimates).
- ▶ By age group using projected **fertility rates**, **survival rates** and the **net migration** for each year by block group.

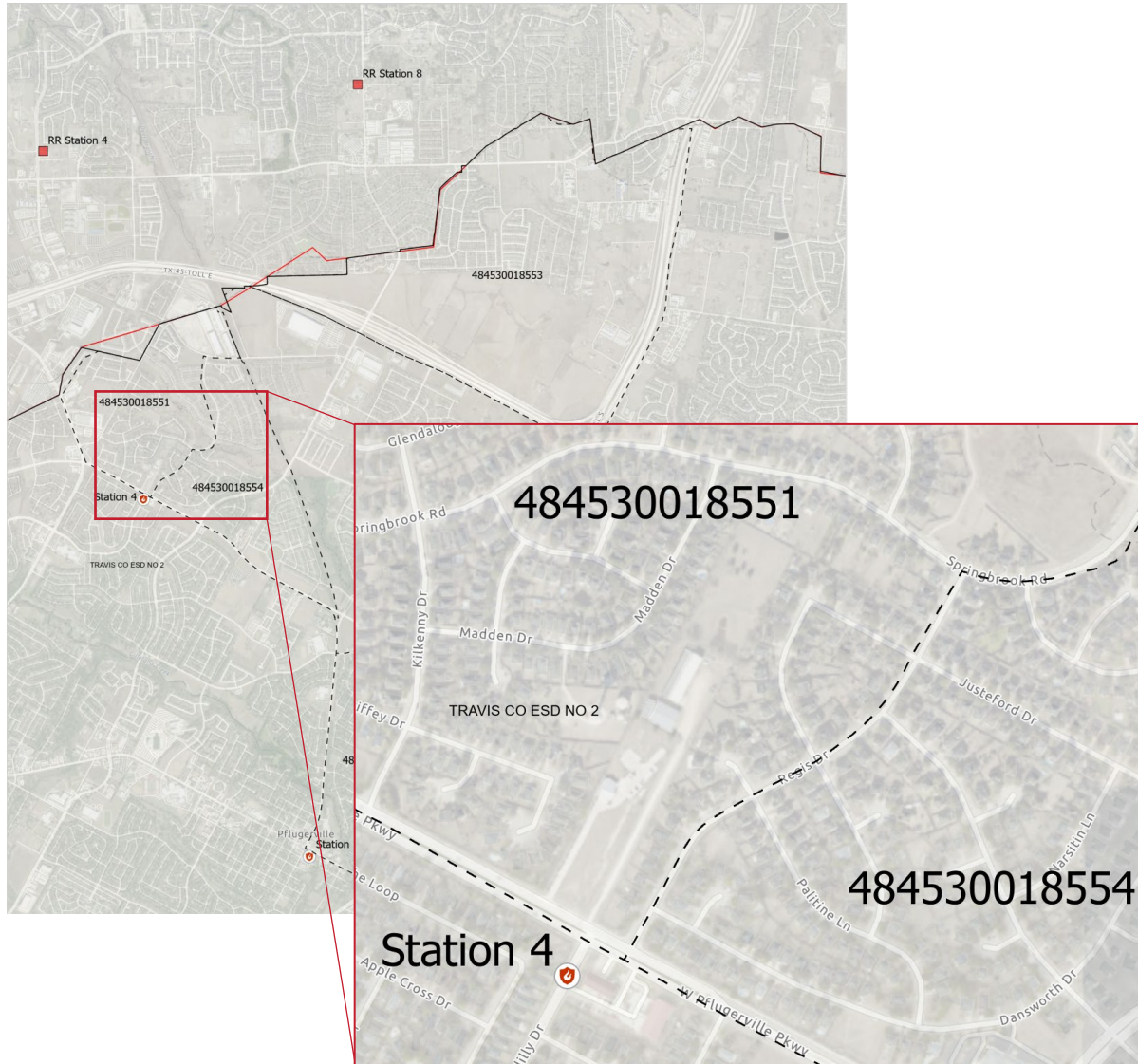
▶ Source(s):

- ▶ CDC (Health Statistics)
- ▶ Census.gov
 - ▶ methodstatement17.pdf
 - ▶ ACS 2018 5-Year Estimate
 - ▶ Migration Flow

▶ ‘Tyranny of Data’ (datapopalliance.org)

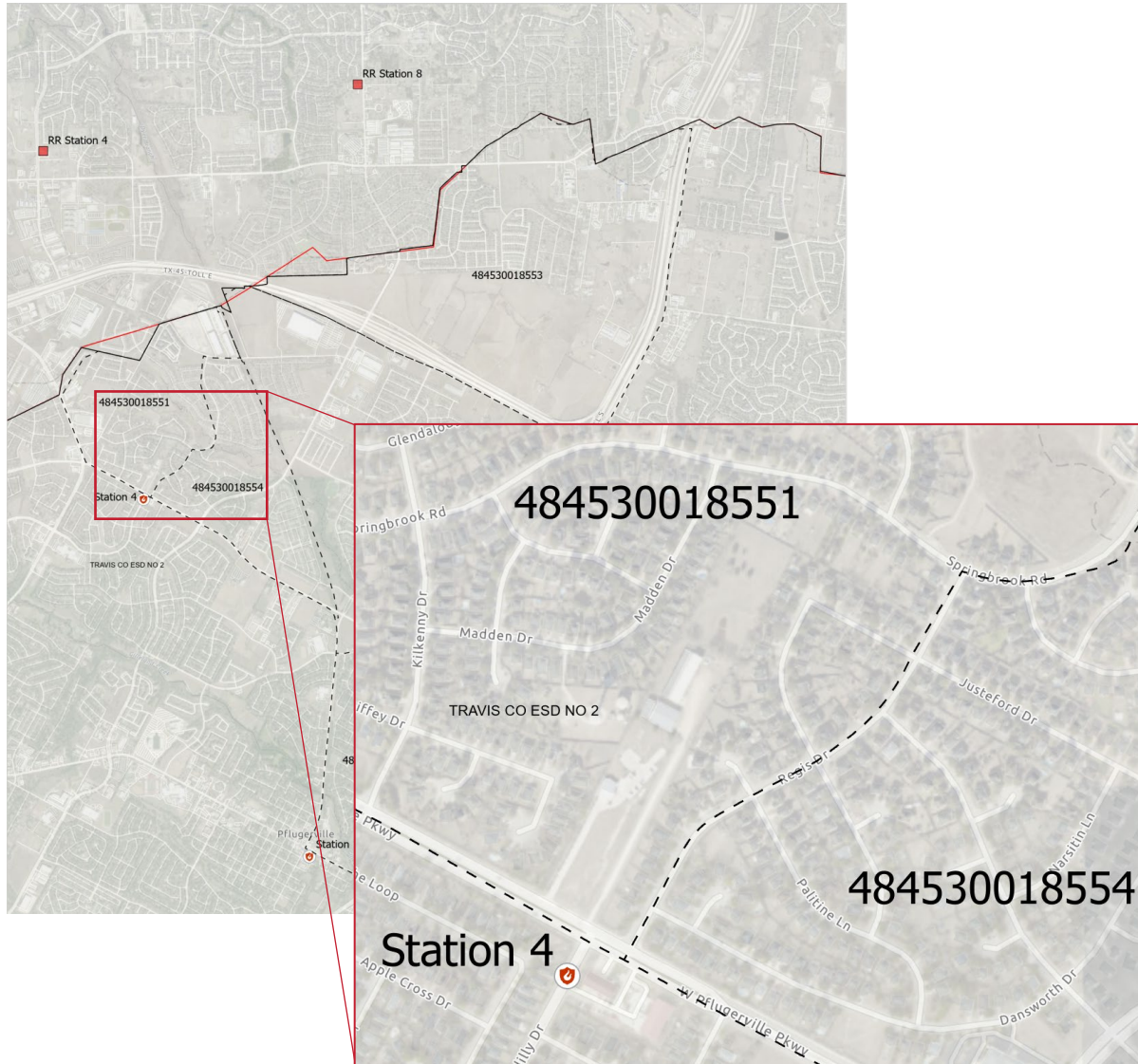
- ▶ Information asymmetry
- ▶ Lack of transparency

Analysis **Population Projection** by Block Group (2023, 2025 and 2030)



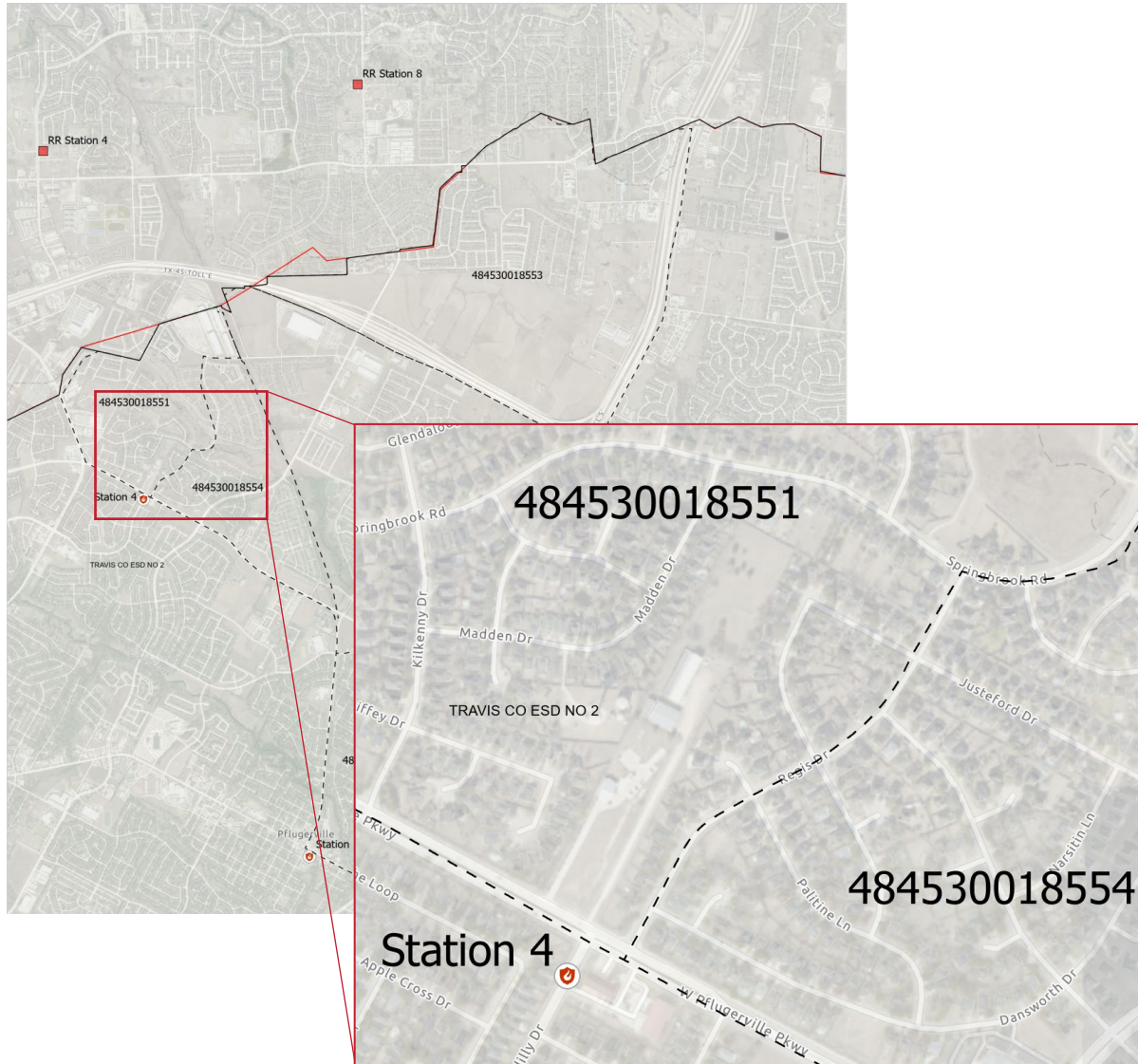
Group	2020	2023	2025	2030
484530018551	2961			
484530018552	4611			
484530018553	5147			
484530018554	4950			
484530018555	2432			
...				
Total Est. ESD2	126,720			
Increase				

Analysis **Population Projection** by Block Group (2023, 2025 and 2030)



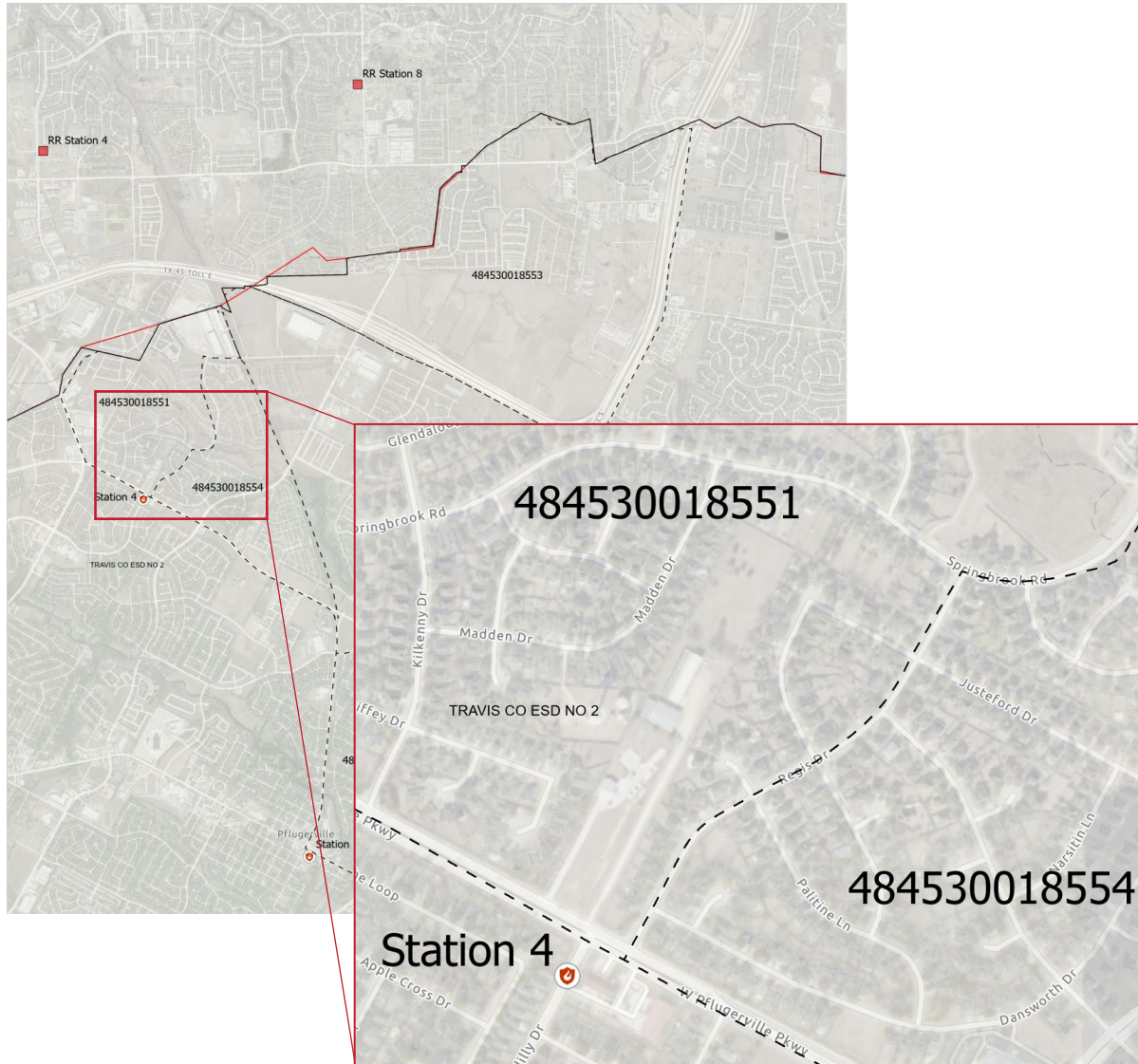
Group	2020	2023	2025	2030
484530018551	2961	3095		
484530018552	4611	4743		
484530018553	5147	5225		
484530018554	4950	5564		
484530018555	2432	2533		
...				
Total Est. ESD2	126,720	131,366		
Increase		3.7%		

Analysis **Population Projection** by Block Group (2023, 2025 and 2030)



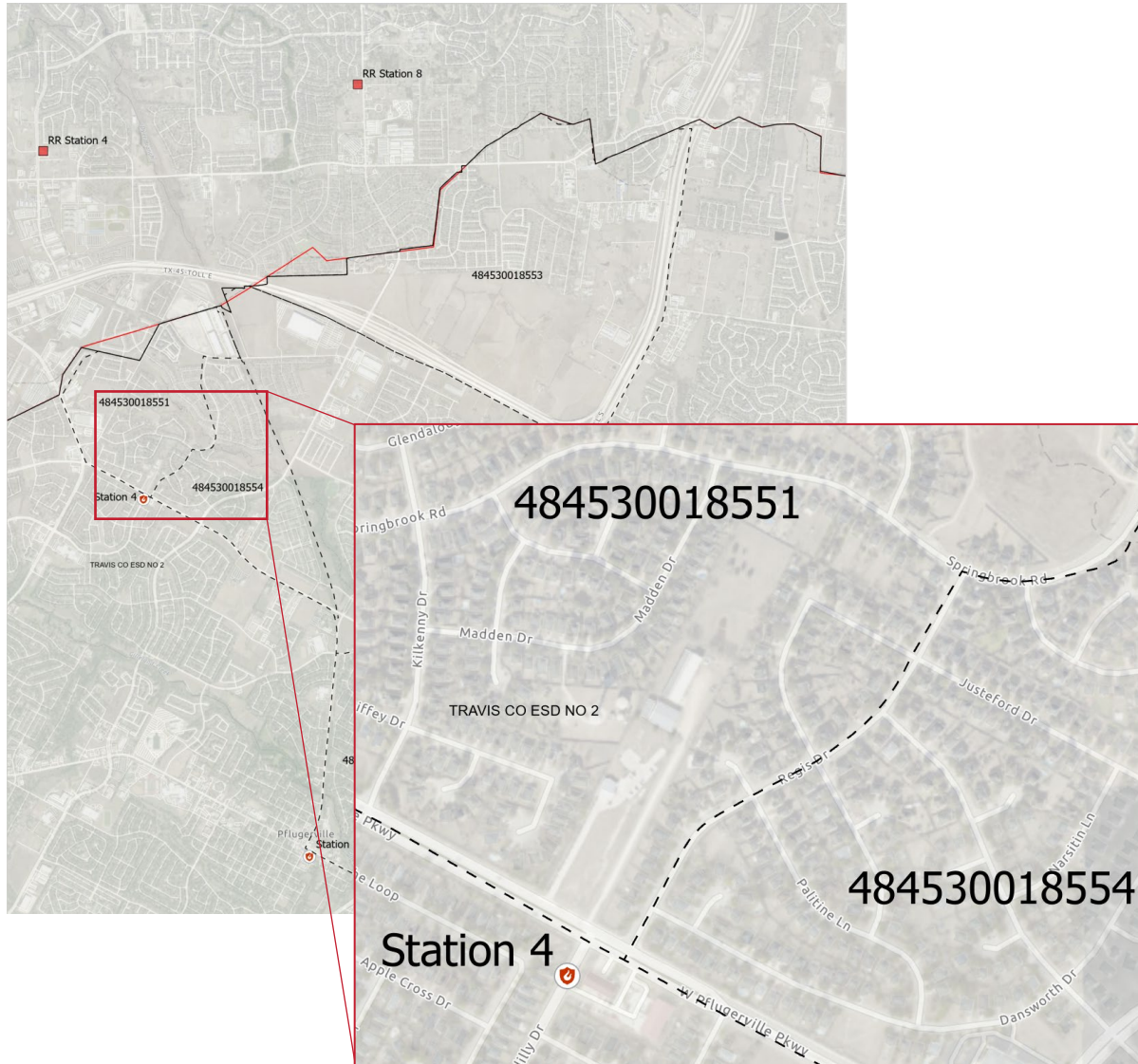
Group	2020	2023	2025	2030
484530018551	2961	3095	3185	
484530018552	4611	4743	4831	
484530018553	5147	5225	5277	
484530018554	4950	5564	5974	
484530018555	2432	2533	2601	
...				
Total Est. ESD2	126,720	131,366	134,476	
Increase		3.7%	2.4%	

Analysis **Population Projection** by Block Group (2023, 2025 and 2030)



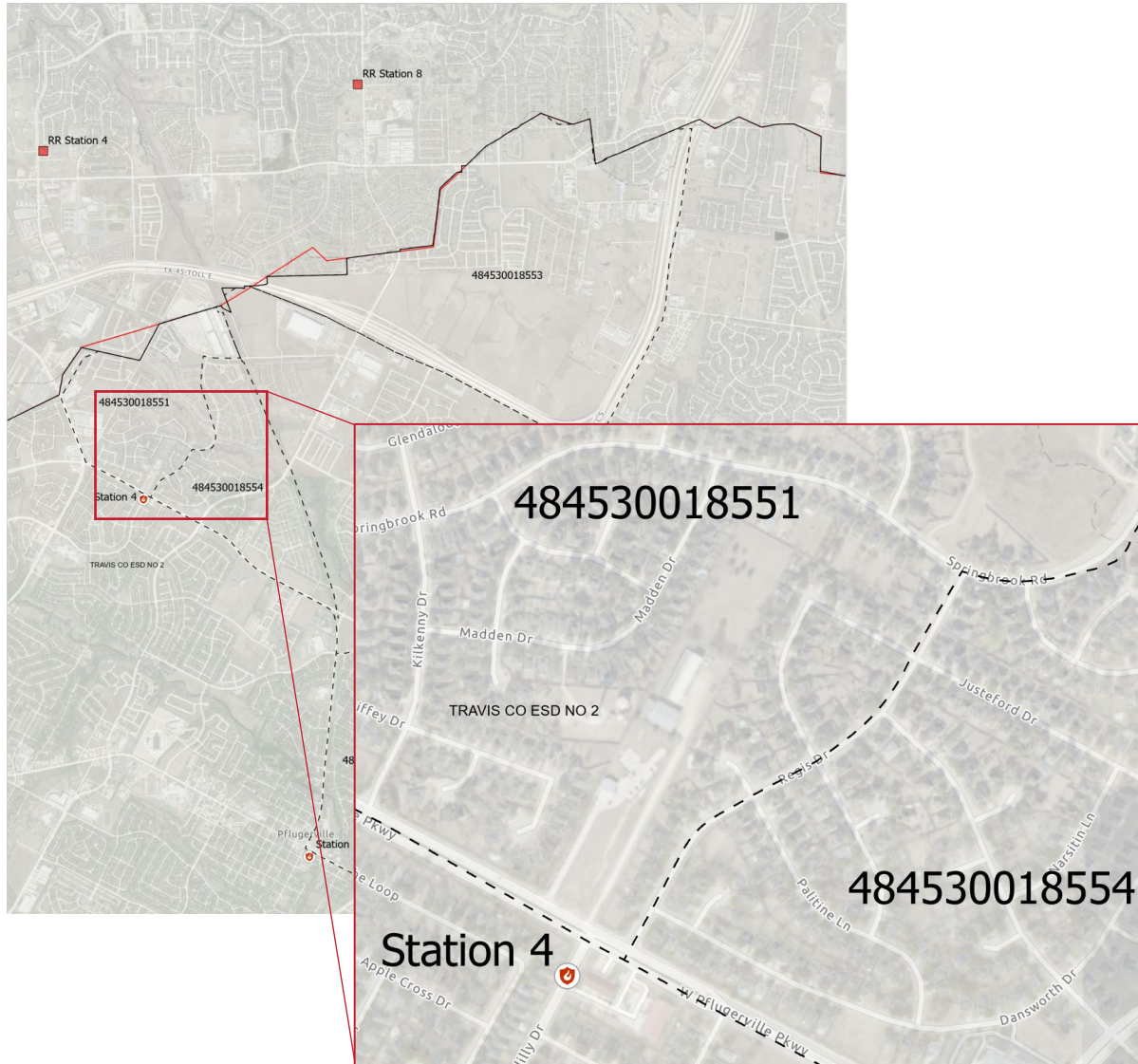
Group	2020	2023	2025	2030
484530018551	2961	3095	3185	3400
484530018552	4611	4743	4831	5043
484530018553	5147	5225	5277	5402
484530018554	4950	5564	5974	6959
484530018555	2432	2533	2601	2765
...				
Total Est. ESD2	126,720	131,366	134,476	141,925
Increase		3.7%	2.4%	5.5%

Analysis **Population Projection** by Block Group (2023, 2025 and 2030)



Group	2020	2023	2025	2030
484530018551	2961	3095	3185	3400
484530018552	4611	4743	4831	5043
484530018553	5147	5225	5277	5402
484530018554	4950	5564	5974	6959
484530018555	2432	2533	2601	2765
...				
Total Est. ESD2	126,720	131,366	134,476	141,925
Increase	(Prev. 2020)	3.7% 3.7%	2.4% 6.1%	5.5% 12%

Analysis **Population Projection** by Block Group (2023, 2025 and 2030)

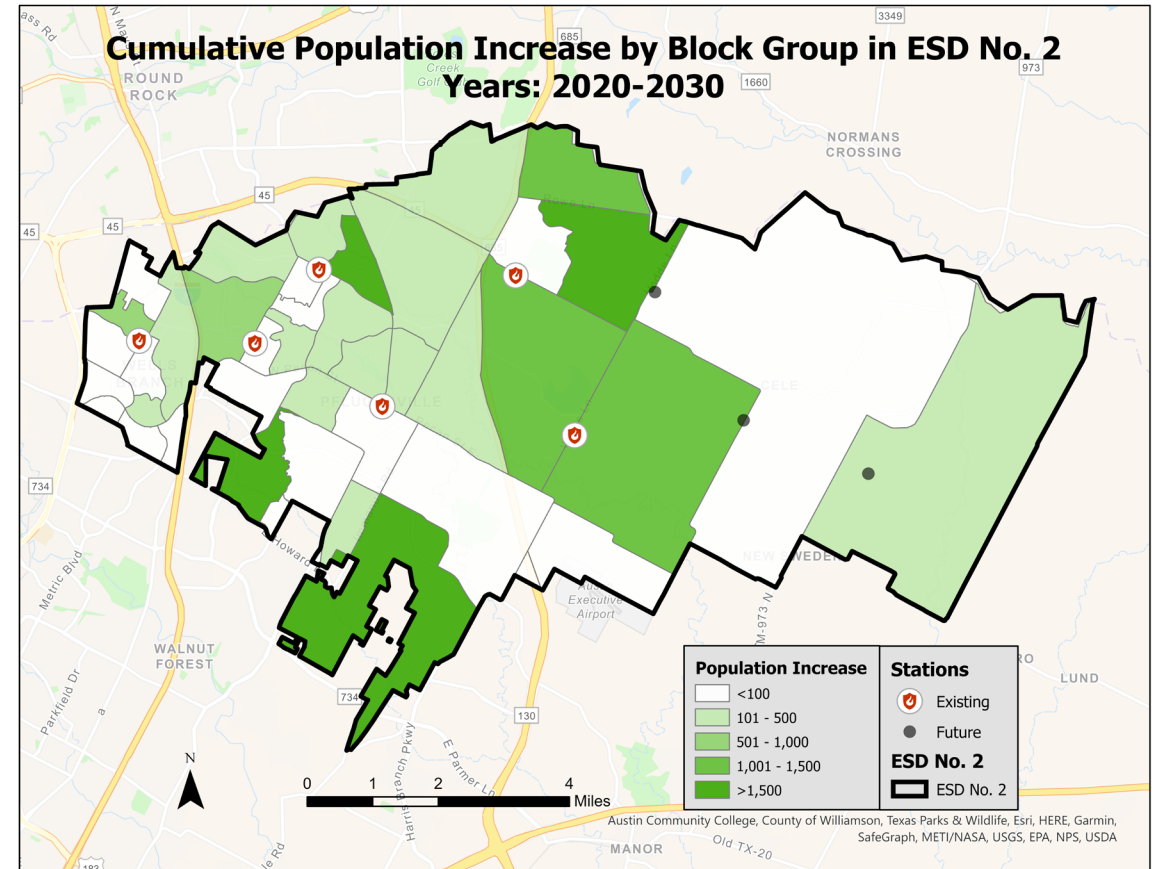
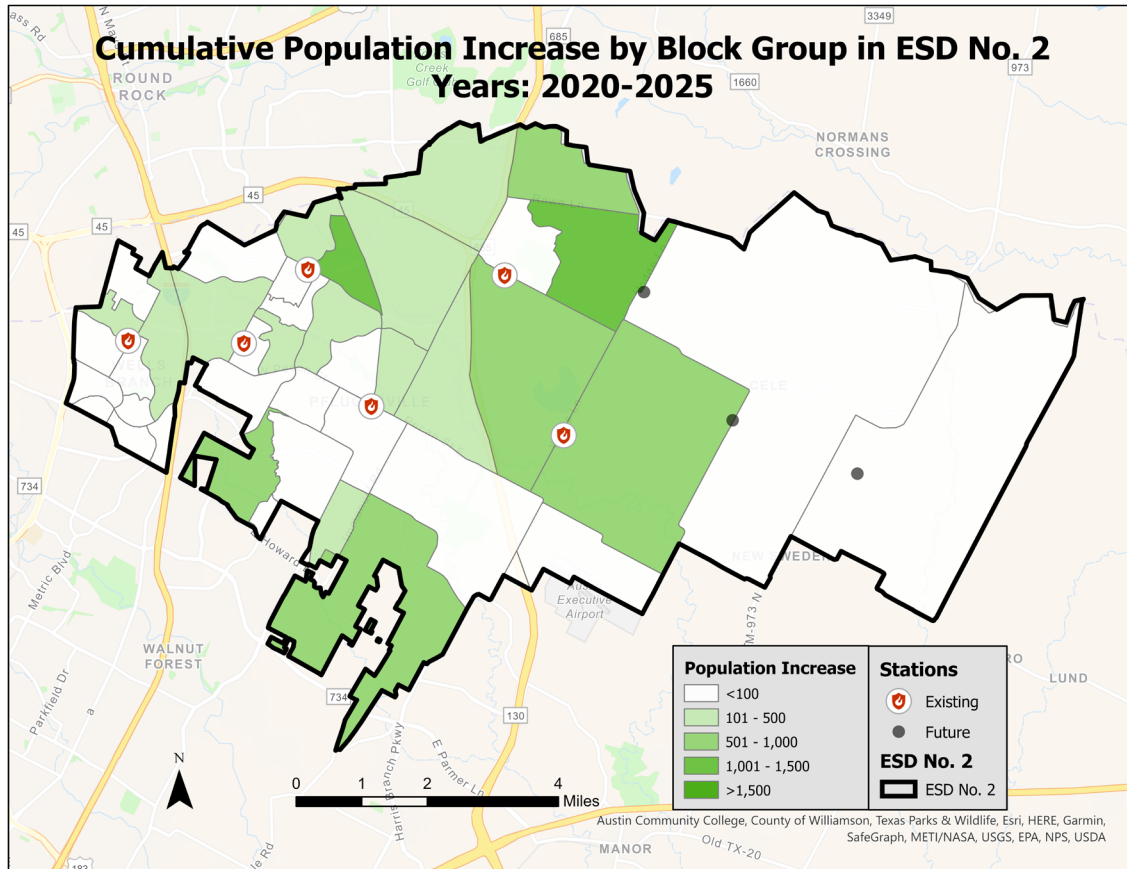


Group	2020	2023	2025	2030
484530018551	2961	3095	3185	3400
484530018552	4611	4743	4831	5043
484530018553	5147	5225	5277	5402
484530018554	4950	5564	5974	6959
484530018555	2432	2533	2601	2765
...				
Total Est. ESD2	126,720	131,366	134,476	141,925
Increase	(Prev. 2020)	3.7% 3.7%	2.4% 6.1%	5.5% 12%

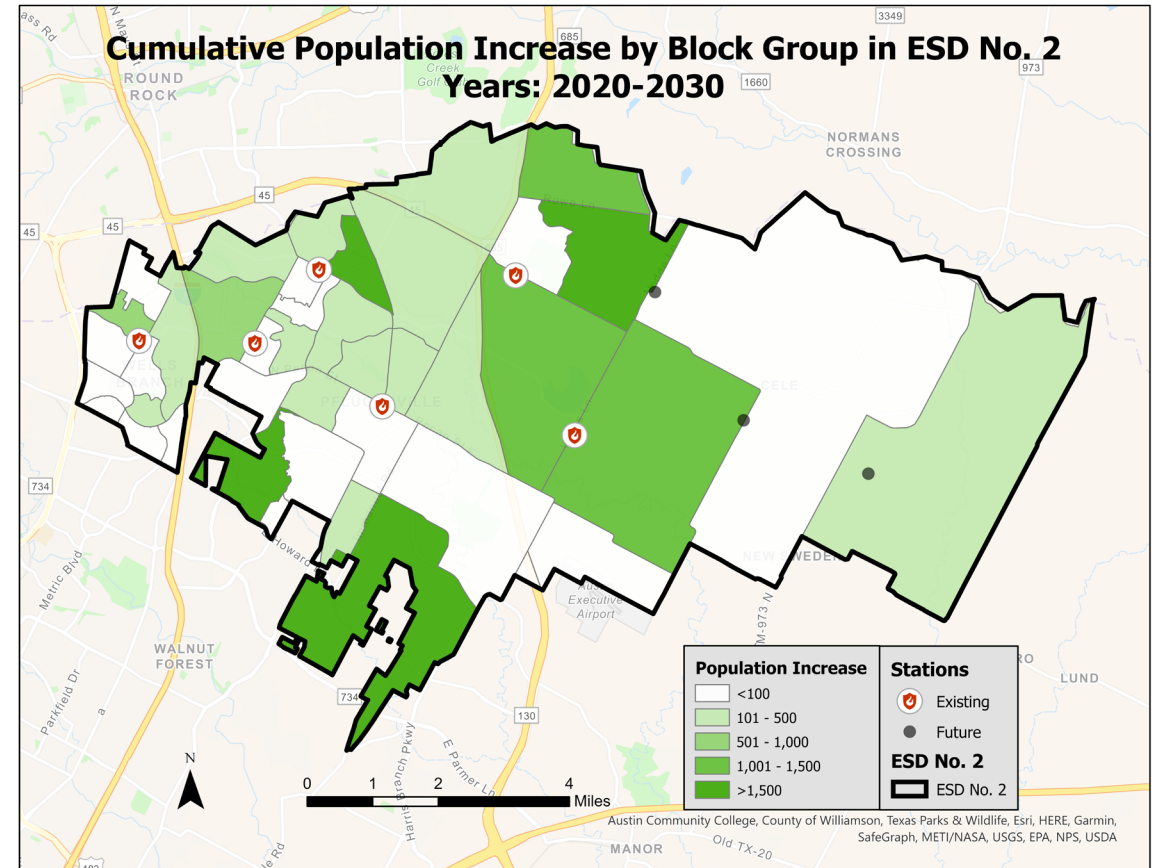
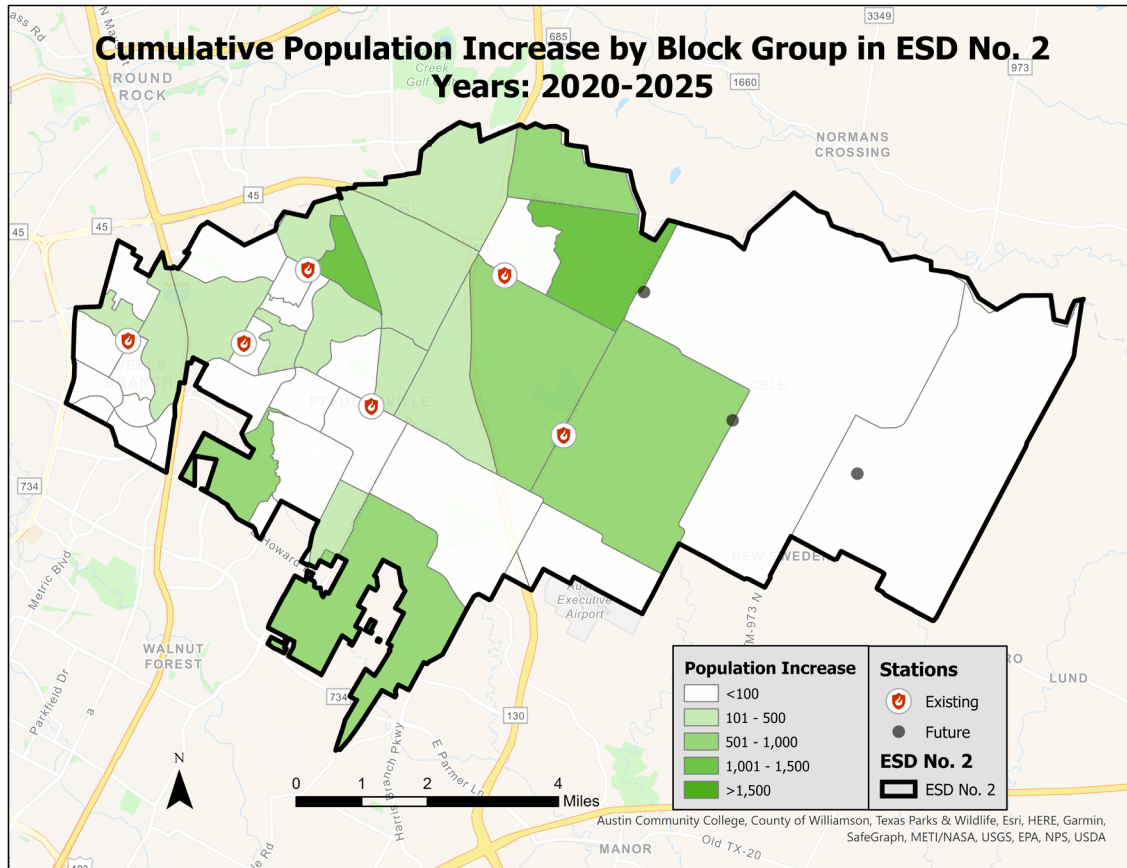
► Fastest 'Movers' (>40% by 2030)

- E. of Station 6 and W. of Training
- Brita Olson
- 554

Analysis **Population Projection** by Block Group (2025 and 2030)

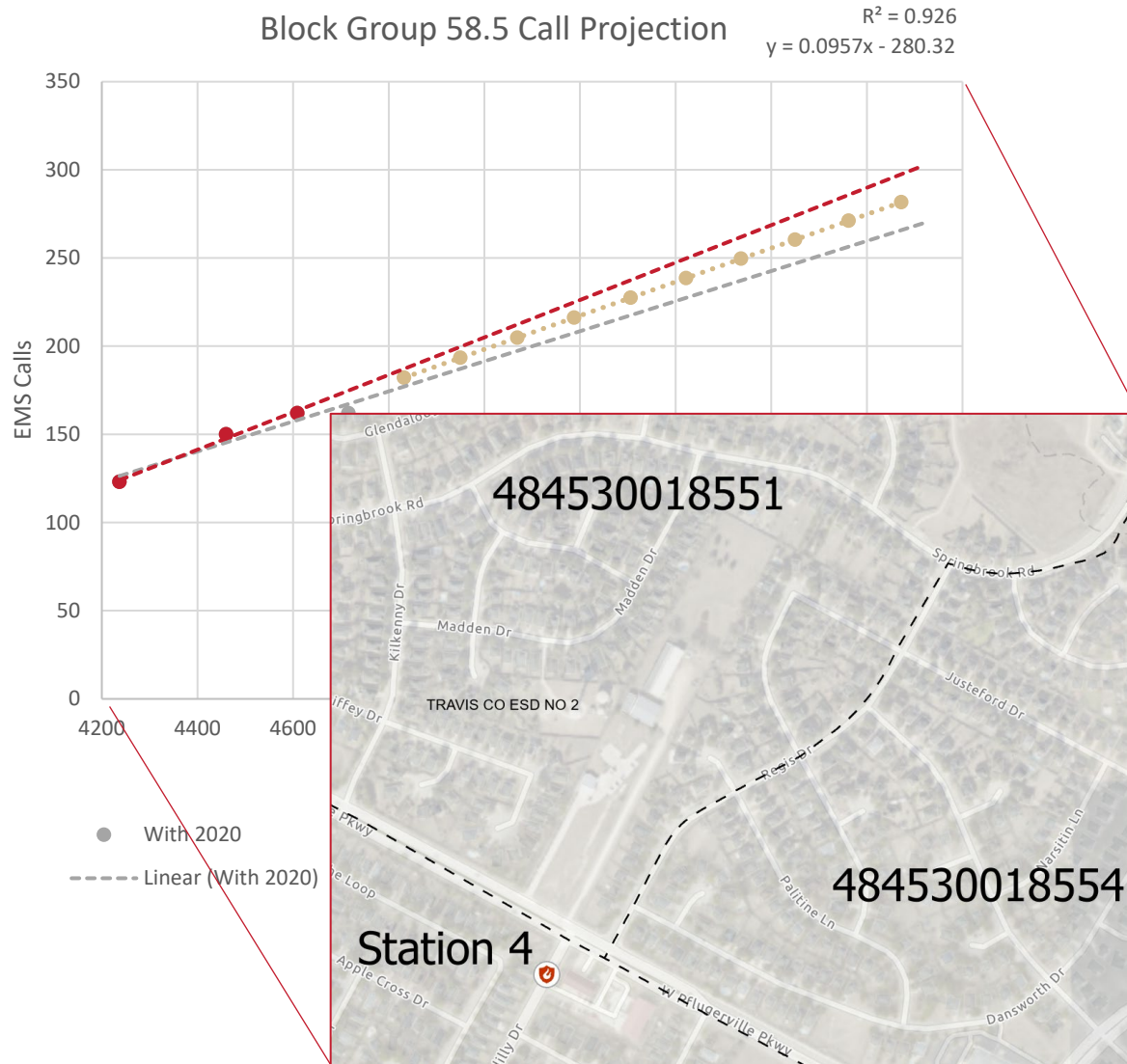


Analysis Population Projection by Block Group (2025 and 2030)



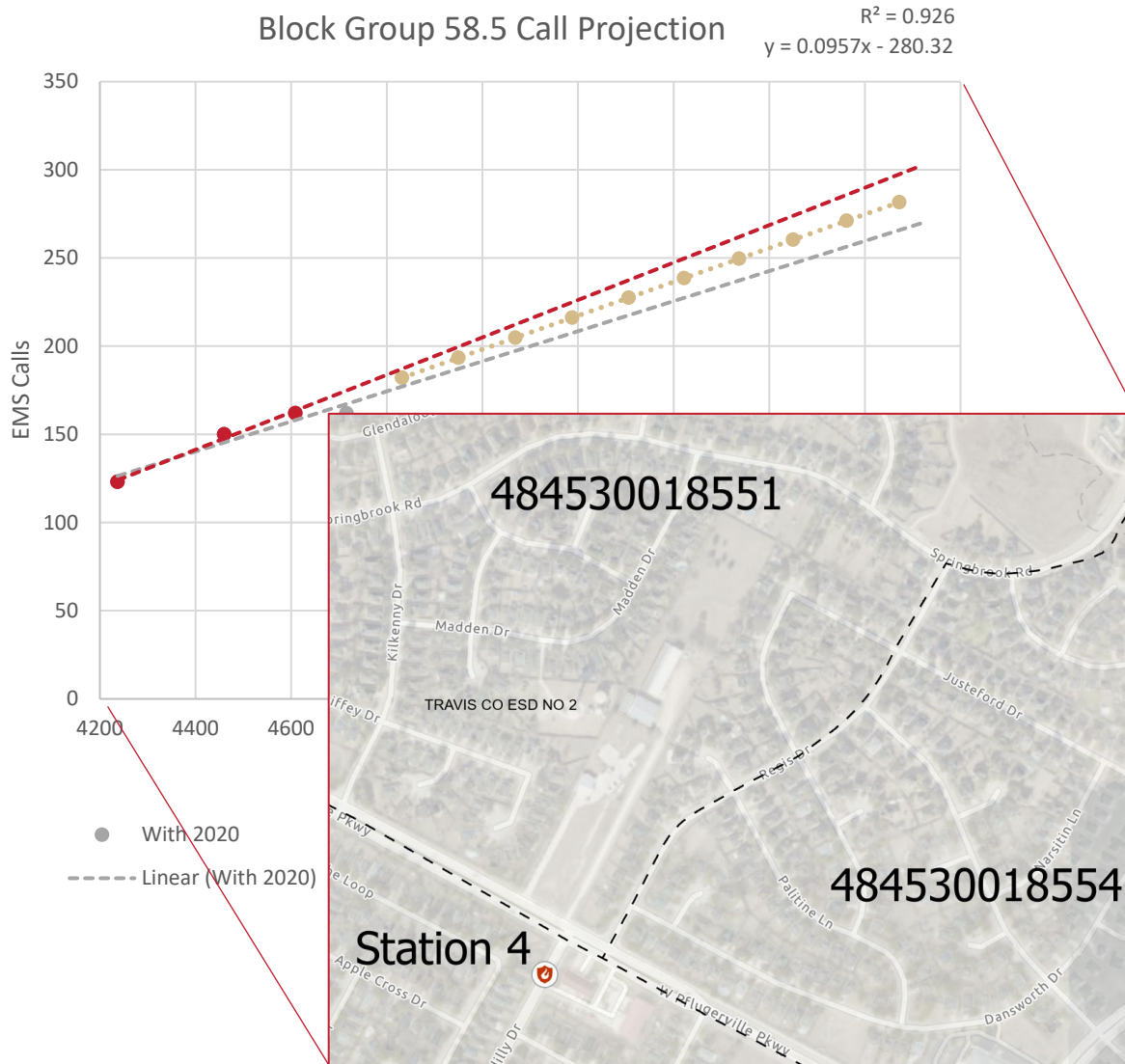
Population increasing at higher rate North, South and Central East.

Analysis EMS Call Projection by Block Group (2023, 2025 and 2030)



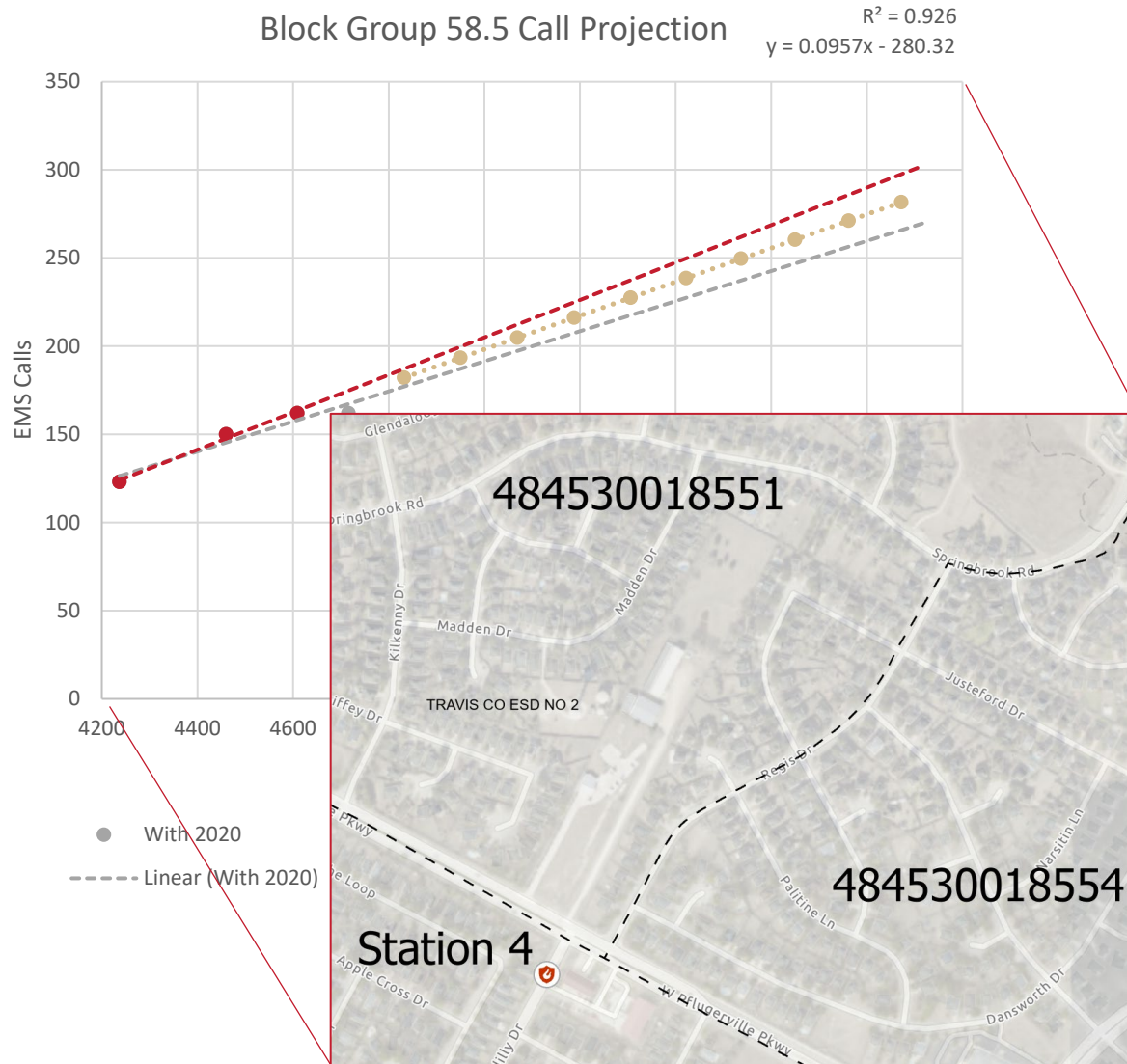
Group	2020	2023	2025	2030
484530018551	106			
484530018552	345			
484530018553	300			
484530018554	111			
484530018555	134			
...				
Total Est. ESD2	7774			
Increase				

Analysis EMS Call Projection by Block Group (2023, 2025 and 2030)



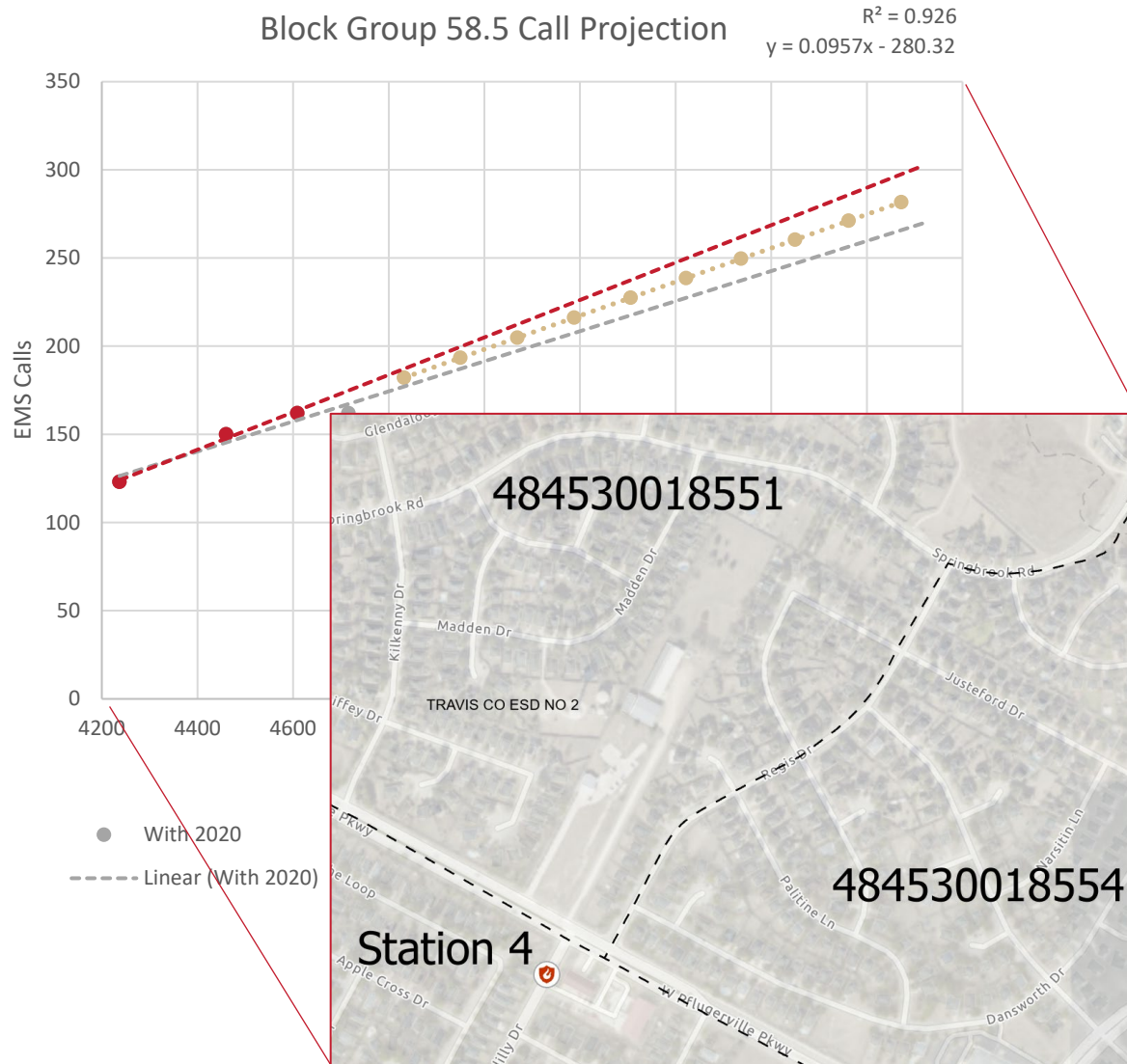
Group	2020	2023	2025	2030
484530018551	106	113		
484530018552	345	358		
484530018553	300	382		
484530018554	111	111		
484530018555	134	147		
...				
Total Est. ESD2	7774	8105		
Increase		4.3%		

Analysis EMS Call Projection by Block Group (2023, 2025 and 2030)



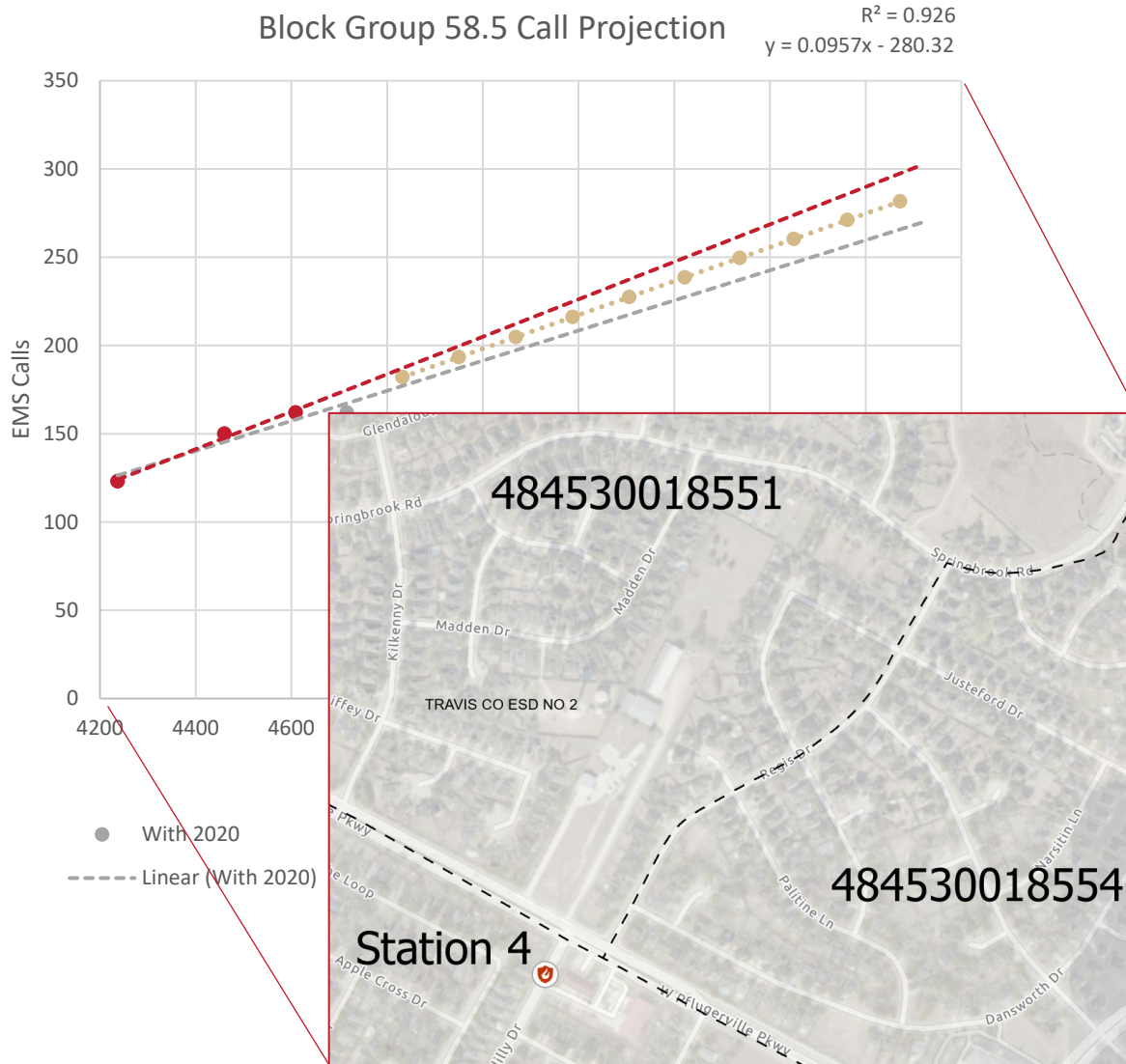
Group	2020	2023	2025	2030
484530018551	106	113	124	
484530018552	345	358	350	
484530018553	300	382	453	
484530018554	111	111	110	
484530018555	134	147	151	
...				
Total Est. ESD2	7774	8105	8626	
Increase		4.3%	6.4%	

Analysis EMS Call Projection by Block Group (2023, 2025 and 2030)



Group	2020	2023	2025	2030
484530018551	106	113	124	149
484530018552	345	358	350	330
484530018553	300	382	453	625
484530018554	111	111	110	107
484530018555	134	147	151	160
...				
Total Est. ESD2	7774	8105	8626	9879
Increase		4.3%	6.4%	14.5%

Analysis EMS Call Projection by Block Group (2023, 2025 and 2030)

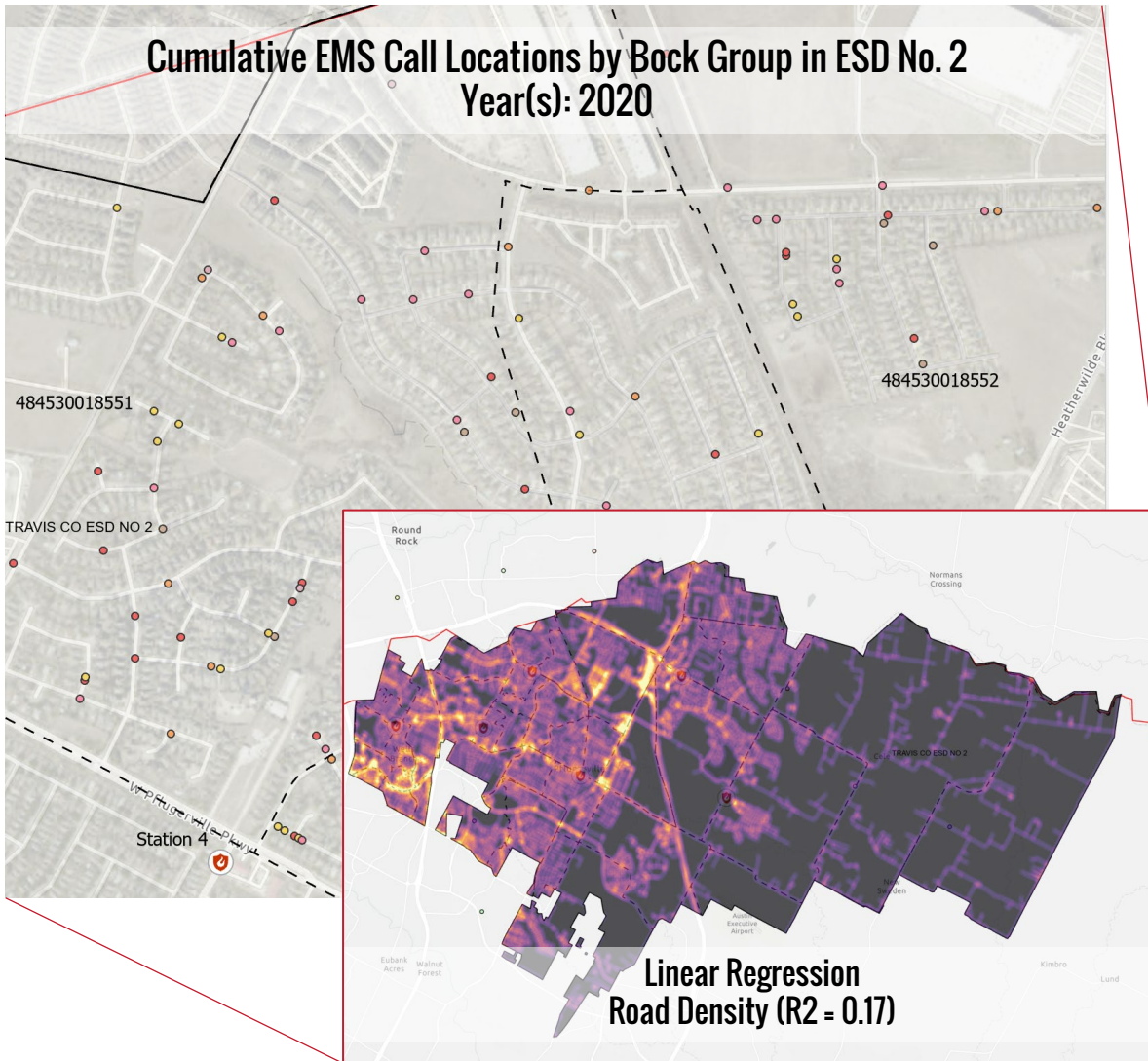


Group	2020	2023	2025	2030
484530018551	106	113	124	149
484530018552	345	358	350	330
484530018553	300	382	453	625
484530018554	111	111	110	107
484530018555	134	147	151	160
...				
Total Est. ESD2	7774	8105	8626	9879
Increase	(Prev. 2020)	4.3% 4.3%	6.4% 11%	14.5% 27%

Findings:

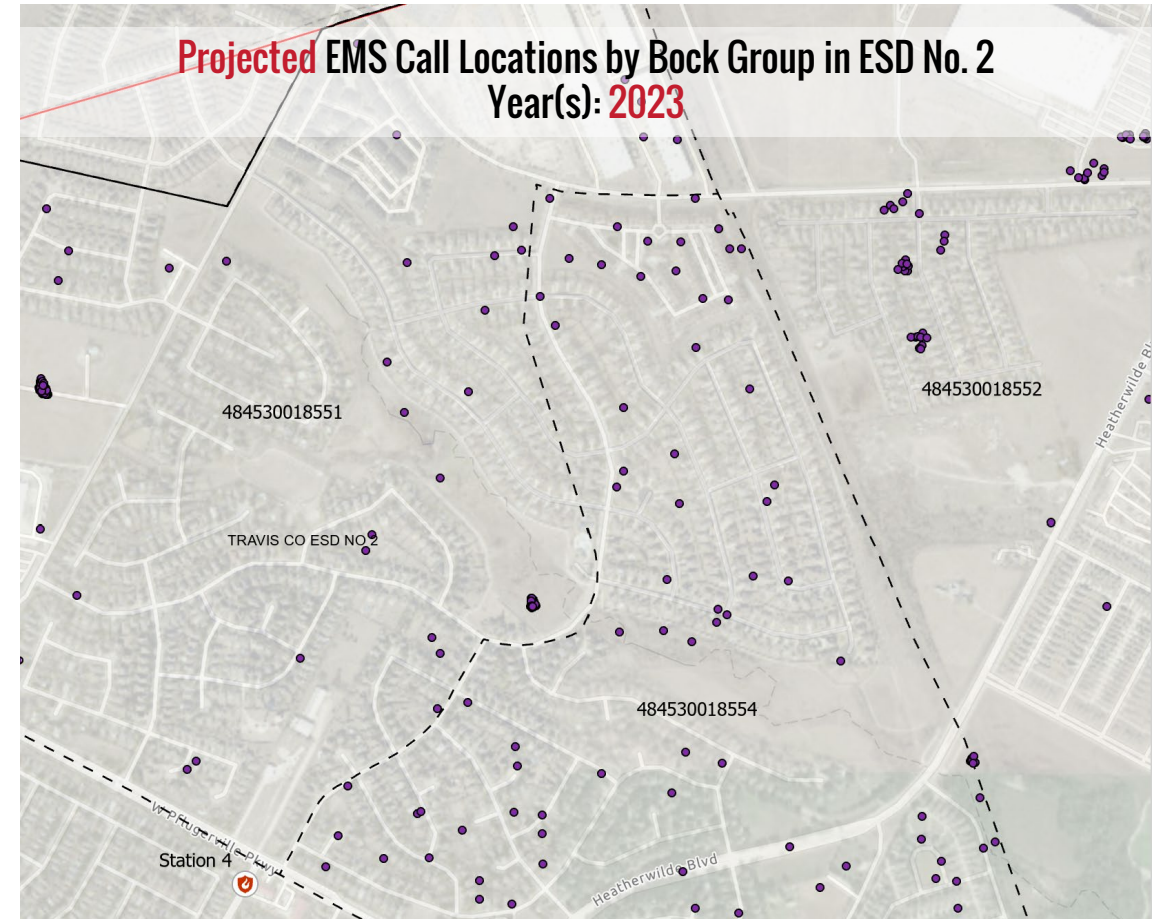
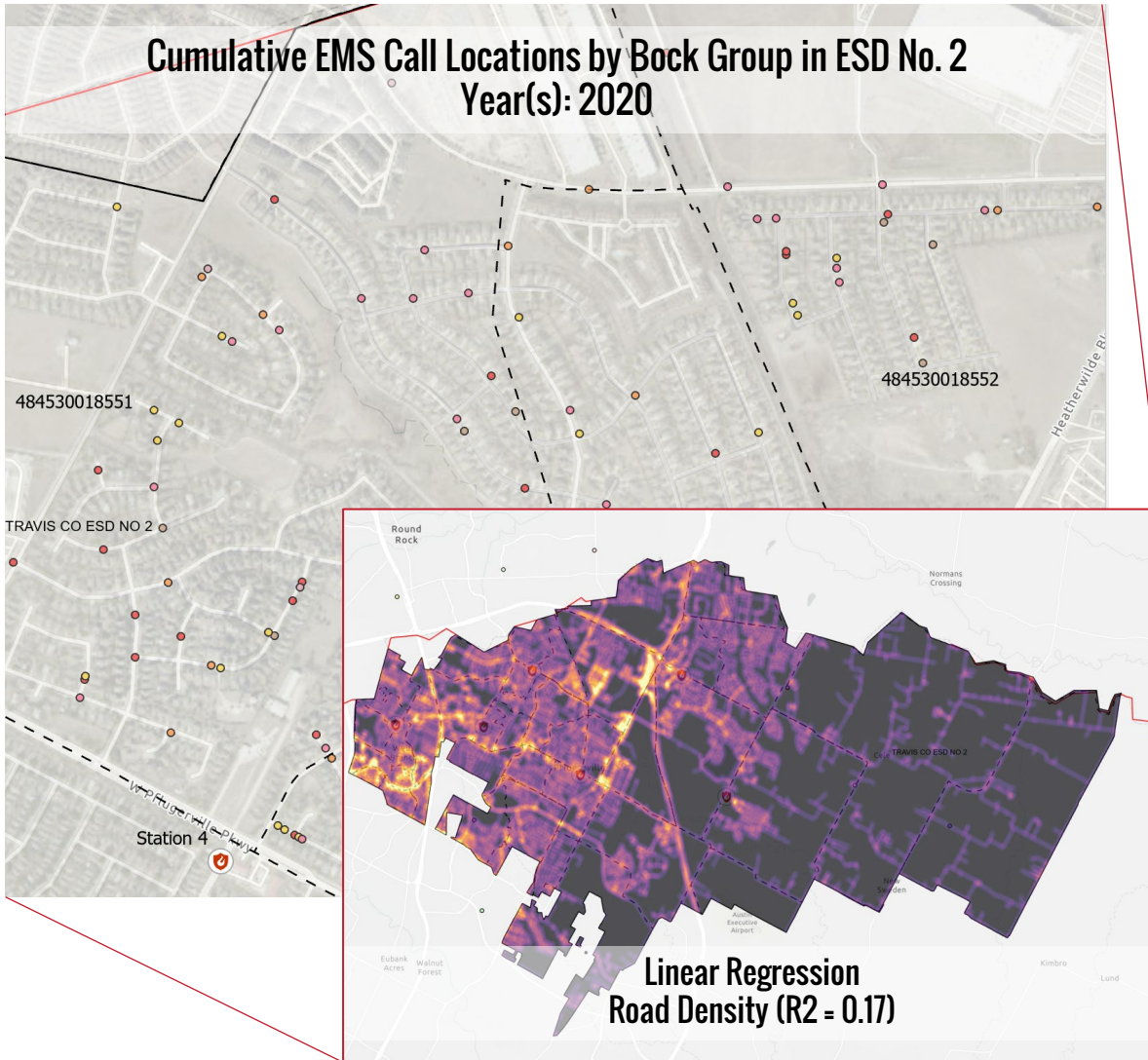
- ▶ Block group fidelity account for population increases even if call decreases (Ex. 554)
- ▶ **Where** do they occur?

Analysis EMS Call Projection by Block Group (2023, 2025 and 2030)



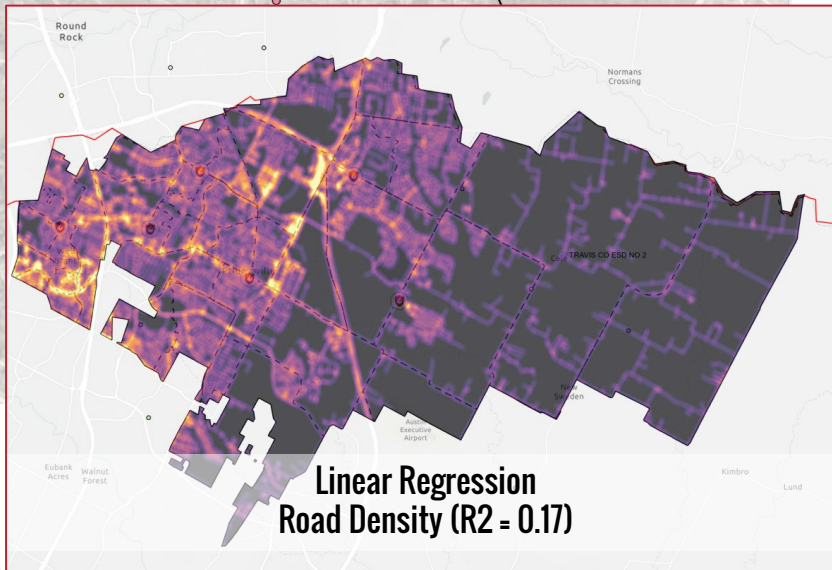
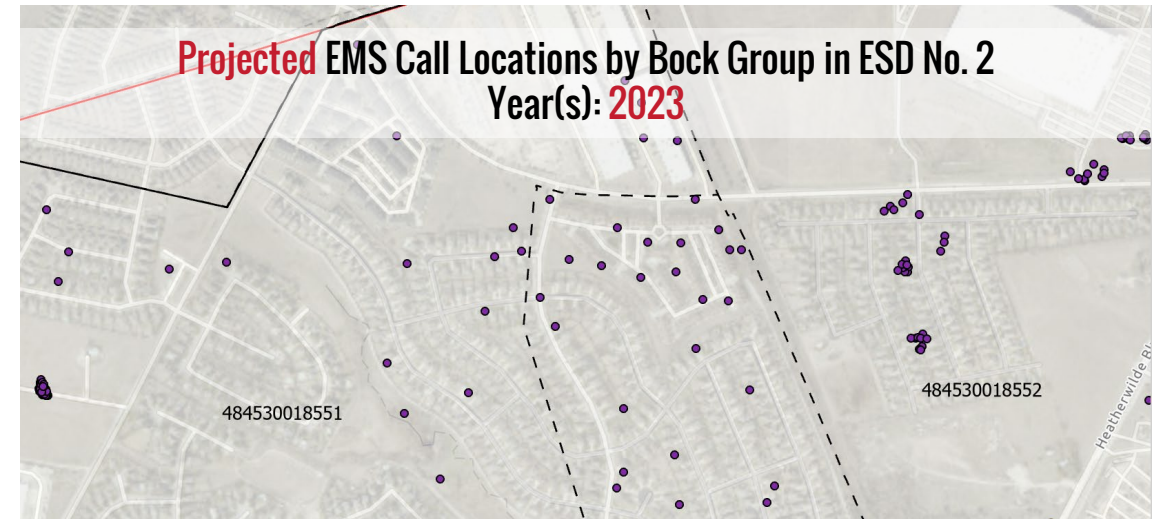
- ▶ **Methodology** (Each Block Group)
 - ▶ Identify areas of highest road density
 - ▶ Generate ‘noise’ to ‘widen net’ (Top 75%)
 - ▶ Random assignment within focused area
- ▶ **Assumption**
 - ▶ Projected EMS Calls randomly generated in areas of greatest road density account for unexplained variance
 - ▶ Effort to make future projections more realistic (‘wrong but useful’)

Analysis EMS Call Projection by Block Group (2023, 2025 and 2030)



Projected EMS Calls randomly generated in areas of greatest road density to account for unexplained variance in effort to make future projections more realistic.

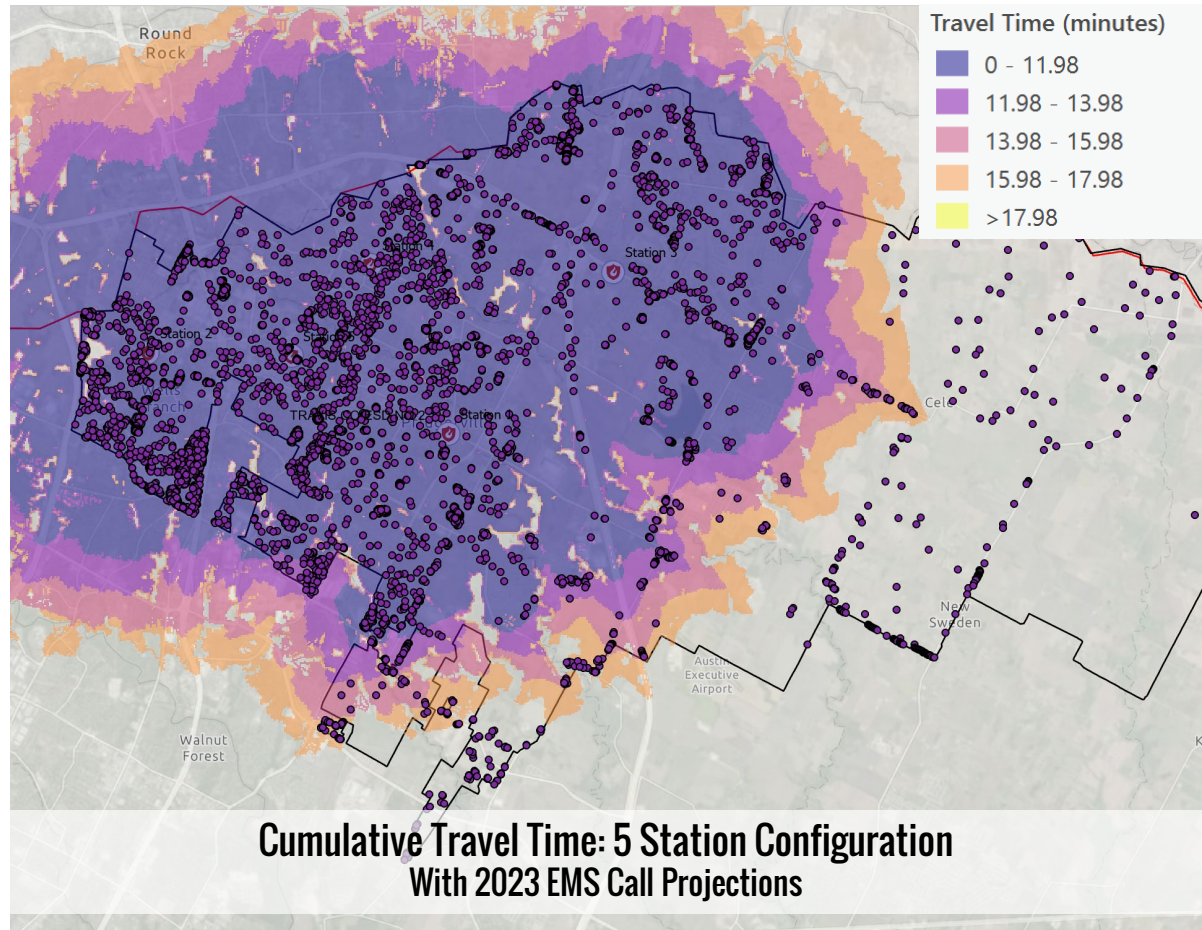
Analysis EMS Call Projection by Block Group (2023, 2025 and 2030)



Next Steps:

- ▶ Determine **estimated travel time** to each projected location
- ▶ Multiple station configurations
- ▶ Compare to current time break performance

Analysis EMS Call Projection **Travel Time Analysis**



▶ Methodology

- ▶ Sage Time Distance Analysis (2020 SOC)
- ▶ x Factor Adjustment (2017-2020 Sage v. Actual)
- ▶ + Median 'Ph PU to Unit Enroute' (2 min.)
- ▶ Cumulative (Current and future station configurations)

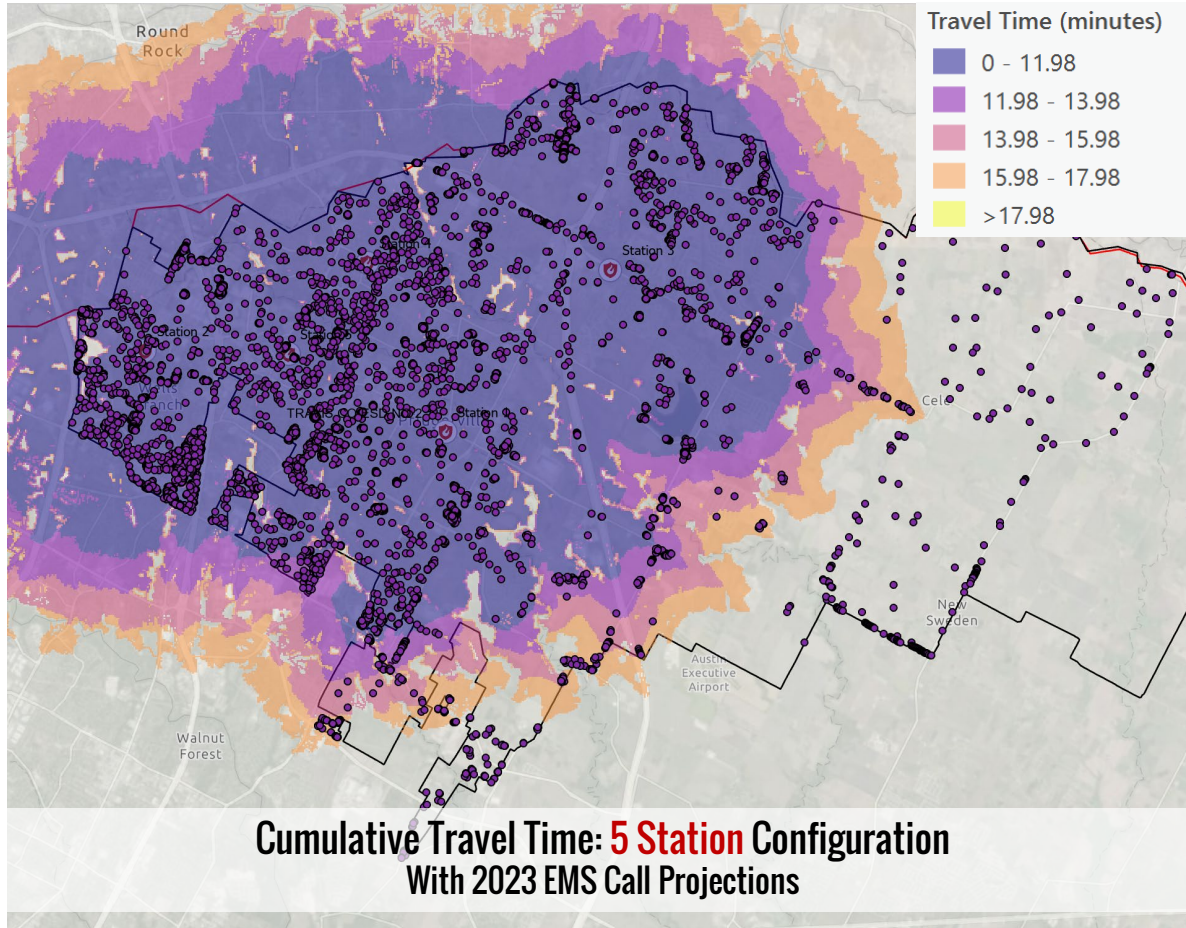
▶ Result

- ▶ Time distance estimate (11:58, 13:58, 15:58, 17:58)
- ▶ For each station configuration
- ▶ For projected EMS call (2023, 2025, 2030)

▶ Analysis

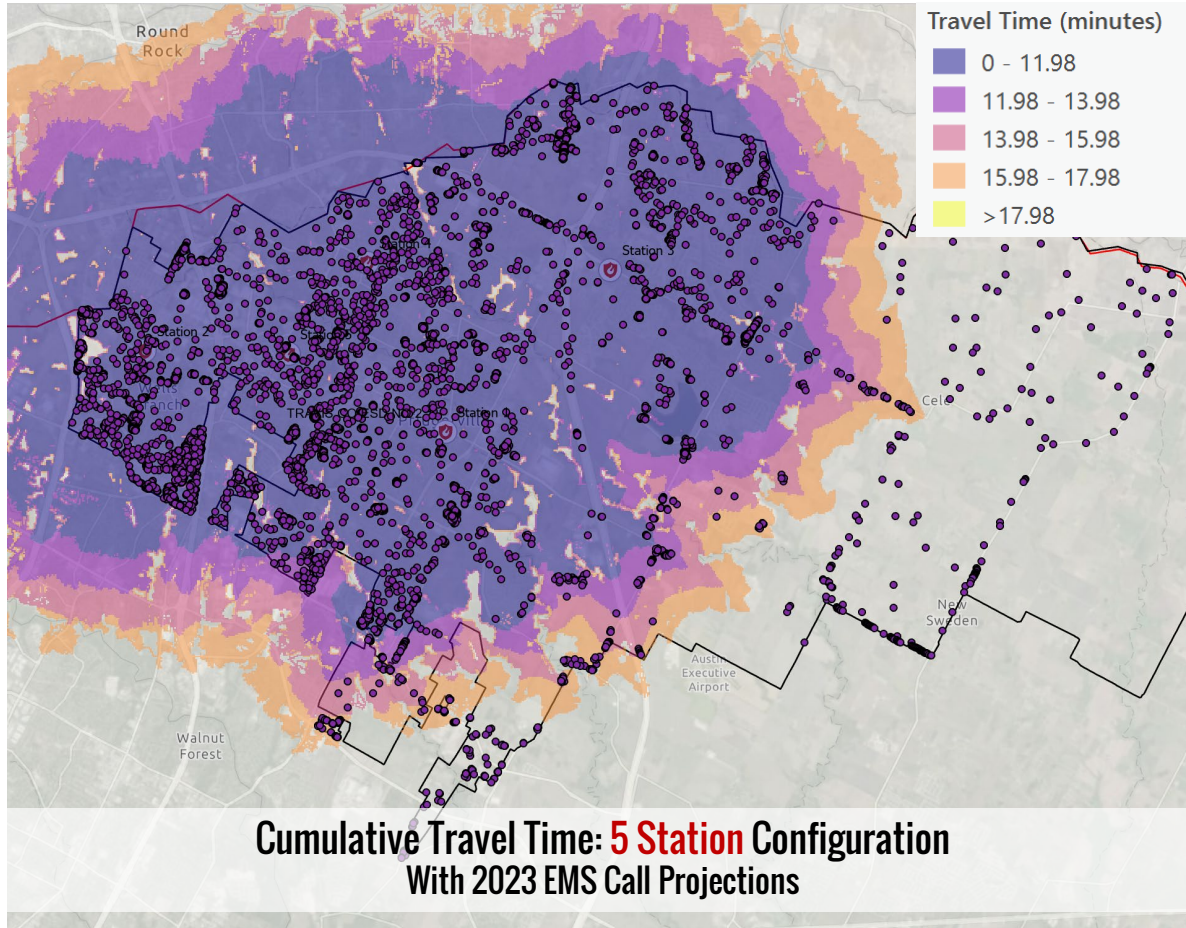
- ▶ 2020 Time Break Comparison

Analysis EMS Call Projection **Travel Time Analysis** (5 Station)



5-Station	2023	2025	2030
MEAN	9.21	9.36	9.68
Minimum	2.12	2.16	2.33
Q1	6.02	6.07	6.35
Median	8.09	8.24	8.61
Q3	11.07	11.26	11.51
Maximum	42.22	39.74	38.99

Analysis EMS Call Projection **Travel Time Analysis** (5 Station)

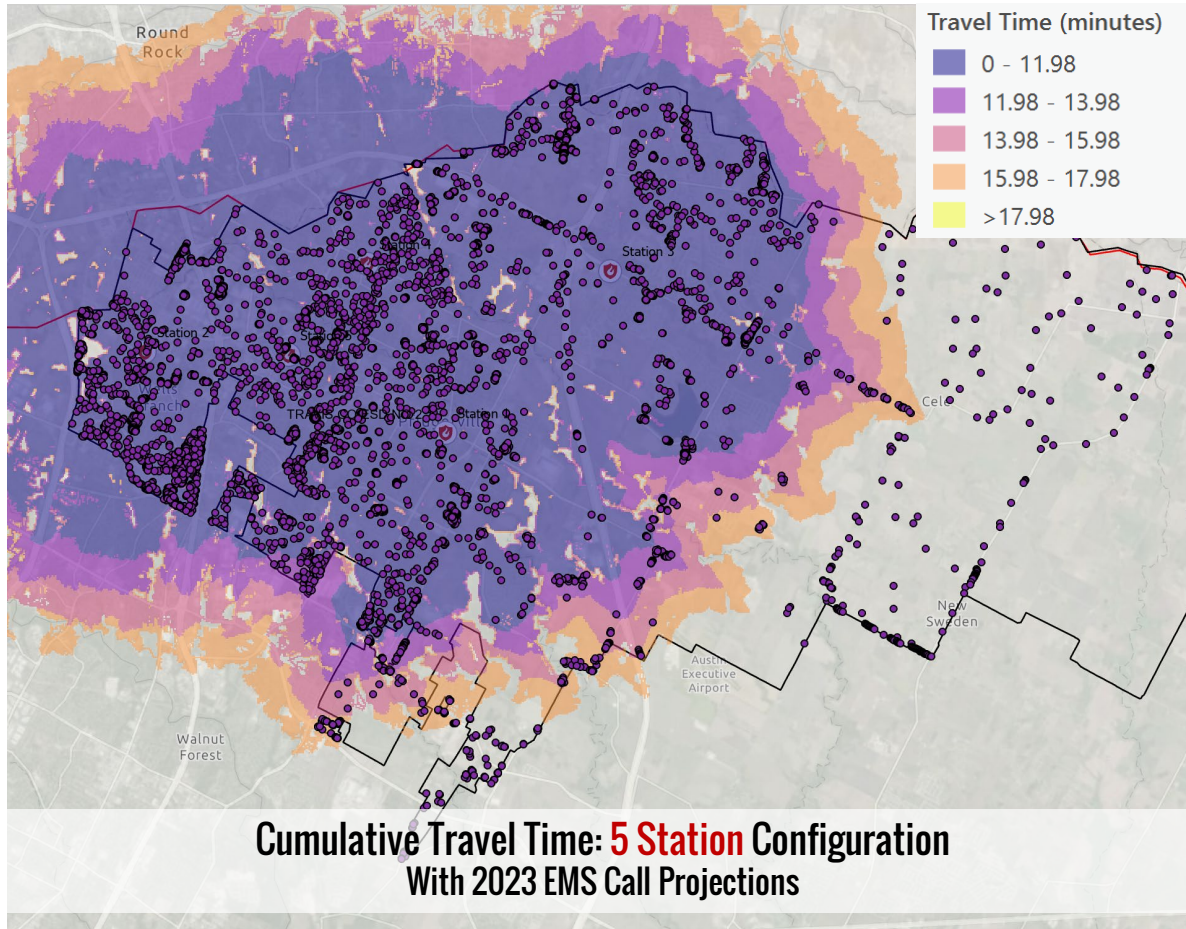


5-Station		2023	2025	2030
MEAN		9.21	9.36	9.68
Minimum		2.12	2.16	2.33
Q1		6.02	6.07	6.35
Median		8.09	8.24	8.61
Q3		11.07	11.26	11.51
Maximum		42.22	39.74	38.99

All Calls	2020	2023	2025	2030
11:59	82.3%			
13:59	89.4%			
15:59	93.0%			
17:59	95.4%			

'All Calls' compared to 2020 performance

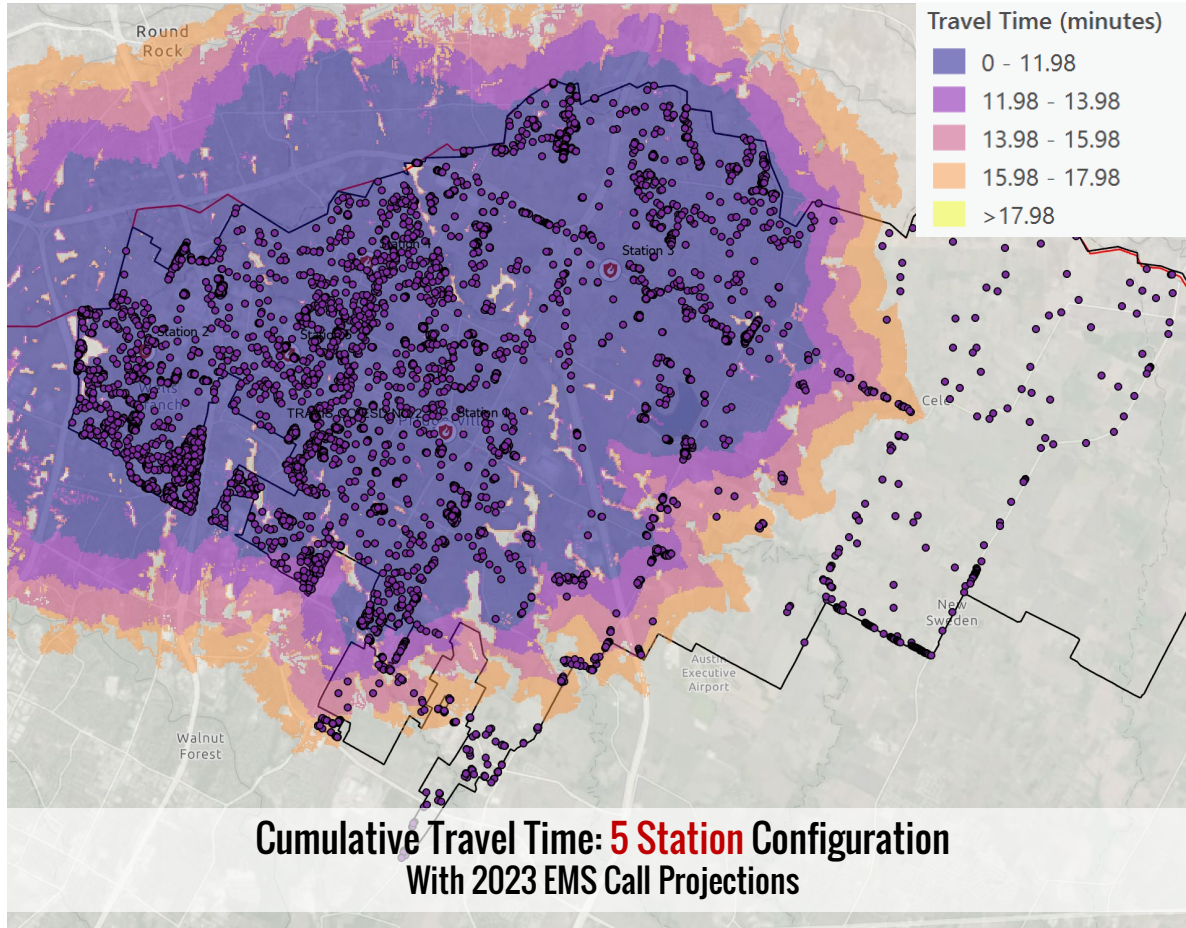
Analysis EMS Call Projection **Travel Time Analysis** (5 Station)



5-Station		2023	2025	2030	
MEAN		9.21	9.36	9.68	
Minimum		2.12	2.16	2.33	
Q1		6.02	6.07	6.35	
Median		8.09	8.24	8.61	
Q3		11.07	11.26	11.51	
Maximum		42.22	39.74	38.99	
All Calls		2020	2023	2025	2030
11:59		82.3%	81.6%		
13:59		89.4%	89.9%		
15:59		93.0%	92.8%		
17:59		95.4%	94.1%		

'All Calls' compared to 2020 performance [**>1% change highlighted in green (+) or red (-)**]

Analysis EMS Call Projection **Travel Time Analysis** (5 Station)

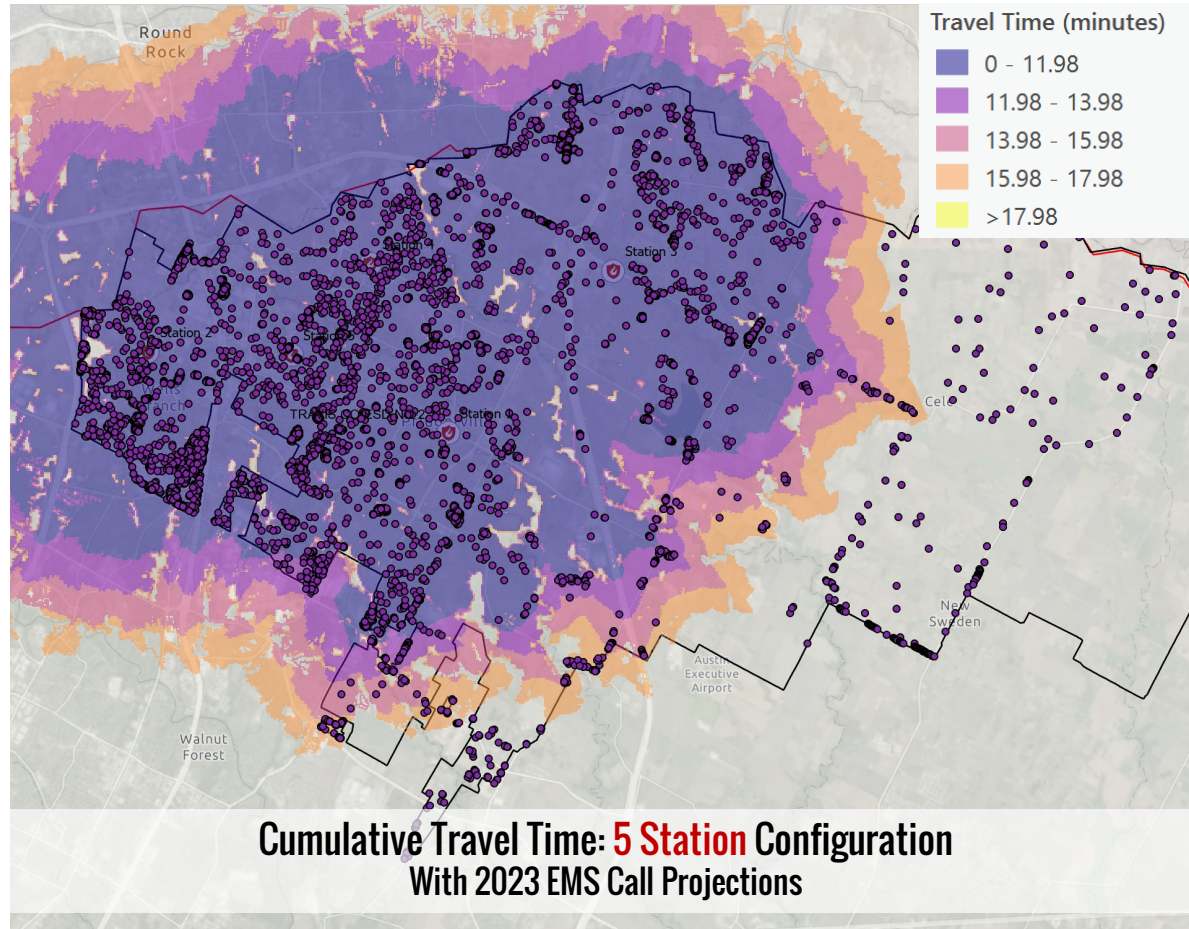


5-Station		2023	2025	2030
MEAN		9.21	9.36	9.68
Minimum		2.12	2.16	2.33
Q1		6.02	6.07	6.35
Median		8.09	8.24	8.61
Q3		11.07	11.26	11.51
Maximum		42.22	39.74	38.99

All Calls	2020	2023	2025	2030
11:59	82.3%	81.6%	80.0%	
13:59	89.4%	89.9%	89.2%	
15:59	93.0%	92.8%	92.6%	
17:59	95.4%	94.1%	93.9%	

'All Calls' compared to 2020 performance [>1% change highlighted in green (+) or red (-)]

Analysis EMS Call Projection **Travel Time Analysis** (5 Station)

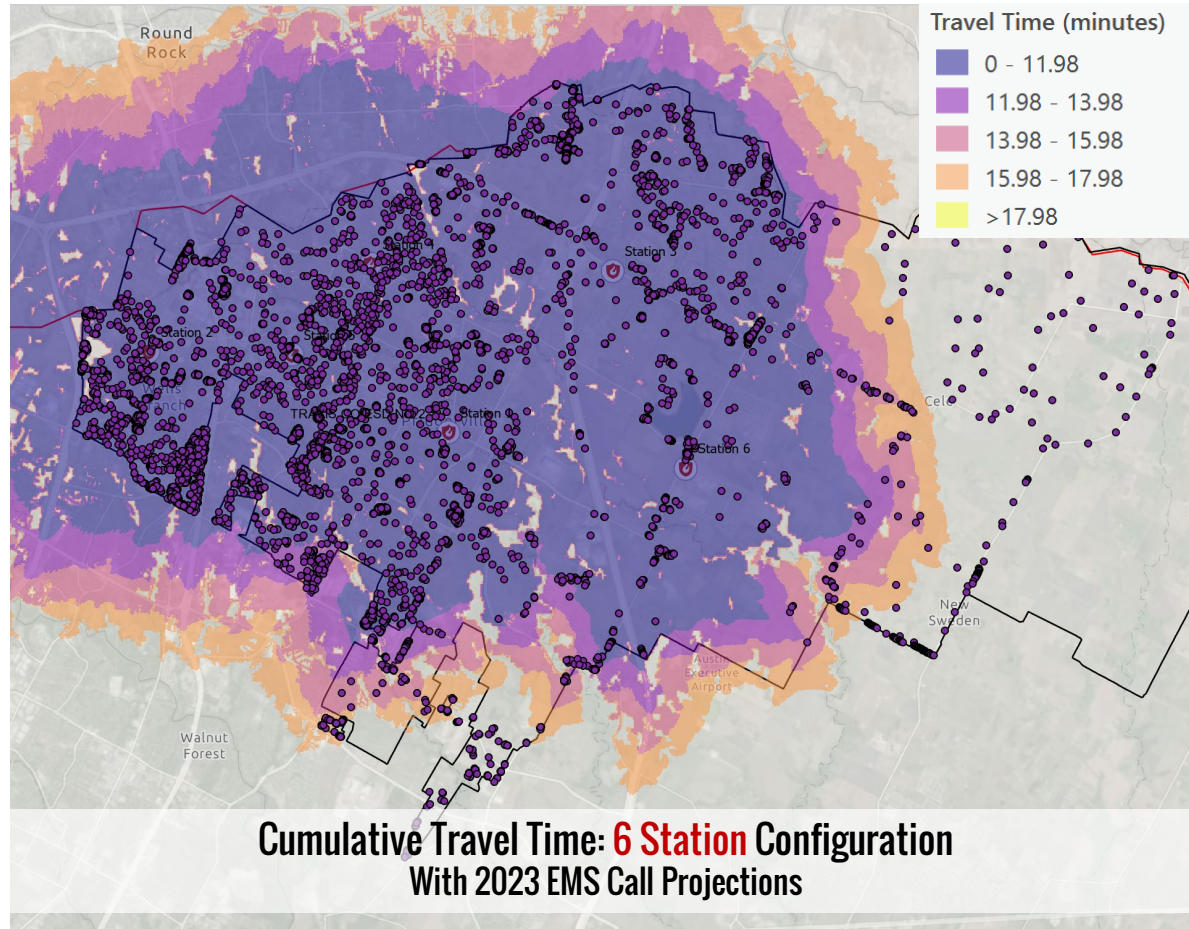


5-Station	2023	2025	2030
MEAN	9.21	9.36	9.68
Minimum	2.12	2.16	2.33
Q1	6.02	6.07	6.35
Median	8.09	8.24	8.61
Q3	11.07	11.26	11.51
Maximum	42.22	39.74	38.99

All Calls	2020	2023	2025	2030
11:59	82.3%	81.6%	80.0%	77.4%
13:59	89.4%	89.9%	89.2%	88.1%
15:59	93.0%	92.8%	92.6%	91.8%
17:59	95.4%	94.1%	93.9%	93.3%

'All Calls' compared to 2020 performance [>1% change highlighted in green (+) or red (-)]

Analysis EMS Call Projection **Travel Time Analysis** (6 Station)

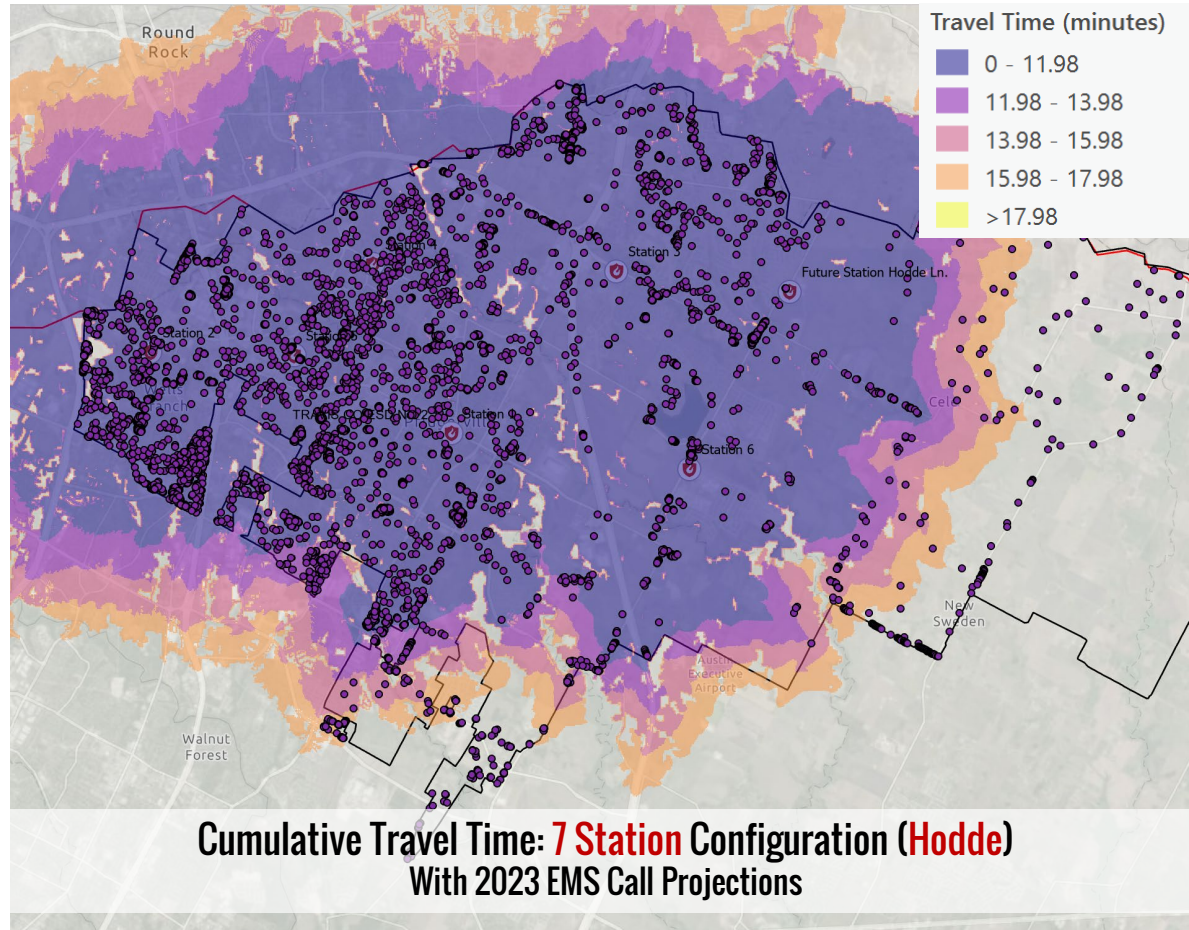


6-Station	2023	2025	2030
MEAN	9.04	9.16	9.47
Minimum	2.15	2.20	2.08
Q1	6.15	6.16	6.32
Median	7.99	8.20	8.51
Q3	11.13	11.29	11.56
Maximum	41.86	38.37	38.37

All Calls	2020	2023	2025	2030
11:59	82.3%	82.4%	81.1%	78.6%
13:59	89.4%	90.1%	89.4%	87.6%
15:59	93.0%	93.7%	93.5%	92.8%
17:59	95.4%	95.2%	95.1%	94.7%

'All Calls' compared to 2020 performance [>1% change highlighted in green (+) or red (-)]

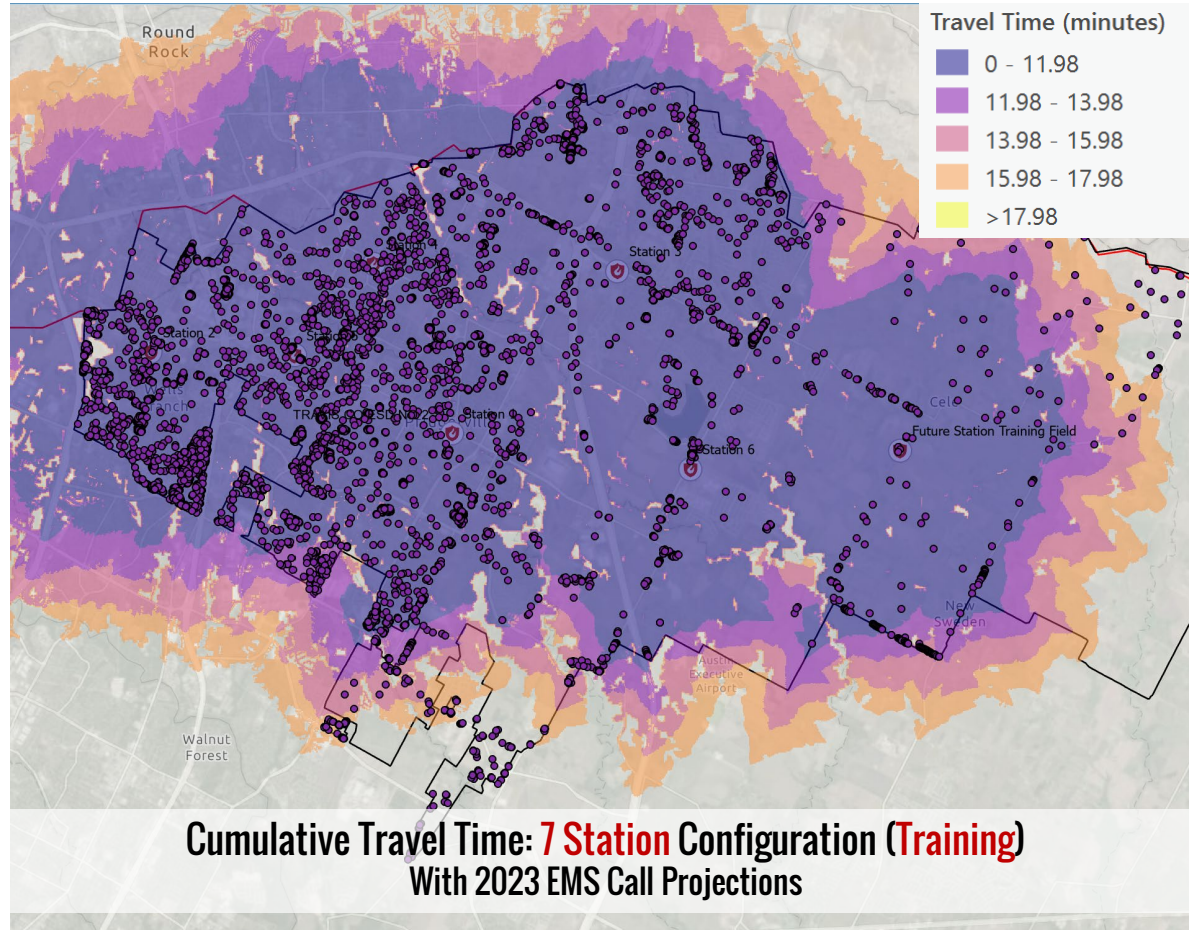
Analysis EMS Call Projection **Travel Time Analysis** (7 Station - Hodde)



7-Station (Hodde)		2023	2025	2030
MEAN		9.04	9.16	9.47
Minimum		2.15	2.20	2.08
Q1		6.15	6.16	6.32
Median		7.99	8.20	8.51
Q3		11.13	11.29	11.56
Maximum		41.86	38.37	38.37
All Calls	2020	2023	2025	2030
11:59	82.3%	84.0%	82.8%	80.4%
13:59	89.4%	90.6%	90.0%	88.4%
15:59	93.0%	94.2%	94.1%	93.6%
17:59	95.4%	95.6%	95.5%	95.1%

'All Calls' compared to 2020 performance [>1% change highlighted in green (+) or red (-)]

Analysis EMS Call Projection **Travel Time Analysis** (7 Station - Training)

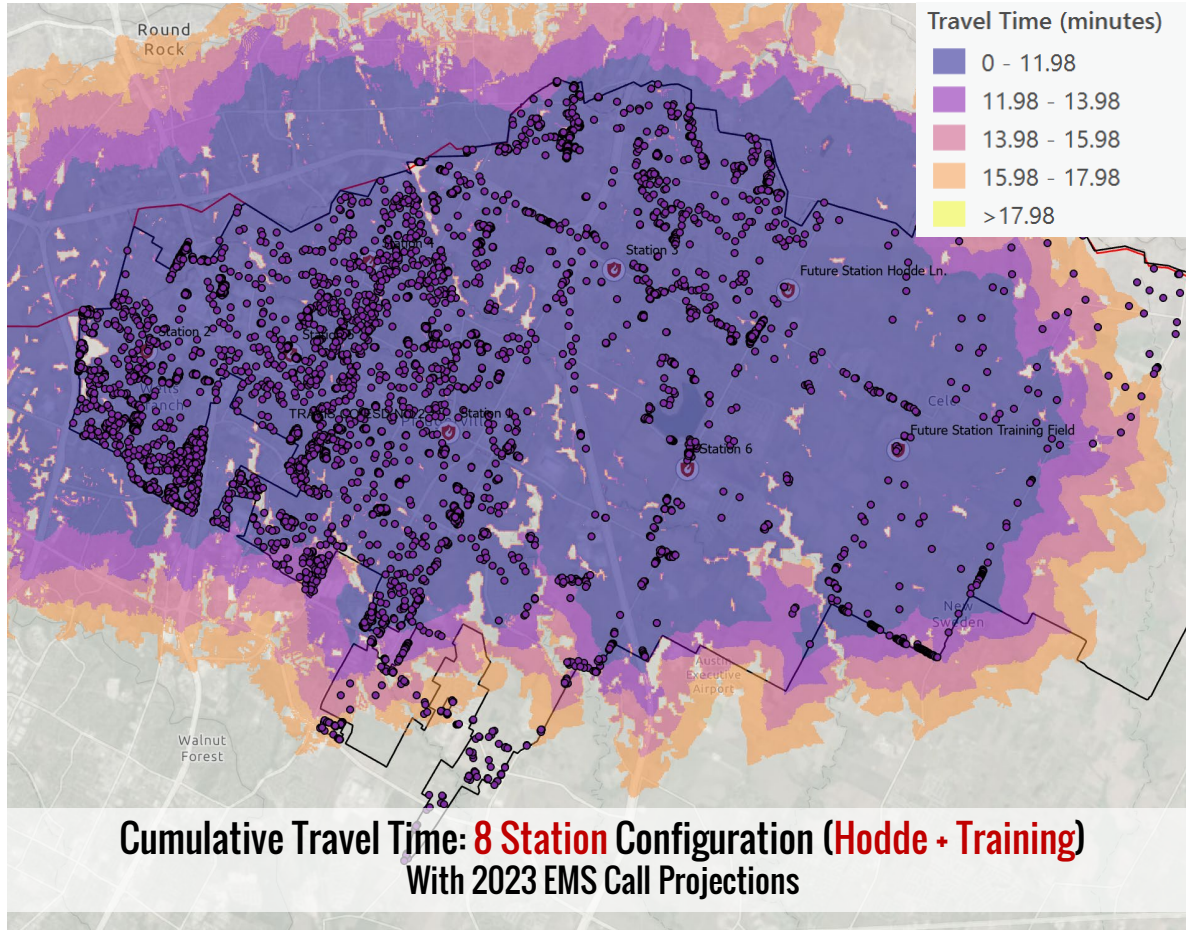


7-Station (Tng.)		2023	2025	2030
MEAN		8.73	8.85	9.15
Minimum		2.07	2.10	2.08
Q1		6.10	6.15	6.23
Median		7.88	8.06	8.42
Q3		10.97	11.13	11.42
Maximum		31.83	30.76	30.83

All Calls	2020	2023	2025	2030
11:59	82.3%	83.9%	82.7%	80.4%
13:59	89.4%	92.1%	91.5%	89.9%
15:59	93.0%	95.9%	95.8%	95.3%
17:59	95.4%	97.0%	96.8%	96.3%

'All Calls' compared to 2020 performance [>1% change highlighted in green (+) or red (-)]

Analysis EMS Call Projection **Travel Time Analysis** (8 Station - Hodde + Training)

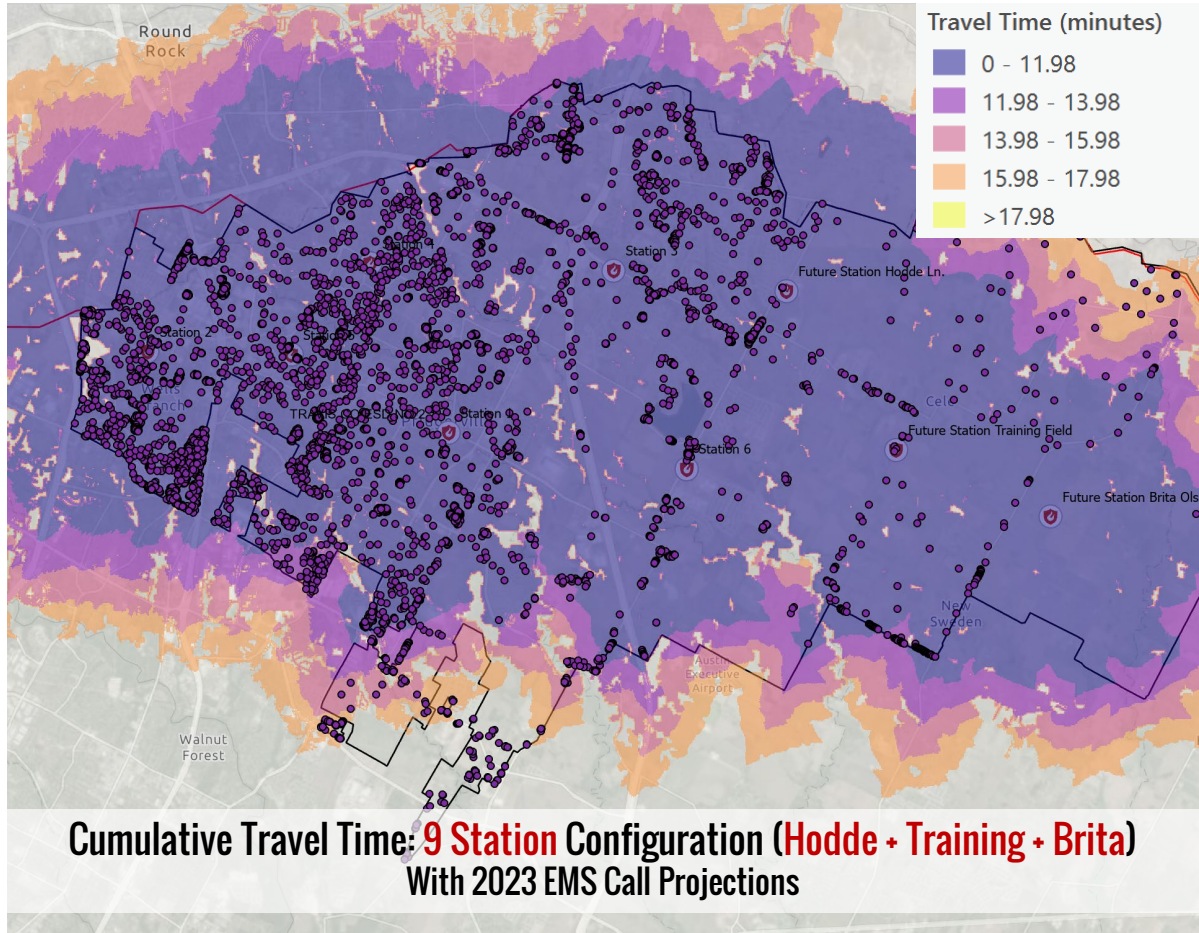


8-Station	2023	2025	2030
MEAN	8.45	8.56	8.84
Minimum	2.07	2.10	2.08
Q1	5.92	5.93	6.01
Median	7.59	7.66	8.00
Q3	10.24	10.57	11.13
Maximum	31.83	30.76	30.83

All Calls	2020	2023	2025	2030
11:59	82.3%	85.2%	84.1%	81.8%
13:59	89.4%	92.2%	91.6%	90.0%
15:59	93.0%	96.0%	95.8%	95.3%
17:59	95.4%	97.1%	96.9%	96.3%

'All Calls' compared to 2020 performance [>1% change highlighted in green (+) or red (-)]

Analysis EMS Call Projection **Travel Time Analysis** (9 Station - Hodde + Training + Brita)



9-Station		2023	2025	2030	
MEAN		8.41	8.52	8.81	
Minimum		2.07	2.10	2.08	
Q1		5.91	5.93	6.01	
Median		7.59	7.67	7.98	
Q3		10.17	10.46	11.07	
Maximum		31.86	30.82	30.90	
All Calls		2020	2023	2025	2030
11:59		82.3%	85.5%	84.4%	82.1%
13:59		89.4%	92.6%	92.0%	90.3%
15:59		93.0%	96.2%	96.1%	95.4%
17:59		95.4%	97.3%	97.1%	96.5%

'All Calls' compared to 2020 performance [>1% change highlighted in green (+) or red (-)]

Next Steps

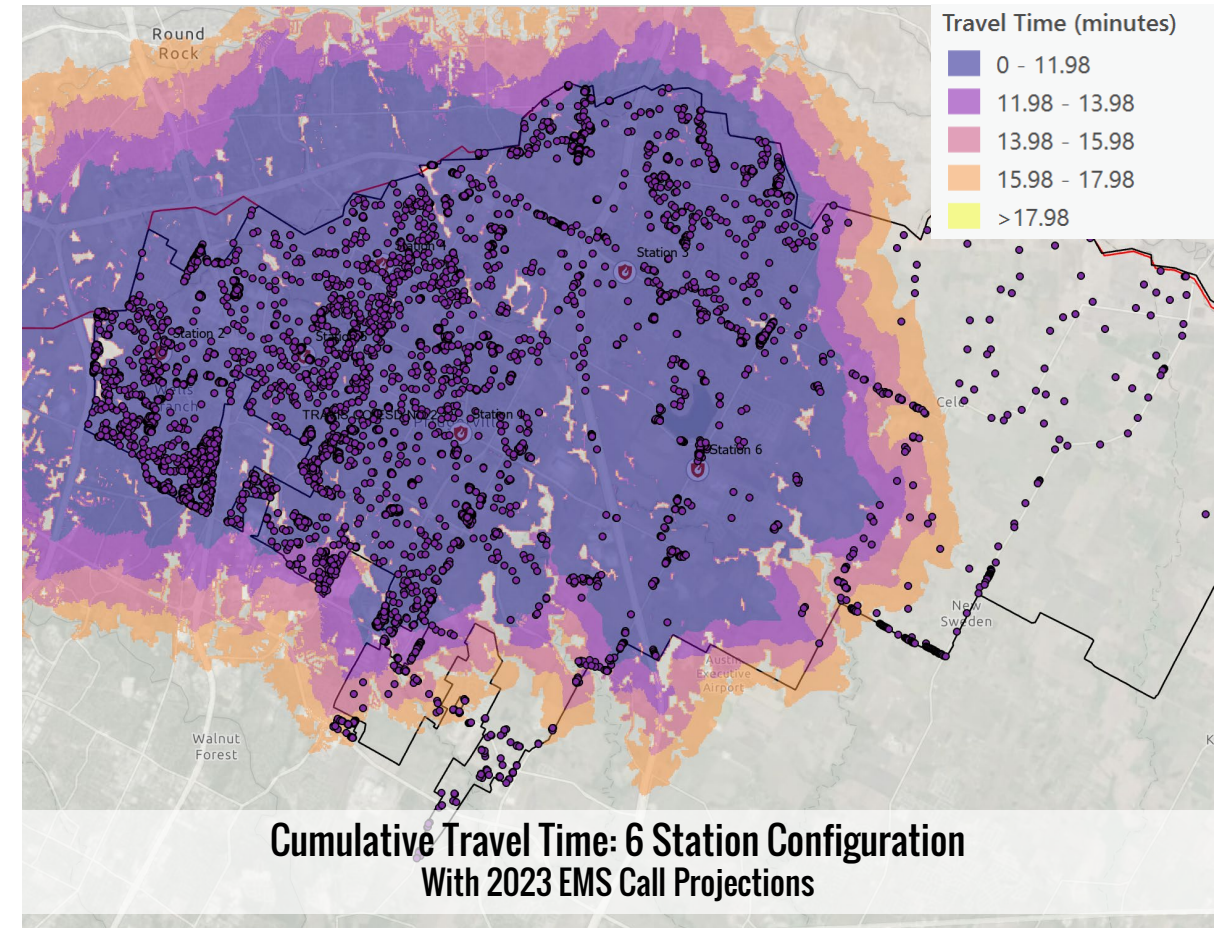
Project Population | Project Call Volume | Project Call Location | Estimate Response Time

▶ Completed Analysis:

- ▶ Project Population
- ▶ Project Call Volume
- ▶ Project Call Location
- ▶ Estimate Response Time
- ▶ Analyze Response Time

▶ Next Steps:

- ▶ Confirm | Deny EMS Methodology
- ▶ Population Estimates (Verification | Validation)
- ▶ Apply to Fire Call 2017_2020 data (FY21)
- ▶ Update with Decennial Census (FY22)



Decision Point(s)

- ▶ Deployment Study:
 - Evaluate current and future needs as it pertains to fire/**EMS** stations and personnel/apparatus deployment required to meet standards of cover

- ▶ Actionable Intelligence:
 - Utilization / deployment
 - Location intelligence
 - Current v. proposed stations

- ▶ Data:
 - EMS 2017_2019 Data.csv; EMS 2020 Data.csv

Appendix B: Ed King, Government Capital Securities Corporation

August 5, 2021

Nick Perkins, Asst. Fire Chief
Travis County ESD No. 2
Pflugerville Fire Department
203 E. Pecan Street
Pflugerville, Tx 78660

Re: Response to AP Triton report

Chief Perkins:

I am writing in regard to the AP Triton report dated June 2021.

As a Municipal Advisor, our role is to advise our clients on the financial feasibility, structure, pricing and closing of debt issuance. We coordinate with the various professionals involved from general and bond counsels, to lenders, underwriters, analysts, and rating agencies.

Though the above referenced consultant's report did not specifically address how Travis County ESD No. 2 (the ESD) issues debt, it does address components of the ESD's administrative and financial policies which intersect with our area of experience and expertise, and it is from that perspective that I am writing.

I want to begin with the District's overall financial management. The financial health of any political subdivision such as the ESD is a reflection of not only the economic environment in which it operates, but the strength of its policy making and administration. Travis County ESD No. 2 is in sound financial condition and represents an attractive credit risk to the capital markets. The 2020 Audit Report was issued with an unqualified opinion. This means the accounting, budgeting, management practices and controls that are in place at the ESD meet the highest standards for transparency and accuracy. This matches up with our experience in working with the ESD over the last several years.

The success the ESD has realized in maintaining its fiscal health has resulted in the ESD being well positioned to adequately fund the substantial capital improvement projects and operational needs that are on the horizon while maintaining its level of service to the community. This is due in large part to the board and administration's careful financial practices that include striking a balance between utilizing cash reserves and debt in order to complete capital projects. I would agree with the AP Trident report which states:

"TCESD 2 has, through prudent cash management, accumulated a significant reserve balance."¹

There are important reasons for the ESD to continue with a policy bias in favor of maintaining this prudent cash and debt management, including:

1. The capital budgeting needs required in order to maintain response times in one of the fastest growing parts of the state. It requires a mix of "pay as you go" and debt in order to balance the immediate growth with the long term financial stability of the ESD. In addition to conservative fiscal policies, there are market restraints on issuing high levels of debt. Lenders and underwriters require debt service coverage be maintained at healthy levels, and in high growth situations similar to what the District is facing, these coverages tend to become stretched as the capital projects are deployed, by necessity, ahead of full capacity and ahead of the associated revenues at full build-out. This lag can be mitigated by maintaining additional reserves in order to purchase shorter life assets with cash, particularly when fund balance reserve yields are at historical lows.

¹ AP Triton report, p. 26

2. ESDs cannot exceed a 10 cent tax rate. This statutory limit is a far more restrictive rate setting environment when compared with a city or county. For example, in years where costs and requirements for service accelerate while tax revenues flatten or decrease, the tax rate needed to maintain the prior year's revenues could be 12 or 13 cents, but the ESD would be limited to a 10 cent tax rate.
3. The ESD is subject to Senate Bill 2, Property Tax Reform limits. In addition to the 10 cent ceiling, the ESD is subject to a 3.5% cap in M&O revenue growth based on the prior year's revenues. So in years where costs are growing much faster than 3.5% - particularly construction costs – the ESD must be prepared to face deficit spend downs of its reserves in order to maintain services. Furthermore, adding to the debt portion of the tax rate only helps in years where TAVs are increasing and only in years where the Voter Approval Rate would be below the 10 cent cap. Thus, the opportunity to issue large amounts of debt to take advantage of the benefits on the tax rate calculation are much more limited for ESDs as compared to cities or counties.

To illustrate the 2nd and 3rd points above, here is a recent excerpt from the Official Statement for a Certificate of Obligation (non-voted bonds backed by an unlimited tax pledge and a nominal revenue pledge) issued by a city in Central Texas which demonstrates the tax rate setting ability of cities in Texas in contrast to ESDs:

The calculations of the no-new-revenue tax rate and voter-approval tax rate **do not limit or impact the City's ability to set a debt service tax rate in each year sufficient to pay debt service** on all of the City's tax-supported debt obligations, including the Obligations.

Reference is made to the Property Tax Code for definitive requirements for the levy and collection of ad valorem taxes and the calculation of the various defined tax rates.

DEBT TAX RATE LIMITATIONS

All taxable property within the City is subject to the assessment, levy and collection by the City of a continuing, direct annual ad valorem tax sufficient to provide for the payment of principal of and interest on all ad valorem tax-supported debt within the limits prescribed by law. Article XI, Section 5, of the Texas Constitution is applicable to the City, and limits its maximum ad valorem tax rate to **\$2.50 per \$100 of Taxable Assessed Valuation**. Administratively, the Attorney General of the State of Texas will permit allocation of \$1.50 of the \$2.50 maximum tax rate for all debt service on ad valorem tax-supported debt, as calculated at the time of issuance.

Clearly, at a 10 cent rate cap versus 2.50 dollars – not even considering access to enterprise funds such as water and wastewater - the ESD does not have this kind of broad and unlimited taxing powers which would perhaps allow an issuer to carry fewer reserves and leverage debt at a higher level.

Why doesn't the ESD just issue more bonds? The only bonds an ESD can issue are via a bond election. ESDs can call bond elections, but they cannot exceed the 10 cent levy regardless. The only practical benefit to voted bonds for ESDs is access to terms longer than 20 years for stations, and potentially lower interest rates - but at a higher cost of issuance. When taking into consideration the cost of the election, the inability to increase the tax rate above 10 cents to cover the debt service, and the higher issuance costs, most ESDs in Texas have chosen to utilize other structures available to them in the capital markets.

Pursuant to Health and Safety Code Section 775.085, ESDs may pledge their tax revenue, funds on hand, or real estate to secure loans. Currently, this is the most common form of ESD financing in Texas and is typically a privately placed bank loan or lease. The ESD has leveraged these structures multiple times to secure competitive financing terms from a range of national, regional, local banks and other investors. The ESD has benefited from this strategy by keeping their transactional costs down and eliminating rate risk with long term fixed rate structures, and will likely do so going forward even as other

avenues to the public sale market are developing. If there comes a point in time where access to the publicly offered bond market becomes an option for non-voted ESD debt – similar to Certificates of Obligations for cities and counties - the ESD along with its Municipal Advisor will review those options and analyze the costs and benefits accordingly.

To summarize our view, we believe it would represent an unnecessary risk if the board were to abandon its conservative bias on cash and debt management. Deciding to issue maximum amounts of debt and drawing down its reserves to address a short-term need might be politically expedient today but could hinder the ESD's ability to access the capital markets over the long term, and this would not serve the interests of the ESD or its constituents.

It has been a pleasure working with the ESD over the last few years and in our role as Municipal Advisor to the ESD, we look forward to continuing to work with the ESD to identify the best paths forward as it meets the challenges ahead.

Sincerely,

\\\\\\\\\\\\\\\\Signed\\\\\\\\\\\\\\\\

Edward L. King
Municipal Advisor
Government Capital Securities Corporation
559 Silicon Drive, Ste 102
Southlake, Texas 76092

Appendix C: Michael Zimmerman, M.D.

To all those concerned with the AP Triton Report,

I'm Dr. Mike Zimmerman, medical director for TCESD#2/Pflugerville Fire Department since 2016. Briefly, I'm a board certified Emergency Medicine physician with over 20 years of clinical and EMS experience. I have the distinct pleasure to work for and with the fine folks at TCESD#2/Pflugerville Fire Department. I have worked with and for multiple EMS agencies, both public and private over my career. Our organization stands out (both from my personal experience and my discussions with multiple colleagues) as a well organized, appropriately staffed fire and EMS system that provides fast, efficient, and excellent medical care for anyone within (and around) TCESD#2.

There are many issues I would like to address with regards to the AP Triton report on TCESD2/Pflugerville Fire Department.

There are several contentions in the report that purport to provide "expert opinion" on staffing levels. First and foremost, we staff our department to meet the needs of our community, to ensure appropriate responses to any and all emergencies. We also staff to ensure the health and safety of all of our fire and EMS professionals.

The report suggests a surplus of 11 paramedics, based on some metrics that are questionable at best. AP Triton gave a presentation that proposes that it is reasonable for our crews to run 20 EMS calls in a 24 hour period. That is not only impossible within the constraints of time available in a 24-hour period based on our total time on calls, it is completely unrealistic for individual responders. No professional organization involved in any facet of public safety, let alone EMS would endorse that as good for patient care, nor for the providers physical and mental health. Do you want firefighter/paramedics caring for your loved one at 4am after running nonstop for 20 hours? Relying on overtime and working extreme hours is a terrible idea. It leads to burnout, mistakes, safety issues, injuries, poor decision making, and staff turnover. We value the health and safety of our community and our employees. I seriously doubt the alleged experts at AP Triton would work for an organization that operated in the manner which they propose as "reasonable" and at whatever "industry standard" they claim.

The industry standard in EMS is for providers to work 24 hour shifts. This is both in private and public EMS systems. This is for a lot of reasons, not the least of which is the workforce shortage. There are not enough EMS providers. Hiring well trained providers is challenging (all around the US). We benefit from a great reputation regionally, and I think it is safe to say this is reflected in our ability to recruit and retain excellent providers. Some of our neighboring systems seemed quite challenged in these key areas (recruitment and retention).

What is clear regarding staffing is this: when disasters strike (for example, our unprecedented snowstorm in February 2021), TCESD2 possesses the ability to flex up and meet the needs of our community in the worst of times. During this snowstorm, other neighboring EMS agencies were near paralyzed. We responded with flexing up for the 300% increase in demand. Our staffing allowed for us to continue with our usual high levels of service even in the face of COVID-19, even with staff members being quarantined for symptoms and or exposures. Our model proves that preparation and appropriate staffing levels makes a huge difference when circumstances demand. A look at other municipal organizations in our area (including ATCEMS and the City of Pflugerville) show what happens when emergency preparedness is not considered and addressed.

It is clear from the report that up for consideration is for a private ambulance service to provide EMS response for the City of Pflugerville. I have worked with private EMS services in several states. There is a common theme with them. They do have great individual EMS practitioners. It is also a for profit business, that staffs with the least number of providers possible, with the least amount of equipment possible. Other important issues such as training, physical and mental wellness, as well as community involvement are not part of the business plan. A day in the life of your average private ambulance paramedic is sitting in a

parking lot somewhere in the ambulance, without their own facilities to sit, eat, toilet, shower, sleep, etc. There is absolutely no way a private ambulance service could have maintained, let alone flexed up EMS service during our February snowstorm.

The AP Triton document continually references the Austin Travis County EMS system. First, I would like to see the in-depth analysis they did of ATCEMS. If this purportedly “expert” opinion report compares one system to another... let us see their deep dive into all things ATCEMS (staffing, finances, service, etc.).

There are more than a few absolutely inaccurate/false statements regarding ATCEMS as compared to TCESD2. One contention is that “The majority of Travis County agencies function under the protocols established by ATCEMS” (p.84). This is false. There are multiple other EMS systems within Travis County, TX who have different protocols (and medical directors). In addition to TCESD2, TCESD5 has different protocols, TCESD1/7 has different protocols, as does the “county plan” that includes TCESD: 3,6,8,9,10,11,14, as well as the Travis County Parks. This is (purposefully?) not even mentioned and gives a very distorted view of the Travis County TX EMS system, seemingly singling TCESD2 out as an outlier. This is clearly NOT the case.

Another contention is that “there are not many differences between the 2 protocol documents [ATCEMS vs. TCESD2]”... (p90) and recommends we use ATCEMS protocols. Even a cursory glance at our protocols vs ATCEMS shows TCESD2 protocols are 106 pages in total. ATCEMS is 370 pages. There are many reasons why we produced our own protocols, which include eliminating redundancy, updating them (which we do continuously), and ensuring the protocols are usable, easily accessible, usable and readable format.

In the same paragraph, there are multiple references to RSI/intubation (advanced airway skills p.90). The purported experts who authored this section are not physicians, nor are they actively practicing paramedics. They conflate all advanced airway management with tracheal intubation. Airway management is complex, multi modal, and encompasses a lot more than placing a tube constructed of polyvinyl chloride into the trachea. As non practitioners of advanced airway skills, the authors at AP Triton clearly are not up to date on recent trends and research in this area of medicine (cite Bengner’s work). Suffice it to say, I, as medical director, have a vested interest in ensuring our prehospital practitioners are up to date on the latest airway management practices and skills. As a board certified Emergency Physician, who has been practicing full time for over 20 years (mostly at trauma centers), and having been involved in EMS for the same amount of time, I am capable of managing our systems approach to airway management. AP Triton is not. ATCEMS has a small percentage of their paramedics credentialed to perform RSI. A thorough examination of ATCEMS would have revealed this.

The AP Triton report also states *“additionally, based on interviews with ATCEMS, the different protocols performed by TCESD2 and different EMS billing practices are excluding auto-aid into the City of Austin.”* (p.9). Also *“Both previous analyses consider only the resources of TCESD2 and do not include any automatic aid responses from other agencies. TCESD2 needs to consider setting up automatic aid responses from other agencies that could supply resources sooner than TCESD2’s resources.”* (p.66). And page 80 states *“TCESD2 is dispatched by Austin Travis County EMS (ATCEMS), so ATCEMS often provides service demand in the south/west district under auto-aid response but TCESD2 is not permitted to reciprocate.”*

None of these statements are correct. These statements (and others) expose the authors lack of due diligence, research, expertise, and knowledge of not only our system, but the surrounding systems and how we interact. It is appalling to include factually inaccurate and misleading information to policy makers in any area, let alone in areas of public safety.

Several years ago, TCESD2 stood up our own paramedic school in response to workforce shortages in our region. Not enough slots in other programs, timing and costs are some of the many reasons we did this. It allows for our own folks to stay “in house” to achieve more advanced certification. This has been an excellent program for TCESD2 for both recruitment and retention. The report states “TCESD2 benefits

from an internal initial paramedic certification program” - a statement that I wholeheartedly agree with. Our program has an excellent track record, and we have standards that meet and usually exceed both state and national requirements. To say “Based on the limited number of patient contacts in the system, AP Triton recommends expanding the clinical training program to include a high-volume EMS transport system such as ATCEMS” is just a misinformed opinion. Again, we meet and usually exceed numbers needed for certifications. The report also states “AP Triton recommends a cost/benefit analysis relating to the provision of an initial paramedic certification program. There appears to be limited participation by surrounding agencies, and the overall cost per student seems too high. Consideration of a regional program may prove to be more cost-effective.” Clearly, this program was started, and continues, because it is cost effective for our organization. The statements also ignore the realities of EMS education in central TX on many levels, including costs, time, lost wages, etc.

I work with an excellent group of fire and EMS professionals who strive each and every day to provide the very best care to our community. I am truly proud to work for and with TCESD2/Pflugerville Fire Department.

Michael Zimmerman, M.D.

Appendix D: After Action Review - Winter Storm (Uri) Response 2021

Situation:

Approximately 8 inches of snow (wintery mix with sleet and ice) fell in the greater Austin area with sub freezing temperatures ranging from 9 degrees to 25 degrees for 7 days. Reported rolling blackouts actually resulted in total blackouts which subsequently led to several utility water pump failures. Parts of the District, mainly including the City of Pflugerville and Manville, had total water system failures for more than 4 days.

The District ran 923 calls for service in a 7 day period. This is about the average number of calls the District runs in one month, about a 300% increase in call volume. Automatic aid was limited on the fire side, and aid of any sort was unreliable for ambulances as all EMS transports systems were in a disaster state, including the for-profit systems.

Strengths:

- Ample number of staff to staff additional units: 3 brush trucks, additional command team, and 7-8 ambos, District Operations Center (DOC) staffed.
- Additional staff brought into the DOC were able to quickly adapt to the workloads and properly manage the intake and dispatch of units, including resources status tracking, fuel planning, eventually rest period planning, call decompression. I think that this developed new skills and abilities for many of these people to assist us for future large scale events.
- Right-sized our responses given the conditions. Keeping the heavies back for fires only, running brush trucks and light support vehicles, adding the command element and adjusting the responses for box alarms.
- Amended ambulance response to only send a first response unit to lower priority calls to confirm a transport was needed and worked.
- Station generators (with the exception of Station 1 which was in process of being replaced) were instrumental in enhancing our response efforts and continuity of operations, particularly at the DOC for command and control.
- Snow cables for almost every frontline vehicle kept us on the road. I believe this contributed to not only our ability to operate in this environment, but to do so in the safest manner. We are one of very few agencies that did not severely damage or have its fleet incapacitated. Other than a mechanical issue on E211, our trucks kept running throughout the event.
- Risk Reduction staff assisting in the DOC and with non-emergency calls for service (broken water pipes, alarm malfunctions); including ad-hoc public messaging, and follow ups with our multi family management contacts was vital.
- The RRO develops and keeps the R1/R2 contact list and updates it 2x/year. Invaluable when trying to make contact to troubleshoot and tirage these calls.
- The District did not experience medical oxygen supply problems based on the “prepper” mentality of the in-station oxygen supplies and the functional relationship with our O2 supplier for a mid-storm pickup from their facility. Ample O2 was on site to have made it through the whole event without a re-supply.
- Multiple staff members working 96-120 hour shifts. While not ideal, and they were provided breaks, these individuals were extremely committed to the District and response effort.

- Procured food and drinking water early on and established a resupply for all of the staff we brought in given the inability to feed and use water through normal means. This needs to be an established logs program that is sustainable and maintained.

Areas to Improve:

- Continue emergency management assessment & development needs for the entire District. There are major needs in the City of Pflugerville. Need to address critical failures at the city where the District had to divert resources to assist with helping them with their responsibilities (fuel and water needs).
- Response would have gone better had we stood up the DOC on Sunday, filled formal ICS positions: IC, OPS, Plans, Logs and placed those sections in service ahead of the storm. We were essentially operating in an initial response mode for the duration of the incident, until we caught up on Thursday. The operational period was originally expected to be much shorter than it actually turned out to be.
 - We have to consider utilization of the conference areas to separate functions as needed. Streamlining incident response and coordination should be considered and shrunk into a smaller room (for broken arrow operations).
- Consideration for temporary adjustments to shift change time to a later time. This could help facilitate personnel commuting to work after daylight, potential that road conditions could be improved, other factors that we have seen with past ice related events. Was true in this event as well, locally, we saw improved road conditions during daylight hours and as roads were more traveled.
- Fleet & Comms
 - Develop a winter preparedness specific supply plan and have readily available in storage for events (i.e. Anti-gelling additives, reserve chains/cables, pear burners, propane cylinders, propane garage heaters, outside truck water treatment, etc.)
 - Finish Radio deployment and assign spare handheld radio cache(s) for use
 - On-Site fuel options based upon usage metrics. 72,96,120 hour (logical methodology for sustaining operations independently for a defined period of time) fuel supply depot.
 - Due to multiple fuel pumps being down throughout the area, fuel man cards options were limited and not available most times. We had to use AC, BC, BAT, SAFE, and CPT credit cards to fill gas. This added a layer that caused operational drag. Experienced a fraud hold, and then we're concerned about hitting credit card limits. Jessica, working from home with limited power/internet, was able to raise the limit on the Training Division Chief's card. Had we not been able to reach Jessica, we would have problems. An employee used a personal credit card to fuel a truck as another example. Need to look at extraordinary spending backup plans. City of Pflugerville staff experienced maxed out credit cards for their fleet at Texcon and added to their fuel problems as a worst case example.
 - Re-evaluate 4x4 (or AWD) capability for all District vehicles, to include ensuring we have enough trucks that have this capability to include maintaining a light support fleet of 4x4 vehicles that the District can fall back on in the event of snow/ice. While snow is rare, ice happens a little more often and has similar needs. Need to consider this with re-evaluation of support vehicles based on organizational changes.
 - Inexperience with snow cables relating to the proper speed and driving techniques led to an inordinate amount of cable breakages and a scramble to keep them operational by

- repairing or rigging them. Need a training program, even if its a just in time training package, should be included with our winter operations SOG.
- Re-visit and update if needed the broken arrow radio plan. VHF back-up to the 800 system. WilCo went down in this event. It was short but still failed.
 - Ensure all Department phones are upgraded to FirstNet, several captains said their phones were not. Verify and correct.
 - More MDC that operate off of the sim card/air card. Consider this for most command MDC.
 - The event further highlighted our needs for communications and dispatch situational status technologies. We were doing paper tracking of units, cross-tabulating from 2 different CAD systems being dispatched in two different ways. We should continue to pursue and advocate for response/status/dispatch technologies that support our abilities to maintain status awareness of units and be able to assist us when we need to manage our units from a central CAD.
 - Under winter ops vehicle policy extended periods of sub-freezing address after a pump has been charged that it needs to be drained again and valves/threads/etc. re-treated, how to rehab pumps after a freeze.
- Facilities:
 - Establish winter practices to prevent freezing, systems knowledge, etc. This should include operating times and tank fuel quantities for generators.
 - Facilities personnel need to be working in the DOC. Staff should be available to address needs that arise and relieve OPS staff members from these duties. These staff employees need to be proactive and responsive to the changing conditions in order to reduce impacts to stations, facilities, etc. (i.e. Staff should be onsite and working during the thawing period to catch leaks, etc.)
 - We should be aware and use all equipment resources if necessary. We have two generators (old military and air/light trailer) that could have been put into service to provide some form of electrical power at central.
 - What are generator fuel tank capacities, run times based on loads and what do our loads look like in a typical daily environment and what would put us into a load that is greater than 50% and 75% of the generator.
 - Develop a better system to get the occupancy contact information to the responding units. Ensure that the information is updated on MDC pre-plans. Suggest expanding that list to include other sprinklered occupancies.
 - Regional oxygen scarcity preparation. Oxygen supplies were exhausted or nearly exhausted in 48 hours for many EMS entities and hospitals. Power outages lead to oxygen generator failures for health-compromised citizens, they then call 911 for help or go to the local hospitals for O2. In this event, the FD was involved in all aspects, as normal vehicles could not travel due to weather conditions. The amount of sick and respiratory related EMS calls were enormous.
 - Hospitals then depleted their O2 supplies because they had so many PT's that just needed O2. This led to the highly reactive practice of bringing a PT's O2 generator with them to the hospital.

- Normal oxygen delivery companies were unable to operate due to road conditions, weather, and unavailability of staffing
- We need to develop plans for establishing an Oxygen distribution center in coordination with partnering facilities. Large tanks with regulators and manifolds could be used to supply “oxygen waiting rooms” with PT’s that just need oxygen. This concept was discussed with BSWPF and partially put in place. Any assembly-type environment with electricity, HVAC, and restrooms could be used as a temporary holding area instead of requiring ambulances and hospitals.
- Have one or more dedicated units for only this process, an ambulance operating in a non-emergency function and as a public assistance alarm could also be utilized and schedule PT pick-ups. Any vehicle could be used to pick up portable O2 generator batteries, charge them, and then later drop them off...and go on a rotation until the power returns.
- Need to evaluate how hard is it to establish an O2 cascade fill system whether temporary or permanent?
- Secondary dispatch capabilities (enhancement to broken arrow)?
 - Is it possible (not preference of AFD) for us to be able to assign calls directly from a designated command unit. In this case, CM202...imagine the simplicity of being able to drop units on calls from the mdc or a computer login after it was assigned to the DOC/CM202
 - Or a remote or mini-console?
 - Have the “not possibles” been proven or just accepted from CTECC?
 - If the above items are truly not possible, is it possible to have a crew report to dispatch and operate from a console for ESD2 (task book and training approval, etc.)?
- District Operations Center (DOC)
 - Preplan workstations in the DOC to run ICS functions to include;
 - Desktop/laptops, cache of power strips, extension cords, HDMI, etc.
 - Ability to plug the large screens into the generator fed outlets and set them to display from other workstations/laptops. Include the whiteboard in the small conference room in this.
 - Several small UPS, including PM so they are maintained, to bridge workstations when power goes off and generator picks up. Interruptions caused the lag when power went out before the generator kicked on, causing operational delays..
 - Explore if other circuits in the admin building can be added to the generator
 - Cache of cots/air mattress for DOC
 - Need a cache of building entry cards for the admin building to be deployed in these events. We had to chock doors open compromising security so that employees without access could come and go. Approximately 15 cards should be adequate.
 - Document templates for call tracking, fuel station availability, etc. Several have been set up now. Ron spoke with Victor about some enhancements to the spreadsheets they used that would reference cells in other sheets for apparatus availability.

Weaknesses and Areas of Concern for the City of Pflugerville:

- No dedicated emergency management staff. Concerned about lack of emergency management funding, planning, training, exercising, capability, ability, and aptitude for large scale emergency response and mitigation within the city.
- Unsure of what steps have been taken to harden City owned infrastructure (ex: generators and fuel supply)
- City Manager and Police Chief absent from regular Monday information sharing meeting on 2/15. No communication from the City Manager throughout the event.
- Only two cop cars equipped with snow cables.
- No fuel resupply plans. Captain Stokes coordinated fuel resupply for city staff.
- No local EOC activation until 2/16/2021 1114hrs.
- District staff had to instruct city staff on how to submit resources requests.
- City did not notify the District that water supply was completely down in the City, leaving no water for fire suppression. Perkins saw mention of loss of water service on social media. Formal notification should have occurred so the District would be prepared to alter suppression tactics. .
- The Chief of Police retired in the middle of the event.
- AC Smith was available and did his best to communicate with the District. Was receptive and helpful with ensuring the city assisted with handling water shut off for broken water pipes, and some limited sanding occurred at our station aprons.

Timeline of Events:

- **Friday, February 12th**
 - NWS issues winter storm warning for the Austin metro area.
- **Saturday, February 13th**
 - District begins relocating apparatus to be kept in doors
 - Snow cables are checked and readied for all units. This includes capability to upstaff brush trucks, ambulances, command, and support abilities.
 - Total call volume for the shift: MED - 26 FIRE - 14 = 40 total (average call volume)
- **Sunday, February 14th**
 - Perkins shares EOC winter weather meetings with all command staff, directs shift commanders to attend.
 - Anderson shares notes. Austin energy issues significant warning about “Perfect Storm” event coming to the region based on weather and power outages. Most public safety agencies in Travis County already reporting multiple fleet accidents.
 - All apparatus are required to place snow cables on their apparatus until further notice and to prepare for extreme conditions.
 - Three brush trucks with cables were placed in service and used as fire EMS Squad units, running a large portion of the alarms on the iced over roads

- Modified response plans begin using Safety 201 for alarms
- BSW Pville requests urgent assistance to help clear ice from their parking lot for driveway access including ambulance bay.
- By 1200 hours, CATRAC region declared closest hospital only transport based on conditions, ATCEMS moved to fire units evaluating P4 & P5 PT's prior to sending ambulances, which also applied to our response.
- Coordination occurred between TSCO and PPD to mark stranded vehicles on and off the road to reduce duplication on checking them for occupants.
- Cots delivered to stations for personnel coming in early based on the weather and road conditions.
- Media reports energy officials stating rolling blackouts are possible as winter storm escalates demand for electricity.
- Total call volume for the shift: MED - 42 FIRE - 40 = 80 total
- **Monday, February 15th**
 - 0100hrs power begins going out at some facilities.
 - 0515hrs power went out of administration and stations 1, 3, and 4.
 - Significant increase in call volume begins.
 - Broken arrow protocol is initiated with the Shift Commander taking all calls for the District and then assigning them manually for better management of District resources. AFD/ATCEMS communications are overloaded at this point.
 - The District Operations Center stood up at 0700 (level 2, 24 hour staffing).
 - Chief Moellenberg and Perkins attend weekly COVID information sharing meeting with AC Smith (no other City staff present). We shared in the meeting:
 - Our DOC was stood up and we were upstaffing for the winter storm. We were seeing an increase in call volume, on generator power at most of our stations..
 - AC Smith advised he was at his house, his spouse was sick, but was monitoring the situation. Current situation was the PD only had enough snow cables for two patrol cars and they were working to get officers in city utility vehicles. The city did not have very much sand, but was going to treat the bridges, and would be available to assist with our aprons and hospital access.
 - Significant call volume continued to increase.
 - Oxygen dependent patients began requesting assistance with oxygen due to not having power for concentrators.
 - EOC Briefing ATCEMS advised there were no ambulances available other than for high priority calls, a comment was made that there were only 10 ATCEMS units currently in service in all of Travis County. AFD reports 16 fire apparatus either struck, damaged, or inaccessible. ATCEMS advised a modified response plan in place, sending first response vehicles to triage on scene first and then request a medic unit if absolutely needed.

- IAP developed for 2/16/2021 with primary objectives being continuity of operations, maintaining services to the community, fuel resupply, additional staffing to prepare for multiple day event, with unprecedented high call volume. Voluntary recall issued.
- Limited refuel options were realized as many gas pumps in the area did not have power to operate. Additional concerns for diesel in our units and in tanks that are not treated or heated could begin gelling at 15 degrees is discussed.
- Per our plan the ISD is a primary backup resource for fuel, as they have their own depot. However, it was determined that their yard was without power and therefore their pumps were not functioning. Secondary plans included use of high reliability relationships with local vendors. These plans are implemented, and along with dedicated commercial fuel station monitoring by the DOC, operations were sustained.
- The District staffs two additional medic units due to call demand and information that there are no ATCEMS available is received. All units are quickly committed and run non-stop for the next 24 hours. There are periods where no units are available and calls are placed in que. First response is maintained to these incidents. One incident has a first response crew waiting for approximately 2 hours for a District ambulance due to no units being available for that period.
- District non-emergency phone line begins receiving several calls for questions related to power and city supplied water. Additional out of area callers requesting that we check or assist family members who live in Pflugerville who have no power or water. This continues daily till Thursday.
- District received a request from ATCEMS Commander Adam Johnson to assist the Wellmed clinic in Pflugerville, which was without power, with relocating 1000 doses of C19 vaccine to a clinic in Round Rock. They have no means to access the clinic and retrieve the vaccines. District accepts the mission and successfully completes it.
- The District received a request from Adam Johnson to evacuate 7 persons from an assisted living facility in the District to a facility in the City of Austin. District accepts the mission and successfully completes it.
- Engine 211 goes out of service due to a broken tie rod.
- Cell phone service begins to degrade and become unreliable. First net phones appear to maintain a usable level of service throughout the event.
- Governor Abbott states “The planned blackouts did not go as planned. Instead of rolling blackouts, the outages have lasted hours”. They would actually be days for many, and ultimately lead to widespread domestic water supply system failures.
- BSW Pflugerville goes on full diversion. Reports they are on generator power, and have no water service. Concerns about continuity of operations are expressed.
- District experiences loss of water at facilities. Water service to the District response area was interrupted and considered unreliable for fire suppression. Alternative firefighting operational guidelines were implemented and communicated that included defensive operations would be the primary strategy used for structure fire incidents, contain fire to building, block of origin.
- Total call volume for the shift: MED - 117 FIRE - 89 = 206

- **Tuesday, February 16th**

- District experiences sustained 300% call volume increase for over 48 hours.
- Emergency recall issued which included canceling vacation and holiday leave til Friday 2/19 (and then later extended to the 2/20).
- CAMOC asks the District to assist BSW with refueling their generator and water supply needs. District staff assist and offer for resupply with fuel utilizing District contracts but advised we cannot assist with potable water. Unmet need communicated in sitrep to EOC. Instructions sent to BSW EMC on how to submit a resource request for this unmet need.
- District staff began assisting the City of Pflugerville with securing refueling vendors for their needs, including the City's generator for their 911 center.
- District begins receiving requests to take discharged patients home from hospitals. These requests are unmet due to limited to no 911 ambulance availability, this is communicated to the EOC as an unmet need, and Austin disaster relief network is offered as a resource for this (local jeep clubs volunteered and began filling this mission). Exceptional work from this organization throughout the County in filling this need.
- Total call volume for the shift: MED - 83 FIRE - 90 = 173
- **Wednesday, February 17th**
 - An eighth ambulance is placed into service to provide a higher level of availability for 911 response and reflex.
 - BC Doyle credit card limit is raised to \$5000 to anticipate ongoing fuel needs as fuel man cards remain unstable.
 - Risk reduction staff reached out to check on the two licensed care facilities in the District. They both report they are managing ok, many patients transferred out. Requesting information about power and water. Licensed Group Homes also contacted with only one reporting an issue (15309 Delahunty evacuated due to water throughout the home).
 - District coordinates with AC Smith to plan for anticipated significant broken water pipe calls as thawing occurs. Plan is for the City to handle as many of these calls in the City as possible in order to decompress some of the calls in the District to handle emergency response.
 - District produces [a how to shut your water off video](#) in an effort to help decompress some of the calls. It is published in the Austin American Statesman and posted by VFIS and Fire Engineering on social media.
 - The City of Pflugerville reports the return of its water service. Low pressure initially, but will improve. Boil notice remains, no ETA for lifting of that notice given.
 - All hospitals are ordered by Dr. Escott to not go on diversion and gives very limited exceptions.
 - Significant efforts from DOC to triage and reduce response needs for broken water pipes and alarm activations. This was done by calling the reporting party and either confirming there was no fire at the location, or re-routing broken water pipes to the City of Pflugerville, and risk reduction staff handling many of these calls.
 - Total call volume for the shift: MED - 57 FIRE - 37 = 94
- **Thursday, February 18th**

- BSW begins accepting patients again.
- Hutto Fire Chief requests assistance with EMS transport mutual aid in the event a WILCO ambulance cannot respond. Perkins agrees to fill requests on a case by case basis based on availability. Never materializes as WILCO EMS capability improves.
- Began seeing an increase in Dialysis patients who are due for treatment begin calling requesting assistance. Strohacker begins working to identify solutions for the situation, including development of protocol to triage these patients.
- Total call volume for the shift: MED - 59 FIRE - 73 = 132
- **Friday, February 19th**
 - Travis County Emergency Management staff (Eric and Fred) advise bottled water is enroute to Austin/Travis county for distribution. They did not know how much or when the water would arrive. A request for assistance from the ESDs for distribution is made. All ESDs agree to assist with distribution in their areas. All request assistance with delivery of water to respective areas, and ESDs can handle management and manpower for distribution. It is acknowledged that most areas have water service, albeit under a boil notice. The obvious concern is that by the time the water gets here, everyone will have full water service. Regardless, discussions centered around the fact that there are residents in Travis County that still do not have water at all, and an effort to provide PODs is necessary. Political sensitivity about the issue is also discussed. A series of 5 additional meetings occurs to discuss further planning. On 2/22 water arrives at the EOC and only 17 pallets are initially allocated for the County. The County decides to send this water to Southern Travis County due to large areas still without water. Last update is that more water is on the way, as early as Monday or Tuesday. District remains ready to assist with Distribution in the event this occurs.
 - Email sent to all R1/R2s advising of the need for Fire Watch due to unreliable pressures, busted supply piping and inadequate back-up batteries for life safety systems.
 - Strohacker determines dialysis centers are coming back online and this situation will improve. Treatment and transport guidance is provided to providers.
 - Total call volume for the shift: MED - 39 FIRE - 70 = 109
- **Saturday, February 20th**
 - Call volume remains high, 140% above normal. However, begins to trend down. Broken water pipes and fire alarms continue to contribute to increased calls volume.
 - With higher temperatures, it is anticipated that call volume will continue to drop.
 - Demobilization of upstaffed resources begins.
 - Total call volume for the shift: MED - 42 FIRE - 54 = 96

Letters of Appreciation:

- Cash Construction for filling our generators.
- ISD for offering their fuel to the FD as they have done in the past.
- “Yankee” for topping off our trucks and delivering fuel for the City’s 911 communications backup generator through local relationships. He drove his vehicle when many vendors were not able to operate.

Appendix E: Resources Cited

1. Alesso-Bendisich, Franziska. July 23, 2020. Forbes. Millennials Want A Healthy Work-Life Balance. Here's What Bosses Can Do. Url: <https://www.forbes.com/sites/ellevate/2020/07/23/millennials-want-a-healthy-work-life-balance-heres-what-bosses-can-do/?sh=4ffff55e7614>
2. Al Lula, Tian, Moy, et al., EMS World. The EMS Suicide Threat. Url: <https://www.hmpgloballearningnetwork.com/site/EMSWorld/1223779/ce-article-ems-suicide-threat>
3. Benger, J., et al., August 28, 2018. JAMA. *Effect of a Strategy of a Supraglottic Airway Device vs Tracheal Intubation During Out-of-Hospital Cardiac Arrest on Functional Outcome*. URL: <https://jamanetwork.com/journals/jama/fullarticle/2698493>
4. Buchanan, Henche, Parr, et al., June, 2021. AP Triton. FIRE & EMS ASSESSMENT Service Options for the City of Pflugerville. Url: <https://www.pflugervilletx.gov/home/showpublisheddocument/9326/637598824552500000>
5. BBC, News. June 2, 2021. *Amazon warehouse injuries '80% higher' than competitors, report claims*. Url: <https://www.bbc.com/news/technology-57332390>
6. Center for Disease Control. Accessed on 8/1/2021. The National Institute for Occupational Safety and Health. Url: <https://www.cdc.gov/niosh/firefighters/health.html>
7. City of Pflugerville. June 21, 2021. City Council Worksession. Url: https://pflugerville.granicus.com/player/clip/389?view_id=1&redirect=true
8. CMS. January 1, 2020. New Medicare Ground Ambulance Data Collection System. Url: <https://www.cms.gov/Center/Provider-Type/Ambulances-Services-Center>
9. Davis, Gene. January 27, 2015. Suicides highlight rift between EMS staff, managers. Ur: <https://www.austinmonitor.com/stories/2015/01/ems-tragedies/>
10. Farnsworth, John. Status.HR. June 26, 2018. HOW BIG SHOULD YOUR HR TEAM BE? THE ANSWER MIGHT SURPRISE YOU. Url: <https://stratus.hr/2018/06/26/hr-team-size/>
11. Federico, Salfi, et al. May 27, 2020. NCBI. Effects of Total and Partial Sleep Deprivation on Reflection Impulsivity and Risk-Taking in Deliberative Decision-Making. Url: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7261660/>
12. FEMA. June, 2012. Operational Templates and Guidance for EMS Mass Incident Deployment. Url: https://www.usfa.fema.gov/downloads/pdf/publications/templates_guidance_ems_mass_incident_deployment.pdf
13. Firefighter's Support Alliance. May 16, 2019. 5 Long-term Health Risks for Firefighters. Url: <https://firefightersupportalliance.com/5-common-long-term-health-concerns-of-being-a-firefighter/>
14. Fry, Richard. April 11, 2018. Pew Research Center. Millennials are the largest generation in the U.S. labor force. Url: <https://www.pewresearch.org/fact-tank/2018/04/11/millennials-largest-generation-us-labor-force/>
15. Gnugnoli, D., et al. July 23, 2021. *EMS Field Intubation*. NCBI. Url: <https://www.ncbi.nlm.nih.gov/books/NBK538221/>

16. Graham, Gordon. July 15, 2020. Lexipol. High-Risk, Low-Frequency Events in Public Safety. Url: <https://www.lexipol.com/resources/blog/high-risk-low-frequency-events-in-public-safety/>
17. Jacobs, P. E., et al. January 2014. *Advances in Prehospital Airway Management*. NCBI. Url:
18. JEMS, Ambulance Crew Configuration: Are Two Paramedics Better Than One? Url: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3982372/>
www.jems.com/operations/ambulance-crew-configuration-are-two-paramedics-better-than-one/
19. Min, Sarah. March 7, 2019. CBS News. The 10 most and least stressful jobs in America. Url: <https://www.cbsnews.com/news/10-most-and-least-stressful-jobs-in-america/>
20. Meyers, Brent, M.D., et al. 2020. ESO. 2020 ESO EMS Index, COVID-19 Special Edition.
21. NFPA 1710. 2020. Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.
22. NFPA 1720. 2020. Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments.
23. PFD Training Division. (September 22, 2018). *Active Shooter Drill*. Vimeo. URL: <https://vimeo.com/291266608/ac6d320274>
24. Provident Insurance Solutions. Accessed on 8/1/2021. The Effects of Stress and Overtime on America's Firefighters. Url: <https://www.providentins.com/the-effects-of-stress-and-overtime-on-americas-firefighters/>
25. RAND. CMS Alliance to Modernize Healthcare (The Health FFRDC) A Federally Funded Research and Development Center. July 30th, 2019. Medicare's Ground Ambulance Data Collection System: Sampling and Instrument Considerations and Recommendations. Url: <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AmbulanceFeeSchedule/Downloads/Ground-Ambulance-Data-Collection-System-Sampling-Instrument-Considerations-Recommendations.pdf#page=82>
26. Thompson, Kelsey. KXAN. August 3, 2021. Austin EMS requests \$1.2M in active attack training post-6th Street shooting. Url: <https://www.kxan.com/news/local/austin/1-3m-decrease-in-ems-funding-proposed-in-austin-city-budget/>
27. Travis County ESD No. 2. Vimeo Channel. Active Shooter Drill. Url: <https://vimeo.com/291266608/ac6d320274>
28. United States Department of Labor. Wage and Hour Division. Fact Sheet #8: Law Enforcement and Fire Protection Employees Under the Fair Labor Standards Act (FLSA). Url: <https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/whdfs8.pdf>
29. Lopez, Steven. November 21, 2020. Los Angeles Times. Want to make a fortune in overtime? Apply today to the L.A. Fire Department. Url: <https://www.latimes.com/california/story/2020-11-21/los-angeles-firefighters-make-a-bonanza-in-inspection-overtime>
30. Wright, Cyndi. September 27, 2018. Austin Statesman. Bastrop county to change EMS provider. Url: <https://www.statesman.com/article/20140324/NEWS/303249605>